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Dispersed Flow Film Boiling in Rod Bundle Geometry—Steady State Heat Transfer Data and Correlation Comparisons

G. L. Yoder
D. G. Morris
C. B. Mullins
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D. A. Reed

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DISPERSED FLOW FILM BOILING IN ROD BUNDLE GEOMETRY – STEADY STATE HEAT TRANSFER DATA AND CORRELATION COMPARISONS

G. L. Yoder C. B. Mullins
D. G. Morris L. J. Ott
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NOMENCLATURE

A	bundle flow area
D_e	hydraulic diameter - 0.0106 m (0.0348 ft) for THTF test section
$f(X)$	function of quality in Groeneveld 5.7 equation
G	mass flux
h	heat transfer coefficient
h_{fg}	latent heat of vaporization
Δh	inlet subcooling
I	subnumber of levels used in stratified sampling technique
i	current
k	thermal conductivity
P	pressure
Pr	Prandtl Number
Q	heat flow rate at any location
R	rod linear resistance
r	radius
Re	Reynolds number $\left(\frac{GD_e}{\mu}\right)$
T	temperature
V	volumetric flow
X	equilibrium quality
X_a	actual flow quality

<u>Greek</u>

α	void fraction
μ	viscosity
ρ	density
σx	uncertainty in the parameter x

Subscripts

B	bulk vapor conditions
b	burnout (dryout)
BN	boron nitride
c	correlation (corr)
con	contact resistance
e	experimental (exp)
f	saturated liquid conditions
fl	film
G	at level G
g	saturated vapor conditions
GD	Groeneveld-Delorme
i	index
is	inside sheath
o	inlet
s	saturation
ss	stainless steel
surf	rod surface
TC	thermocouple
v	actual vapor conditions
w	rod surface

Supercripts

'	per unit length
''	per unit area
*	perturbed value

SUMMARY

A series of steady state experiments (test series 3.07.9) were completed October 1, 1981, at the Oak Ridge National Laboratory Thermal-Hydraulic Test Facility. The tests provide steady state film boiling heat transfer data in rod bundle geometry. The data are to be used in assessing film boiling heat transfer correlations used in reactor analysis codes. The experiments conducted were high-pressure and high-temperature steady state tests with water flowing upward through an 8 x 8 rod bundle. The rod bundle used in the experiments contains four unheated rods and has a flat axial power profile. The heated pin diameter and rod pitch are typical of later generation presurized-water reactors with 17 x 17 fuel assemblies. The bundle is heavily instrumented with thermocouples, and two flow measurement sites are positioned at each end of the test section containing the rod bundle.

Equilibrium fluid conditions within the bundle can easily be calculated using mass and energy conservation considerations. Accurate calculations are possible because of the steady state nature of the tests. However, nonequilibrium conditions probably exist within the bundle, and a more sophisticated calculational method is needed if actual bundle fluid conditions are desired.

Comparisons were made between experimentally determined heat transfer coefficients (heat fluxes), those determined from six film boiling correlations, and one single-phase vapor correlation. These correlations are:

1. Dougall-Rohsenow,
2. Dougall-Rohsenow (wall Prandtl number),
3. Groeneveld 5.7,
4. Groeneveld 5.9,
5. Condie-Bengston IV,
6. Groeneveld-Delorme, and
7. Dittus-Boelter.

Uncertainties in experimental heat transfer coefficients and in three film boiling heat transfer coefficients were also calculated (Dougall-Rohsenow, Groeneveld 5.9, and Groeneveld 5.7).

A comparison between results of the steady-state film boiling tests and the three transient film boiling tests (3.03.6AR, 3.06.6B, and 3.08.6C) indicates that conclusions are similar for all the tests. The heat transfer coefficients of the Dougall-Rohsenow correlation are often high (by as much as a factor of 2.5) compared with experimentally determined heat transfer coefficients discussed in this report. This is possibly caused by thermodynamic nonequilibrium in the flow. Because the Dougall-Rohsenow correlation is basically a Dittus-Boelter correlation for vapor (not accounting for wall-to-liquid heat transfer and assuming perfect vapor-to-liquid heat transfer), an error in the fluid quality will result in an error in the vapor Reynolds number ($Re_v = G \times D_e/\mu_v \alpha$) used in the correlation. Therefore, the heat transfer coefficient produced would be in error. Nonequilibrium also implies that liquid can be present in the flow when equilibrium qualities are >1. This also reduces the vapor Reynolds

number compared with equilibrium assumptions and would cause the Dittus-Boelter single-phase vapor correlation (assessed only when equilibrium quality was >1) to overpredict heat transfer coefficients. The Groeneveld 5.7, Groeneveld 5.9, and Condie-Bengston IV correlations perform better than the Dougall-Rohsenow correlation. The Groeneveld-Delorme correlation predicts heat fluxes lower than experimental fluxes near dryout but improves as the distance from dryout increases.

DISPERSED FLOW FILM BOILING IN ROD BUNDLE GEOMETRY – STEADY STATE HEAT TRANSFER DATA AND CORRELATION COMPARISONS

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ABSTRACT

Assessment of six film boiling correlations and one single-phase vapor correlation has been made using data from 22 steady state upflow rod bundle tests (series 3.07.9):

1. Dougall-Rohsenow,
2. Dougall-Rohsenow (wall Prandtl number),
3. Groeneveld 5.7,
4. Groeneveld 5.9,
5. Condie-Bengston IV,
6. Groeneveld-Delorme, and
7. Dittus-Boelter.

Bundle fluid conditions were calculated using energy and mass conservation considerations. Results of the steady state film boiling tests support the conclusions reached in the analysis of prior transient tests 3.03.6AR, 3.06.6B, and 3.08.6C. Comparisons between experimentally determined and correlation-predicted heat transfer coefficients indicate that the Dougall-Rohsenow correlation often overpredicts the heat transfer coefficient, while the Groeneveld 5.7, Groeneveld 5.9, and Condie-Bengston IV correlations tend to be in better agreement with the data. The Groeneveld-Delorme correlation underpredicts heat fluxes near dryout but improves as distance from dryout increases. The Dittus-Boelter correlation, which tends to overpredict the heat transfer coefficient, was evaluated only when equilibrium qualities were >1.

---

1. INTRODUCTION

In flow boiling systems, a transition in flow pattern occurs when the liquid becomes depleted at the heated (or hot) surface. This is the dryout or burnout point, which signals a significant change in the type of heat transfer mechanism important at the surface. Upstream of dryout, heat transfer is primarily from the surface to the liquid in contact with it, resulting in high heat transfer coefficients and low surface temperatures. Downstream of dryout, heat transfer is primarily to the vapor, and heat transfer coefficients are much lower with correspondingly higher surface temperatures. Surface temperatures downstream are high enough to prevent intimate liquid-surface contact and can cause material failure.

Therefore, characterization of the heat transfer in this regime, termed the film boiling regime, is very important.

A significant amount of film boiling experimental data is available. Single-tube experiments for both water[1-3] and refrigerants,[4-6] along with tube bundle experiments with water as coolant,[7] have been conducted and used in developing dispersed flow predictive schemes.

In general, analysis techniques fall into two categories, correlational and phenomenological.

Correlational techniques have been used by several investigators. Typically, the correlation takes the same form as a single-phase heat transfer coefficient

$$Nu = A\ Re^{a}\ Pr^{b}\ ,$$

with modifications to account for such factors as slip in the flow and local vapor velocity. A good review of such correlations is presented in Ref. 8.

Phenomenological techniques have also been used to predict film boiling heat transfer. This type of analysis usually involves integrating the two-phase transport equations stepwise along the flow path beginning at the dryout point. Some analyses include drop-wall effects,[9,10] while others assume that these effects are negligible.[1] This type of analysis has also been used for various fluids other than water[11,12] and has met with varying degrees of success.

Both Chen[13] and Groeneveld[14] have attempted to combine the correlational and phenomenological techniques. Both assume that a single-phase heat transfer coefficient can adequately describe the heat transfer in film boiling. A correlation for actual quality (including the effects of nonequilibrium) is then developed based on known flow conditions.

This report compares several of the correlational models with experimental data.

A series of 22 steady state film boiling experiments (test series 3.07.9) was completed October 1, 1981, at the Oak Ridge National Laboratory (ORNL) Thermal-Hydraulic Test Facility (THTF). These experiments provided steady state data for rod bundle film boiling over a range of flow conditions. Tests such as these provide accurate bundle fluid conditions and rod surface conditions to assess or develop film boiling heat transfer correlations. These tests also provide a means of obtaining data in the high-flow film boiling data ranges requested by the Nuclear Regulatory Commission (NRC) Office of Nuclear Reactor Regulation (NRR).[15] This report presents an evaluation of steady state rod bundle post-critical heat flux (CHF) heat transfer. The following seven correlations are assessed in this document:

1. Dougall-Rohsenow,[16]
2. Dougall-Rohsenow [wall Prandtl number (Pr)],[17]
3. Groeneveld 5.7,[18]
4. Groeneveld 5.9,[18]
5. Condie-Bengston IV,[19]
6. Groeneveld-Delorme,[14] and
7. Dittus-Boelter.[20]

The experimental data were obtained from high-pressure, high-temperature, steady state tests with water flowing upward through the rod bundle. Assessments of the seven correlations were made for all the steady state tests. The test conditions for each run are shown in Table 1.

Table 1. THTF steady state upflow film boiling data ranges

Test	Pressure MPa (psi)	Mass flux kg/m²·s [lb_m/(ft²·h) x 10^5]	Average heat flux kW/m² [Btu/(ft²·h) x 10^5]	X_b	X_o	X_G
B	12.76 (1849.4)	713 (5.25)	910 (2.9)	0.373	−0.107	1.039
C	12.46 (1805.3)	334 (2.46)	560 (1.8)	0.684	−0.179	1.320
D	12.75 (1847.3)	518 (3.81)	690 (2.2)	0.541	−0.154	1.052
E	13.2 (1908.0)	593 (4.37)	710 (2.3)	0.482	−0.155	0.950
F	12.62 (1829.6)	255 (1.88)	380 (1.2)	0.886	−0.180	1.175
G	12.54 (1817.6)	249 (1.84)	320 (1)	0.929	−0.171	0.995
H	8.89 (1288.9)	256 (1.89)	417 (1.3)	0.870	−0.146	1.088
I	9.19 (1331.5)	362 (2.67)	550 (1.8)	0.881	−0.087	1.087
J	13.37 (1937.3)	732 (5.4)	770 (2.4)	0.406	−0.157	0.819
K	4.38 (634.8)	226 (1.66)	440 (1.4)	0.883	−0.128	1.101
L	8.30 (1202.5)	527 (3.88)	770 (2.5)	0.794	−0.082	1.005
M	8.57 (1242.1)	657 (4.84)	870 (2.8)	0.742	−0.061	0.936
N	8.52 (1234.2)	806 (5.94)	940 (3.0)	0.662	−0.056	0.815
O	5.98 (866.7)	307 (2.26)	530 (1.7)	0.874	−0.071	1.088
P	6.03 (874.3)	520 (3.83)	810 (2.6)	0.771	−0.029	1.018
Q	6.53 (946.7)	325 (2.4)	560 (1.8)	0.838	−0.067	1.118
R	6.57 (952.4)	363 (2.68)	640 (2.0)	0.846	−0.073	1.130
T	11.89 (1723)	240 (1.77)	320 (1)	0.967	−0.135	1.025
U	11.69 (1694.4)	241 (1.78)	320 (1)	0.940	−0.127	1.013
V	12.04 (1744.6)	249 (1.84)	320 (1)	0.957	−0.151	0.986
W	12.55 (1819.5)	256 (1.89)	380 (1.2)	0.882	−0.177	1.170
X	6.01 (871.5)	344 (2.54)	590 (1.9)	0.856	−0.026	1.126

Chapter 2 contains a description of the THTF and the experimental procedure. The data reduction scheme is presented in Chap. 3, and correlation comparisons are presented in Chap. 4. The conclusions are discussed in Chap. 5. A summary of the transient film boiling experiments conducted in the THTF is given in Appendixes A (test 3.03.6AR), B (test 3.06.6B), and C (test 3.08.6C). Appendix D contains experimental data and correlation comparisons for all the tests in the steady state test series.

2. FACILITY DESCRIPTION AND EXPERIMENTAL PROCEDURE

The steady state upflow film boiling experiments (test series 3.07.9) were conducted with the THTF slightly altered from its standard configuration to that shown in Fig. 1 and diagramed in Fig. 2. Notice that the alteration involves locating the pressurizer connection in the pump bypass line rather than just beyond the horizontal outlet spool piece (Fig. 2). The THTF is a heavily instrumented nonnuclear pressurized-water loop containing 64 full-length [3.66-m (12-ft)] rods arranged in an 8 x 8 bundle [D_e = 0.0106 m (0.0348 ft)]; 60 of the rods are electrically heated. The instrumentation located in the outlet nozzle, vertical outlet, and external downcomer spool pieces is listed in Table 2.

Rods 19, 22, 36, and 46 are the four unheated rods in the 8 x 8 bundle, as shown in Fig. 3. Rod 32, normally a heated rod, failed during the testing. Rods 19 and 22 contain thermocouples that extend a short distance from the rod surface into the fluid and thus measure in-bundle fluid

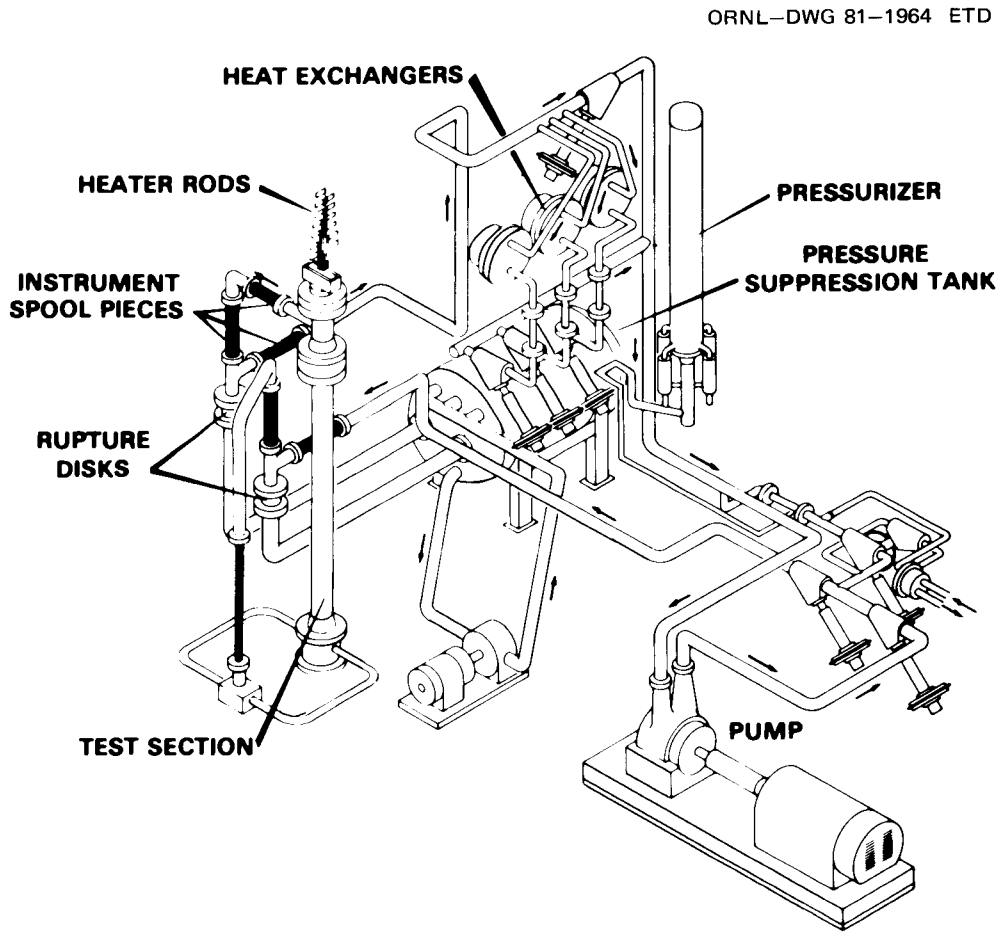

Fig. 1. THTF configuration.

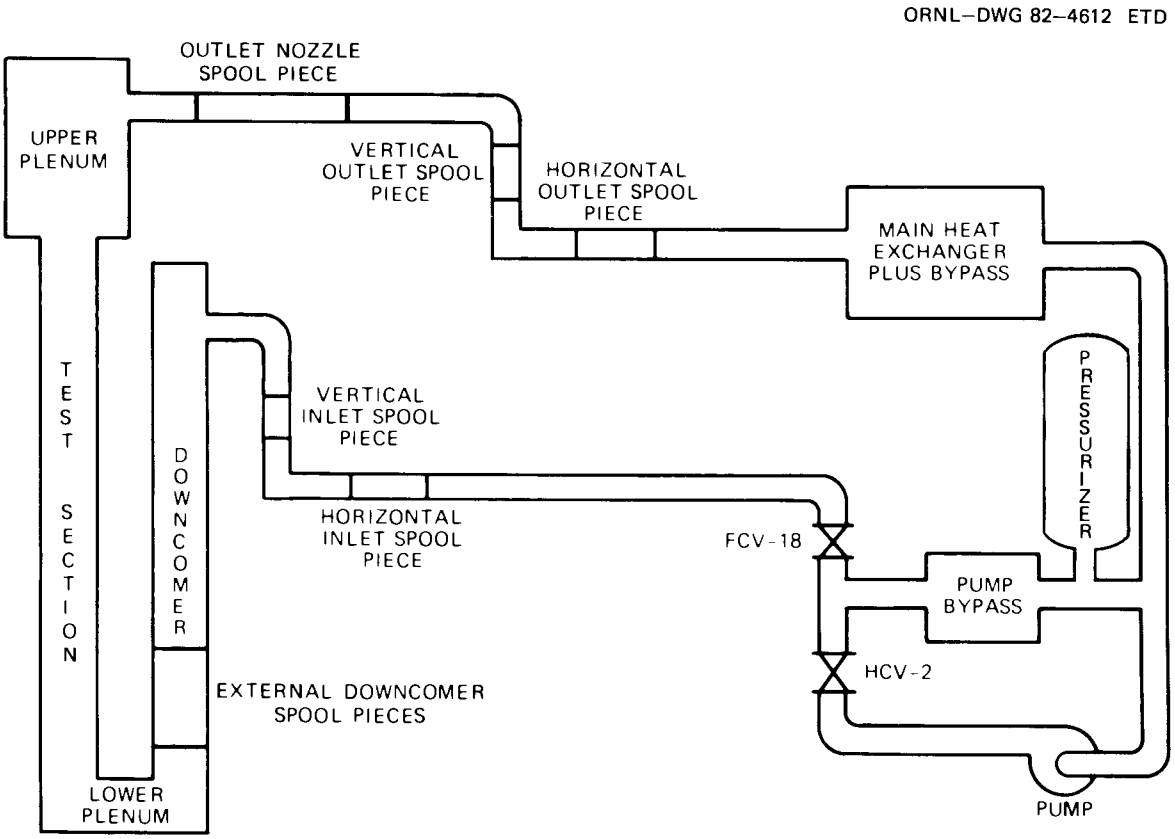

Fig. 2. Diagram of THTF.

Table 2. Instrumentation located in selected spool pieces

Instrument	Outlet nozzle spool piece	Vertical outlet spool piece	External downcomer spool pieces
Turbine meter	FE-202	FE-216	FE-250 FE-260
Drag target	FMFE-206	FMFE-220	FMFE-264
Pressure tap	PE-209	PE-224	PE-258
Thermocouple	TE-208	TE-222	TE-256
Densitometer	DE-204	DE-218	DE-20

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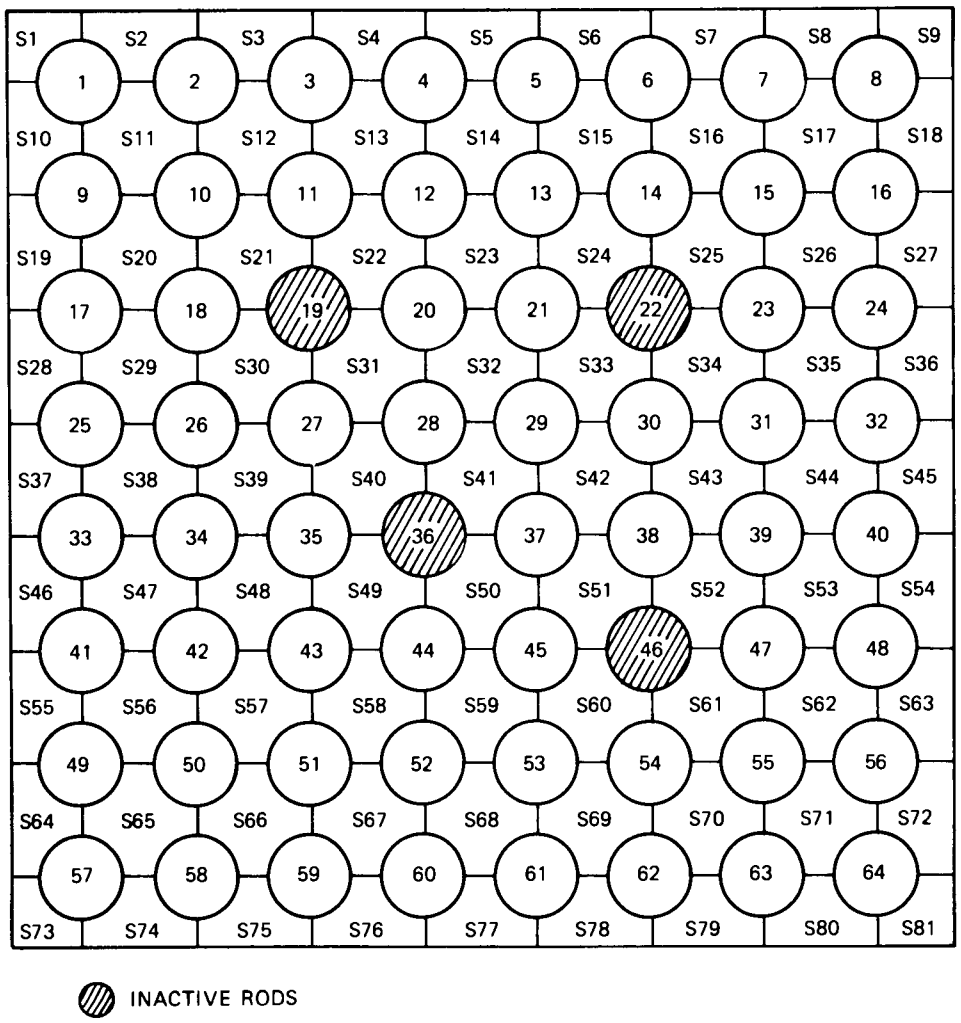

Fig. 3. Identification of THTF heater rods, subchannel locations, and inactive rods in THTF heater bundle 3.

temperature. In-bundle fluid temperature is also measured using thermocouples mounted on the spacer grids (Fig. 4). Rods 36 and 46 contain gamma densitometer instrumentation for measuring in-bundle fluid density. The axial locations of the fuel rod simulator (FRS) thermocouples are shown schematically in Fig. 4. The heated pin diameter is 0.0095 m (0.374 in.) and rod pitch is 0.0127 m (0.501 in.) on a square lattice, typical of later generation pressurized-water reactors (PWRs) with 17 x 17 fuel assemblies. The axial and radial power profile is flat. Figure 5 shows a simplified cross section of a typical FRS.

During steady state operation of the THTF, fluid flows from the pump (Fig. 2) through two flow control valves, through the horizontal inlet spool piece, past the inlet rupture disk assembly, and through a vertical spool piece before it enters the external downcomer. Fluid then passes

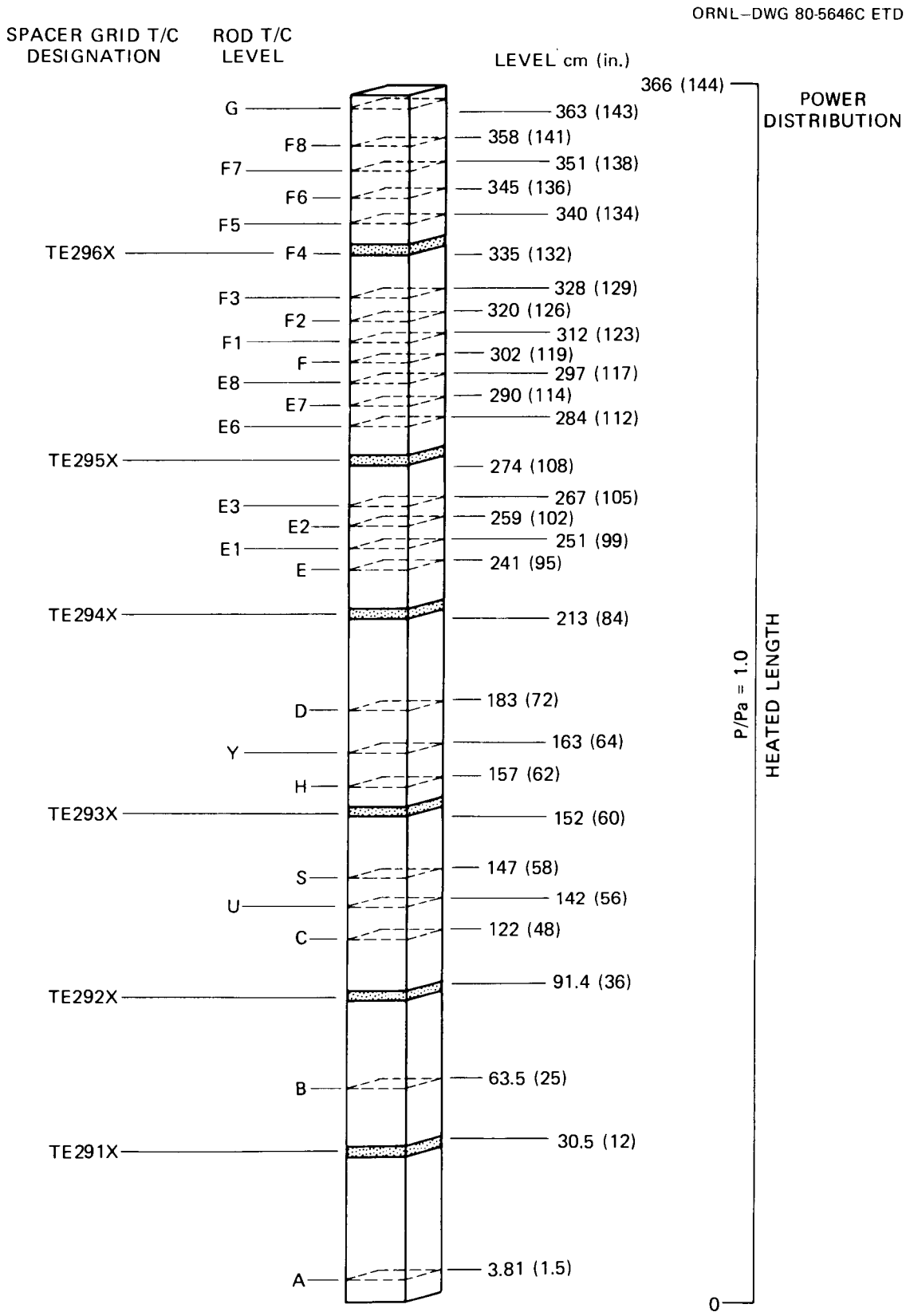

Fig. 4. Axial location of spacer grids and FRS thermocouples.

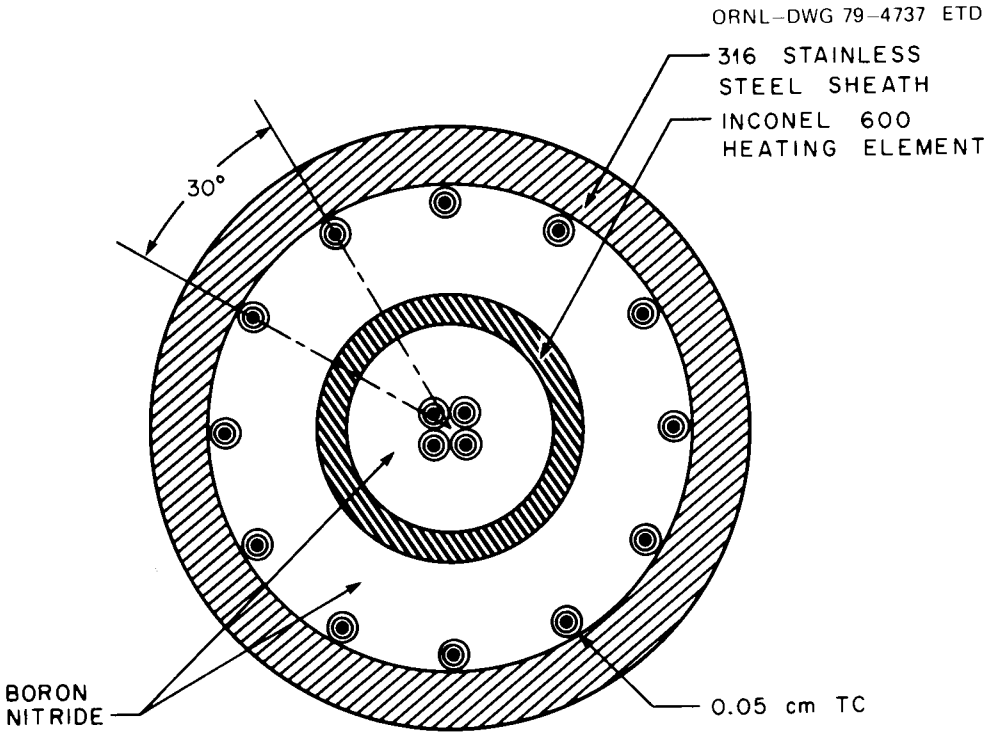

Fig. 5. Cross section of a typical FRS.

through two spool pieces in the downcomer before it enters the test section, where it is heated as it flows past the rods. The fluid leaves the test section from the upper plenum, passes through the three outlet spool pieces, passes through the heat exchangers, and returns to the pump.

Inlet flow for each steady state test was established, and the loop was adjusted to provide the desired inlet fluid temperature and inlet pressure. The bundle power was then increased until the dryout point was at the desired position in the bundle. The steady state operating point was assumed to have been reached when operating pressure and rod surface temperatures stabilized. Instruments were scanned for 20 s during each experiment. Standard deviations of the rod voltage and current during the scans were on the order of 0.1 V and 0.2 A, respectively. Of the tests presented in this report, rod 32 did not function properly during tests B, C, D, E, and J.

3. DATA REDUCTION

Characterization of bundle heat transfer requires knowledge of both rod surface conditions and local fluid conditions. Two heat transfer coefficients can be defined, depending on the intended use of these equations:

$$h_s = \frac{Q''}{T_w - T_s}, \tag{1}$$

where T_s is the saturation temperature, and

$$h_B = \frac{Q''}{T_W - T_B}, \tag{2}$$

where T_B is the bulk vapor temperature. These equations will be equivalent when the equilibrium quality is <1.

Accurate surface conditions are ensured by careful measurement of rod parameters, such as heater cross-sectional areas, rod dimensions, and rod liner resistance. Rod resistance (a function of temperature) along with measured rod current are used to calculate local heat flux:

$$Q'' = \frac{i^2 R(T)}{2 \pi r_w}. \tag{3}$$

Rods are calibrated in situ, and values for local boron nitride thermal conductivity, thermocouple contact resistance, and thermocouple bead position are determined.[21,22] These values and the linear heat flow rate are used in a numerical one-dimensional conduction equation to calculate the rod surface temperature when the measured inside sheath temperature is known. The analytical form of the equation follows:

$$T_w = T_{TC} - \frac{Q'}{2\pi}\left[\frac{\ln \frac{r_{is}}{r_{TC}}}{k_{BN}} + \frac{1}{r_{is} h_{con}} + \frac{\ln \frac{r_w}{r_{is}}}{k_{ss}}\right]. \tag{4}$$

Local fluid conditions are calculated from a steady state energy balance using measured inlet conditions T_o and V_o and assuming negligible pressure drop through the bundle. The bundle inlet fluid is always subcooled to ensure accurate measurement of inlet volumetric flow. Measured bundle pressure and inlet temperature are used to calculate the inlet

enthalpy. The total heat absorbed by the fluid up to the point of interest is calculated by adding the contribution from each individual rod on a level-to-level basis.

An energy balance at any axial location then yields an equation for equilibrium quality in terms of known parameters:

$$X = \frac{Q}{\rho_o V_o h_{fg}} - \frac{\Delta h}{h_{fg}} \quad . \tag{5}$$

The equilibrium quality defined by Eq. (5) may yield qualities >1 because it is a thermodynamic rather than a mass-based quality. Once equilibrium quality and pressure at any location are known, equilibrium fluid properties at that location are also known.

Experimental heat transfer coefficients [Eqs. (1) and (2)] are calculated only when rod surface temperatures are 222°C (400°F) above the saturation temperature to ensure that film boiling exists on the rod surface.

Seven heat transfer coefficient correlations were evaluated for comparison with the experimental heat transfer coefficient. A compilation of these correlations follows. Also included is the appropriate experimental heat transfer coefficient (included in parentheses) used for comparison with correlation-predicted values. The Groeneveld-Delorme correlation-predicted heat flux is compared with the experimental heat flux. Dougall-Rohsenow (h_s) is calculated by:

$$h_c = 0.023 \frac{k_g}{D_e} Pr_g^{0.4} \left\{ Re_g \left[X + \frac{\rho_g}{\rho_f} (1 - X) \right] \right\}^{0.8} \quad . \tag{6}$$

Dougall-Rohsenow (wall Pr) (h_s) is calculated by:

$$h_c = 0.023 \frac{k_g}{D_e} Pr_w^{0.4} \left\{ Re_g \left[X + \frac{\rho_g}{\rho_f} (1 - X) \right] \right\}^{0.8} \quad . \tag{7}$$

Groeneveld 5.7 (h_s) is calculated by:

$$h_c = \frac{0.052 \frac{k_g}{D_e} Pr_w^{1.26} \left\{ Re_g \left[X + \frac{\rho_g}{\rho_f} (1 - X) \right] \right\}^{0.688}}{\left[1.0 - 0.1 (1 - X)^{0.4} \left(\frac{\rho_f}{\rho_g} - 1 \right)^{0.4} \right]^{1.06}} \quad . \tag{8}$$

Groeneveld 5.9 (h_s) is calculated by:

$$h_c = \frac{0.00327 \frac{k_g}{D_e} Pr_w^{1.32} \left\{ Re_g \left[X + \frac{\rho_g}{\rho_f} (1 - X) \right] \right\}^{0.901}}{\left[1.0 - 0.1 (1 - X)^{0.4} \left(\frac{\rho_f}{\rho_g} - 1 \right)^{0.4} \right]^{1.5}} . \quad (9)$$

Condie-Bengston IV (SI units) (h_s) is calculated by:

$$h_c = 0.05345 \frac{k_g^{0.4593} Pr_w^{2.2598} Re_g^{[0.6249+0.2043 \ln (X+1)]}}{D_e^{0.8095} (X + 1)^{2.0514}} . \quad (10)$$

Groeneveld-Delorme (Q'') is calculated by:

$$Q_c'' = 0.008348 \frac{k_{fl}}{D_e} \left\{ \frac{GD_e}{\mu_{fl}} \left[X_a + \frac{\rho_v}{\rho_f} (1 - X_a) \right] \right\}^{0.8774}$$

$$\times Pr_{fl}^{0.6112} (T_w - T_v) , \quad (11)$$

where X_a and T_v are determined from a correlation dependent on flow and saturated fluid conditions.

One single-phase vapor correlation is also evaluated when equilibrium quality is >1. Dittus-Boelter (h_B) is calculated by:

$$h_c = 0.023 \frac{k_B}{D_e} Re_B^{0.8} Pr_B^{0.4} . \quad (12)$$

Uncertainties in the fluid and surface conditions were used to calculate uncertainties in both the experimental and correlation heat transfer coefficients. Uncertainty analysis was carried out for the Dougall-Rohsenow, Groeneveld 5.7, and Groeneveld 5.9 correlations.

3.1 Uncertainty Analysis

Uncertainties in rod surface conditions (T_w, Q'') are calculated using Eqs. (3) and (4). The method of propagation of errors[23] is used along with uncertainties for the various independent parameters to arrive at uncertainties in local heat flux and surface temperature. Typical values of independent variable uncertainties are shown in Table 3.

Table 3. Typical uncertainties for independent variables

Variable	Uncertainty, 1σ
h_{con}, %	100
i, %	0.425
k_{BN}, %	15
k_{ss}, %	5
R, %	5.5
r_{is}, m (ft)	5.6×10^{-6} (1.8×10^{-5})
r_{surf}, m (ft)	1.3×10^{-5} (4×10^{-5})
r_{TC}, m (ft)	4.5×10^{-5} (1.5×10^{-4})
T, °C (°F)	4 (7)

To determine the uncertainties of the calculated heat transfer coefficients (both experimental and correlation), the method presented in Ref. 24 is employed. The application of this method for a test case of the experimental heat transfer coefficient [Eqs. (1) or (2)] is outlined.

For purposes of this analysis, the input parameters have uncorrelated errors. The parameters themselves may be related. Suppose the input parameters included T_w and T_o, the bundle inlet temperatures. Obviously, T_w has some dependence on T_o. The uncertainties of T_w and T_o are not correlated because they are measured by separate instrumentation. Independence of input uncertainties is a requirement for application of the uncertainty analysis outlined here.

Consider the second-order Taylor expansion of the equation for the experimental heat transfer coefficient. If the values of P, T_w, and Q'' are perturbed by amounts ΔP, ΔT_w, and ΔQ'', then the resulting h_e^* is approximated by:

$$h_e^* \cong h_e + \frac{\partial h_e}{\partial P}\Delta P + \frac{\partial h_e}{\partial T_w}\Delta T_w + \frac{\partial h_e}{\partial Q''}\Delta Q''$$

$$+ \frac{\partial^2 h_e}{\partial P \partial T_w}\Delta P \Delta T_w + \frac{\partial^2 h_e}{\partial P \partial Q''}\Delta P \Delta Q'' + \frac{\partial^2 h_e}{\partial T_w \partial Q''}\Delta T_w \Delta Q''$$

$$+ \frac{1}{2}\left[\frac{\partial^2 h_e}{\partial P^2}(\Delta P)^2 + \frac{\partial^2 h_e}{\partial T_w^2}(\Delta T_w)^2 + \frac{\partial^2 h_e}{\partial Q''^2}(\Delta Q'')^2\right]. \quad (13)$$

The partial derivative terms are the sensitivity coefficients of h_e with respect to the input parameters. To approximate these derivatives, multiple calculations of h_e are performed.

First, the nominal value of h_e is calculated at the set of input parameters (P, T_w, and Q''). Each input parameter is varied, one at a

time, by plus or minus one standard deviation, and h_e is calculated. This requires a total of seven calculations and yields six sensitivity coefficients. For example, let h_P be the value of h_e at ($P + \sigma P$, T_w, and Q''), and let h_{-P} be the value of h_e at ($P - \sigma P$, T_w, and Q''). Solution of the Taylor expansions of h_P and h_{-P} yield:

$$\frac{\partial h_e}{\partial P} = \frac{h_P - h_{-P}}{2\sigma P} , \tag{14}$$

and

$$\frac{\partial^2 h_e}{\partial P^2} = \frac{h_P + h_{-P} - 2h_e}{(\sigma P)^2} . \tag{15}$$

The coefficients for T_w and Q'' are obtained in a similar manner.

The mixed derivative coefficients require three more calculations of h_e. Two input parameters are now varied by plus one standard deviation. If h_{P,T_w} is the value of h_e at ($P + \sigma P$, $T_w + \sigma T_w$, and Q''), then the corresponding sensitivity coefficient is found:

$$\frac{\partial^2 h_e}{\partial P \partial T_w} \cong \frac{h_{P,T_w} - h_P - h_{T_w} + h_e}{\sigma P \ \sigma T_w} . \tag{16}$$

The relationship of the input uncertainties and sensitivity coefficients to the uncertainty of h_e is given by:

$$\begin{aligned}(\sigma h_e)^2 = {} & \left(\frac{\partial h_e}{\partial P}\sigma P\right)^2 + \left(\frac{\partial h_e}{\partial T_w}\sigma T_w\right)^2 + \left(\frac{\partial h_e}{\partial Q''}\sigma Q''\right)^2 + \left(\frac{\partial h_e}{\partial P \partial T_w}\sigma P \sigma T_w\right)^2 \\ & + \left(\frac{\partial h_e}{\partial P \partial Q''}\sigma P \sigma Q''\right)^2 + \left(\frac{\partial h_e}{\partial T_w \partial Q''}\sigma T_w \sigma Q''\right)^2 + \frac{1}{2}\left[\frac{\partial^2 h_e}{\partial P^2}\frac{\partial^2 h_e}{\partial T_w^2}(\sigma P \sigma T_w)^2\right. \\ & \left. + \frac{\partial^2 h_e}{\partial P^2}\frac{\partial^2 h_e}{\partial Q''^2}(\sigma P \sigma Q'')^2 + \frac{\partial^2 h_e}{\partial T_w^2}\frac{\partial^2 h_e}{\partial Q''^2}(\sigma T_w \sigma Q'')^2\right] \\ & + \frac{3}{4}\left[\left(\frac{\partial^2 h_e}{\partial P^2}\right)^2(\sigma P)^4 + \left(\frac{\partial^2 h_e}{\partial T_w^2}\right)^2(\sigma T_w)^4 + \left(\frac{\partial^2 h_e}{\partial Q''^2}\right)^2(\sigma Q'')^4\right] .\end{aligned} \tag{17}$$

The first three terms contain over 99% of the contribution to $(\sigma h_e)^2$. The expression for h_e is a smoothly varying function of the input parameters; thus, all second-order sensitivity coefficients are small, and the use of a second-order Taylor expansion for h_e is valid.

The method of propagation of errors mentioned previously also utilizes a Taylor series expansion to determine the uncertainty in the dependent variable. However, it includes only first-order derivatives [i.e., terms like the first three terms in Eq. (17)], which are obtained by direct differentiation.

Evaluations of the uncertainties for the Dougall-Rohsenow and Groeneveld heat transfer coefficients are performed similarly. However, the correlations are slightly reformulated. Typically, heat transfer correlations are expressed as functions of mass flux G and equilibrium quality X. For the steady state tests, G and X are calculated from values of inlet temperature T_o, volumetric flow rate V_o, pressure P, and bundle power Q. Thus, G and X are strongly correlated. To overcome this, the equations for G and X are substituted into the correlations for the sensitivity analysis. The expression used for G is

$$G = \frac{\rho_o V_o}{A} . \tag{18}$$

Equation (5) is used for evaluation of X.

Because the correlative heat transfer coefficients have more input parameters, the application of this uncertainty analysis requires more calculations of h_c. For N input parameters, 1/2 N (N + 3) + 1 calculations of h_c are required to yield all first- and second-order sensitivity coefficients. Thus, 15 calculations of the Dougall-Rohsenow h_c and 21 calculations of the Groeneveld h_c were necessary at a given set of steady state test conditions. Also, additional coolant properties were used for the correlative h_c. For example, six values of the wall Prandtl number Pr_w at these combinations of pressure and temperature are used: (P, T_w); $(P + \sigma P, T_w)$; $(P - \sigma P, T_w)$; $(P, T_w + \sigma T_w)$; $(P, T_w - \sigma T_w)$; and $(P + \sigma P, T_w + \sigma T_w)$.

Note that uncertainties in coolant properties, such as σPr_w, need not be considered explicitly in this analysis. Uncertainties in the input steady state test conditions are directly propagated through the property values to contribute to σh_c. Because Pr_w (and similar quantities) would be calculated from measured data, propagation of measurement uncertainties through the calculation includes propagation through the Pr_w calculation.

A particular modification to the uncertainty analysis was necessary for the Groeneveld correlations. Consider the quality-dependent term f(X) in the Groeneveld 5.7 equation:

$$f(X) = \frac{\left[X + \frac{\rho_g}{\rho_f}(1 - X)\right]^{0.688}}{\left[1 - 0.1\,(1 - X)^{0.4}\left(\frac{\rho_f}{\rho_g} - 1\right)^{0.4}\right]^{1.06}} . \tag{19}$$

In the range X = 0.93 to 1.0, f(X) is strongly nonlinear. All orders of derivatives of f with respect to X approach negative infinity as X approaches 1.0. Use of a second-order Taylor series expansion in this interval causes σh_c to become increasingly large as X increases, until σh_c becomes infinite at X = 1. However, σh_c is bounded by using an alternate procedure in this range of qualities. First, the uncertainty is calculated using the Taylor series expansion. Then, the two sets of input parameters that yield the maximum and minimum values of h_c are found. These parameters are the test conditions, perturbed by plus or minus one standard deviation. With a high probability, the difference in the maximum and minimum values of h_c is >2 σh_c. Therefore, σh_c from the Taylor expansion is compared with the upper limit on σh_c; the value of σh_c then is set to the lower of the two values.

A set of computer routines was created to implement this uncertainty analysis for the steady state tests. These routines accepted as basic input the values of P, V_o, T_o, Q'', T_w, and the bundle power distribution. The bundle power distribution was expressed as average nodal powers with the bundle detailed in seven nodes. The individual nodal powers and their uncertainties were combined to yield the total power delivered to the fluid Q and its uncertainty at the axial level of interest. The routines also calculated G, X, T_B, and their uncertainties. As before, the uncertainties σG and σX need not be included explicitly in the calculation of σh_c because the uncertainties in the measured quantities are propagated through the calculation. Coolant properties were evaluated using WATERS, a computer package for water and steam physical properties. Within the range of test conditions, the percentage error of WATERS properties compared with American Society for Mechanical Engineers (ASME) Steam Table values was <1%. The uncertainty in the coolant properties yielded a negligible contribution to the evaluated σh.

A set of input parameters typical of the steady state test series is given in Table 4. The uncertainties are given in terms of one standard deviation and fractional standard deviation (fsd) values. Included in these are uncertainties in T_w and Q'', which have fsd values that are representative of the entire test series. The heat transfer coefficients and their associated uncertainties for this set of sample input are given in Table 5.

To verify the routines used to calculate the heat transfer coefficient uncertainties, an entirely different method was used to analyze the set of test conditions in Table 1. The method used was the Factorial Stratified Sampling (FSS) method.[25] The FSS technique can be considered an analog method.

To implement the FSS method, a larger set of input parameters is generated for each uncorrelated input parameter. The number of values for each input parameter is called the number of levels I. For instance, if I = 10 and the input parameters P and σP are given, then a new set of ten input pressures P_i is generated. The P_i are distributed about P so that the frequency distribution of the P_i follows the normal distribution curve. If the normal distribution curve is integrated between two adjacent P_i values, 10% of the total area under the curve is obtained. Thus, there is a 10% chance that the true value of P lies in the interval between two adjacent P_i values. The set of P_i may be considered to be an ideal simulated set of I measurements of P, made at the steady state test

Table 4. Typical steady state test parameter uncertainties

Parameter	Value	Uncertainty[a]
P, MPa	8.9	0.0414 (0.005)
psi	1205.5	6.0
V_o, m^3/s	0.0043	9×10^{-5} (0.022)
ft^3/s	0.15083	0.00332
Q'', kW/m^2	788.15	43.35 (0.055)
$Btu/h \cdot ft^2$	2.5×10^5	1.375×10^4
T_o, °C	275.7	2.22 (0.008)
°F	528.4	4.0
T_w, °C	687.4	11.0 (0.016)
°F	1269.4	19.8
Q, kW	2647.9	76.0 (0.029)
Btu/s	2511.3	72.1

[a]Uncertainty values are given as one standard deviation; values in parentheses refer to the fractional standard deviation.

Table 5. Sample heat transfer coefficient and uncertainties

Coefficient	Value	Uncertainty[a]
Dougall-Rohsenow, kW/m^2 °C	2.507	0.067 (0.0265)
Btu/h ft^2 °F	441.72	11.720
Groeneveld 5.7, kW/m^2 °C	1.397	0.026 (0.0183)
Bth/h ft^2 °F	246.12	4.515
Groeneveld 5.9, kW/m^2 °C	1.232	0.029 (0.0237)
Bth/h ft^2 °F	217.04	5.153
Experimental, kW/m^2 °C	2.021	0.125 (0.0619)
Bth/h ft^2 °F	356.15	22.032

[a]Uncertainty values are given as one standard deviation; values in parentheses refer to the fractional standard deviation.

conditions. For each of the N input parameters and uncertainties, I levels are generated. All possible combinations of the new inputs are used to calculate heat transfer coefficients, giving I^N values of h_i. Each input parameter occurs with equal probability, each set of input parameters occurs with equal probability, and the set of h_i models the true normal distribution of the expected value of h. The set of h_i is evaluated to provide σh, using basic statistical analysis.

The FSS method was applied to the test case using I = 10 levels. The resulting σh were in good agreement with the results of Table 5, differing by about ~7% for all heat transfer coefficients. For the experimental heat transfer coefficient, the FSS method was repeatedly applied as I increased from I = 10 to I = 100. As I increased, the value of σh uniformly converged to the value given in Table 5. Therefore, the results of the FSS calculations verify the computer routines used to analyze the steady state test heat transfer coefficient uncertainties.

4. RESULTS

4.1 Correlation Comparisons

Results for each of the steady state tests are presented in tabular form in both SI and English units in Appendix D. Each test is divided into five separate sections. Surface conditions along with their cross-sectional standard deviations are presented in the first section. Surface conditions presented are the average conditions for each level. Standard deviations of the surface conditions are the cross-sectional standard deviations (as opposed to measurement uncertainty) that are determined by calculating the mean surface temperature or heat flux for a level and determining the standard deviation of these quantities across the bundle about that mean. Thus, cross-sectional standard deviations are an indication of the variation across the bundle at one axial location. Surface conditions were averaged only when rod superheat was 222°C (400°F) or greater. If only one rod was in film boiling at a given axial level, the cross-sectional uncertainty will therefore be zero for that level. If no rods were in film boiling [i.e., $(T_w - T_s) < 400°F$] at a level, that level is omitted from the table.

Also shown in Sect. 1 are the local equilibrium fluid conditions (fluid temperature and quality) and their uncertainties (one standard deviation). Uncertainties in these quantities reflect errors in measurement of bundle pressure, flow rate, heat input, and inlet conditions [propagated through Eq. (5) and the steam property tables].

The second and third sections for each test show only the primary-level thermocouple information (levels A, B, C, D, E, F, and G). Primary-level thermocouples should show little or no influence of the spacer grids.

The second section presented for each test shows heat transfer correlation comparisons when the equilibrium qualities are <1. Uncertainties for three of these correlations are also presented (Dougall-Rohsenow, Groeneveld 5.7, and Groeneveld 5.9). The fractional standard deviation for the Dougall-Rohsenow correlation with Pr evaluated at the wall temperature is expected to be similar to the fsd for the standard Dougall-Rohsenow equation because the Pr is insensitive to variations in both pressure and temperature at high temperatures (i.e., the wall temperature). Surface conditions in this section and the remainder of the sections for each test are local surface conditions. Both the experimental heat transfer coefficient and its uncertainty are also presented. Correlation uncertainty and experimental heat transfer coefficient uncertainty in this section and in the remainder of the sections for each test reflect measurement uncertainties and represent one standard deviation. Correlations presented in this section are

1. Dougall-Rohsenow heat transfer coefficient,
2. Dougall-Rohsenow (wall Pr) heat transfer coefficient,
3. Groeneveld 5.7 heat transfer coefficient,
4. Groeneveld 5.9 heat transfer coefficient,
5. Condie-Bengston IV heat transfer coefficient, and
6. Groeneveld-Delorme heat flux.

The Dougall-Rohsenow correlation was developed from the single-phase Dittus-Boelter equation using the actual vapor velocity based on the equilibrium quality. Therefore, it assumes perfect vapor-to-liquid heat transfer and does not account for drop-wall interactions.

The Groeneveld 5.7 and 5.9 equations, along with the Condie-Bengston IV correlation, were correlated using dispersed flow heat transfer data. Therefore, they would partially account for the nonequilibrium in the flow and the presence of droplets.

The Groeneveld-Delorme correlation was also developed from dispersed flow data. It explicitly accounts for nonequilibrium within the flow and contains a correlation for actual quality as a function of flow conditions.

The third section presented shows heat transfer correlation comparisons and uncertainties when equilibrium qualities are >1. Both experimental heat transfer coefficients based on ($T_w - T_s$) and experimental coefficients based on ($T_w - T_B$) are tabulated. Correlations in this table are (1) Dittus-Boelter heat transfer coefficient, (2) Condie-Bengston IV heat transfer coefficient, and (3) Groeneveld-Delorme heat flux.

The Dittus-Boelter correlation is a single-phase heat transfer coefficient developed from several types of single-phase data. The Condie-Bengston IV and Groeneveld-Delorme equations were described previously.

The fourth and fifth sections for each test present information for the intermediate-level thermocouples (E1, E2, E3, E6, E7, E8, F1, F2, F3, F4, F5, F6, F7, and F8). The values for k_{BN}, h_{con}, and r_{TC} used in Eq. (4) are calculated from data taken while exposing the rods to known conditions. The calculation procedure assumes that a single-phase heat transfer coefficient is applicable when water alone is flowing through the heated bundle. This heat transfer coefficient includes no grid spacer effects; thus, the calculation of rod properties would tend to wash out some of the grid effects present during testing. The error in surface temperature caused by this effect is estimated to be on the order of 6°C (10°F); however, because it is only approximate, uncertainties listed in the tabulation do not reflect this error.

The fourth section presents intermediate-level information for equilibrium qualities that are <1. The same correlation comparisons are presented as in the second section.

The fifth section presents intermediate-level information for equilibrium qualities that are >1. The same correlation comparisons are presented as in the third section.

Please note that values from rod 54 were not presented for any tests. Centerline thermocouples that are used in the rod property calculation procedure were not functioning properly in rod 54. This led to high uncertainty values in surface conditions, although the absolute values of the surface conditions were reasonable. Rod 54 is used in the grid spacer section presented later in this report because the calculational technique used when analyzing grid spacer effects differs from the normal calculation technique.

Axial conduction within the rods near the dryout point is not considered in the data reduction procedure. Calculations were performed to investigate this phenomena by treating the rod as a semi-infinite fin with the base temperature at the saturation temperature and a constant heat

transfer coefficient on the surface. For typical surface heat transfer coefficients, axial conduction effects are present for distances <2.5 cm (1 in.) from dryout. Rod thermocouples in the THTF are spaced at a minimum of 5 cm (2 in.) apart. Because the exact point of dryout can only be identified to within ±2.5 cm, some thermocouples near dryout can include this effect. Appendix D contains information that identifies (1) the highest level where all thermocouples are wet, (2) the lowest level where all thermocouples are dry, and (3) the ratio of the number of wet thermocouples to the total number of thermocouples monitored for levels between the all-wet and all-dry levels.

Several rods are constructed with thermocouples positioned at differing azimuthal locations (Fig. 5) and the same axial level. Thus, rods may have multiple entries in the tables at one level.

Results of tests typical of the series are also shown as plots of the correlation-predicted heat transfer coefficient (heat flux) vs the experimental heat transfer coefficient (heat flux) in Figs. 6–53.

Any data point lying above and to the left of the diagonal line in the figures indicates that predicted heat transfer coefficients (heat fluxes) are lower than the experimentally measured heat transfer coefficients. Data lying below and to the right indicate an overprediction of the heat transfer coefficient (heat flux).

Each vertical data string represents one axial level. The scatter in the data is primarily caused by radial variations in the fluid conditions and their effect on surface temperatures, because uncertainties in experimental heat transfer coefficients (shown as one standard deviation error

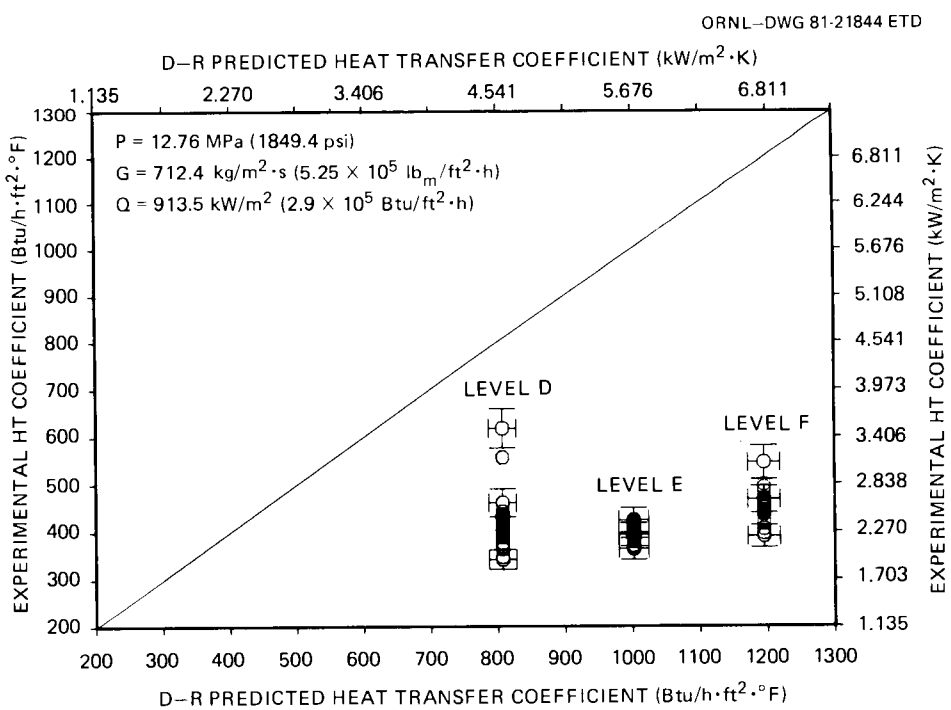

Fig. 6. h_{exp} vs h_{corr} for Dougall-Rohsenow, test B.

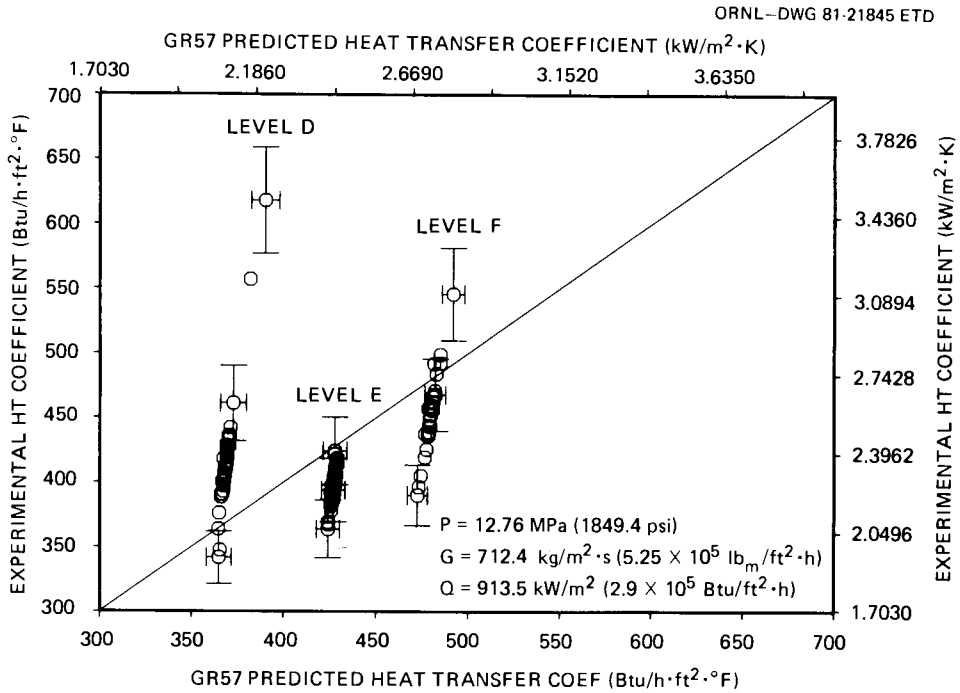

Fig. 7. h_{exp} vs h_{corr} for Groeneveld 5.7, test B.

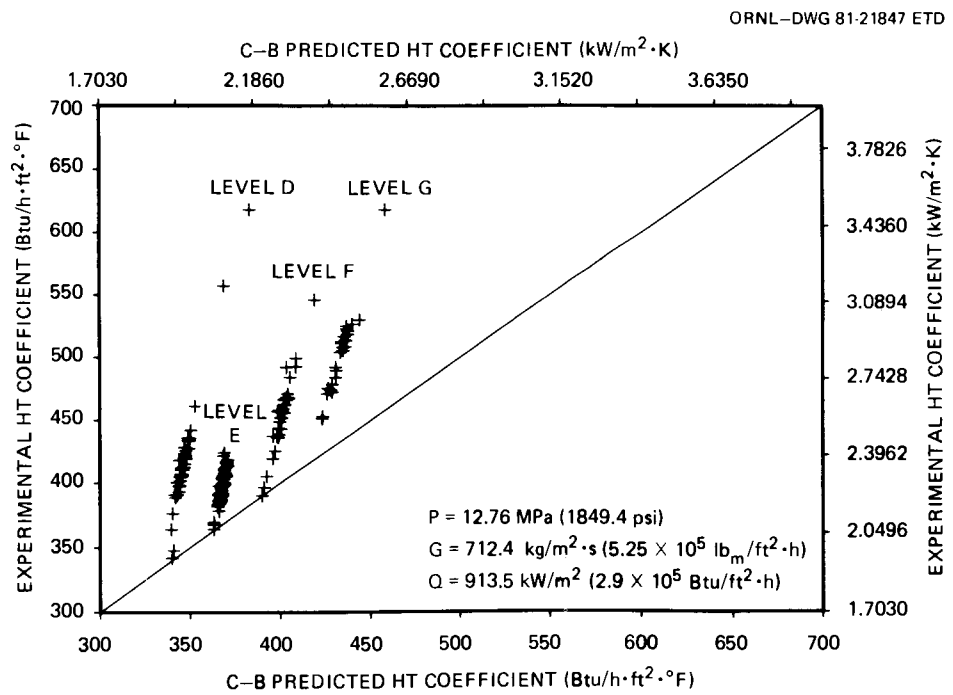

Fig. 8. h_{exp} vs h_{corr} for Condie-Bengston IV, test B.

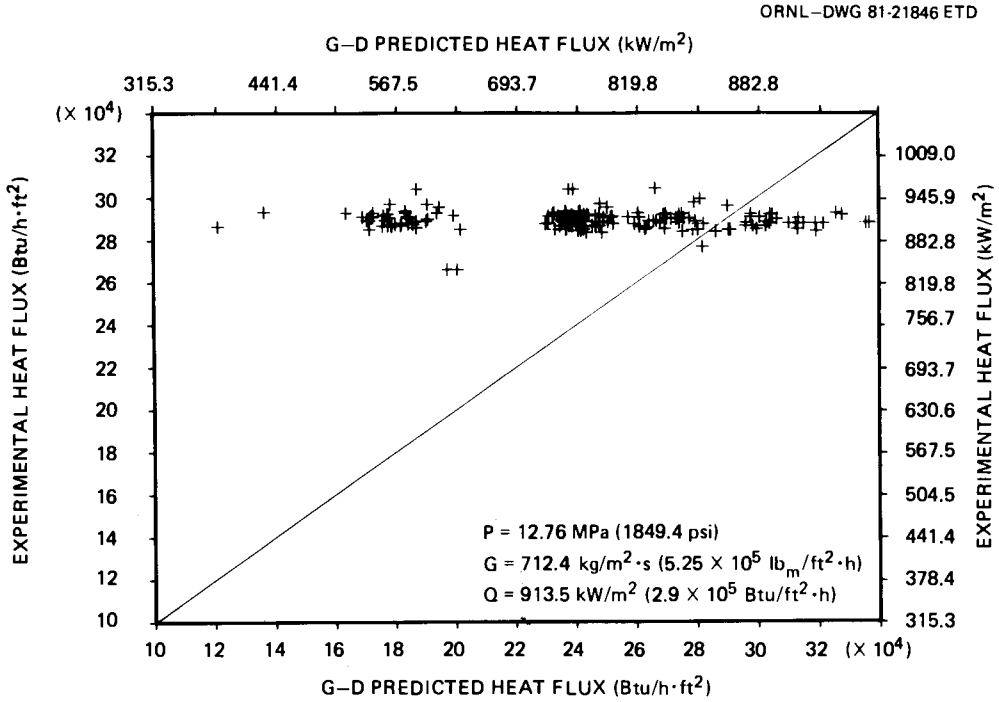

Fig. 9. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, test B.

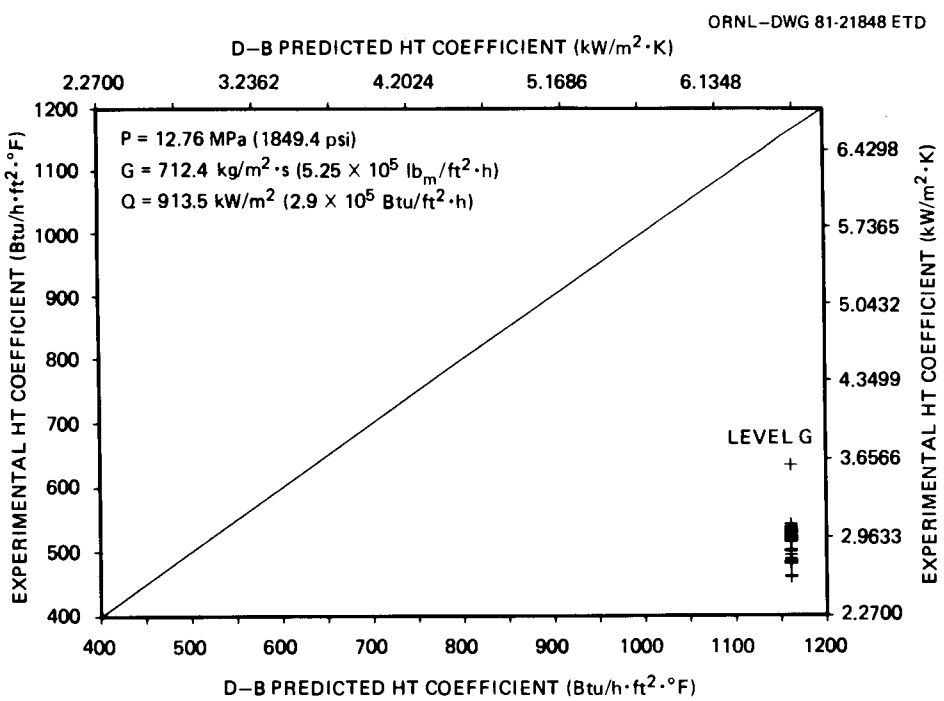

Fig. 10. h_{exp} vs h_{corr} for Dittus-Boelter, test B.

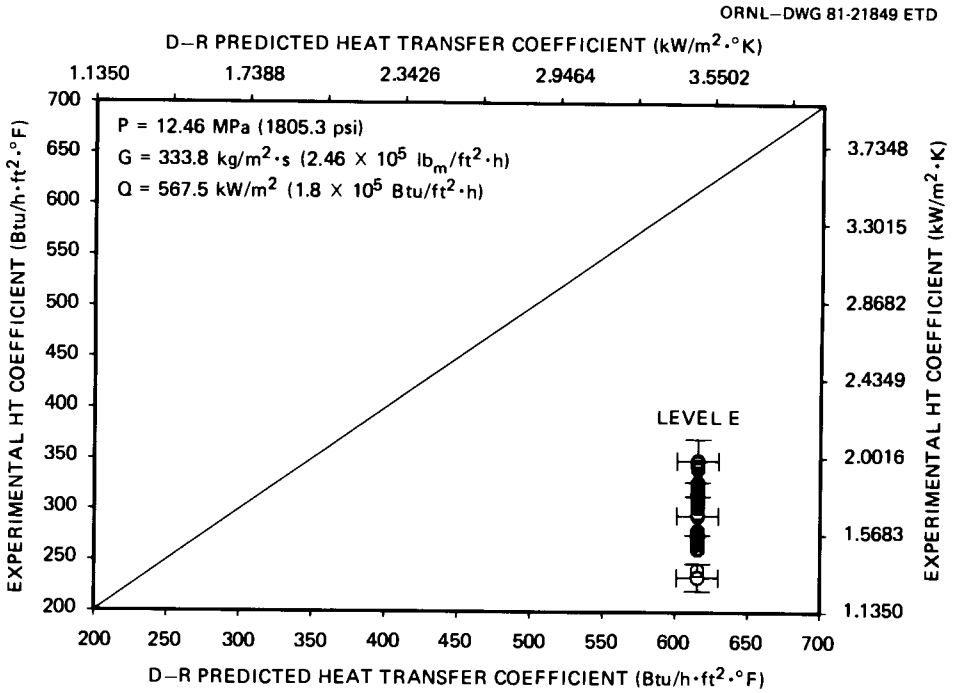

Fig. 11. h_{exp} vs h_{corr} for Dougall–Rohsenow, test C.

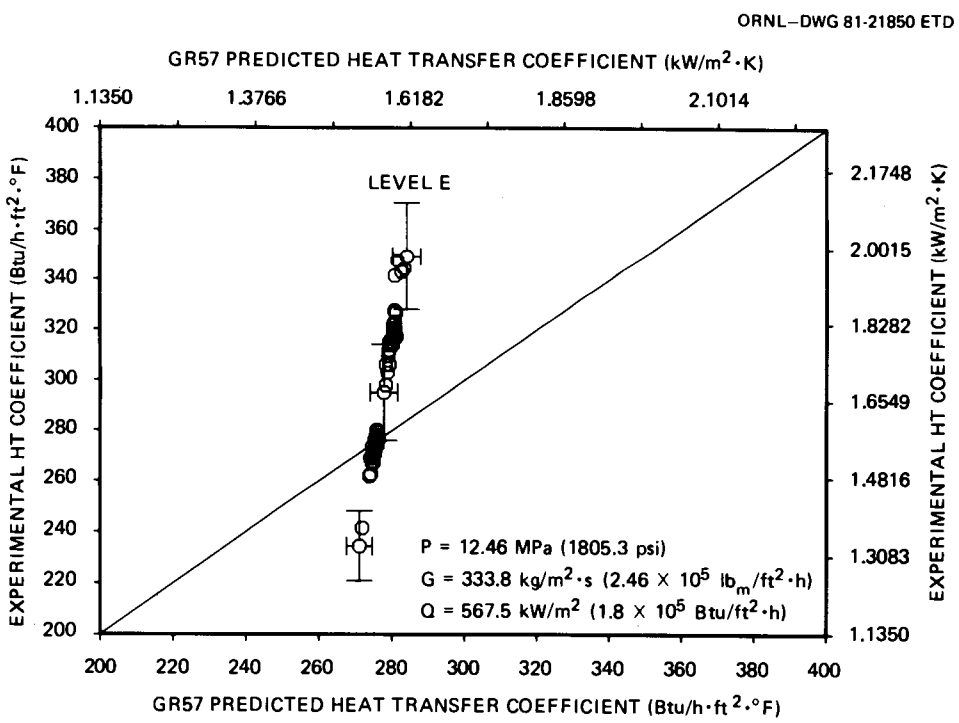

Fig. 12. h_{exp} vs h_{corr} for Groeneveld 5.7, test C.

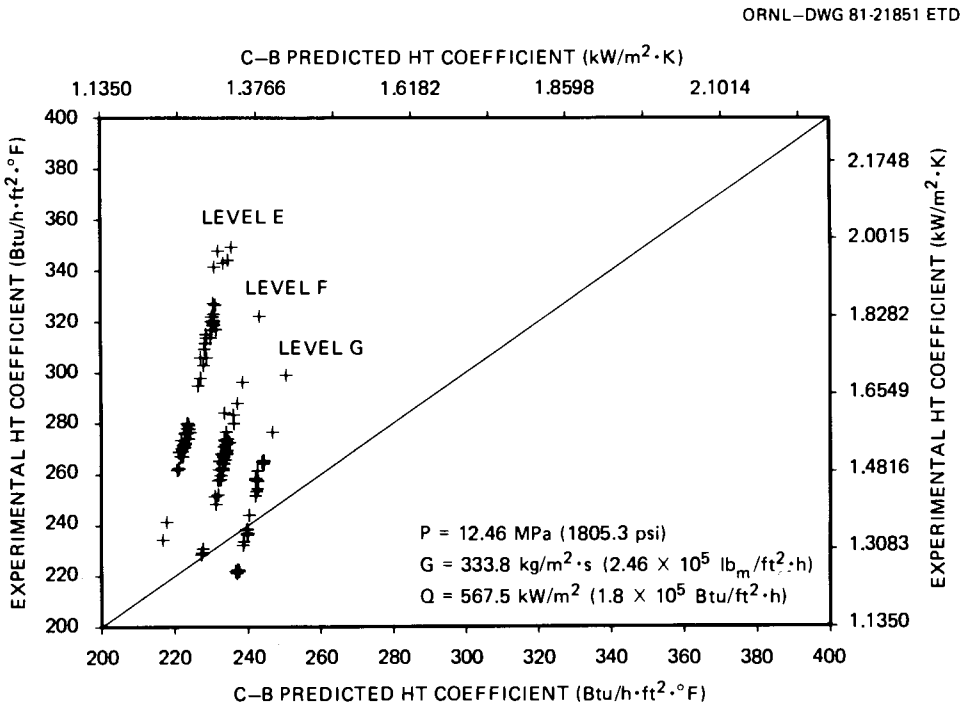

Fig. 13. h_{exp} **vs** h_{corr} **for Condie-Bengston IV, test C.**

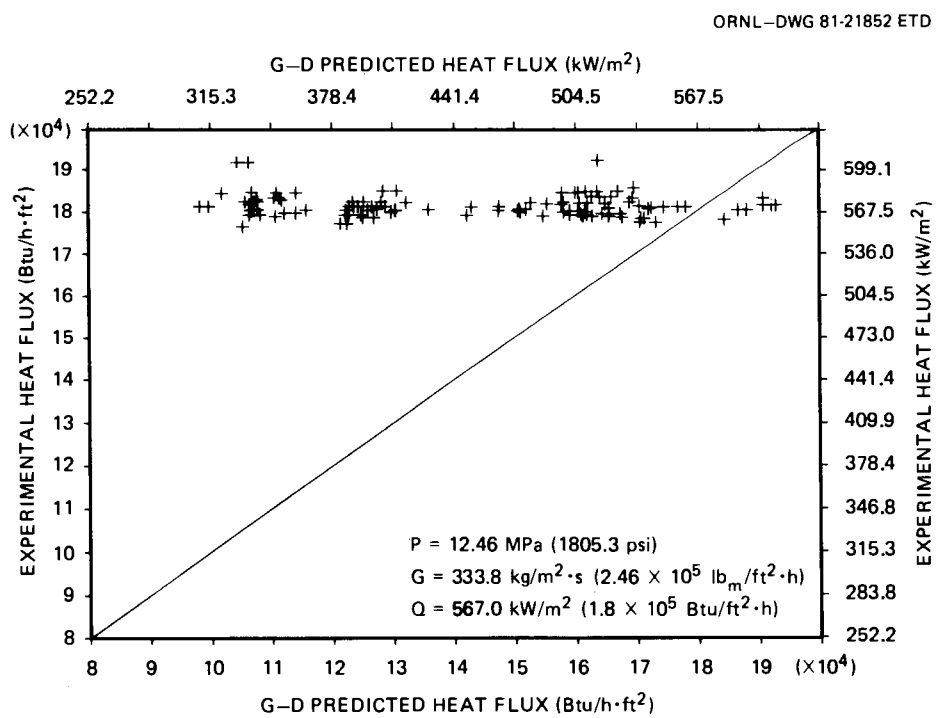

Fig. 14. Q_{exp} **vs** Q_{corr} **for Groeneveld-Delorme, test C.**

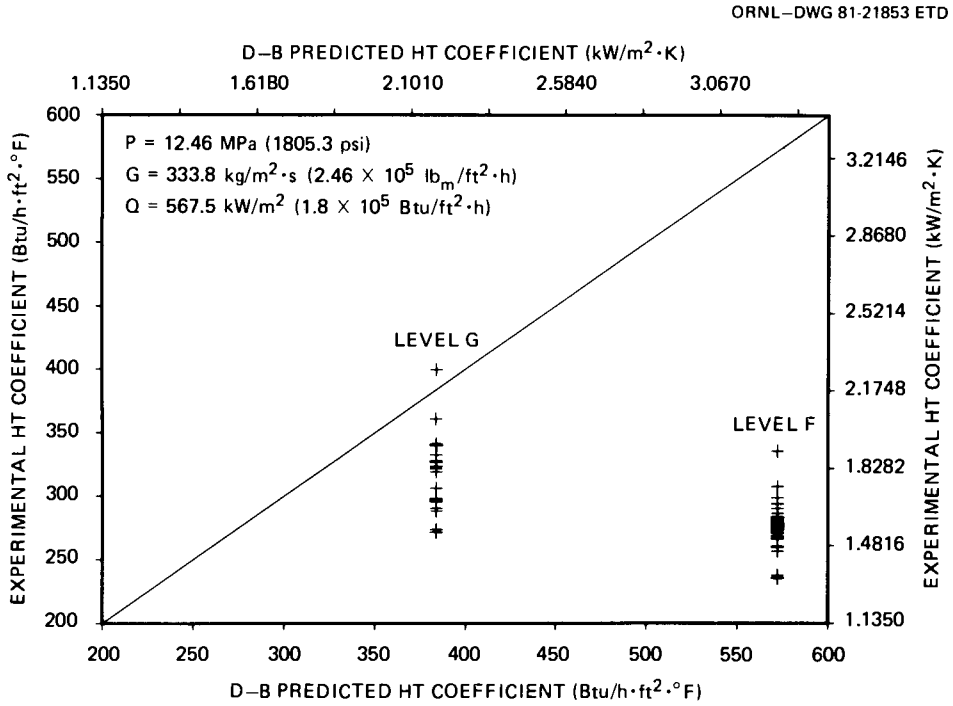

Fig. 15. h_{exp} vs h_{corr} for Dittus-Boelter, test C.

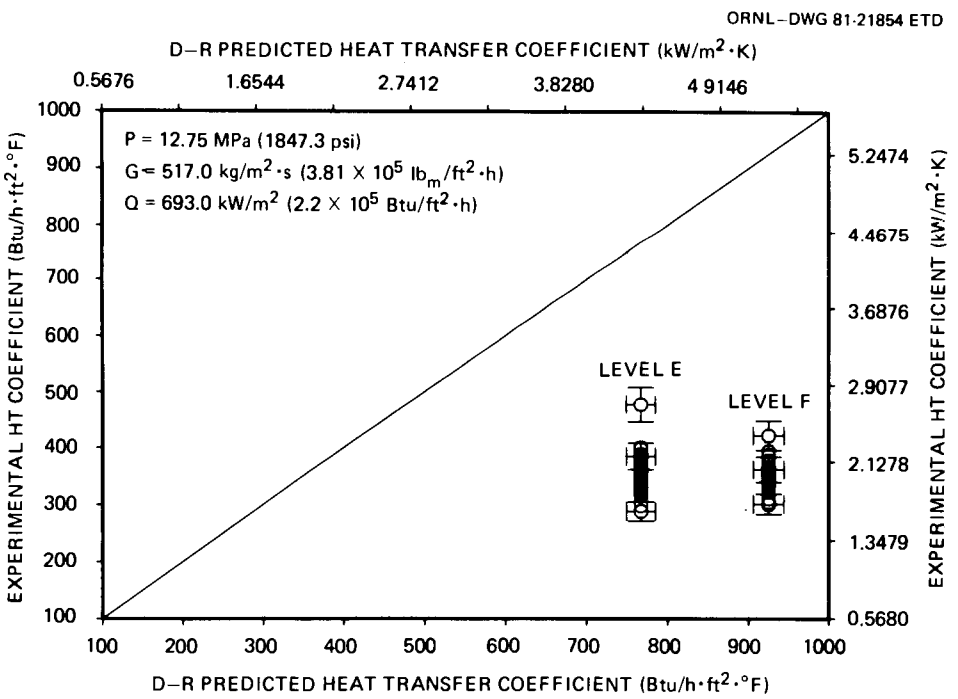

Fig. 16. h_{exp} vs h_{corr} for Dougall-Rohsenow, test D.

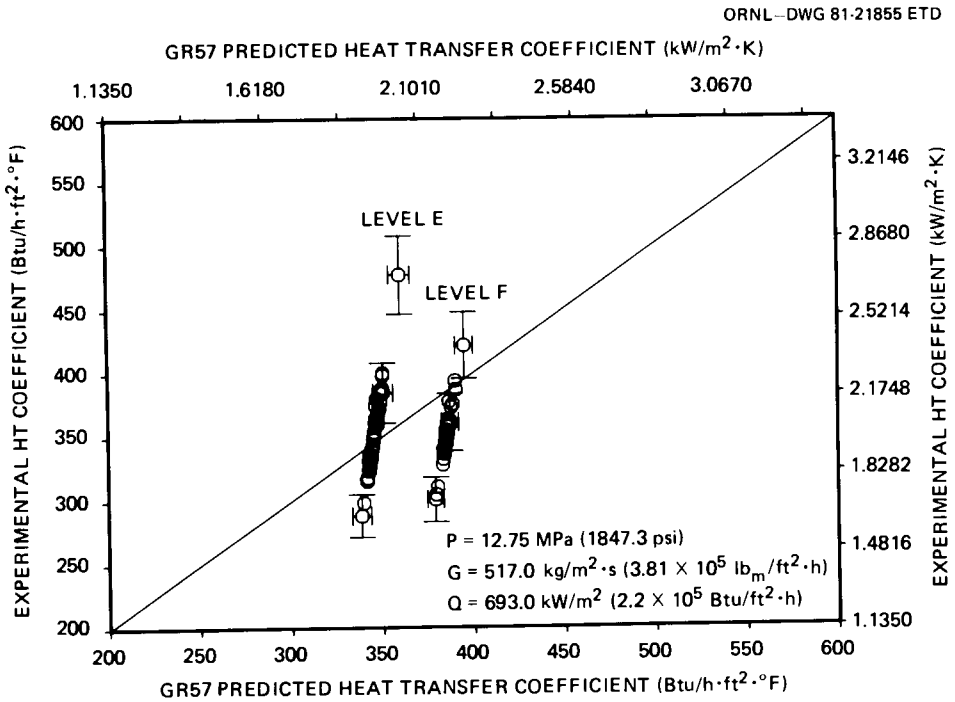

Fig. 17. h_{exp} vs h_{corr} for Groeneveld 5.7, test D.

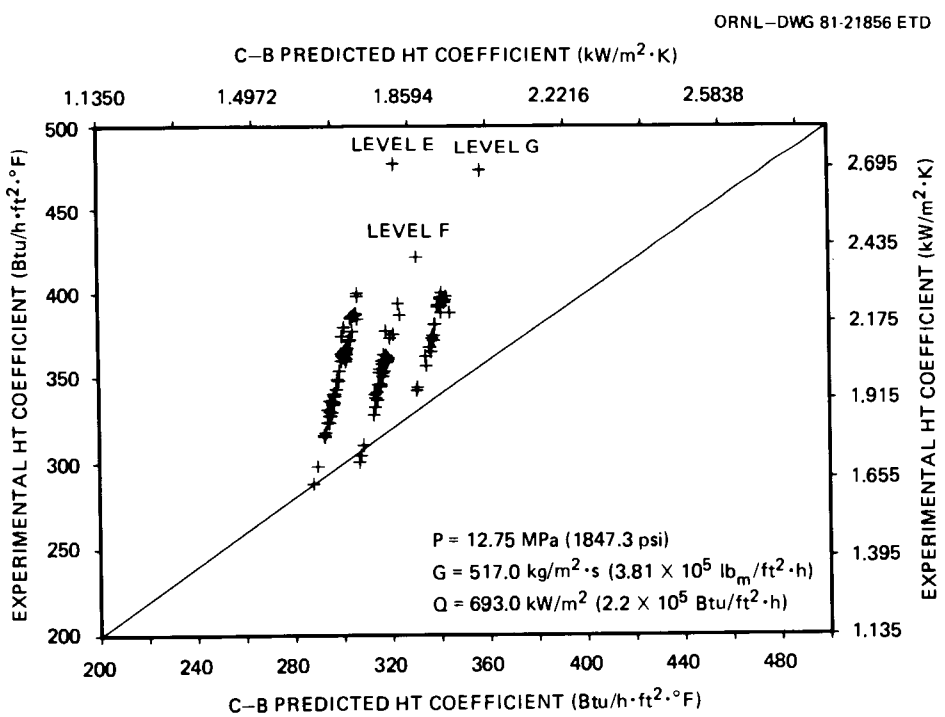

Fig. 18. h_{exp} vs h_{corr} for Condie-Bengston IV, test D.

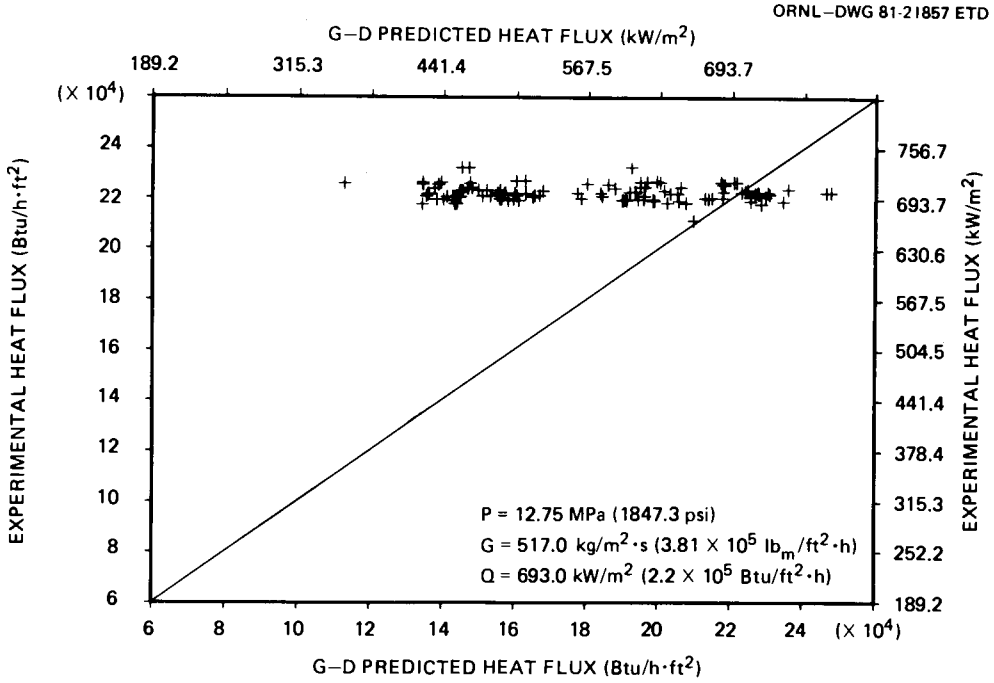

Fig. 19. Q_{exp} **vs** Q_{corr} **for Groeneveld-Delorme, test D.**

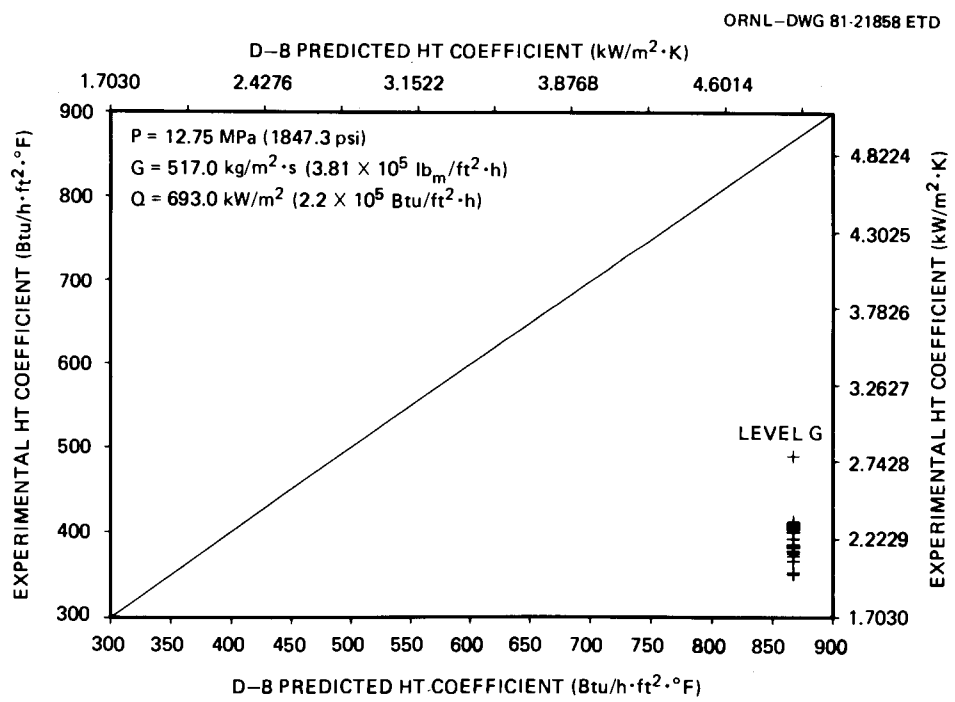

Fig. 20. h_{exp} **vs** h_{corr} **for Dittus-Boelter, test D.**

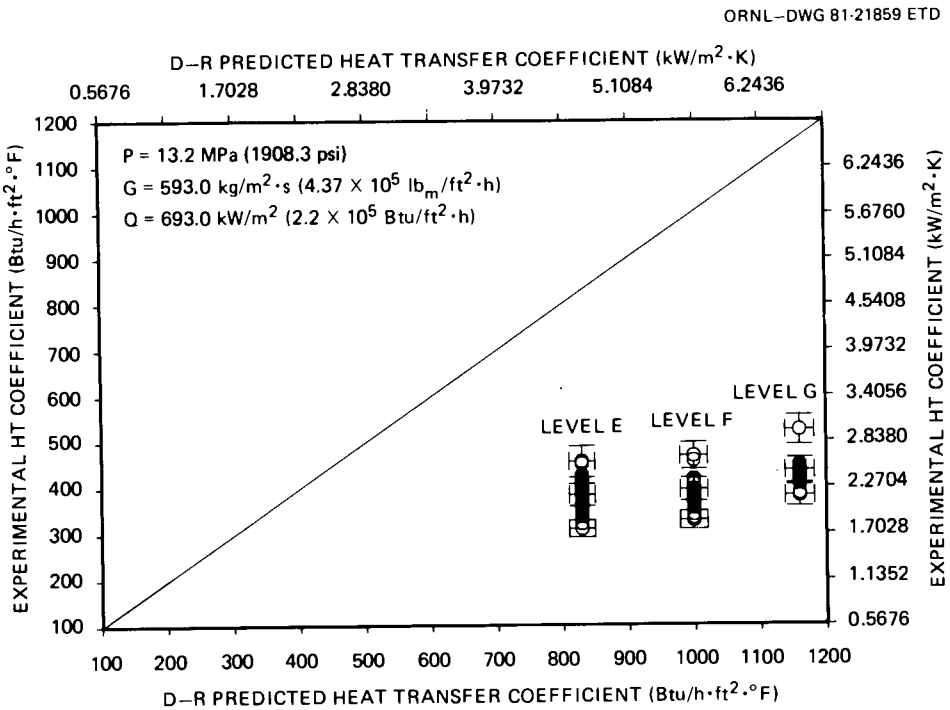

Fig. 21. h_{exp} **vs** h_{corr} **for Dougall–Rohsenow, test E.**

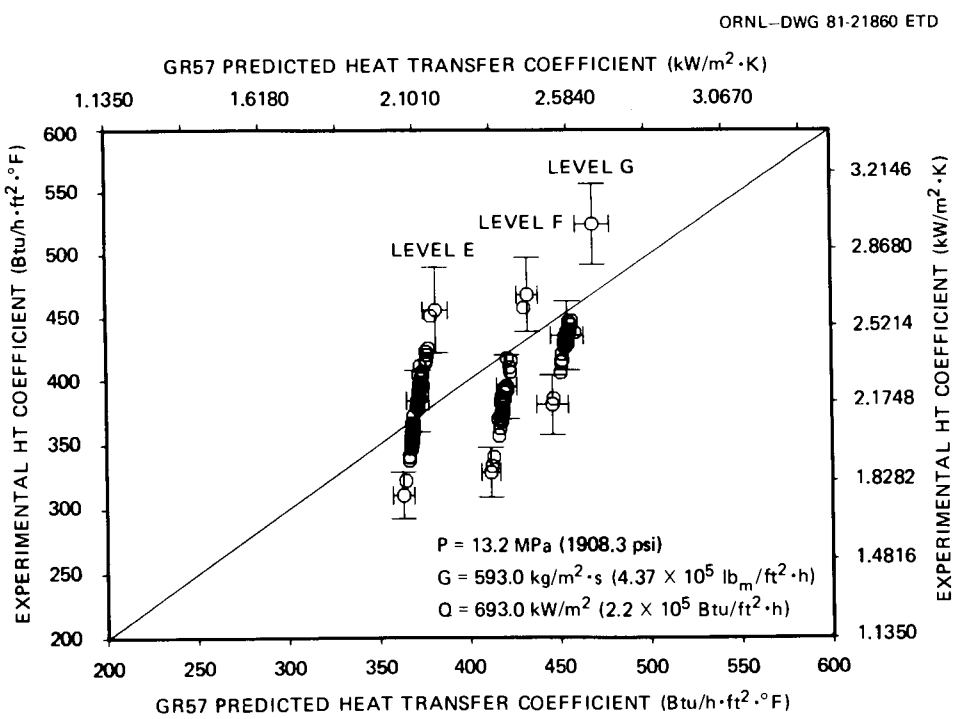

Fig. 22. h_{exp} **vs** h_{corr} **for Groeneveld 5.7, test E.**

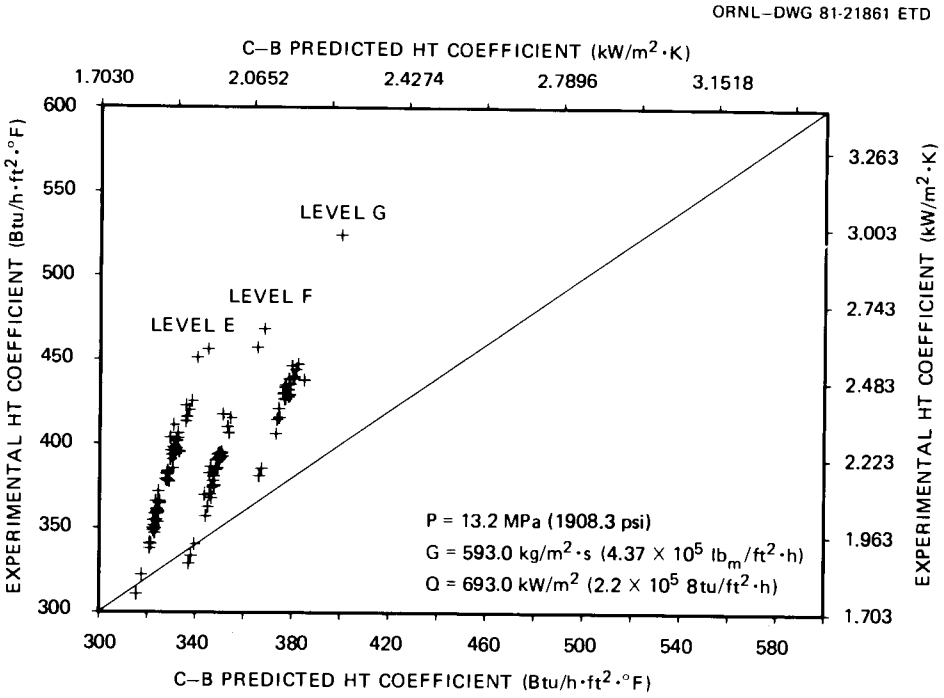

Fig. 23. h_{exp} vs h_{corr} for Condie-Bengston IV, test E.

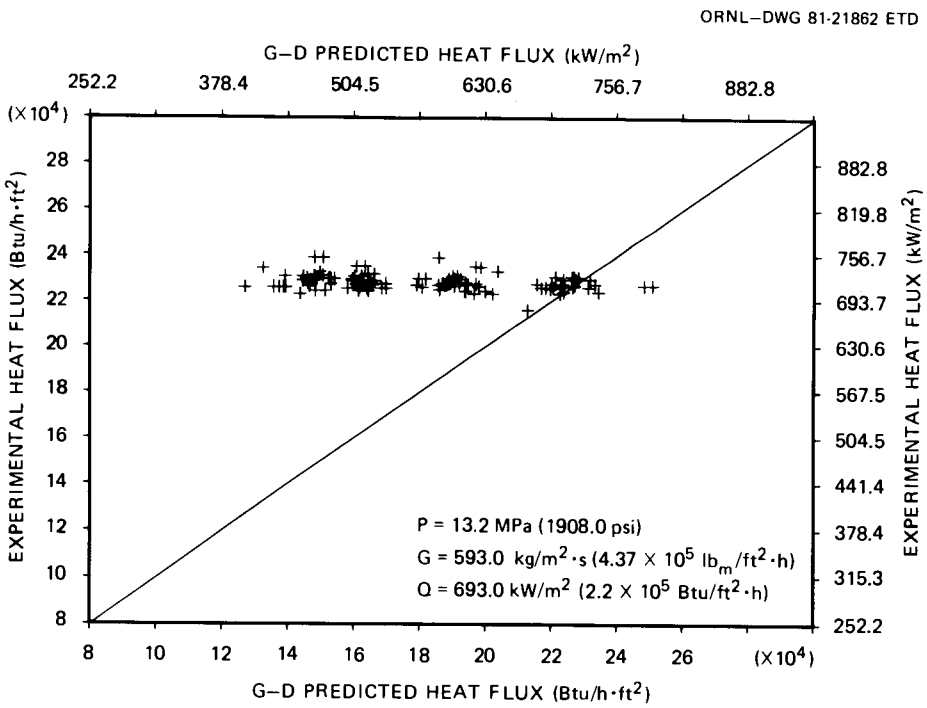

Fig. 24. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, test E.

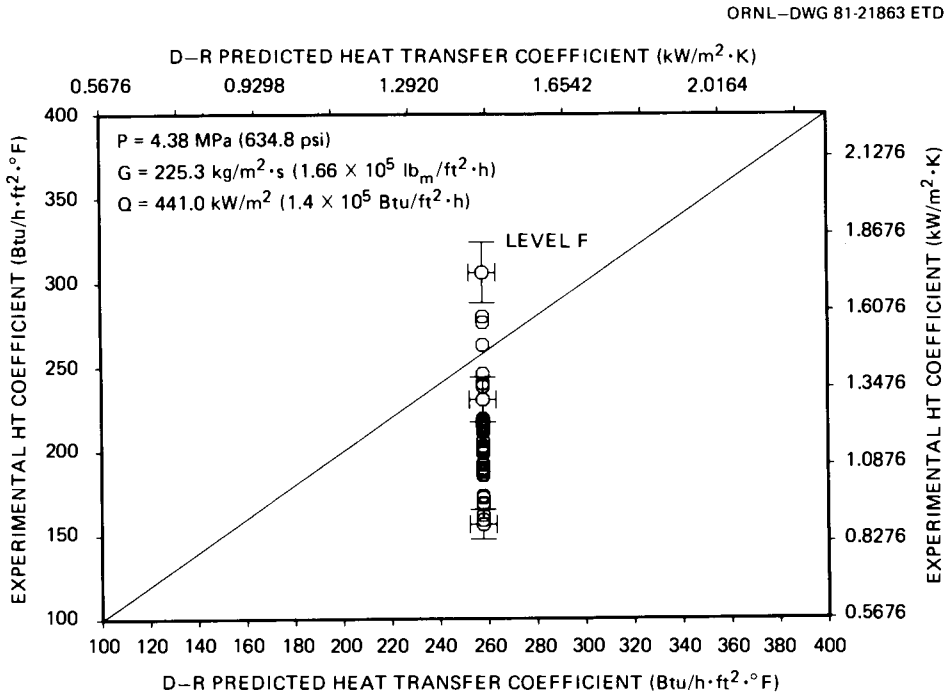

Fig. 25. h_{exp} **vs** h_{corr} **for Dougall–Rohsenow, test K.**

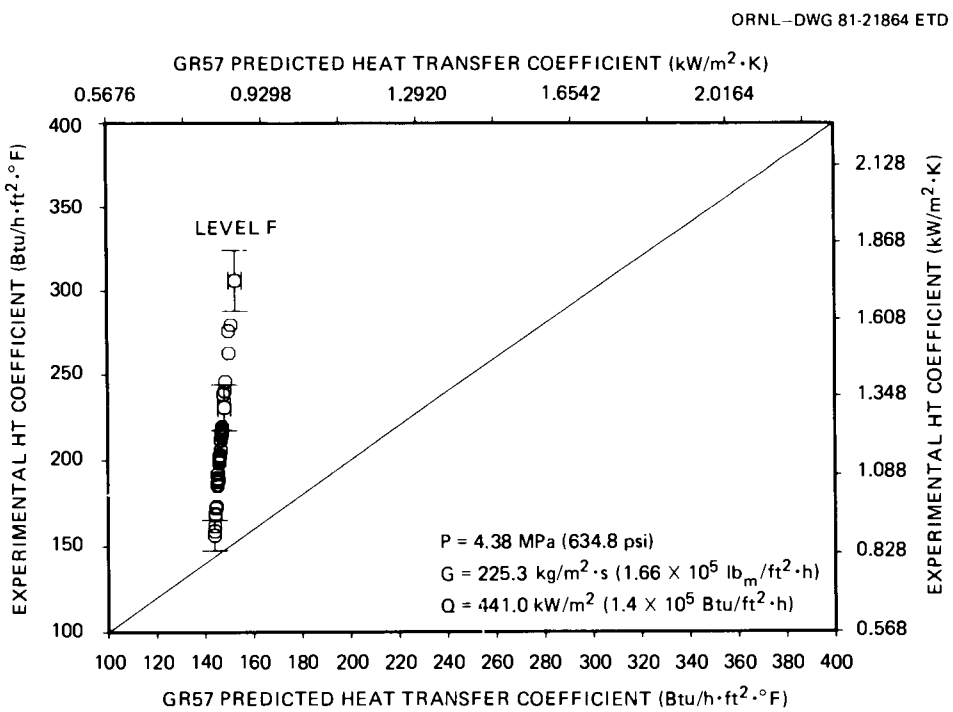

Fig. 26. h_{exp} **vs** h_{corr} **for Groeneveld 5.7, test K.**

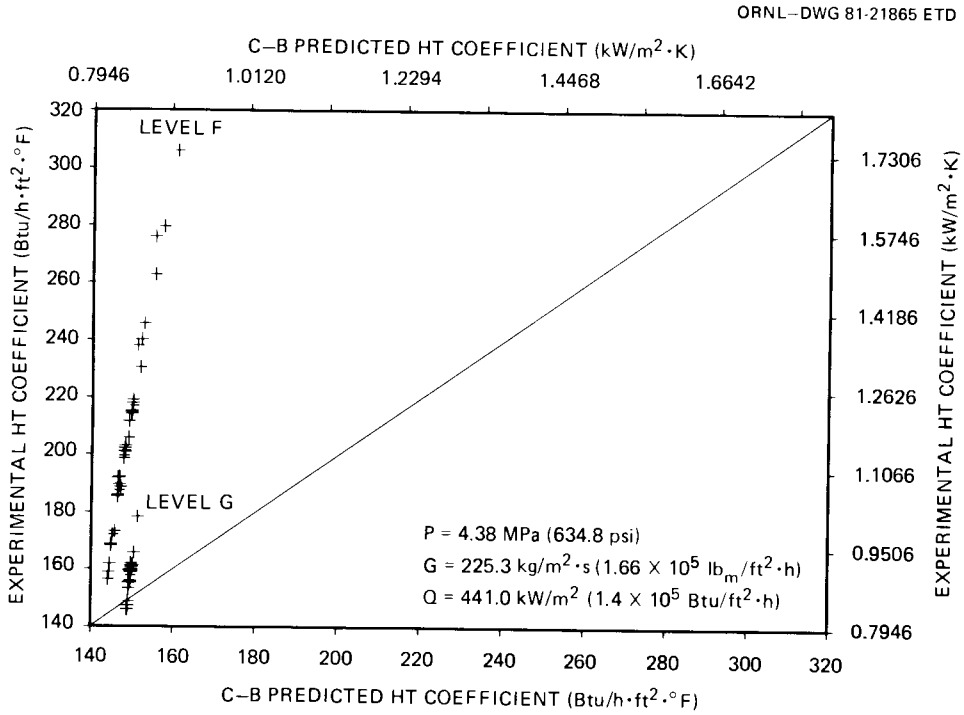

Fig. 27. h_{exp} **vs** h_{corr} **for Condie–Bengston IV, test K.**

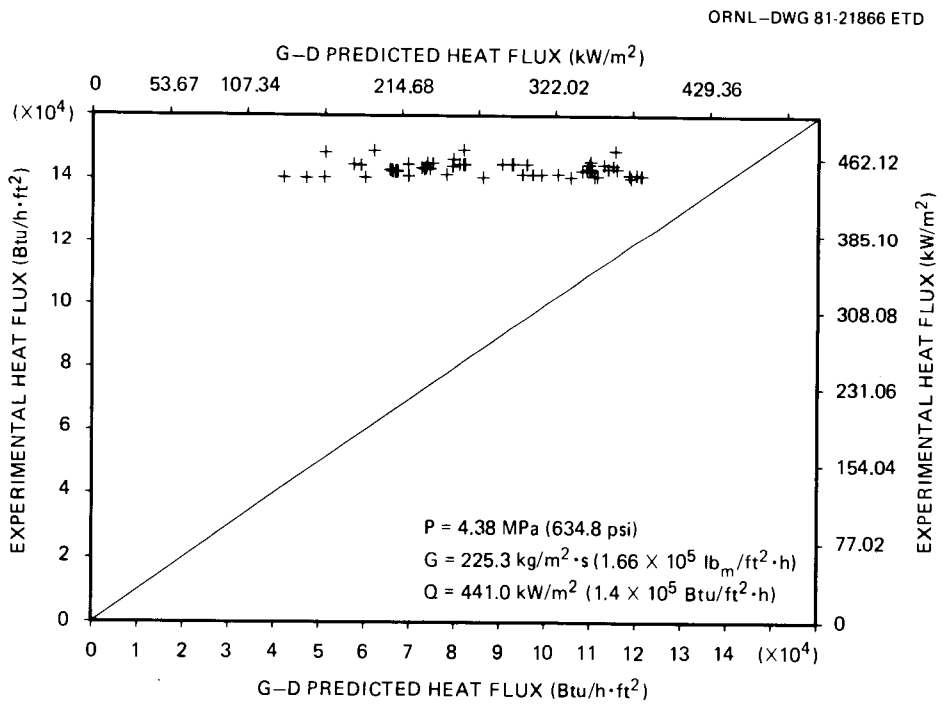

Fig. 28. Q_{exp} **vs** Q_{corr} **for Groeneveld–Delorme, test K.**

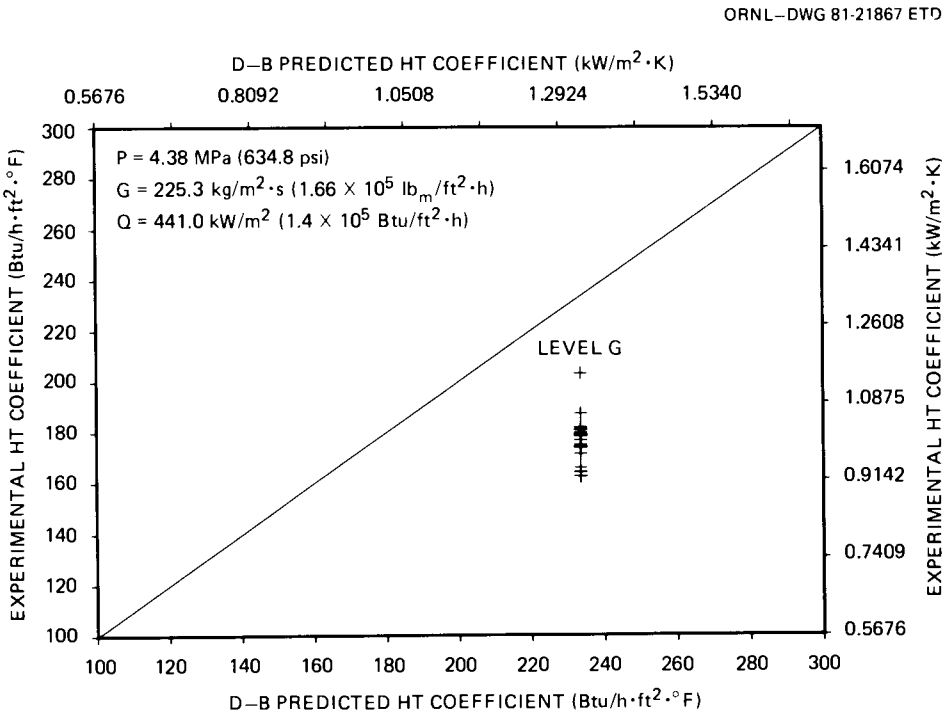

Fig. 29. h_{exp} vs h_{corr} for Dittus-Boelter, test K.

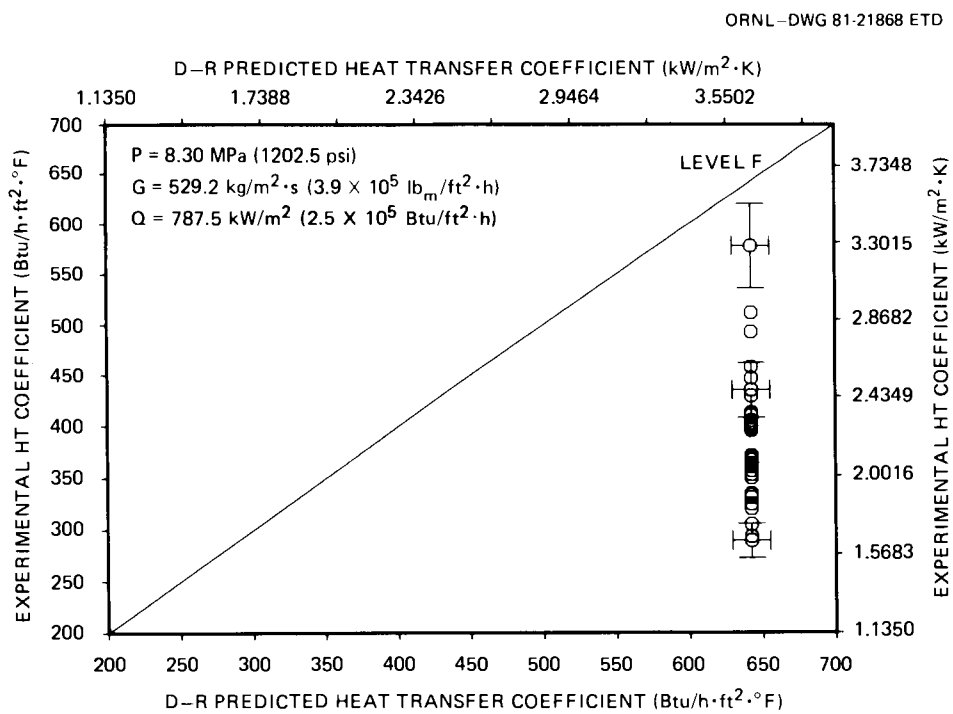

Fig. 30. h_{exp} vs h_{corr} for Dougall-Rohsenow, test L.

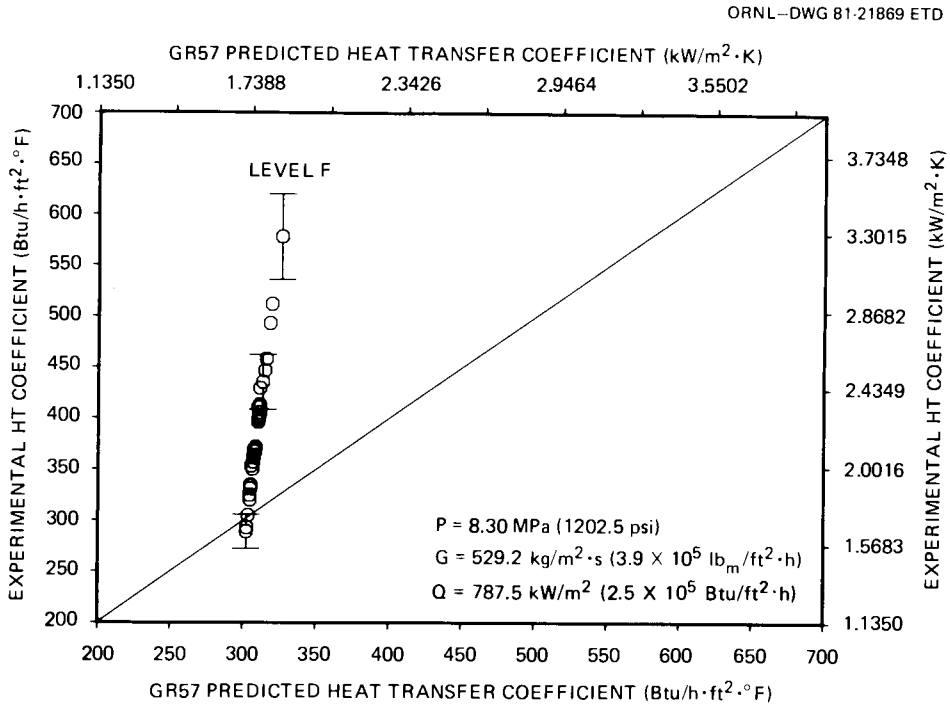

Fig. 31. h_{exp} **vs** h_{corr} **for Groeneveld 5.7, test L.**

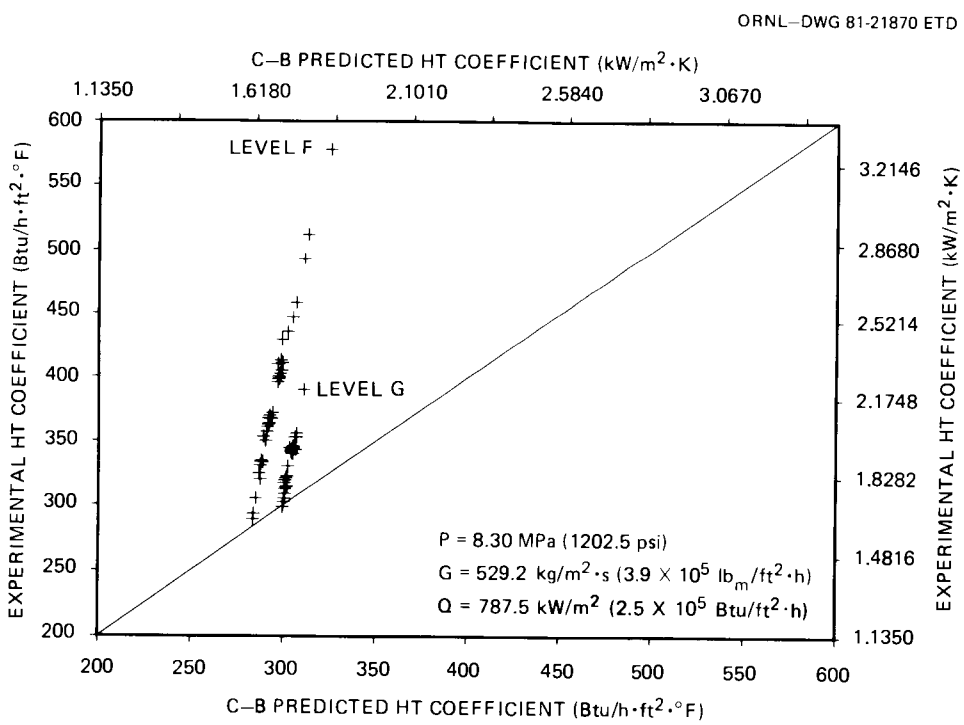

Fig. 32. h_{exp} **vs** h_{corr} **for Condie-Bengston IV, test L.**

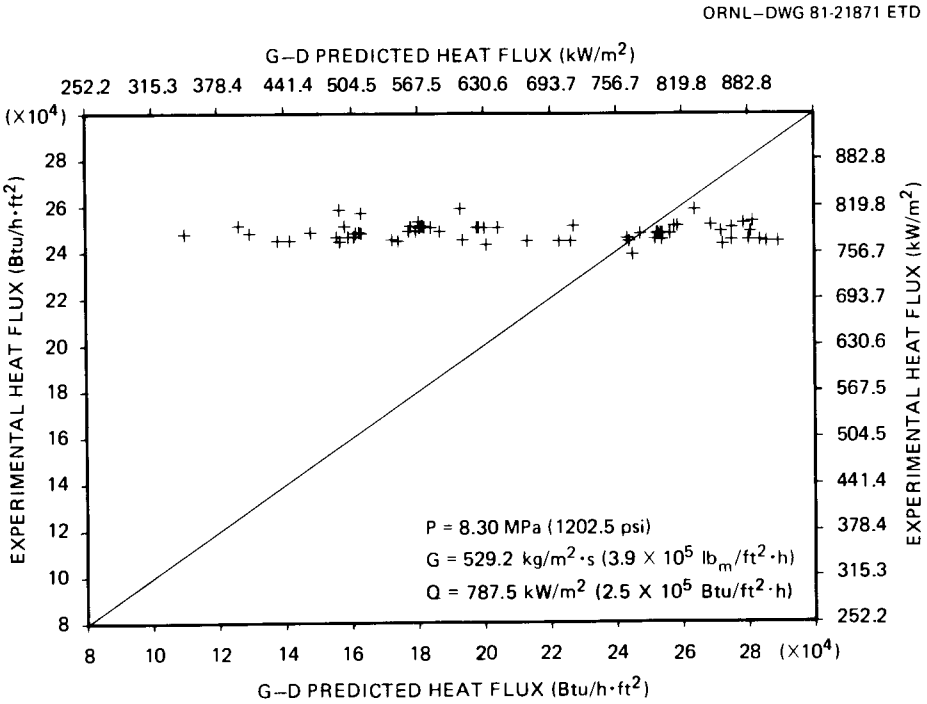

Fig. 33. Q_{exp} **vs** Q_{corr} **for Groeneveld-Delorme, test L.**

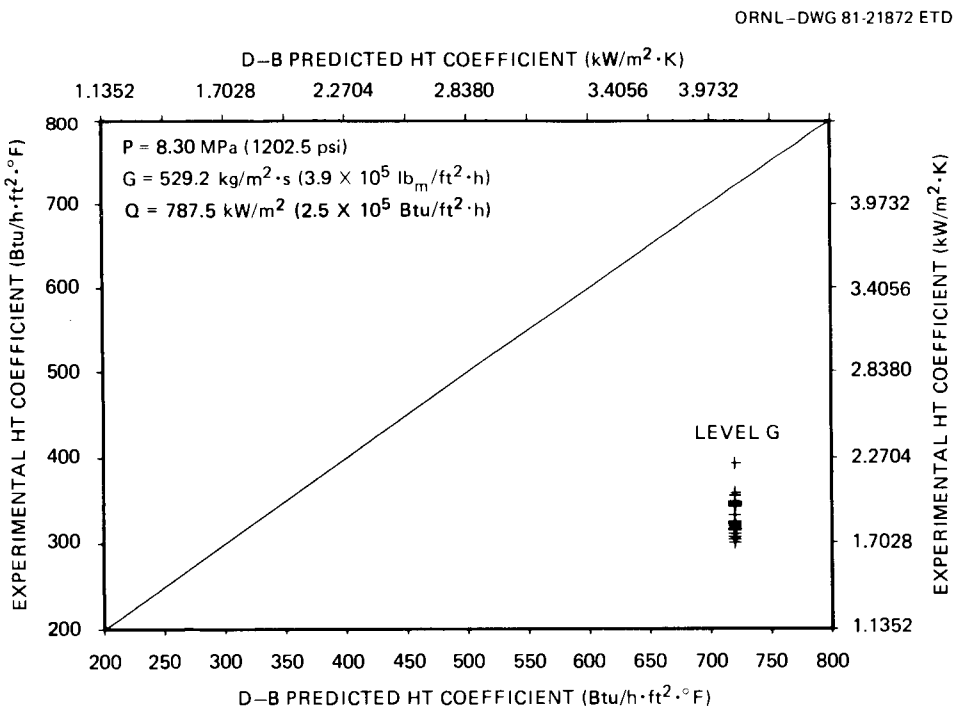

Fig. 34. h_{exp} **vs** h_{corr} **for Dittus-Boelter, test L.**

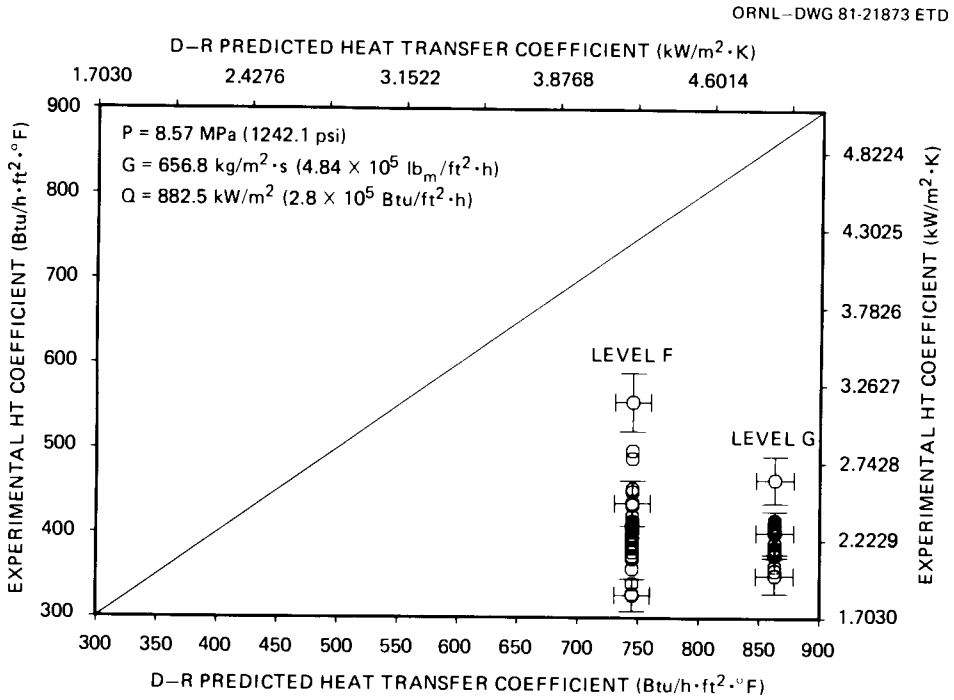

Fig. 35. h_{exp} vs h_{corr} for Dougall-Rohsenow, test M.

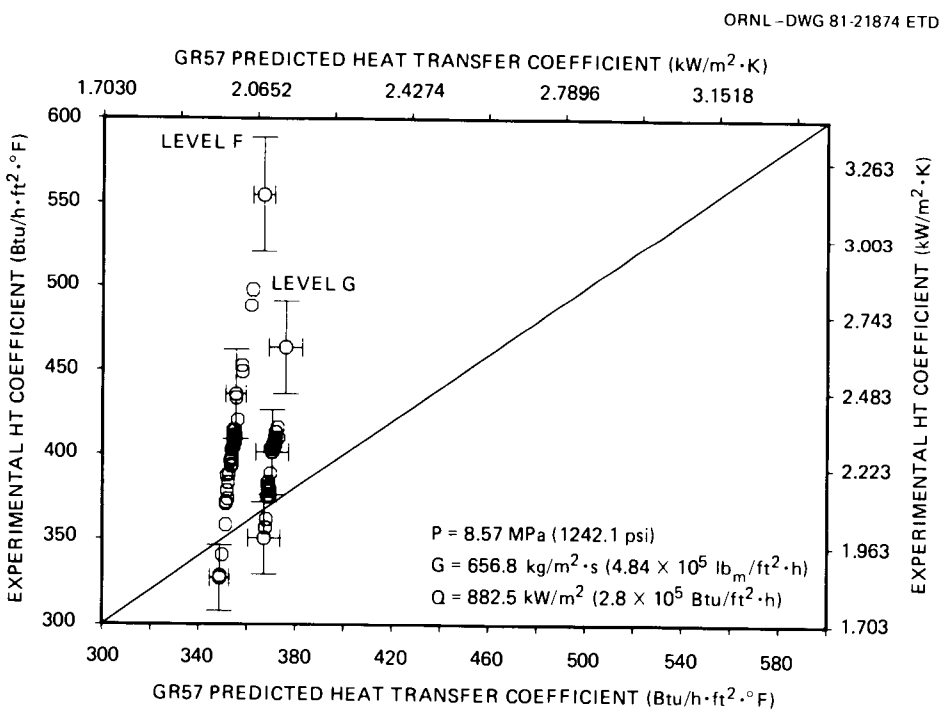

Fig. 36. h_{exp} vs h_{corr} for Groeneveld 5.7, test M.

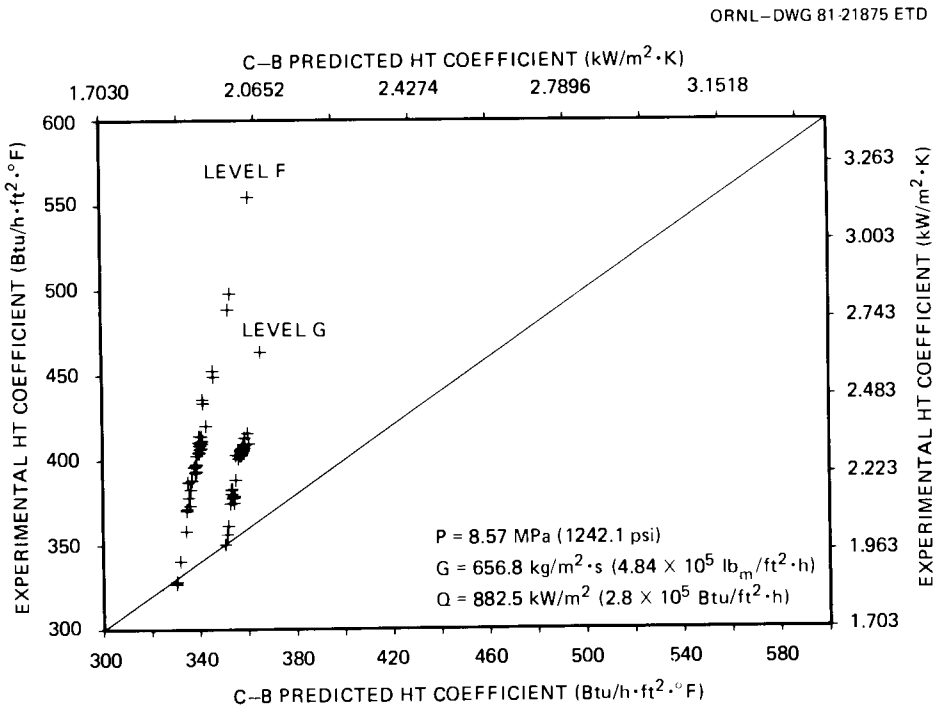

Fig. 37. h_{exp} vs h_{corr} for Condie-Bengston IV, test M.

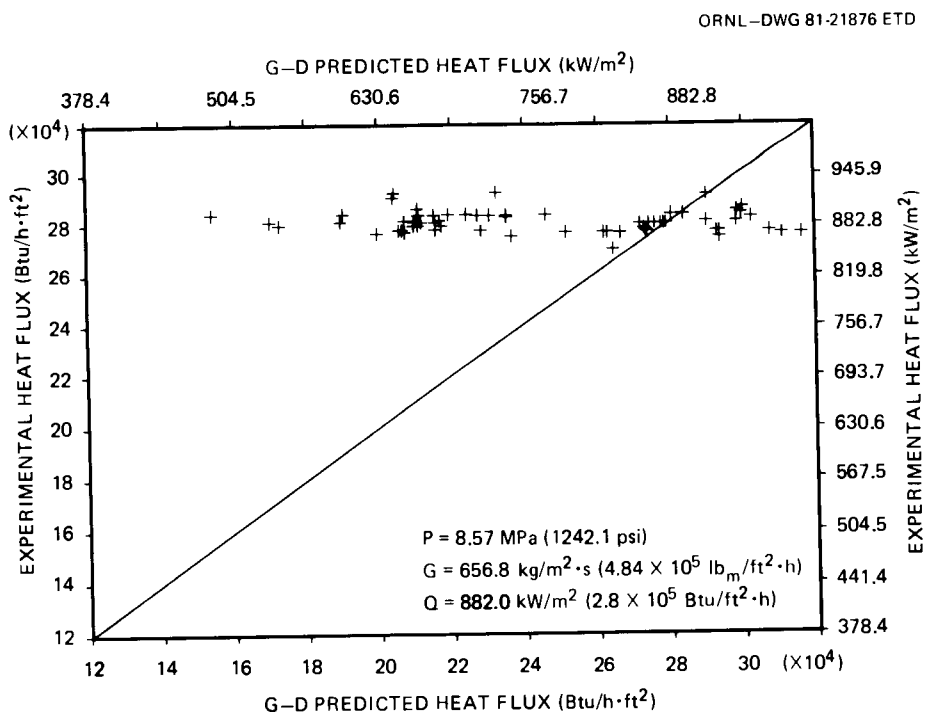

Fig. 38. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, test M.

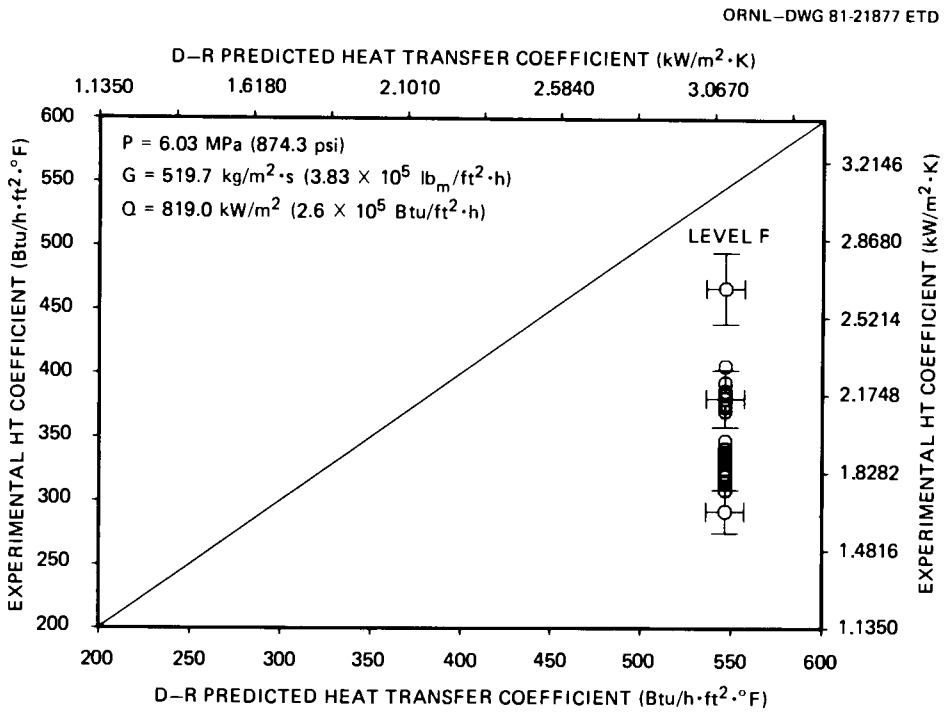

Fig. 39. h_{exp} vs h_{corr} for Dougall–Rohsenow, test P.

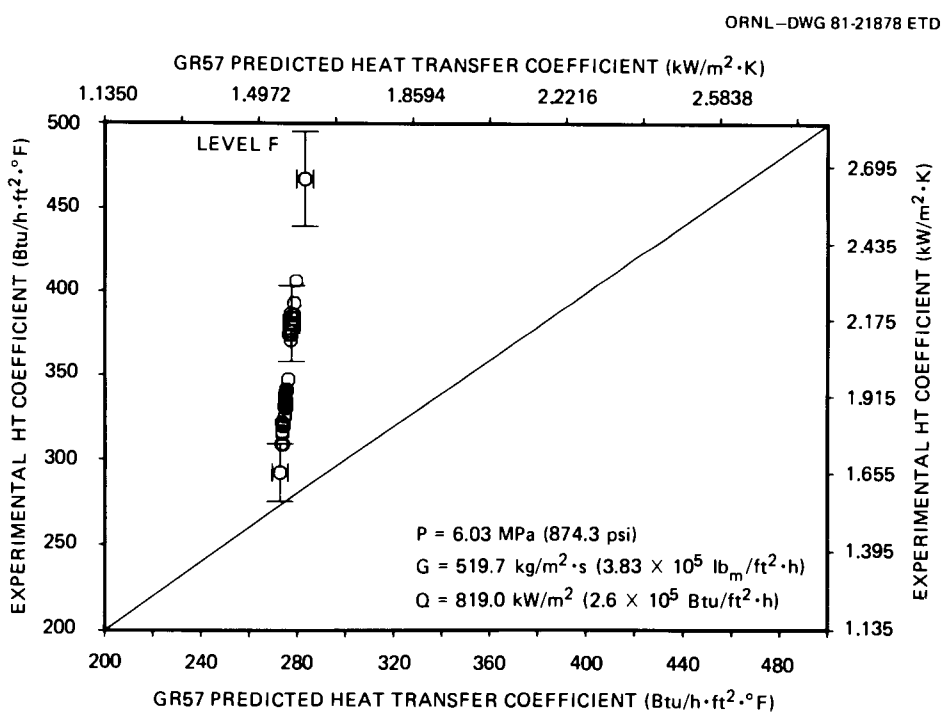

Fig. 40. h_{exp} vs h_{corr} for Groeneveld 5.7, test P.

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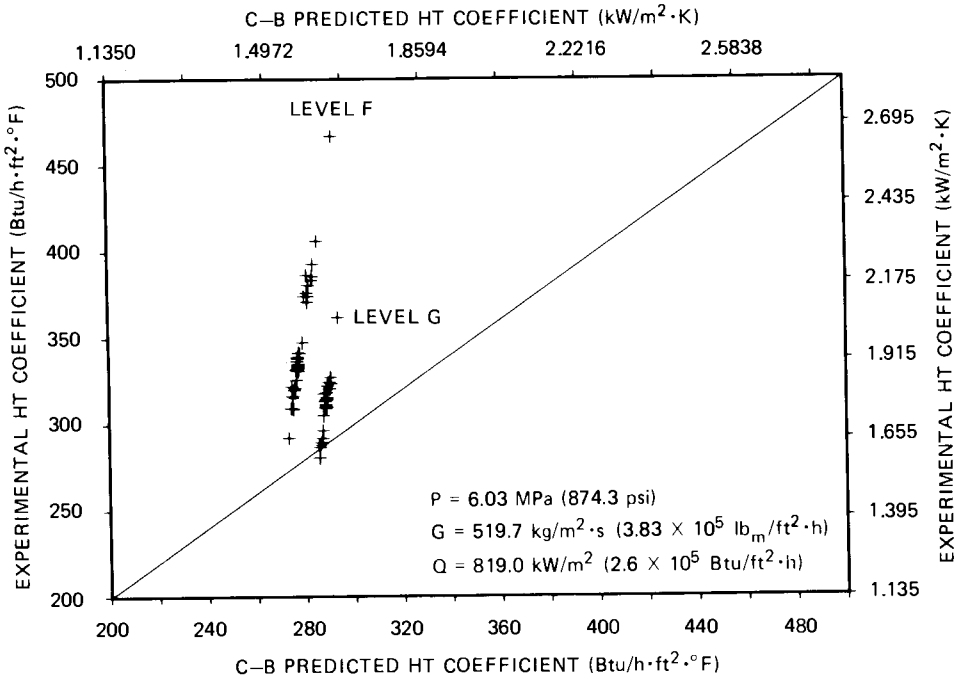

Fig. 41. h_{exp} **vs** h_{corr} **for Condie-Bengston IV, test P.**

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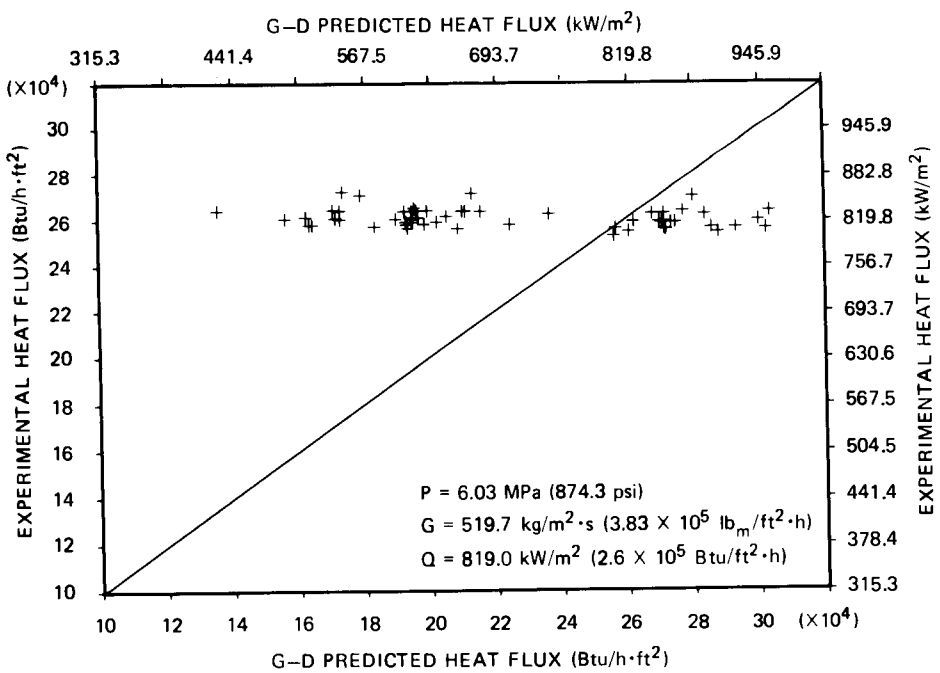

Fig. 42. Q_{exp} **vs** Q_{corr} **for Groeneveld-Delorme, test P.**

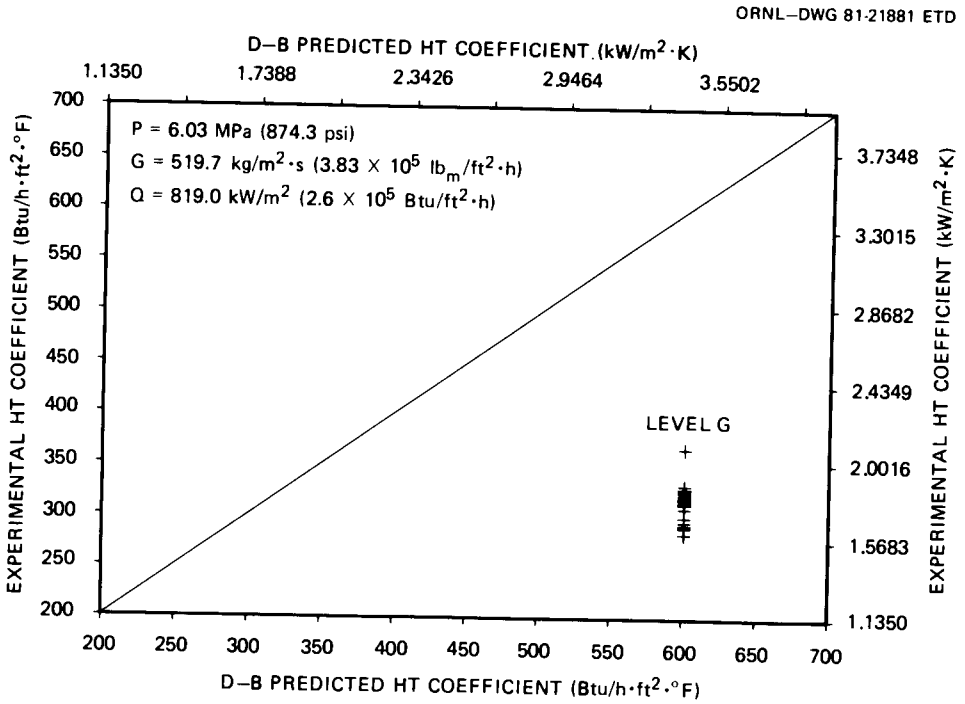

Fig. 43. h_{exp} vs h_{corr} for Dittus-Boelter, test P.

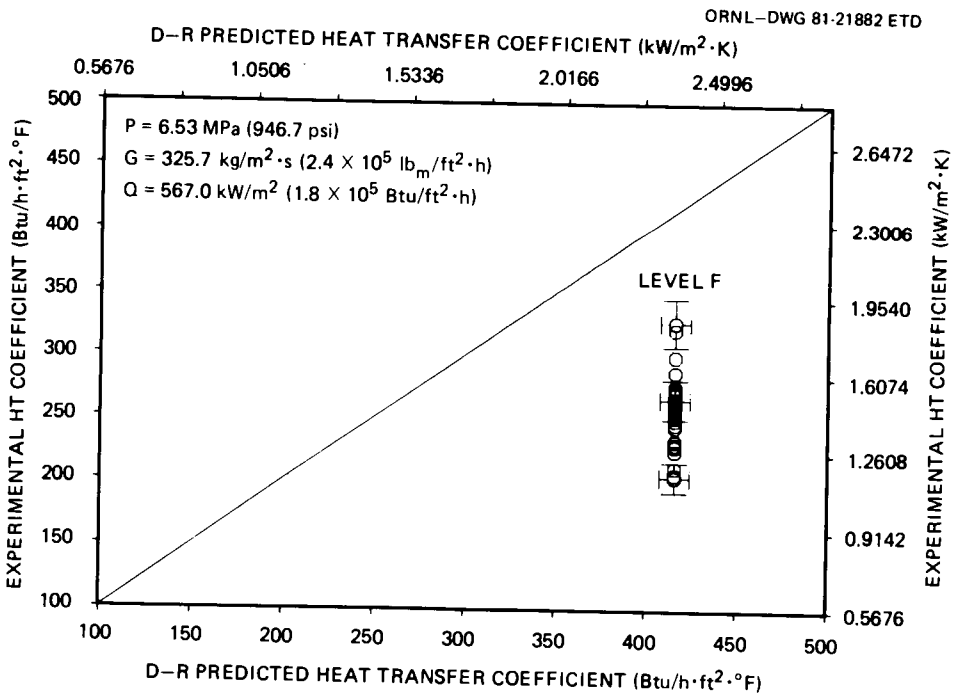

Fig. 44. h_{exp} vs h_{corr} for Dougall-Rohsenow, test Q.

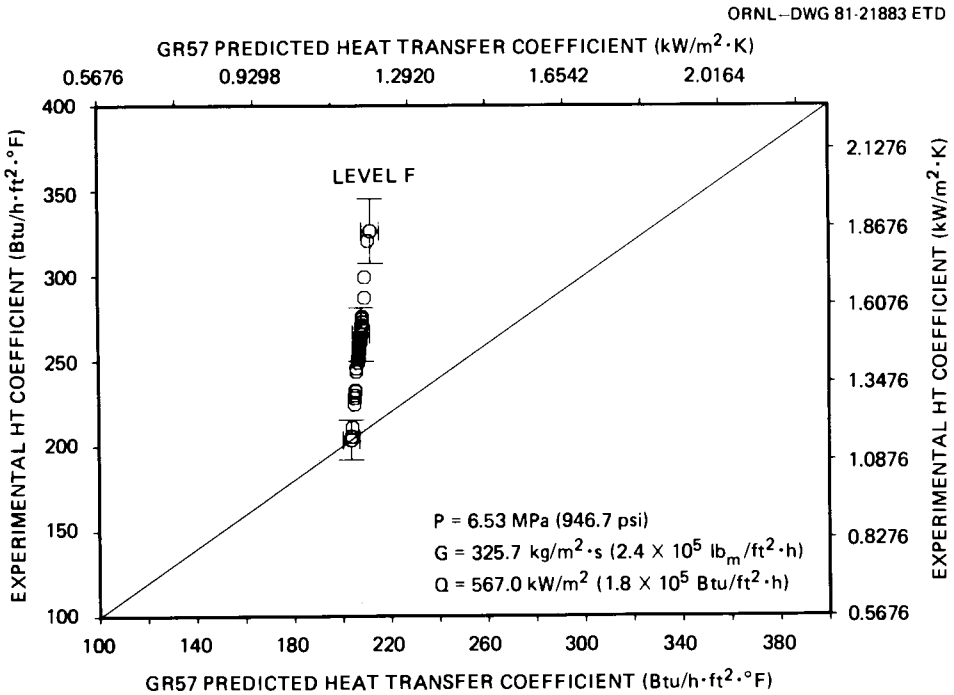

Fig. 45. h_{exp} vs h_{corr} for Groeneveld 5.7, test Q.

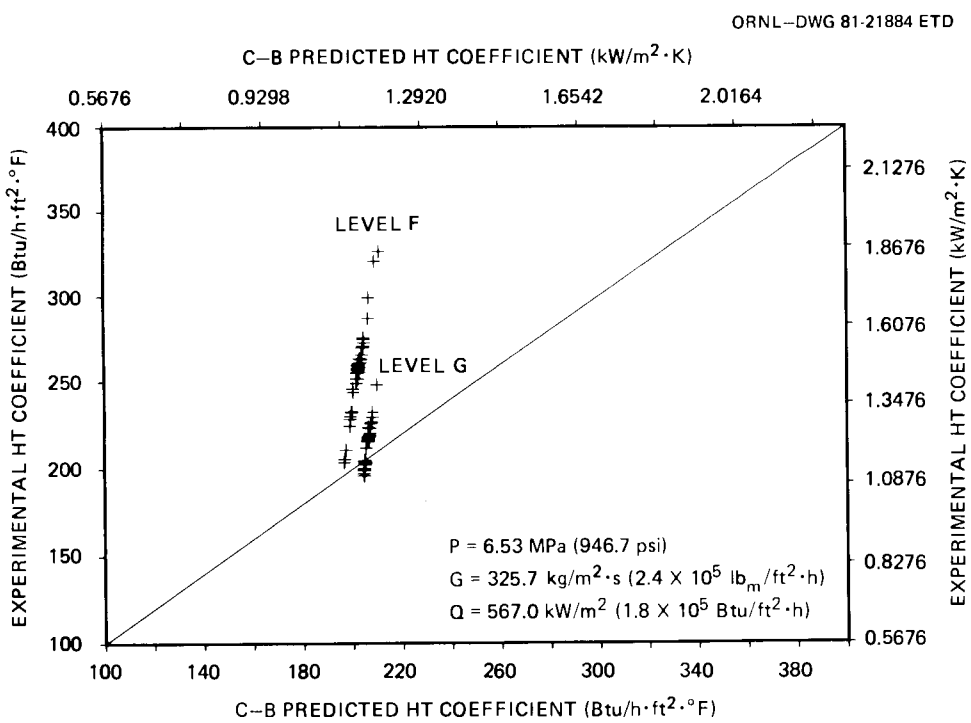

Fig. 46. h_{exp} vs h_{corr} for Condie-Bengston IV, test Q.

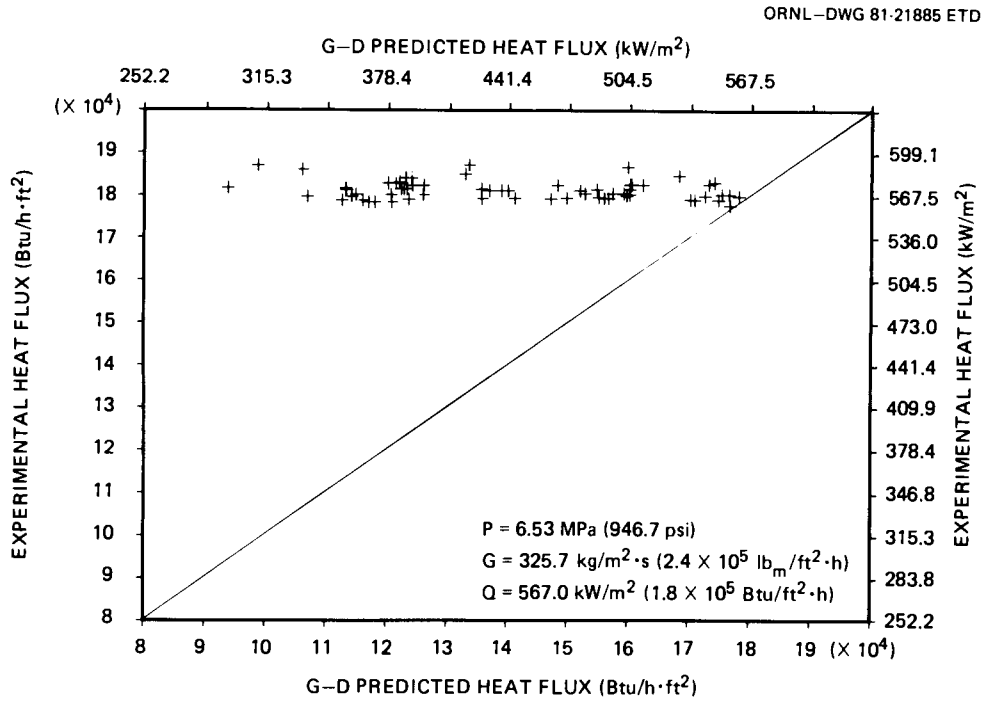

Fig. 47. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, test Q.

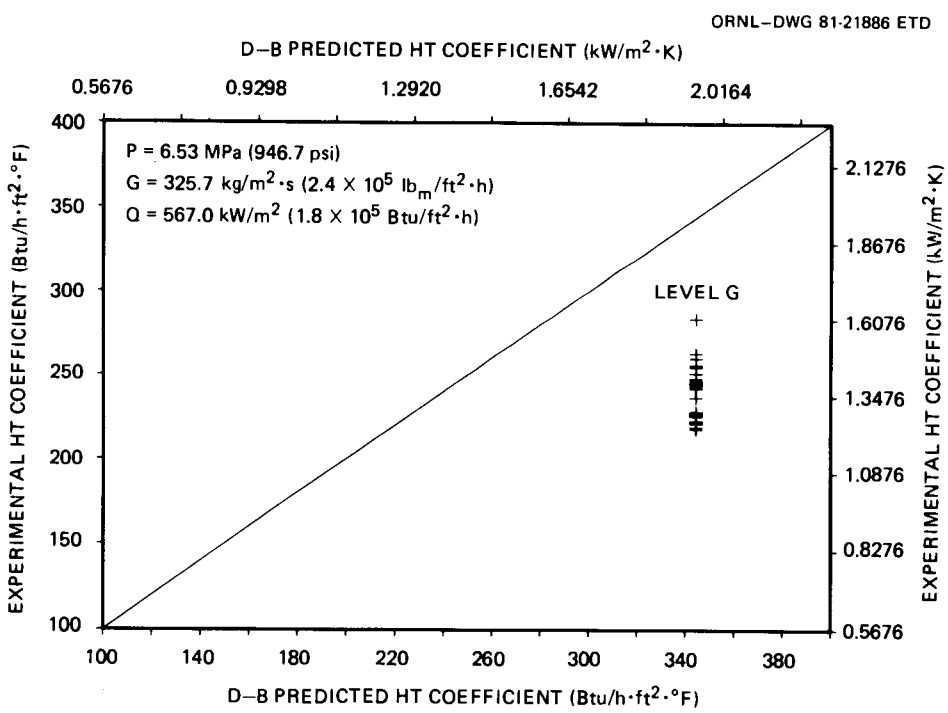

Fig. 48. h_{exp} vs h_{corr} for Dittus-Boelter, test Q.

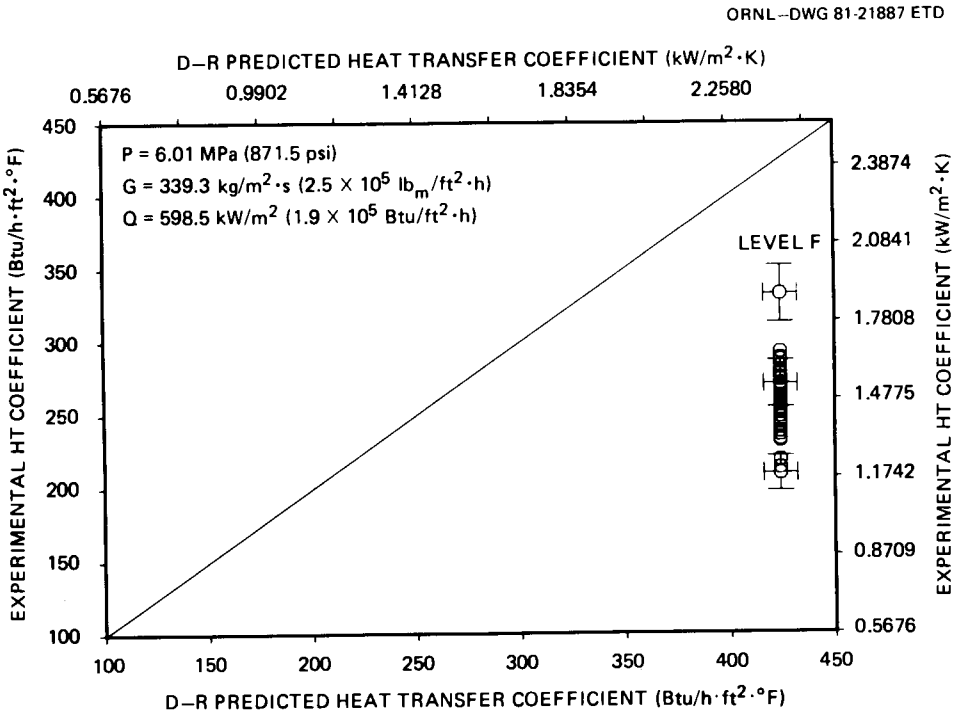

Fig. 49. h_{exp} vs h_{corr} for Dougall–Rohsenow, test X.

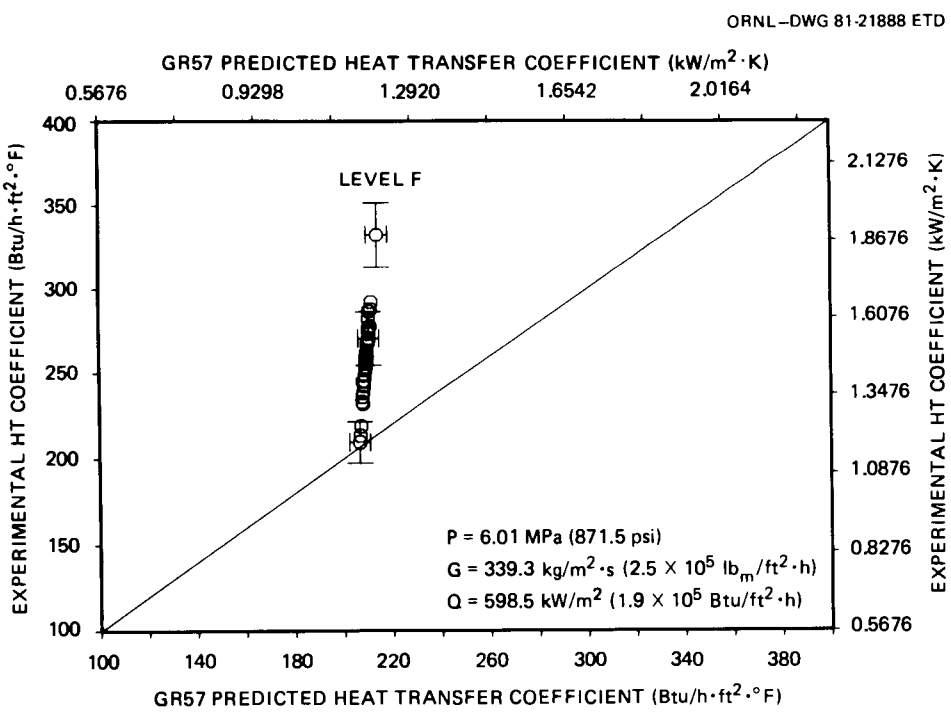

Fig. 50. h_{exp} vs h_{corr} for Groeneveld 5.7, test X.

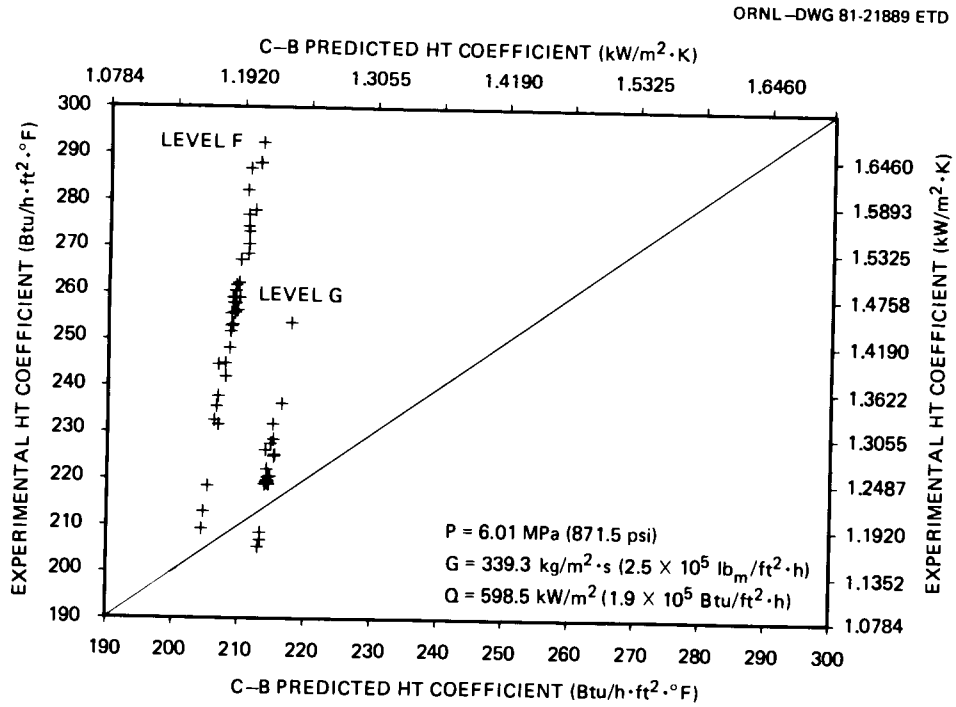

Fig. 51. h_{exp} vs h_{corr} for Condie-Bengston IV, test X.

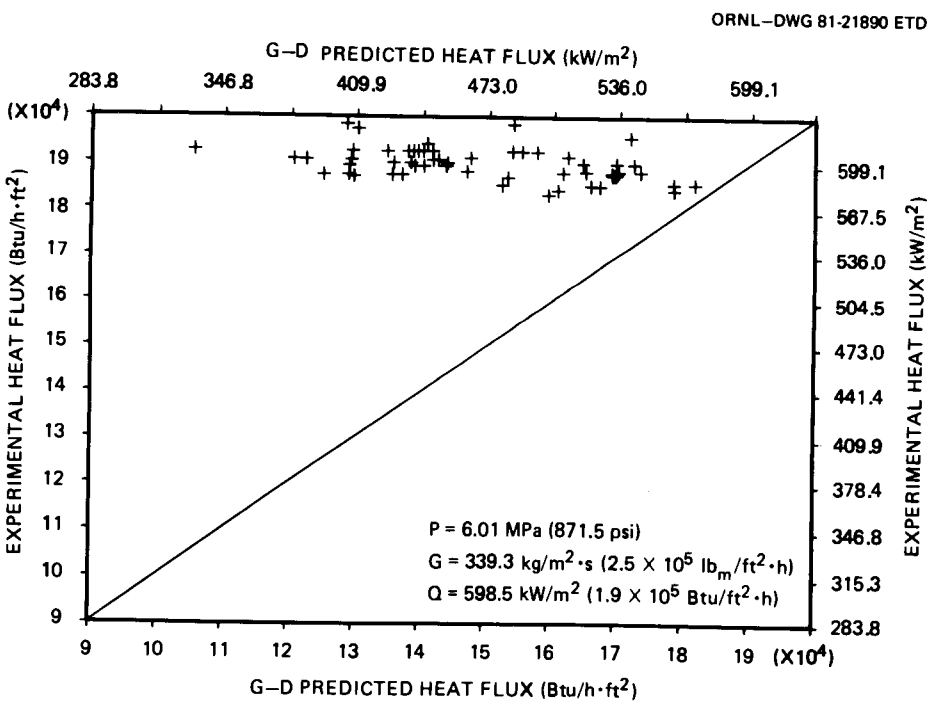

Fig. 52. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, test X.

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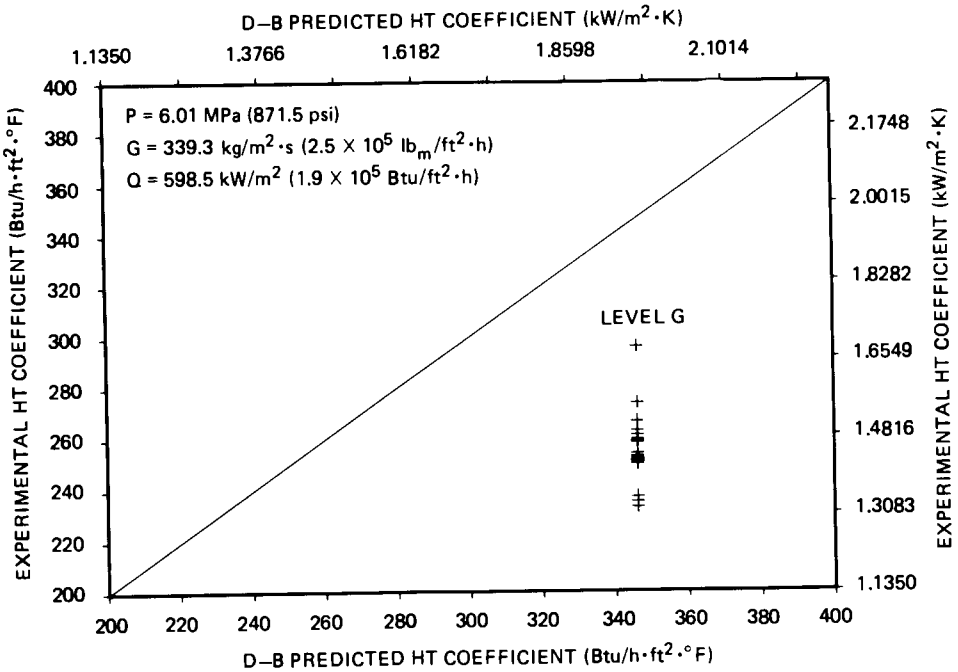

Fig. 53. h_{exp} vs h_{corr} for Dittus-Boelter, test X.

bars) are significantly smaller than the data scatter. The slope in the vertical data strings for the Groeneveld 5.7 and Condie-Bengston IV plots reflect the surface temperature variation and its effect on the wall Pr. Scatter in the Groeneveld-Delorme correlation is horizontal. Wall temperature variations are now incorporated in the correlation predicted heat flux because $Q_{GD} = h_{GD} (T_w - T_v)$.

Plots that show data for all tests are presented in Figs. 54–60. In general, results of these tests show that both Dougall-Rohsenow correlations tend to overpredict heat transfer coefficents, while the Groeneveld 5.7, Groeneveld 5.9, and Condie-Bengston IV correlations predict the data better. The Groeneveld-Delorme correlation predicts heat fluxes that are low at points near dryout. However, predictions improve as the distance from dryout increases. The Dittus-Boelter correlation also tends to overpredict the observed experimental heat transfer coefficients. These conclusions agree with results obtained in the three transient tests (3.03.6AR, 3.06.6B, and 3.08.6C) conducted in the THTF (Appendixes A, B, and C).

The Dougall-Rohsenow correlation was not developed from two-phase data and does not account for nonequilibrium effects. Nonequilibrium within the flow would tend to decrease experimental heat transfer coefficients and could explain the discrepancy between the Dougall-Rohsenow correlations and the data.

All other film boiling correlations presented were developed from two-phase data and would partially account for nonequilibrium within the flow. At the dryout point (the point beyond which liquid no longer comes in contact with the heated surface), conditions should be close to equilibrium.

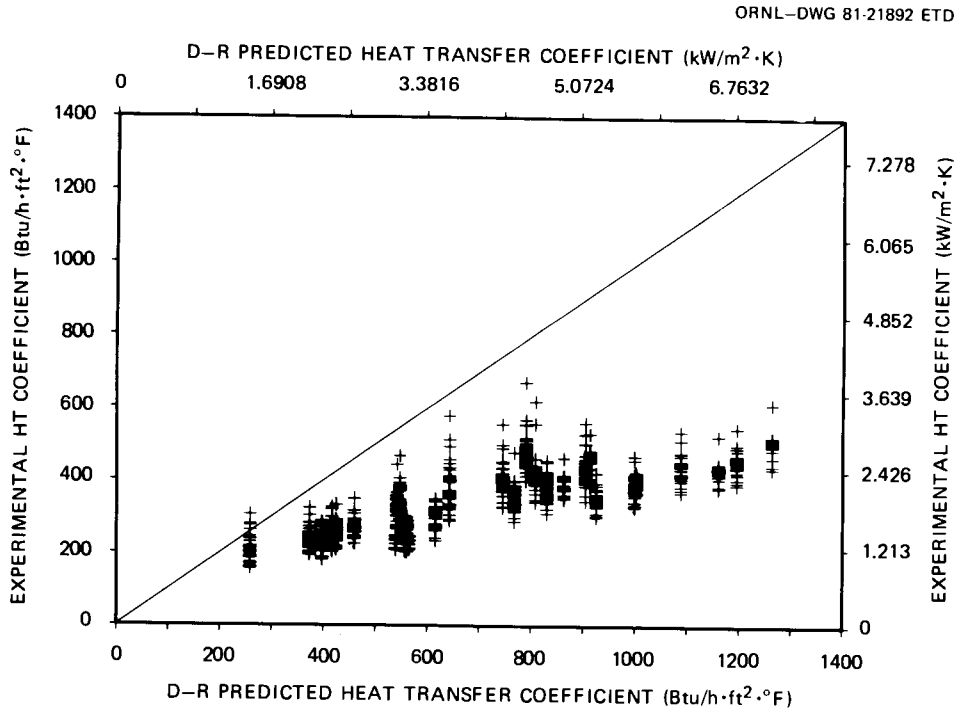

Fig. 54. h_{exp} vs h_{corr} for Dougall-Rohsenow, all data.

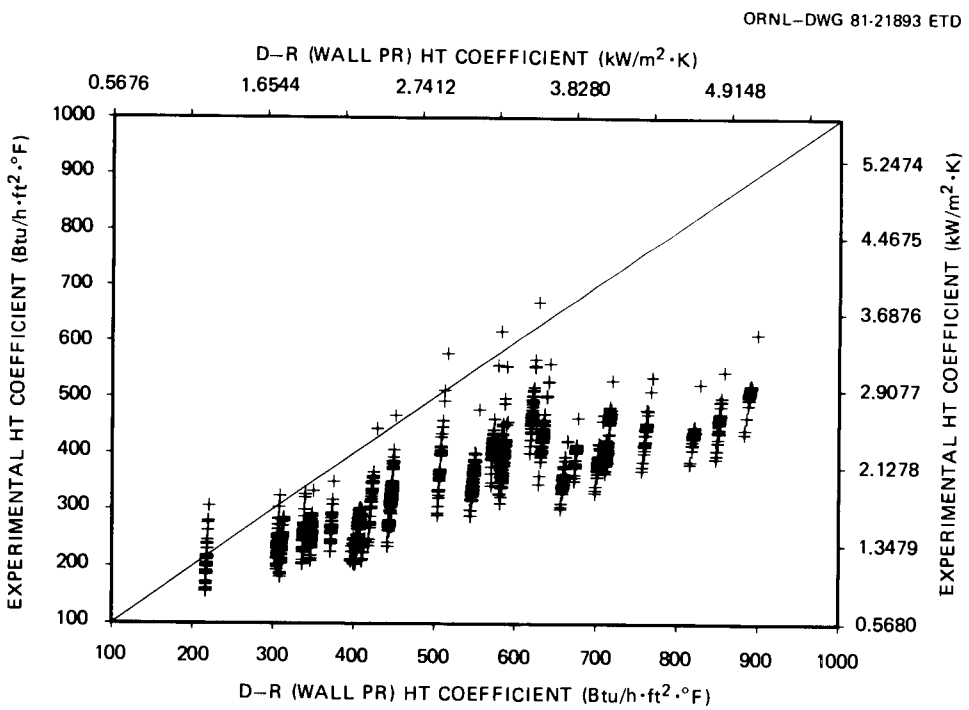

Fig. 55. h_{exp} vs h_{corr} for Dougall-Rohsenow (wall Pr), all data.

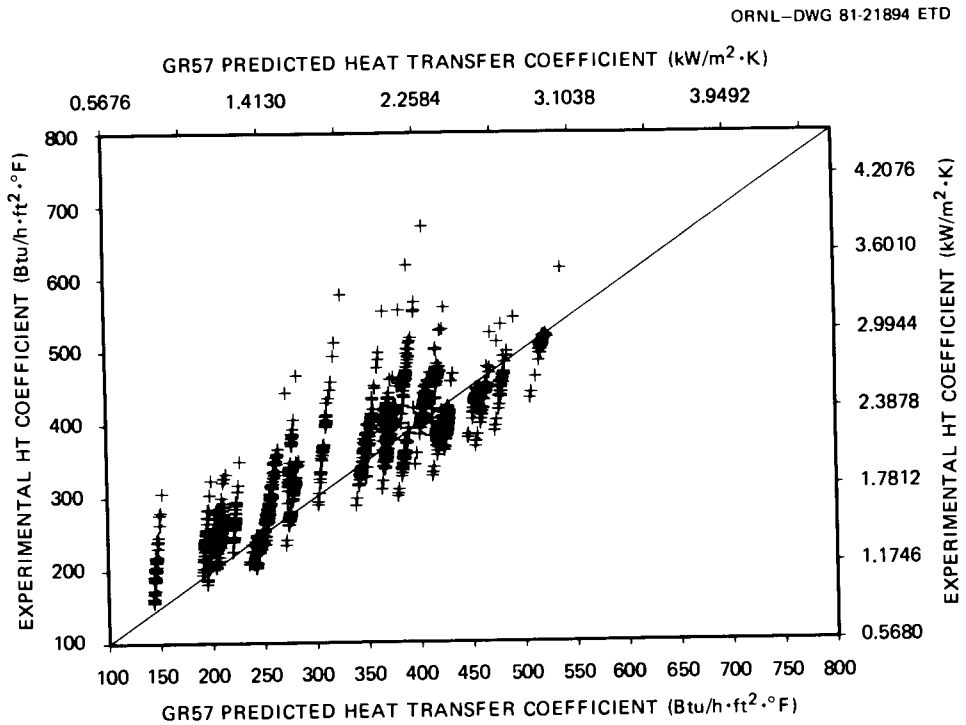

Fig. 56. h_{exp} vs h_{corr} for Groeneveld 5.7, all data.

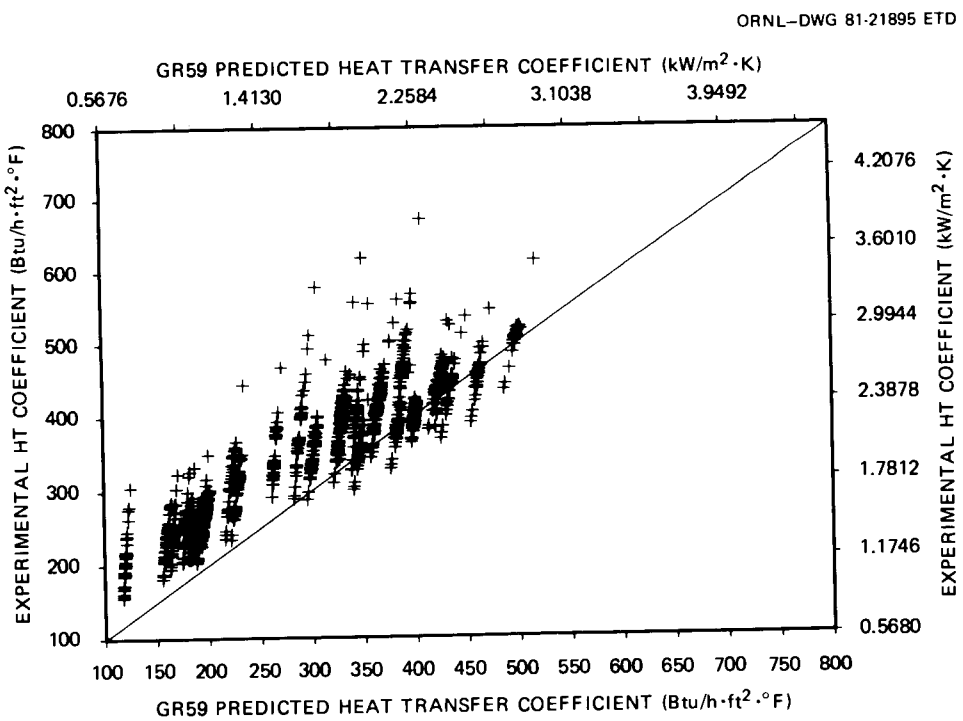

Fig. 57. h_{exp} vs h_{corr} for Groeneveld 5.9, all data.

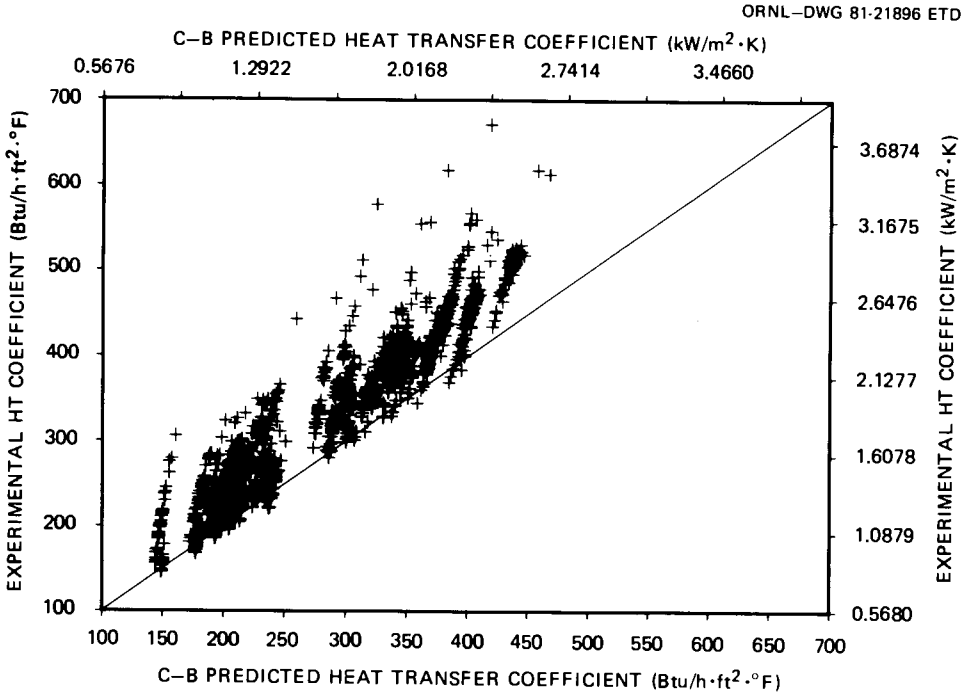

Fig. 58. h_{exp} vs h_{corr} for Condie-Bengston IV, all data.

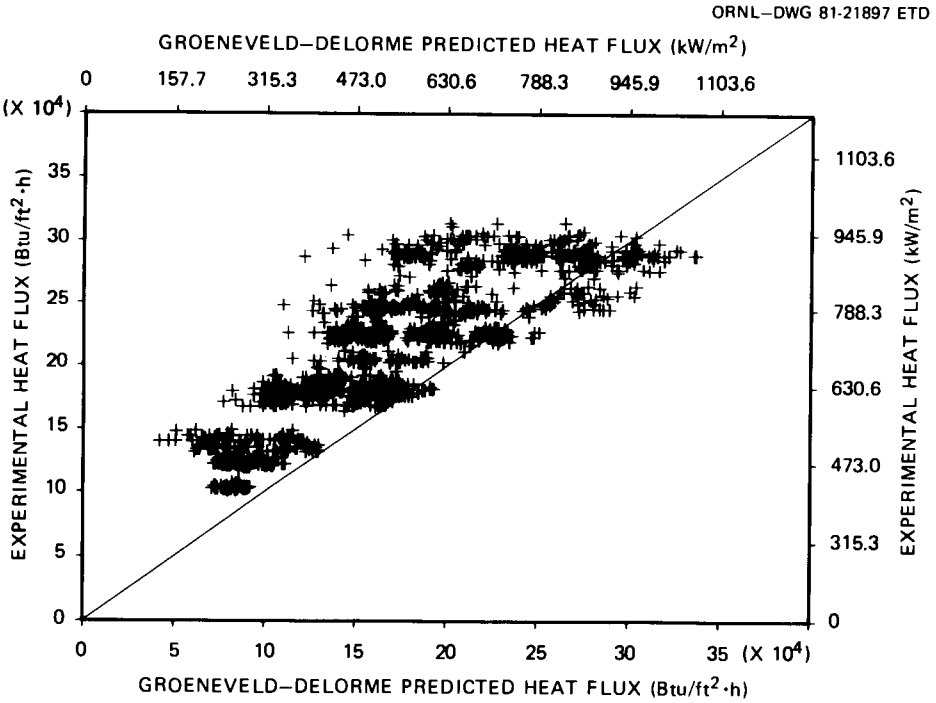

Fig. 59. Q_{exp} vs Q_{corr} for Groeneveld-Delorme, all data.

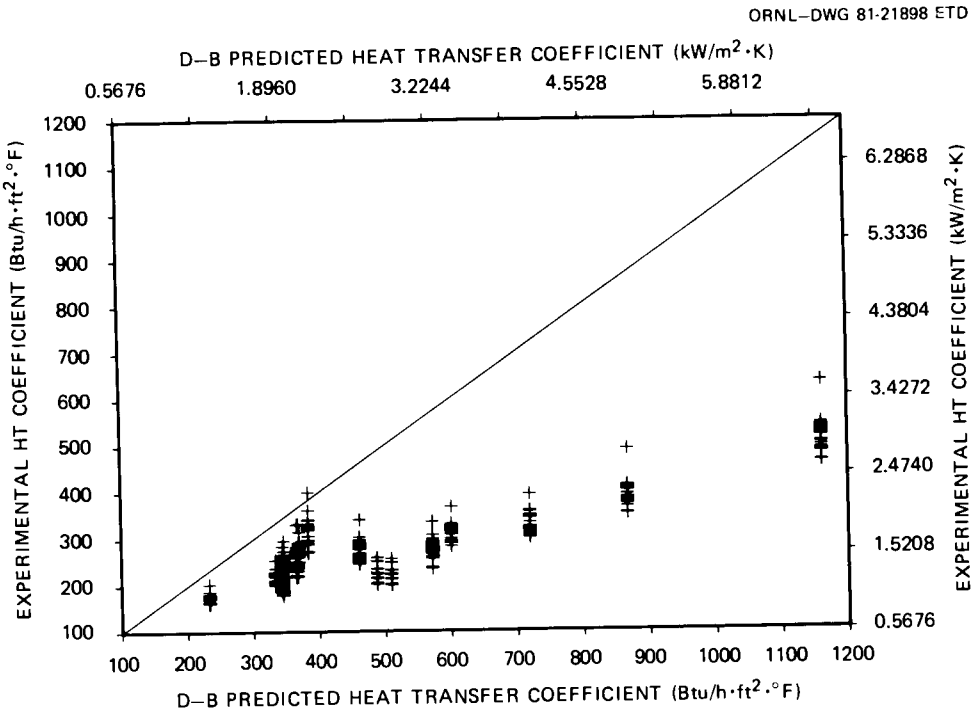

Fig. 60. h_{exp} vs h_{corr} for Dittus-Boelter, all data.

As distance from dryout increases, the amount of nonequilibrium in the flow increases. None of these correlations explicitly accounts for this phenomenon. In particular, the Groeneveld-Delorme correlation predicts the existence of some nonequilibrium at dryout, causing the predicted heat transfer coefficients to be low. As distance from dryout increases, nonequilibrium effects are more prominent, and the predictions tend to be better. Because nonequilibrium is present in all heated dispersed flows to some extent, liquid is present in the flow even after the equilibrium quality reaches one. Thus, the Dittus-Boelter correlation that uses single-phase equilibrium conditions beyond qualities of one tends to overpredict heat transfer coefficients for reasons similar to those discussed for the Dougall-Rohsenow correlation.

4.2 Nonequilibrium

No instrumentation presently available for use in the THTF can measure the degree of nonequilibrium in the flow. However, the degree of nonequilibrium in the steady state tests can be estimated by using techniques developed for predicting nonequilibrium in dispersed flows. Three techniques were used on representative steady state tests:

1. Groeneveld-Delorme,[14]
2. Chen,[13] and
3. Yoder.[26]

Both the Groeneveld-Delorme and Chen techniques are correlational techniques developed from two-phase heat transfer data assuming the wall heat transfer could properly be described by a suitable single-phase heat transfer coefficient. The Yoder technique develops a method of calculating actual quality from the governing transport equations in two-phase flows. This technique has been slightly modified in this report to account for differences between bundle geometry and tube geometry (the geometry for which it was developed).

Results of these calculations are presented as plots of actual quality vs equilibrium quality (Figs. 61–70). Also shown in the figures is the predicted vapor superheat for level G. Predicted superheats range as high as 235°C (423°F). A considerable amount of nonequilibrium is probably present in most of the tests and would tend to cause the Dougall-Rohsenow correlations to overpredict heat transfer coefficients.

The Dittus-Boelter correlation would also tend to overpredict heat transfer coefficients when nonequilibrium is present in the flow. Liquid can be present even when equilibrium qualities are >1, lowering the vapor Reynolds number and raising the vapor temperature.

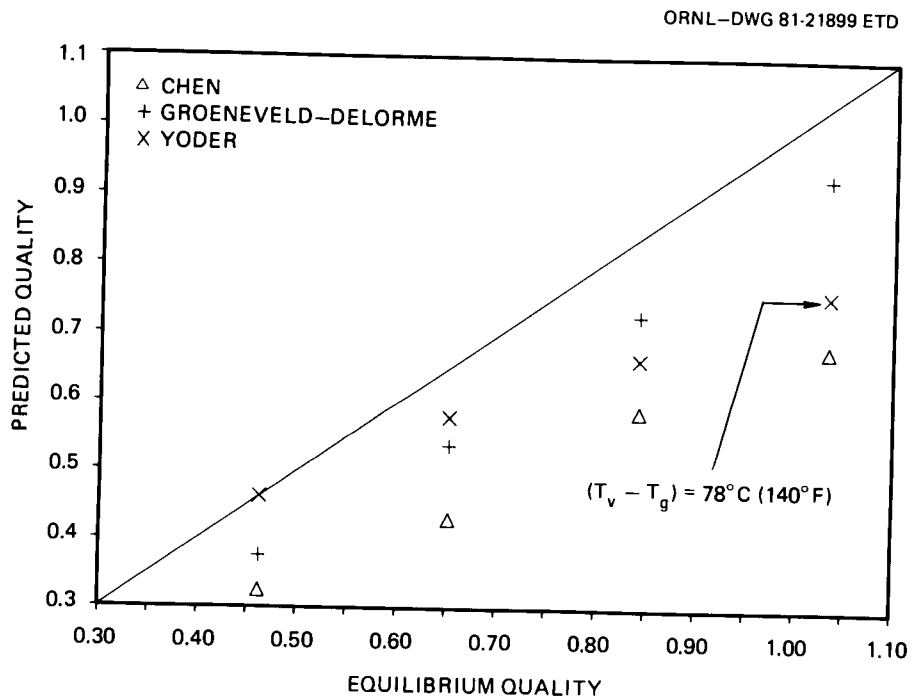

Fig. 61. Actual quality vs equilibrium quality, test B.

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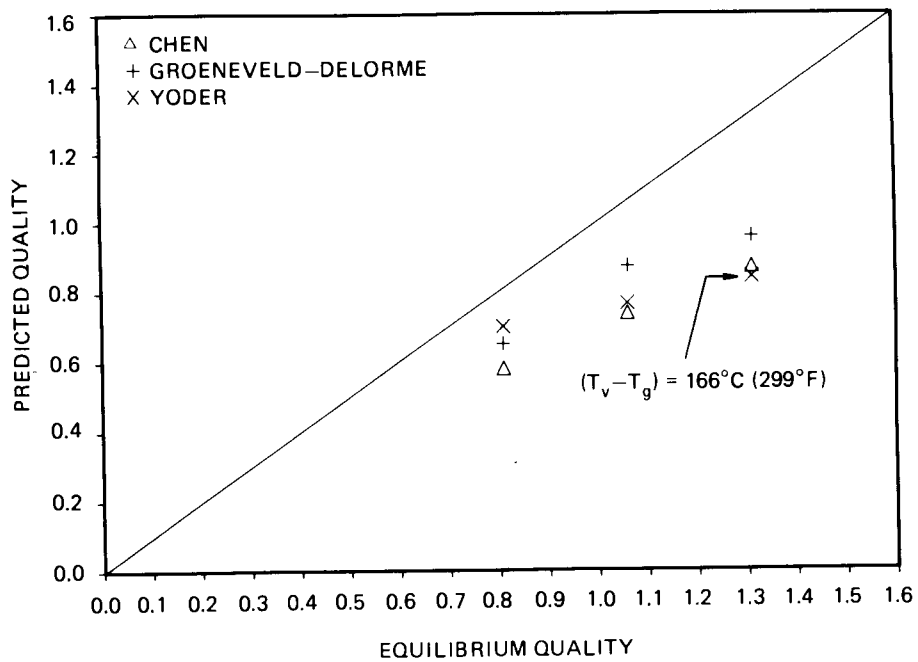

Fig. 62. Actual quality vs equilibrium quality, test C.

ORNL–DWG 81-21901 ETD

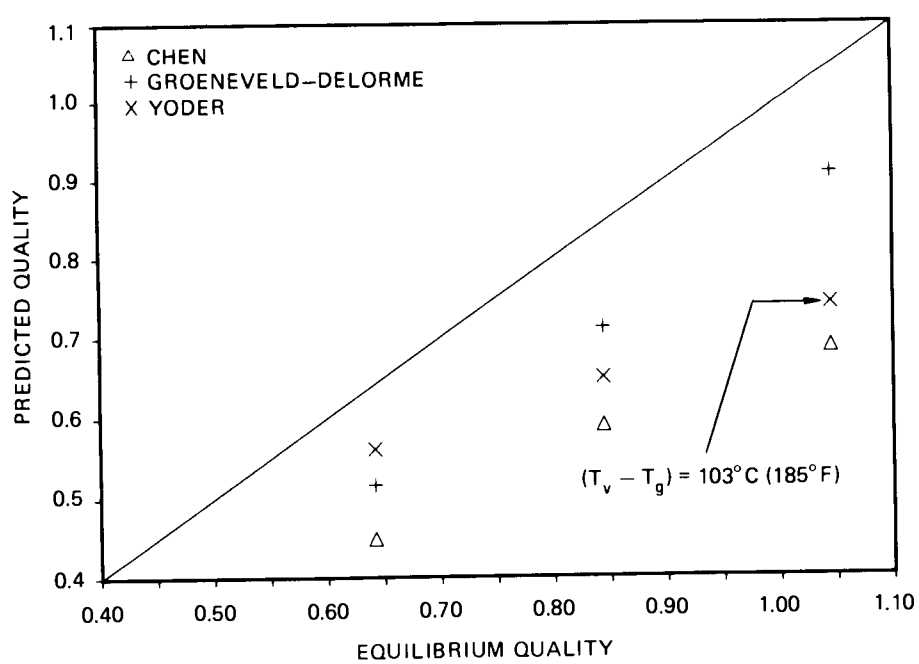

Fig. 63. Actual quality vs equilibrium quality, test D.

ORNL–DWG 81-21902 ETD

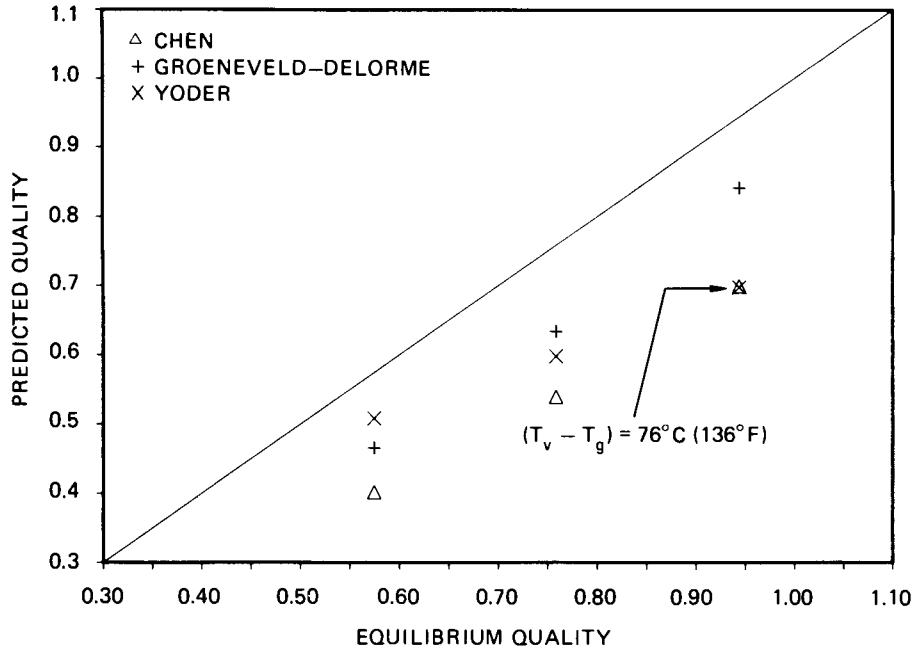

Fig. 64. Actual quality vs equilibrium quality, test E.

ORNL–DWG 81-21903 ETD

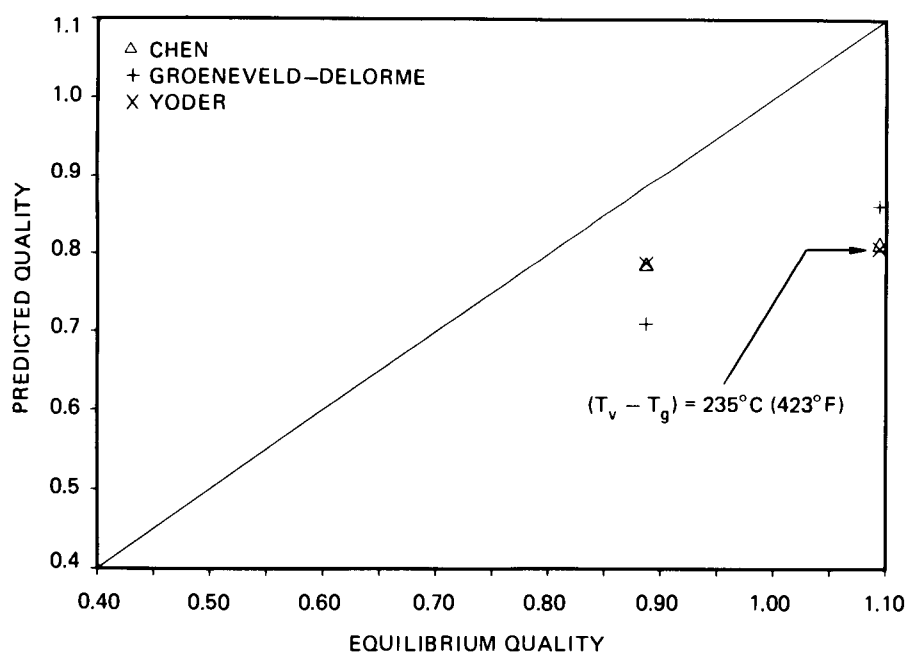

Fig. 65. Actual quality vs equilibrium quality, test K.

ORNL–DWG 81-21904 ETD

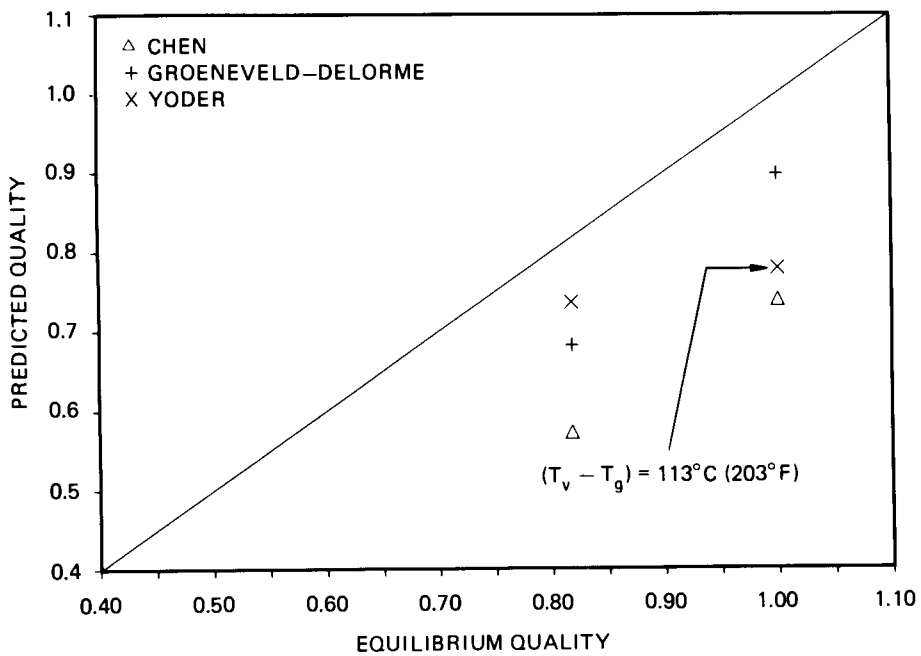

Fig. 66. Actual quality vs equilibrium quality, test L.

ORNL–DWG 81-21905 ETD

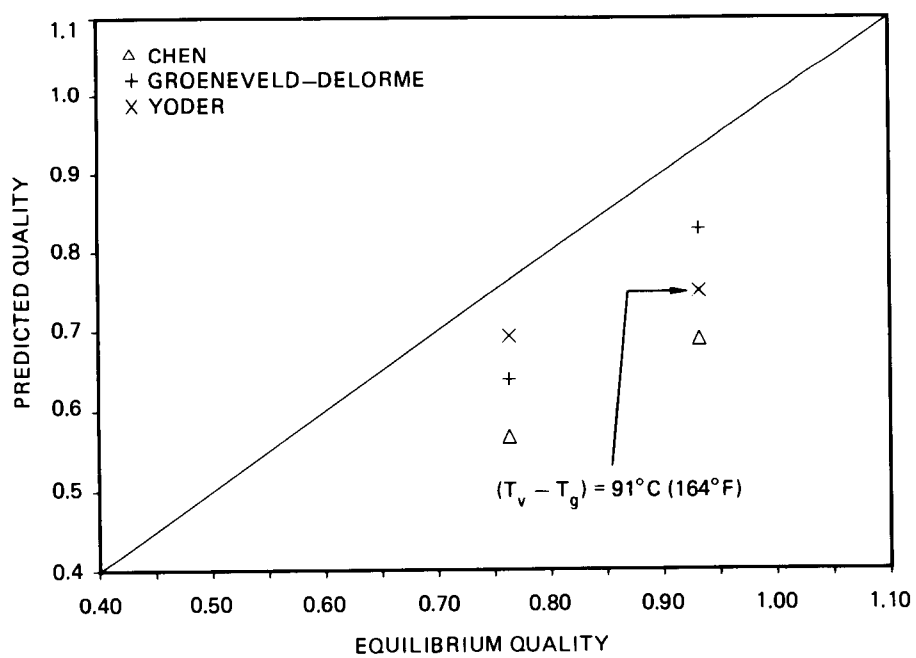

Fig. 67. Actual quality vs equilibrium quality, test M.

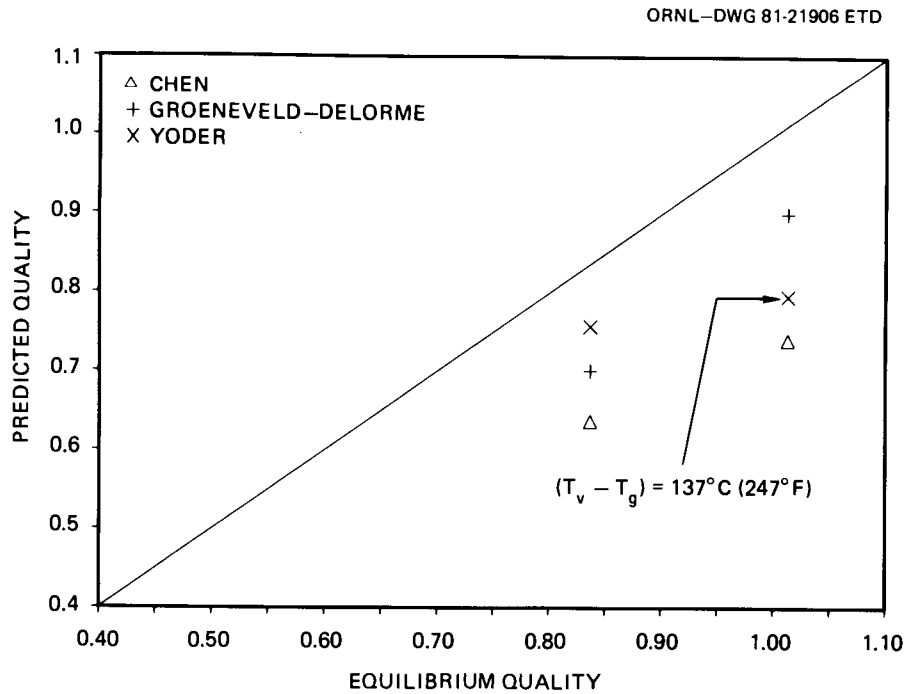

Fig. 68. Actual quality vs equilibrium quality, test P.

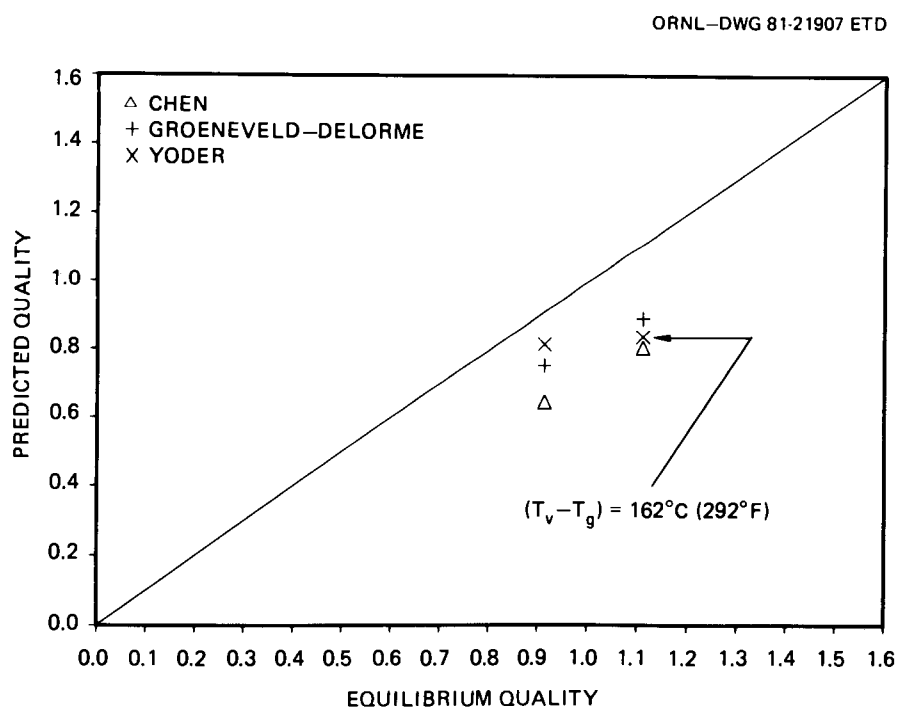

Fig. 69. Actual quality vs equilibrium quality, test Q.

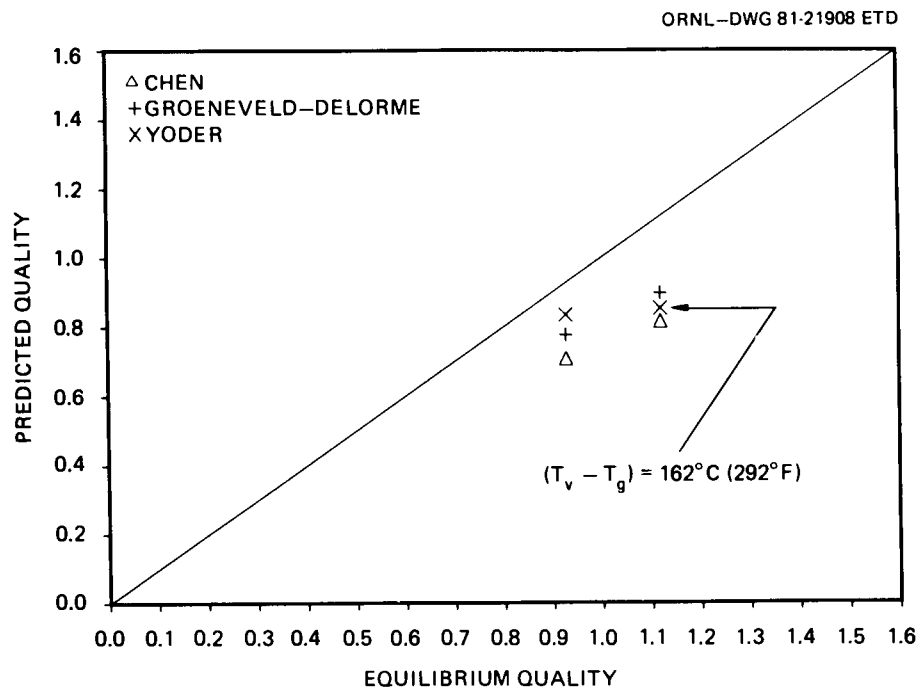

Fig. 70. Actual quality vs equilibrium quality, test X.

4.3 Grid Spacer Effects

Low-pressure drop and egg-crate-type spacer grids without swirl inducers are spaced at 0.61-m (2-ft) intervals along the THTF bundle. Closely spaced intermediate thermocouples are located axially above and below the two topmost grids to investigate grid effects during film boiling. To eliminate the grid spacer effect on intermediate-level rod property calculation, an averaging technique was used. Values for boron nitride thermal conductivity and sheath thermocouple contact resistance were averaged for all major-level thermocouples (A, B, C, D, E, F, and G). These values were then used to calculate rod surface conditions at the intermediate levels using a numerical form of Eq. (4), assuming the thermocouple bead was at the center of the thermocouple sheath.

Results are presented as plots of surface temperature vs axial distance along the bundle. Surface temperatures are level average temperatures. Only thermocouples with $(T_w - T_s) > 222°C$ (400°F) are used in the averaging. One exception is level F4. All thermocouples are averaged at level F4 because this level is wet in many of the tests and thus emphasizes the degree of grid heat transfer augmentation.

Figures 71–75 show level average rod surface temperatures for thermocouples near the grid. Surface temperatures downstream of the grid are up to 110°C (200°F) lower than temperatures upstream of the grid. These results are consistent with results obtained by other investigators.[27,28] These effects last ~20 to 30 hydraulic diameters downstream of the grid. This length is consistent with entrance length studies[29,30] and suggests a boundary layer breakup-rebuild process at the grid.

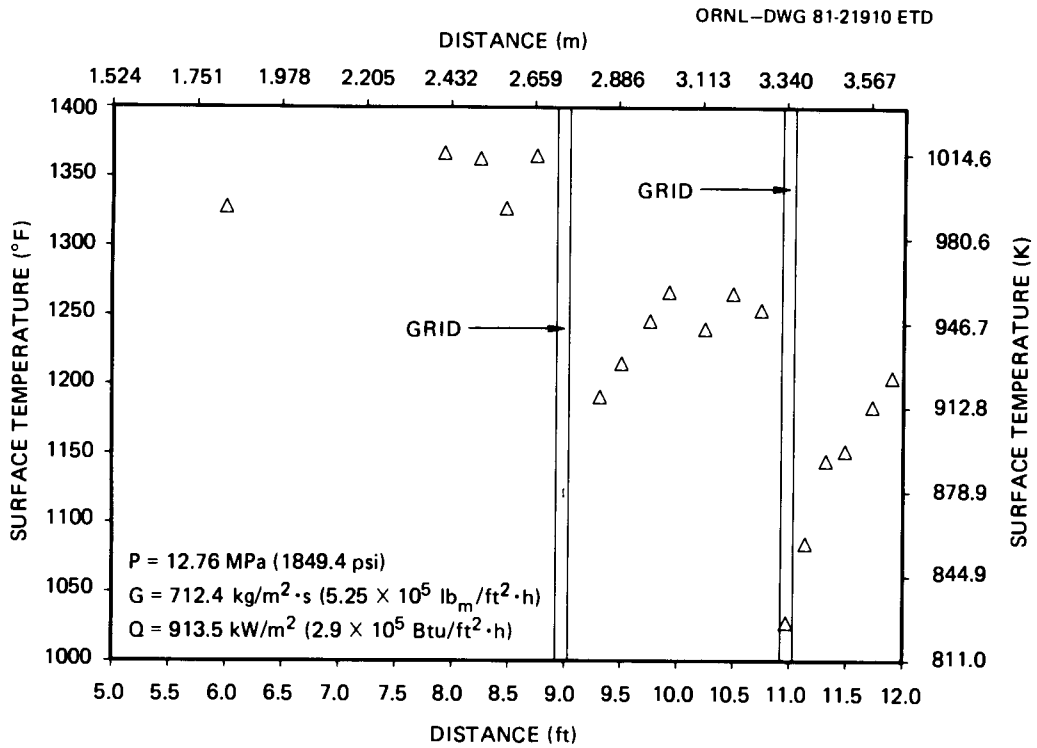

Fig. 71. Grid spacer effects, test B.

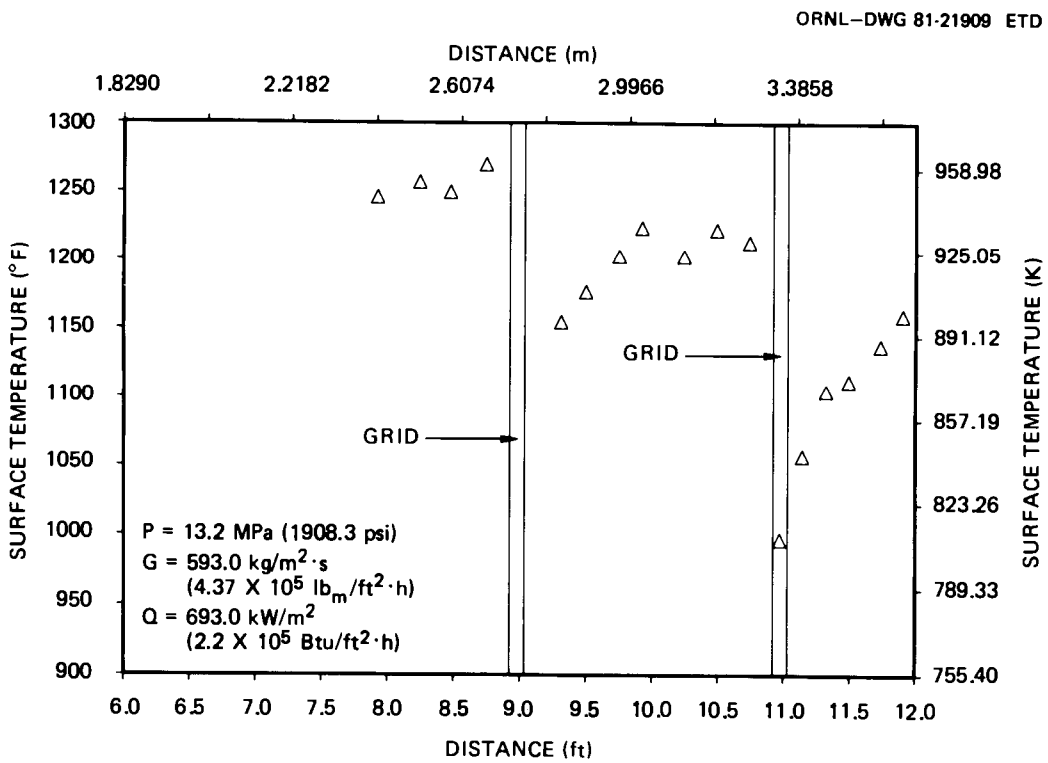

Fig. 72. Grid spacer effects, test E.

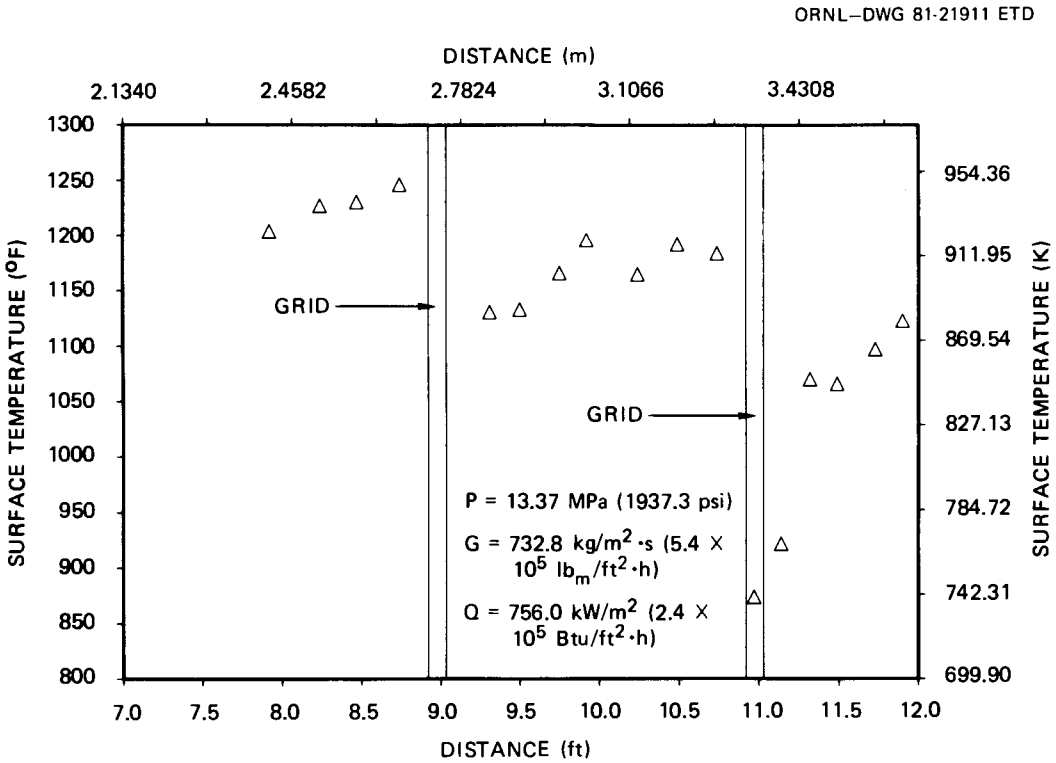

Fig. 73. Grid spacer effects, test J.

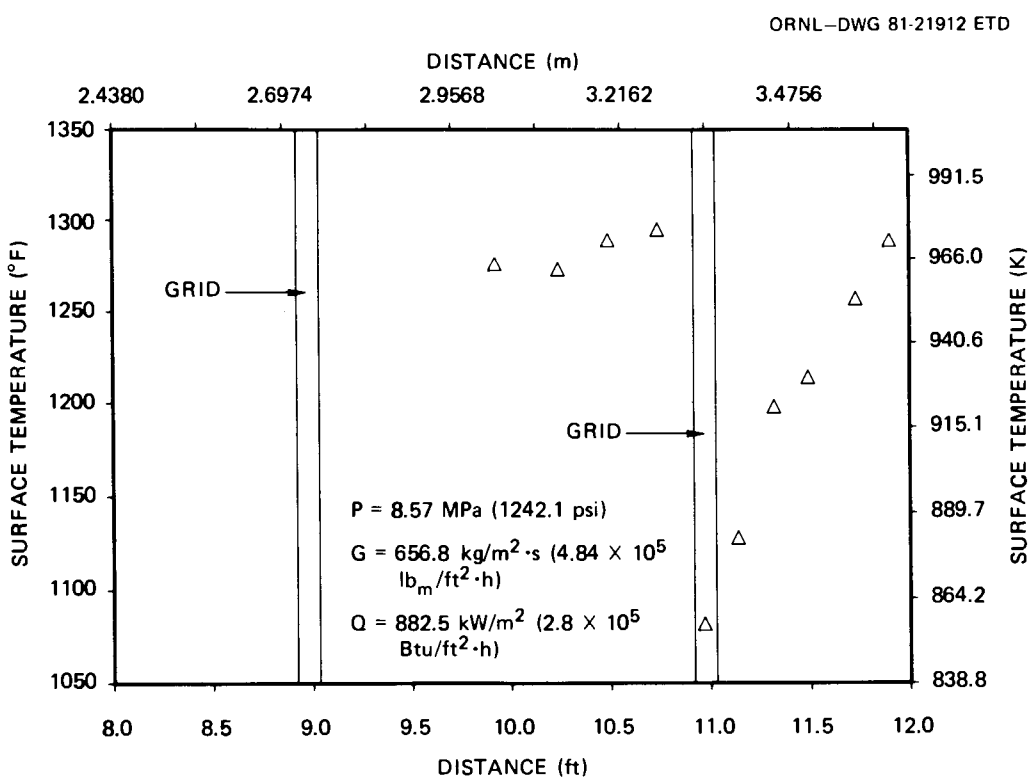

Fig. 74. Grid spacer effects, test M.

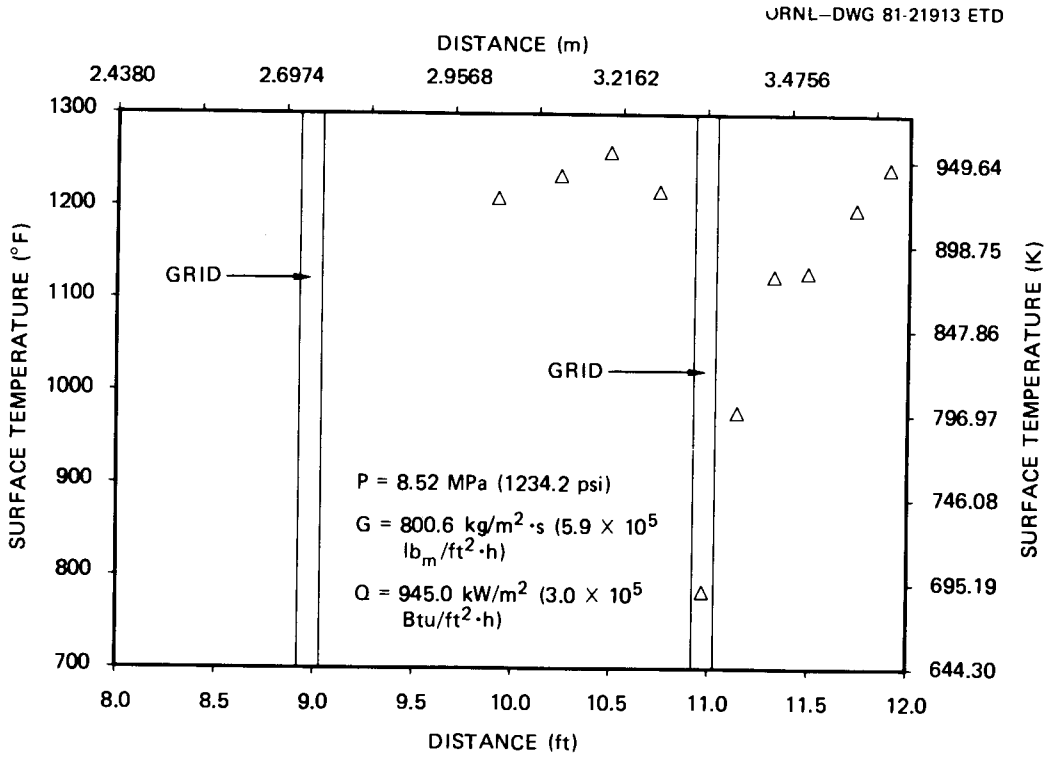

Fig. 75. Grid spacer effects, test N.

5. CONCLUSIONS

An analysis of 22 steady state film boiling tests (series 3.07.9) has been performed. Mass and energy conservation relationships were used to calculate equilibrium fluid conditions within the rod bundle. These fluid conditions, along with calculated rod surface temperatures, were used to evaluate six film boiling correlations and one single-phase vapor correlation:

1. Dougall-Rohsenow,
2. Dougall-Rohsenow (wall Pr),
3. Groeneveld 5.7,
4. Groeneveld 5.9,
5. Condie-Bengston IV,
6. Groeneveld-Delorme, and
7. Dittus-Boelter.

The correlations were then compared with experimentally determined heat transfer coefficients.

The Groeneveld 5.7, Groeneveld 5.9, and Condie-Bengston IV correlations perform better than either Dougall-Rohsenow correlation. The Dougall-Rohsenow and Dittus-Boelter correlations predict heat transfer coefficients that are often 150% higher than the experimentally determined heat transfer coefficients discussed in this report. This could be partly caused by thermodynamic nonequilibrium that can exist in the flow. The Groeneveld-Delorme correlation, which explicitly accounts for nonequilibrium in the flow, predicts low heat fluxes near burnout that improve as distance from burnout increases.

The conclusions reached concerning the accuracy of the film boiling correlations concur with those reached in reports describing the three transient film boiling experiments, tests 3.03.6AR, 3.06.6B, and 3.08.6C. Appendixes A, B, and C show comparisons of the Dougall-Rohsenow, Groeneveld 5.7, Condie-Bengston IV, and Groeneveld-Delorme correlations for tests 3.03.6AR, 3.06.6B, and 3.08.6C.

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Appendix A

THTF TEST 3.03.6AR RESULTS

Transient tests 3.03.6AR, 3.06.6B, and 3.08.6C were all tests in which the test section pressure and fluid conditions varied with time. As a result, flow conditions do not vary independently; that is, X and P both generally decrease with time.

The first upflow film boiling experiment (THTF test 3.03.6AR) was conducted on May 21, 1980. Morris et al.[1] have documented the results of the experiment in an ORNL report. This appendix summarizes those results. The experiment was a controlled transient test executed from high-pressure and high-temperature conditions. The flow, pressure, and power transient were initiated with an outlet-only break. The experiment was planned and conducted to maintain unidirectional upflow (no flow reversals) and prolong film boiling. Dispersed flow film boiling data were collected over the following parameter ranges in THTF test 3.03.6AR:

1. Mass flux: 136–502 $kg/m^2 \cdot s$ (1×10^5–3.7×10^5 $lb_m/h \cdot ft^2$)
2. Quality: ~23–100%
3. Pressure: 5–10 MPa (700–1500 psi)
4. Heat flux: 158–1000 kW/m^2 (5×10^4–3.2×10^5 $Btu/h \cdot ft^2$)

The data are in the high-flow film boiling data ranges requested by the NRR.

Local bundle fluid conditions were calculated with the homogeneous two-phase flow and thermodynamic equilibrium thermal-hydraulics code RLPSFLUX.[2] The calculation of local fluid conditions permitted the assessment of the Dougall-Rohsenow, Groeneveld 5.7, Condie-Bengston IV, and Groeneveld-Delorme heat transfer correlations. Correlation comparisons with the data are presented in Figs. A.1–A.4 for these correlations. Figure A.1 indicates that the Dougall-Rohsenow correlation generally overpredicts the heat transfer coefficient. It also shows that the Dougall-Rohsenow correlation produces ratios of h_c-to-h_e that tend to be greater at high quality. The Groeneveld 5.7 correlation comparisons are shown in Fig. A.2. The correlation is seen to predict heat transfer coefficients both above and below the data. The Condie-Bengston IV correlation comparisons, shown in Fig. A.3, indicate that the correlation predicts heat transfer slightly below the data. The Groeneveld-Delorme correlation tends to predict heat transfer coefficients lower than experimental values (Fig. A.4).

In general, the results obtained in THTF test 3.03.6AR concur with those obtained in THTF test series 3.07.9.

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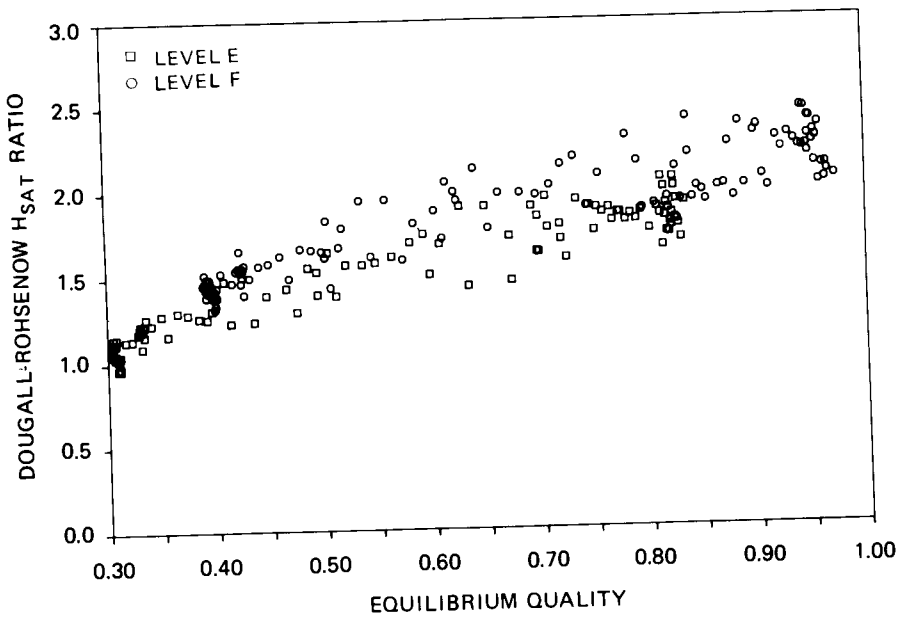

Fig. A.1. h_{corr}/h_{exp} vs equilibrium quality for Dougall–Rohsenow.

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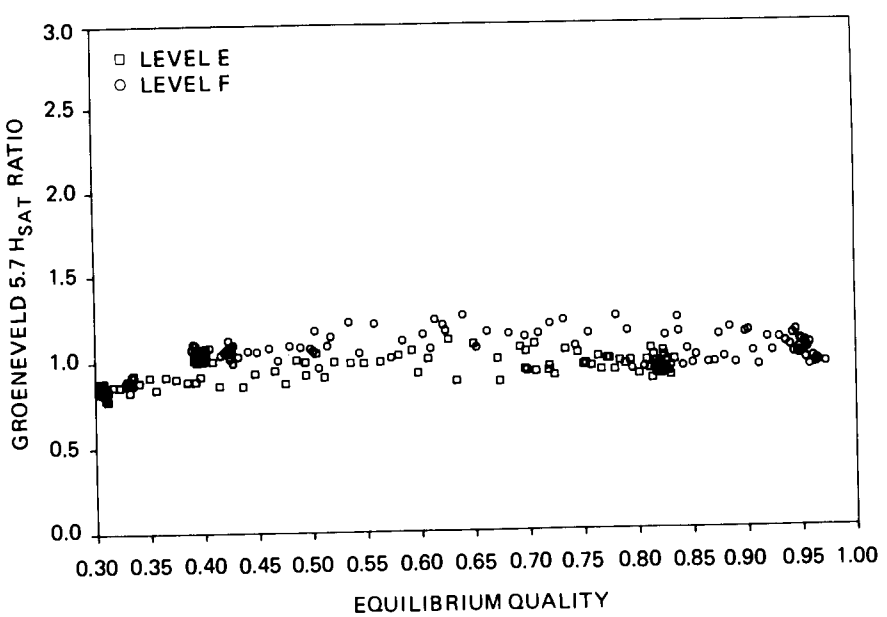

Fig. A.2. h_{corr}/h_{exp} vs equilibrium quality for Groeneveld 5.7.

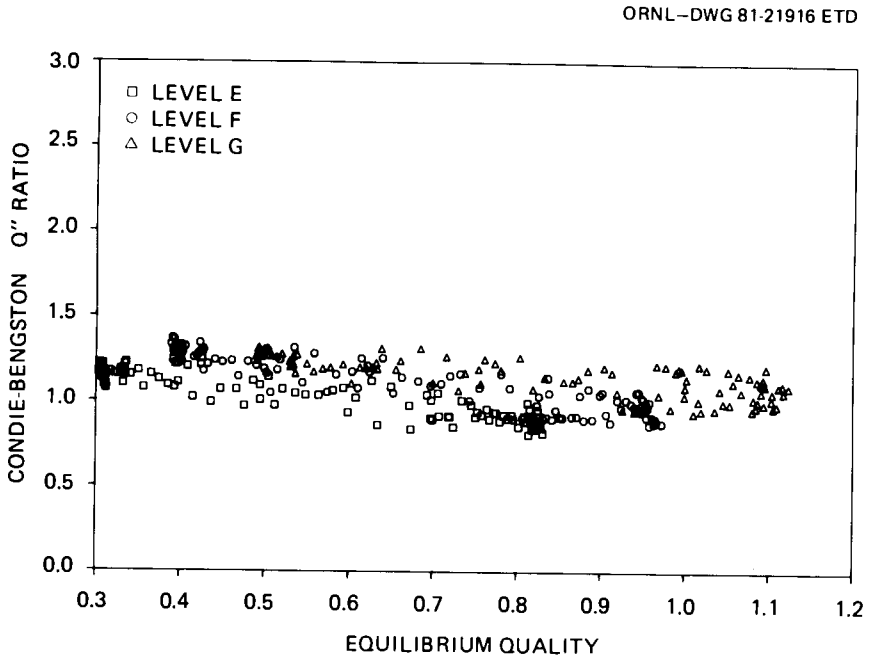

Fig. A.3. h_{corr}/h_{exp} vs equilibrium quality for Condie-Bengston IV.

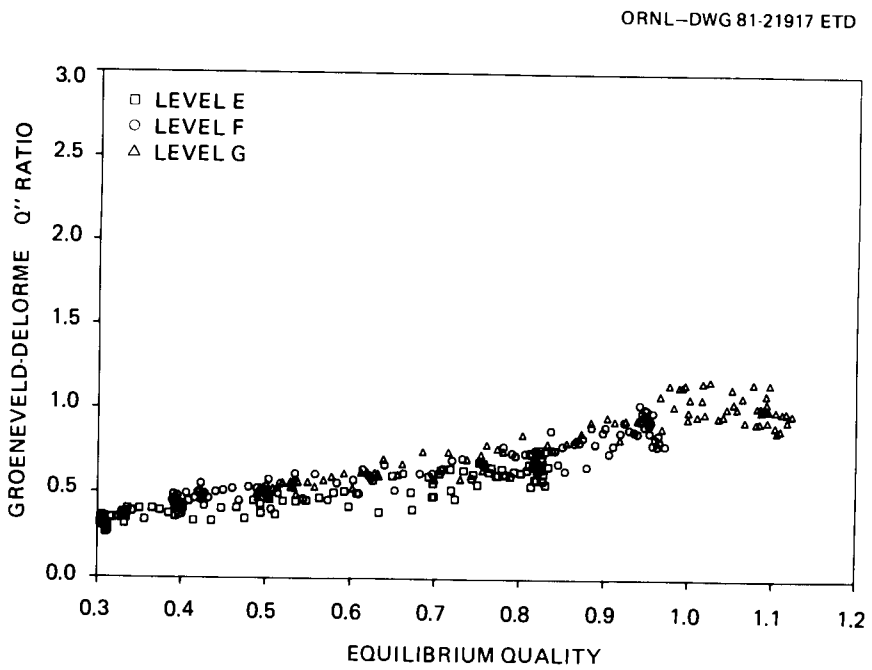

Fig. A.4. Q_{corr}/Q_{exp} vs equilibrium quality for Groeneveld-Delorme.

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Appendix B

THTF TEST 3.06.6B RESULTS

The second upflow film boiling experiment (THTF test 3.06.6B) was conducted on August 29, 1980. The experiment was conducted and analyzed in a very similar fashion to THTF test 3.03.6AR. Morris et al.[1] have documented the results of the experiment in an ORNL report. This appendix summarizes those results.

Correlation comparisons were performed with data collected over the following parameter ranges:

1. Mass flux: 136–610 $kg/m^2 \cdot s$ (1×10^5–4.5×10^5 $lb_m/h \cdot ft^2$)
2. Quality: 5–100%
3. Pressure: 6–13 MPa (875–1900 psi)
4. Heat flux: 158–630 kW/m^2 (5×10^4–2×10^5 $Btu/h \cdot ft^2$)

The film boiling correlations examined here include:

1. Dougall-Rohsenow,
2. Groeneveld 5.7,
3. Condie-Bengston IV, and
4. Groeneveld-Delorme.

Figure B.1 indicates that the Dougall-Rohsenow correlation overpredicts the heat transfer coefficient except at low quality. The correlation

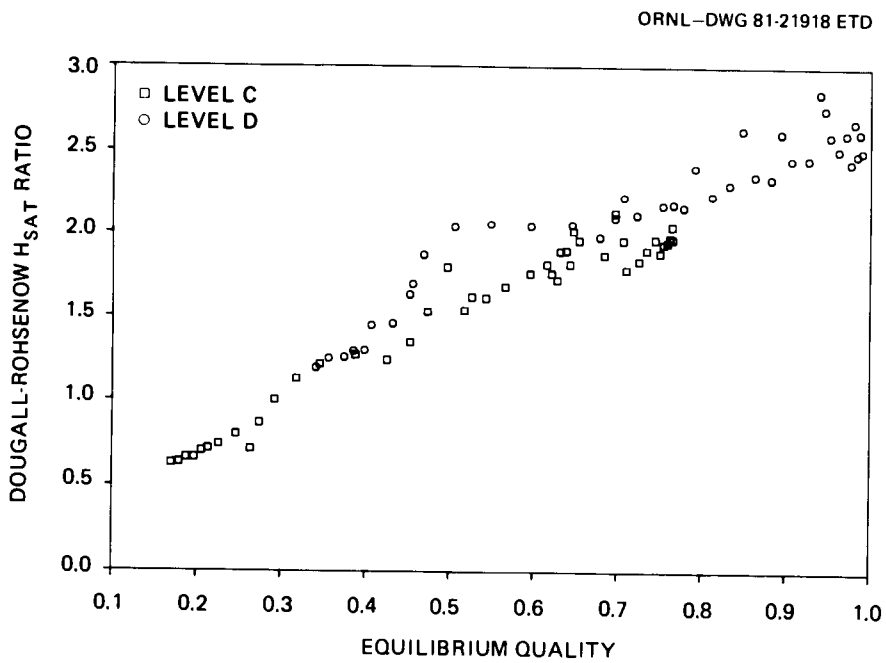

Fig. B.1. h_{corr}/h_{exp} vs equilibrium quality for Dougall-Rohsenow.

overpredicts the data most at high quality. The Groeneveld 5.7 correlation comparison (Fig. B.2) indicates that the correlation predicts heat transfer above and below the data. The Groeneveld 5.7 correlation produces ratios of h_c-to-h_e that tend to be greater at high quality and pressure. The Condie-Bengston IV correlation shown in Fig. B.3 predicts data

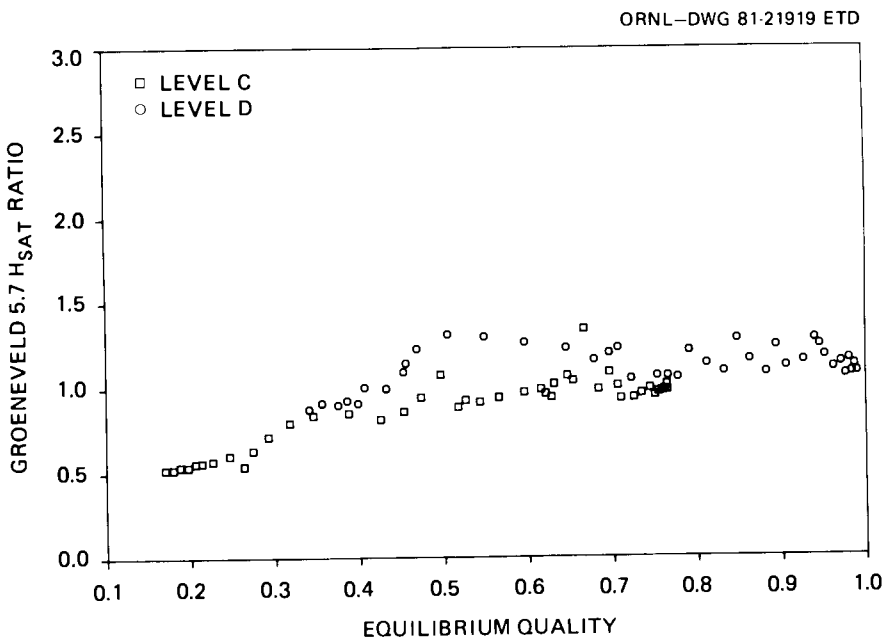

Fig. B.2. h_{corr}/h_{exp} vs equilibrium quality for Groeneveld 5.9.

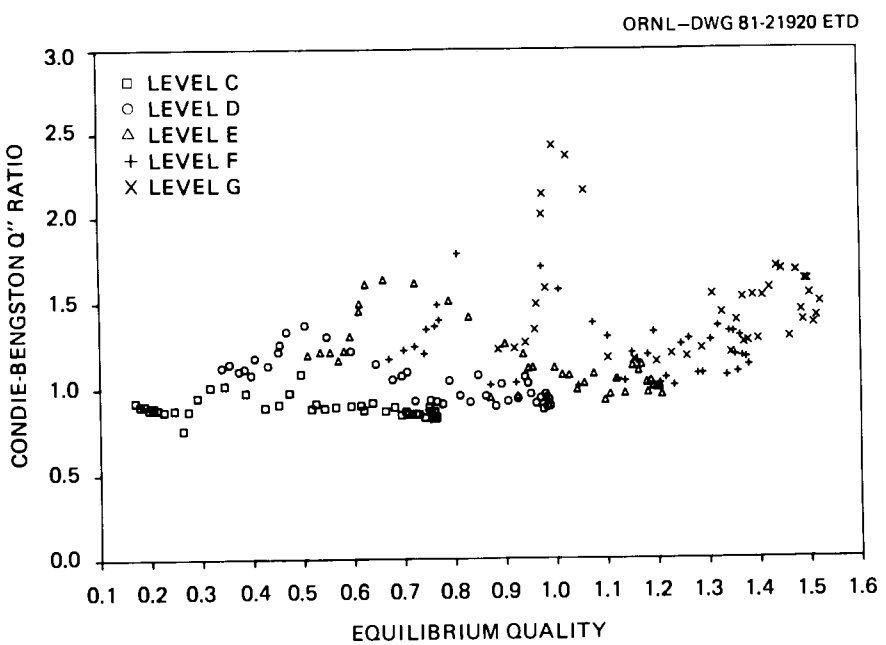

Fig. B.3. h_{corr}/h_{exp} vs equilibrium quality for Condie-Bengston IV.

better than the Dougall-Rohsenow correlation. The Groeneveld-Delorme correlation (Fig. B.4) tends to underpredict heat transfer coefficients.

In general, the results obtained in THTF test 3.06.6B concur with those obtained in THTF test 3.03.6AR and test series 3.07.9.

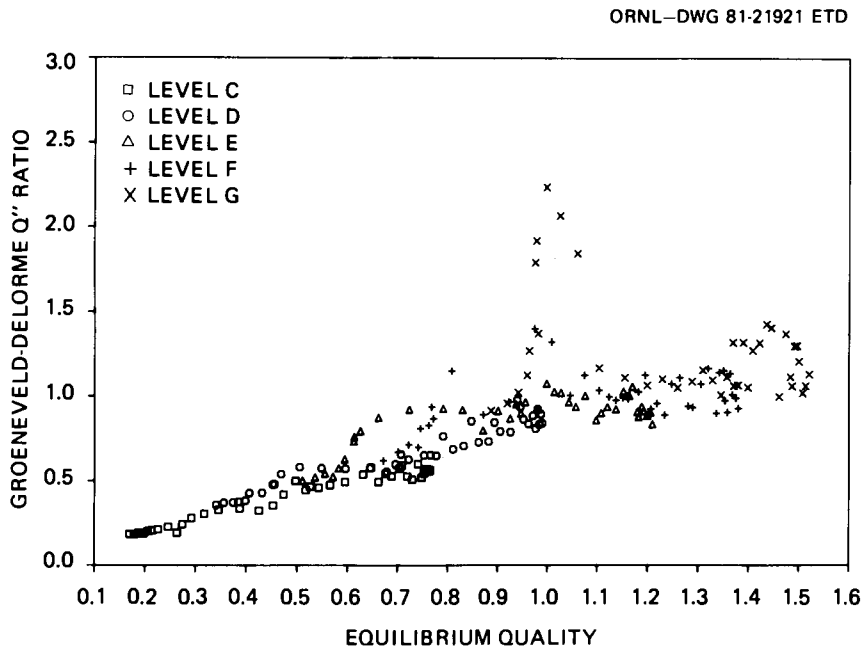

Fig. B.4. Q_{corr}/Q_{exp} vs equilibrium quality for Groeneveld-Delorme.

Reference

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Appendix C

THTF TEST 3.08.6C RESULTS

The third upflow film boiling experiment (THTF test 3.08.6C) was conducted on October 1, 1980. The experimental procedure and data analysis were similar to the two previous transient tests (3.06.6A and 3.06.6B) and are discussed in Ref. 1.

Test conditions were as follows:

1. Mass flux: 330–1090 kg/s·m² (2.4×10^5–8×10^5 $lb_m/h \cdot ft^2$)
2. Quality: ~35–100%
3. Pressure: 6.6–11.7 MPa (950–1700 psia)
4. Heat flux: 160–1100 kW/m² (5×10^4–3.5×10^5 Btu/h·ft²)

Four correlations are examined in this appendix:

1. Dougall-Rohsenow,
2. Groeneveld 5.7,
3. Condie-Bengston IV, and
4. Groeneveld-Delorme.

Each correlation displays characteristics similar to those discussed in Appendixes A and B. The Dougall-Rohsenow correlation (Fig. C.1) tends to overpredict heat transfer coefficients while the Groeneveld 5.7 (Fig. C.2) and the Condie-Bengston IV (Fig. C.3) correlations predict the data

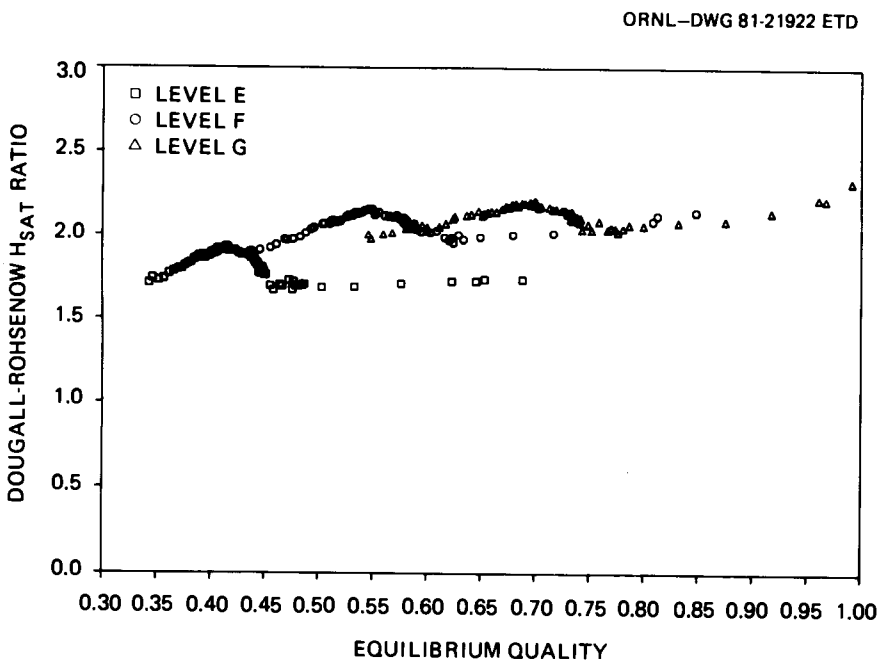

Fig. C.1. h_{corr}/h_{exp} vs equilibrium quality for Dougall-Rohsenow.

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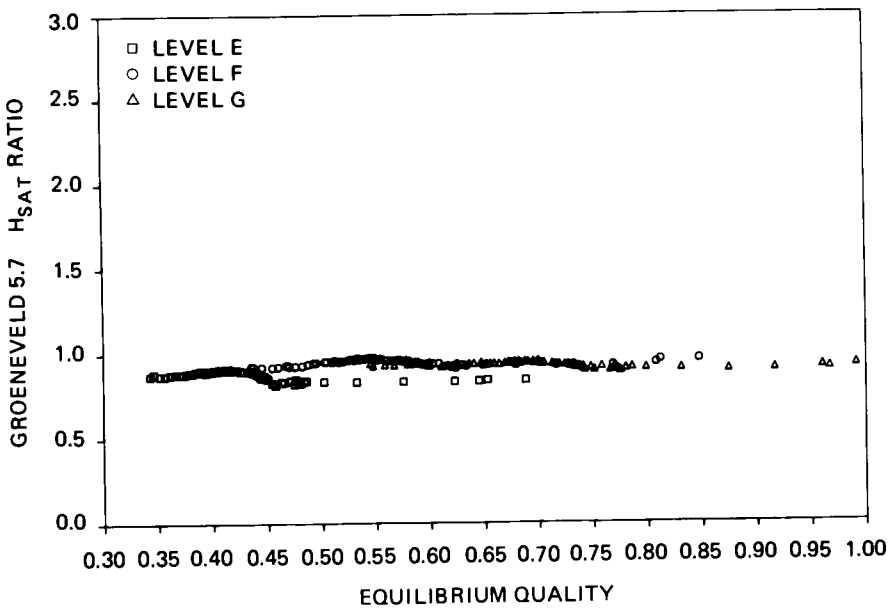

Fig. C.2. h_{corr}/h_{exp} **vs equilibrium quality for Groeneveld 5.7.**

ORNL–DWG 81-21924 ETD

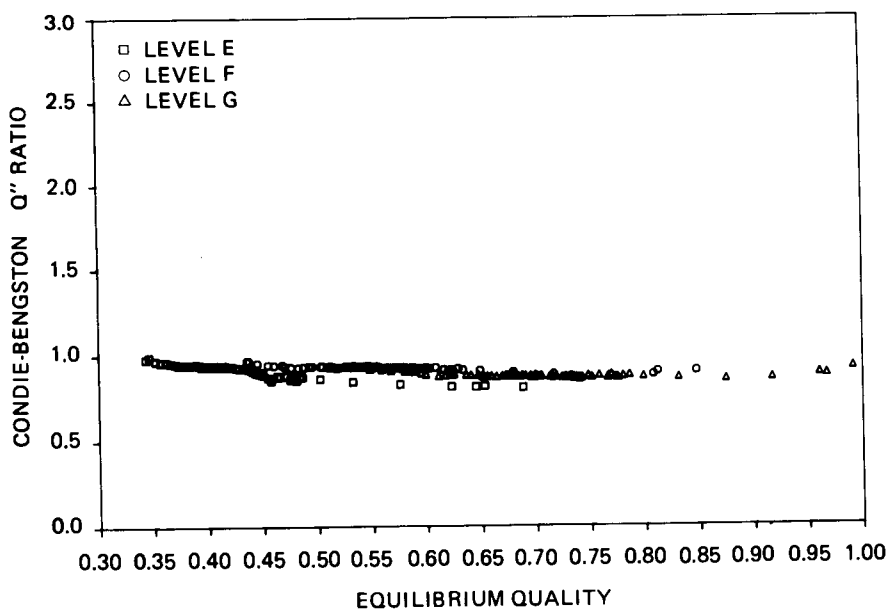

Fig. C.3. h_{corr}/h_{exp} **vs equlibrium quality for Condie-Bengston.**

better. The Groeneveld-Delorme correlation underpredicts heat fluxes (Fig. C.4).

Results of transient test 3.08.6C are in agreement with results of the steady state test series 3.07.9 and both previous transient tests 3.03.6AR and 3.06.6B.

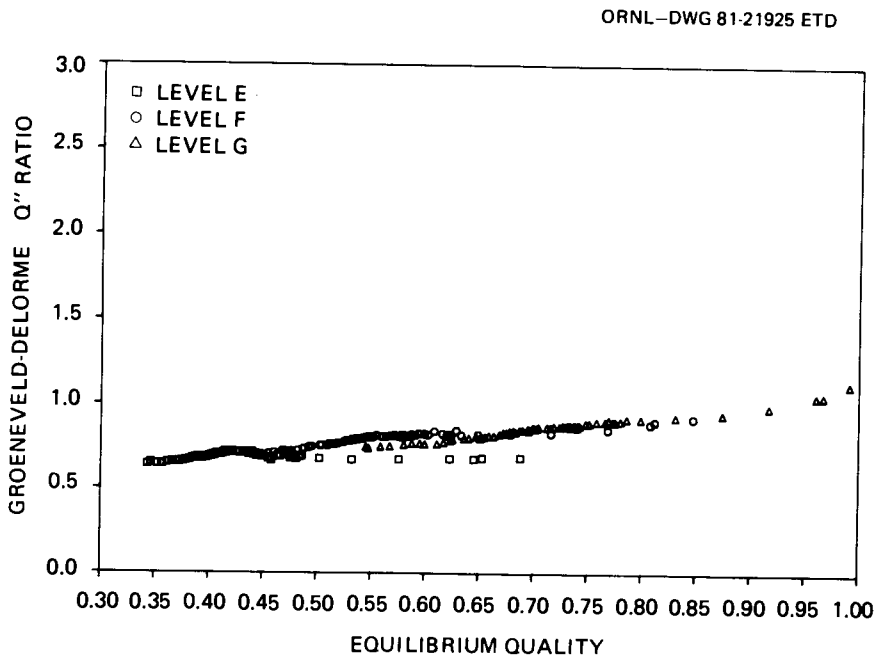

Fig. C.4. Q_{corr}/Q_{exp} vs equilibrium quality for Groeneveld-Delorme.

Reference

1. D. G. Morris, C. B. Mullins, and G. L. Yoder, *An Analysis of Transient Film Boiling of High Pressure Water in a Rod Bundle*, ORNL/NUREG-85 (to be published).

Appendix D

STEADY STATE DATA AND CORRELATION COMPARISONS

Appendix D contains tables listing fluid conditions, surface conditions, and correlation-predicted and experimentally determined heat transfer coefficients (heat fluxes). Also included are one standard deviation uncertainties for several of these quantities. The tables are arranged in two divisions. The first division contains these quantities in SI units. The second division is a duplicate of the first; however, quantities are given in English units. Tests are identified on each page of the tables, and the units in use (SI or English) along with the nomenclature are given on the header page preceding each test tabulation.

Appendix D.1

STEADY STATE TESTS IN SI UNITS

STEADY STATE TEST B

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST B **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.253E+05 LBM/SQFT H — 712.89 KG/SQM S
UNC. MASS FLUX 1.205E+04 LBM/SQFT H — 16.3578 KG/SQM S
PRESSURE 1849.4 PSI — 12.76 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
D	2.893	911.2	0.063	19.99	1322.6	717.3	58.12	32.292	624.7	329.6	0.443	0.2	.4663	.0246
E	2.900	913.5	0.041	13.07	1353.5	734.5	21.53	11.959	624.7	329.6	0.443	0.2	.6524	.0294
F	2.893	911.2	0.052	16.26	1262.3	683.8	38.30	21.280	624.7	329.6	0.443	0.2	.8465	.0343
G	2.874	905.2	0.061	19.20	1199.2	648.8	35.86	19.924	638.4	337.2	14.423	8.0	1.0387	.0391
H	2.880	907.2	0.000	0.00	1373.9	745.8	0.00	0.000	624.7	329.6	0.443	0.2	.3849	.0228
Y	2.881	907.6	0.000	0.00	1223.2	662.1	0.00	0.000	624.7	329.6	0.443	0.2	.4004	.0231
E1	2.868	903.4	0.027	8.48	1364.3	740.5	41.04	22.800	624.7	329.6	0.443	0.2	.6834	.0302
E2	2.823	889.3	0.089	27.88	1329.1	720.9	7.77	4.316	624.7	329.6	0.443	0.2	.7057	.0309
E3	2.872	904.8	0.026	8.28	1364.7	740.7	16.00	8.890	624.7	329.6	0.443	0.2	.7319	.0317
E6	2.797	881.1	0.107	33.77	1199.1	648.7	34.93	19.406	624.7	329.6	0.443	0.2	.7872	.0330
E7	2.887	909.3	0.032	10.09	1222.0	661.4	34.21	19.005	624.7	329.6	0.443	0.2	.8057	.0333
E8	2.888	909.8	0.027	8.56	1256.3	680.5	19.83	11.014	624.7	329.6	0.443	0.2	.8300	.0339
F1	2.853	898.6	0.068	21.52	1249.8	676.9	15.00	8.332	624.7	329.6	0.443	0.2	.8776	.0351
F2	2.884	908.4	0.031	9.63	1272.1	689.2	19.33	10.738	624.7	329.6	0.443	0.2	.9019	.0358
F3	2.850	897.7	0.068	21.31	1260.0	682.6	18.16	10.090	624.7	329.6	0.443	0.2	.9262	.0365
F4	2.797	881.1	0.107	33.77	1039.0	559.8	3.89	2.161	624.7	329.6	0.443	0.2	.9485	.0372
F5	2.823	889.3	0.089	27.88	1096.3	591.6	32.77	18.204	624.7	329.6	0.443	0.2	.9650	.0375
F6	2.851	898.2	0.060	18.91	1152.2	622.7	20.45	11.364	624.7	329.6	0.443	0.2	.9825	.0378
F7	2.850	897.9	0.054	16.94	1160.0	627.0	23.54	13.079	624.7	329.6	0.443	0.2	.9990	.0381
F8	2.862	901.7	0.061	19.10	1191.7	644.6	32.61	18.119	632.5	334.0	12.213	6.8	1.0222	.0387

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test B

T/C Level	(# wet T/C)/(Total # T/C)
C	All wet
U	4/5
S	5/5
H	5/6
Y	5/6
D	3/50
E	All dry

********** STEADY STATE TEST B **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL D														
2	0.47	760.1	918.7	2.134	0.130	4.578	0.116	3.233	2.070	0.038	1.854	0.045	1.930	628.9
4	0.47	749.8	931.3	2.216	0.135	4.578	0.116	3.235	2.075	0.039	1.858	0.045	1.937	614.0
8	0.47	762.4	838.9	1.938	0.116	4.578	0.116	3.232	2.069	0.038	1.853	0.045	1.928	632.5
8	0.47	755.2	838.9	1.971	0.123	4.578	0.116	3.234	2.072	0.039	1.855	0.045	1.933	621.7
9	0.47	740.2	910.0	2.217	0.139	4.578	0.116	3.237	2.079	0.039	1.862	0.045	1.945	600.0
10	0.47	698.3	911.2	2.472	0.150	4.578	0.116	3.249	2.102	0.039	1.884	0.046	1.984	538.5
10	0.47	710.7	911.2	2.391	0.146	4.578	0.116	3.245	2.095	0.039	1.877	0.046	1.971	556.6
12	0.47	725.6	925.2	2.336	0.142	4.578	0.116	3.241	2.087	0.039	1.869	0.045	1.957	578.5
13	0.47	710.1	918.6	2.414	0.153	4.578	0.116	3.245	2.095	0.039	1.877	0.046	1.972	555.6
15	0.47	733.4	957.8	2.372	0.142	4.578	0.116	3.239	2.083	0.039	1.865	0.045	1.950	590.0
16	0.47	764.8	898.3	2.064	0.127	4.578	0.116	3.232	2.068	0.038	1.852	0.045	1.926	636.1
17	0.47	733.5	900.5	2.230	0.138	4.578	0.116	3.239	2.082	0.039	1.865	0.045	1.950	590.1
18	0.47	718.6	905.6	2.328	0.141	4.578	0.116	3.243	2.090	0.039	1.873	0.046	1.964	568.1
18	0.47	730.8	905.6	2.257	0.136	4.578	0.116	3.240	2.084	0.039	1.866	0.045	1.953	586.1
20	0.47	694.9	916.2	2.508	0.163	4.578	0.116	3.250	2.104	0.040	1.886	0.046	1.987	533.6
20	0.47	701.6	916.2	2.463	0.148	4.578	0.116	3.248	2.100	0.039	1.882	0.046	1.980	543.2
20	0.47	700.5	916.2	2.470	0.150	4.578	0.116	3.248	2.101	0.039	1.882	0.046	1.981	541.7
24	0.47	587.2	902.5	3.504	0.233	4.578	0.116	3.302	2.212	0.043	1.987	0.050	2.173	382.1
25	0.47	716.1	903.8	2.338	0.148	4.578	0.116	3.244	2.092	0.039	1.874	0.046	1.966	564.5
25	0.47	722.4	903.8	2.301	0.145	4.578	0.116	3.242	2.088	0.039	1.871	0.046	1.960	573.7
26	0.47	727.8	915.4	2.299	0.140	4.578	0.116	3.240	2.085	0.039	1.868	0.045	1.955	581.7
26	0.47	728.6	915.4	2.295	0.138	4.578	0.116	3.240	2.085	0.039	1.868	0.045	1.955	582.8
26	0.47	713.4	915.4	2.385	0.143	4.578	0.116	3.244	2.093	0.039	1.875	0.046	1.968	560.6
29	0.47	715.7	903.1	2.339	0.141	4.578	0.116	3.244	2.092	0.039	1.874	0.046	1.966	563.9
29	0.47	713.1	903.1	2.355	0.142	4.578	0.116	3.244	2.093	0.039	1.875	0.046	1.969	560.0
29	0.47	709.2	903.1	2.379	0.143	4.578	0.116	3.246	2.096	0.039	1.878	0.046	1.973	554.3
30	0.47	700.0	898.2	2.425	0.156	4.578	0.116	3.248	2.101	0.040	1.883	0.046	1.982	541.0
31	0.47	699.7	910.8	2.461	0.152	4.578	0.116	3.248	2.101	0.039	1.883	0.046	1.982	540.5
35	0.47	726.8	916.7	2.308	0.140	4.578	0.116	3.241	2.086	0.039	1.868	0.045	1.956	580.3
39	0.47	727.7	906.7	2.277	0.144	4.578	0.116	3.241	2.085	0.039	1.868	0.046	1.955	581.6
42	0.47	722.9	906.9	2.306	0.145	4.578	0.116	3.242	2.088	0.039	1.870	0.046	1.960	574.5
43	0.47	714.7	935.5	2.429	0.161	4.578	0.116	3.244	2.093	0.039	1.875	0.046	1.967	562.4
43	0.47	741.6	935.5	2.271	0.151	4.578	0.116	3.237	2.079	0.039	1.861	0.046	1.944	601.7
44	0.47	622.3	924.0	3.157	0.205	4.578	0.116	3.280	2.166	0.041	1.943	0.048	2.092	430.7
45	0.47	702.6	922.3	2.473	0.172	4.578	0.116	3.248	2.100	0.040	1.881	0.046	1.979	544.7
45	0.47	682.3	922.3	2.615	0.166	4.578	0.116	3.254	2.113	0.040	1.894	0.046	2.002	515.9
49	0.47	733.4	909.7	2.253	0.137	4.578	0.116	3.239	2.083	0.039	1.865	0.045	1.950	590.0
51	0.47	712.9	920.6	2.402	0.150	4.578	0.116	3.245	2.094	0.039	1.876	0.046	1.969	559.9
55	0.47	702.0	916.0	2.460	0.153	4.578	0.116	3.248	2.100	0.039	1.882	0.046	1.980	543.9
58	0.47	748.1	922.2	2.204	0.133	4.578	0.116	3.236	2.075	0.039	1.859	0.045	1.938	611.4
58	0.47	725.8	922.2	2.328	0.144	4.578	0.116	3.241	2.086	0.039	1.869	0.045	1.957	578.7
59	0.47	741.8	913.1	2.215	0.136	4.578	0.116	3.237	2.078	0.039	1.861	0.045	1.943	602.0
LEVEL E														
2	0.65	744.7	918.7	2.213	0.137	5.681	0.127	4.038	2.416	0.036	2.259	0.043	2.077	781.4
3	0.65	745.1	936.6	2.254	0.140	5.681	0.127	4.037	2.416	0.036	2.259	0.043	2.076	782.2
4	0.65	749.3	931.3	2.219	0.133	5.681	0.127	4.036	2.413	0.036	2.256	0.043	2.073	789.8
7	0.65	737.4	893.6	2.191	0.136	5.681	0.127	4.040	2.420	0.036	2.263	0.043	2.083	767.4
7	0.65	746.2	893.6	2.145	0.132	5.681	0.127	4.037	2.415	0.036	2.258	0.043	2.076	784.3
10	0.65	731.7	909.0	2.261	0.137	5.681	0.127	4.041	2.423	0.036	2.266	0.043	2.088	756.7
12	0.65	726.0	925.2	2.334	0.145	5.681	0.127	4.043	2.427	0.036	2.270	0.044	2.094	745.8
13	0.65	738.8	918.6	2.245	0.142	5.681	0.127	4.039	2.419	0.036	2.262	0.043	2.082	770.1
13	0.65	742.6	918.6	2.224	0.137	5.681	0.127	4.038	2.417	0.036	2.260	0.043	2.079	777.4
15	0.65	727.7	957.8	2.406	0.148	5.681	0.127	4.043	2.426	0.036	2.268	0.043	2.092	749.1
15	0.65	730.1	957.8	2.392	0.146	5.681	0.127	4.042	2.424	0.036	2.267	0.043	2.090	753.5
16	0.65	736.0	898.3	2.210	0.134	5.681	0.127	4.040	2.421	0.036	2.264	0.043	2.084	764.8
16	0.65	726.4	898.3	2.264	0.138	5.681	0.127	4.043	2.427	0.036	2.269	0.043	2.093	746.6
20	0.65	726.8	916.2	2.307	0.140	5.681	0.127	4.043	2.426	0.036	2.269	0.043	2.093	747.4
20	0.65	729.0	916.2	2.294	0.141	5.681	0.127	4.042	2.425	0.036	2.268	0.043	2.091	751.5
24	0.65	766.7	902.3	2.064	0.128	5.681	0.127	4.032	2.405	0.036	2.248	0.043	2.059	822.8
24	0.65	742.6	902.3	2.185	0.154	5.681	0.127	4.038	2.417	0.037	2.260	0.044	2.079	777.3
26	0.65	716.4	918.1	2.374	0.144	5.681	0.127	4.046	2.433	0.036	2.275	0.044	2.103	727.7
26	0.65	719.2	918.1	2.357	0.142	5.681	0.127	4.046	2.431	0.036	2.274	0.043	2.100	732.9
26	0.65	721.8	918.1	2.341	0.141	5.681	0.127	4.045	2.429	0.036	2.272	0.043	2.098	737.8
28	0.65	734.4	896.2	2.214	0.133	5.681	0.127	4.041	2.422	0.036	2.265	0.043	2.086	761.7
28	0.65	732.9	896.2	2.222	0.137	5.681	0.127	4.041	2.423	0.036	2.265	0.043	2.087	759.0
29	0.65	736.3	903.1	2.221	0.132	5.681	0.127	4.040	2.421	0.036	2.264	0.043	2.084	765.3
29	0.65	722.8	903.1	2.297	0.141	5.681	0.127	4.044	2.429	0.036	2.271	0.044	2.097	739.8
29	0.65	729.7	903.1	2.257	0.136	5.681	0.127	4.042	2.425	0.036	2.267	0.043	2.090	752.8
30	0.65	720.1	898.2	2.300	0.138	5.681	0.127	4.045	2.430	0.036	2.273	0.043	2.099	734.7
30	0.65	726.2	898.2	2.265	0.137	5.681	0.127	4.043	2.427	0.036	2.269	0.043	2.093	746.1

********** STEADY STATE TEST B **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E														
31	0.65	724.2	910.8	2.308	0.140	5.681	0.127	4.044	2.428	0.036	2.271	0.043	2.095	742.4
33	0.65	766.6	915.6	2.095	0.127	5.681	0.127	4.032	2.405	0.036	2.249	0.043	2.059	822.6
33	0.65	751.2	915.6	2.172	0.137	5.681	0.127	4.036	2.412	0.036	2.255	0.043	2.071	793.5
33	0.65	747.3	915.6	2.192	0.135	5.681	0.127	4.037	2.414	0.036	2.257	0.043	2.075	786.3
35	0.65	730.7	916.7	2.285	0.144	5.681	0.127	4.042	2.424	0.036	2.267	0.044	2.089	754.8
42	0.65	716.2	906.9	2.346	0.155	5.681	0.127	4.047	2.433	0.037	2.276	0.044	2.103	727.2
44	0.65	729.2	907.1	2.270	0.142	5.681	0.127	4.042	2.425	0.036	2.268	0.044	2.091	751.8
45	0.65	729.4	920.1	2.301	0.143	5.681	0.127	4.042	2.425	0.036	2.267	0.043	2.090	752.2
45	0.65	737.8	920.1	2.254	0.141	5.681	0.127	4.040	2.420	0.036	2.263	0.043	2.083	768.3
49	0.65	733.3	909.7	2.253	0.136	5.681	0.127	4.041	2.422	0.036	2.265	0.043	2.087	759.7
49	0.65	749.8	909.7	2.165	0.130	5.681	0.127	4.036	2.413	0.036	2.256	0.043	2.073	790.7
49	0.65	736.7	909.7	2.234	0.138	5.681	0.127	4.040	2.420	0.036	2.263	0.043	2.084	766.2
51	0.65	719.3	920.6	2.362	0.149	5.681	0.127	4.045	2.431	0.036	2.274	0.044	2.100	733.2
51	0.65	718.9	920.6	2.365	0.152	5.681	0.127	4.046	2.431	0.036	2.274	0.044	2.100	732.5
53	0.65	744.7	920.2	2.217	0.139	5.681	0.127	4.038	2.416	0.036	2.259	0.043	2.077	781.4
53	0.65	736.1	920.2	2.264	0.144	5.681	0.127	4.040	2.421	0.036	2.264	0.044	2.084	764.9
58	0.65	726.3	922.2	2.325	0.142	5.681	0.127	4.043	2.427	0.036	2.269	0.043	2.093	746.3
58	0.65	719.6	922.2	2.365	0.152	5.681	0.127	4.045	2.431	0.036	2.273	0.044	2.100	733.6
59	0.65	733.8	913.1	2.259	0.139	5.681	0.127	4.041	2.422	0.036	2.265	0.043	2.086	760.6
59	0.65	724.5	913.1	2.312	0.142	5.681	0.127	4.044	2.428	0.036	2.270	0.044	2.095	743.0
59	0.65	724.4	913.1	2.313	0.142	5.681	0.127	4.044	2.428	0.036	2.270	0.044	2.095	742.8
61	0.65	728.2	903.3	2.267	0.138	5.681	0.127	4.043	2.425	0.036	2.268	0.043	2.092	749.9
61	0.65	740.7	903.3	2.198	0.132	5.681	0.127	4.039	2.418	0.036	2.261	0.043	2.080	773.7
61	0.65	744.8	903.3	2.176	0.130	5.681	0.127	4.037	2.416	0.036	2.259	0.043	2.077	781.5
62	0.65	744.8	908.5	2.188	0.130	5.681	0.127	4.037	2.416	0.036	2.259	0.043	2.077	781.5
63	0.65	734.1	924.7	2.286	0.136	5.681	0.127	4.041	2.422	0.036	2.265	0.043	2.086	761.1
63	0.65	733.4	924.7	2.290	0.140	5.681	0.127	4.041	2.422	0.036	2.265	0.043	2.087	759.8
64	0.65	764.2	905.8	2.084	0.125	5.681	0.127	4.032	2.406	0.036	2.249	0.043	2.061	818.0
LEVEL F														
1	0.85	688.8	914.1	2.545	0.167	6.777	0.136	4.827	2.717	0.033	2.610	0.041	2.267	874.7
3	0.85	690.8	937.9	2.596	0.161	6.777	0.136	4.826	2.715	0.032	2.608	0.040	2.264	879.5
4	0.85	705.6	932.6	2.480	0.151	6.777	0.136	4.820	2.703	0.032	2.596	0.040	2.246	913.8
7	0.85	700.4	894.8	2.413	0.154	6.777	0.136	4.822	2.707	0.033	2.600	0.040	2.252	901.7
7	0.85	685.6	894.8	2.513	0.157	6.777	0.136	4.829	2.719	0.033	2.613	0.040	2.271	867.4
10	0.85	673.9	910.2	2.643	0.173	6.777	0.136	4.835	2.730	0.033	2.623	0.041	2.287	840.5
10	0.85	670.6	910.2	2.670	0.178	6.777	0.136	4.837	2.733	0.034	2.627	0.041	2.292	832.8
10	0.85	672.6	910.2	2.654	0.176	6.777	0.136	4.836	2.731	0.034	2.625	0.041	2.289	837.4
13	0.85	684.1	919.8	2.595	0.161	6.777	0.136	4.830	2.721	0.033	2.614	0.040	2.273	863.9
13	0.85	677.2	919.8	2.647	0.176	6.777	0.136	4.833	2.727	0.034	2.620	0.041	2.282	847.9
14	0.85	668.7	898.3	2.649	0.166	6.777	0.136	4.838	2.735	0.033	2.629	0.041	2.295	828.4
15	0.85	673.4	959.1	2.790	0.172	6.777	0.136	4.835	2.731	0.033	2.624	0.040	2.288	839.3
16	0.85	677.7	899.5	2.584	0.162	6.777	0.136	4.833	2.727	0.033	2.620	0.040	2.282	849.1
17	0.85	669.2	900.7	2.652	0.159	6.777	0.136	4.838	2.735	0.032	2.628	0.040	2.294	829.7
18	0.85	622.6	906.2	3.094	0.202	6.777	0.136	4.868	2.790	0.035	2.684	0.043	2.378	724.6
20	0.85	653.8	917.5	2.830	0.172	6.777	0.136	4.847	2.751	0.033	2.644	0.041	2.318	795.4
21	0.85	654.2	906.6	2.793	0.205	6.777	0.136	4.846	2.750	0.036	2.644	0.043	2.317	796.3
28	0.85	706.9	897.5	2.379	0.143	6.777	0.136	4.819	2.702	0.032	2.595	0.039	2.245	916.7
28	0.85	692.4	897.5	2.474	0.150	6.777	0.136	4.826	2.713	0.032	2.607	0.040	2.262	883.1
28	0.85	690.3	897.5	2.488	0.152	6.777	0.136	4.827	2.715	0.032	2.609	0.040	2.265	878.2
31	0.85	682.7	913.6	2.587	0.163	6.777	0.136	4.830	2.722	0.033	2.615	0.040	2.275	860.7
31	0.85	680.6	913.6	2.603	0.161	6.777	0.136	4.832	2.724	0.033	2.617	0.040	2.278	855.7
34	0.85	665.6	922.3	2.745	0.177	6.777	0.136	4.840	2.738	0.033	2.632	0.041	2.299	821.4
37	0.85	675.7	907.5	2.622	0.196	6.777	0.136	4.834	2.728	0.035	2.622	0.043	2.284	844.5
38	0.85	691.3	910.0	2.516	0.159	6.777	0.136	4.826	2.714	0.033	2.608	0.040	2.263	880.6
42	0.85	684.1	908.2	2.562	0.169	6.777	0.136	4.830	2.721	0.033	2.614	0.041	2.273	863.8
45	0.85	678.1	921.3	2.644	0.161	6.777	0.136	4.833	2.726	0.032	2.620	0.040	2.281	850.0
45	0.85	685.3	921.3	2.590	0.158	6.777	0.136	4.829	2.720	0.032	2.613	0.040	2.271	866.6
53	0.85	693.6	943.2	2.592	0.164	6.777	0.136	4.825	2.712	0.033	2.606	0.040	2.261	885.8
59	0.85	678.4	914.3	2.621	0.163	6.777	0.136	4.833	2.726	0.033	2.619	0.040	2.281	850.9
59	0.85	682.8	914.3	2.588	0.158	6.777	0.136	4.830	2.722	0.032	2.615	0.040	2.275	861.0
59	0.85	686.3	914.3	2.563	0.170	6.777	0.136	4.829	2.719	0.033	2.612	0.041	2.270	869.1
60	0.85	695.1	906.1	2.479	0.160	6.777	0.136	4.824	2.711	0.033	2.605	0.040	2.259	889.2
64	0.85	724.4	907.1	2.297	0.138	6.777	0.136	4.812	2.689	0.032	2.582	0.039	2.226	957.8
64	0.85	739.6	907.1	2.212	0.132	6.777	0.136	4.806	2.679	0.031	2.572	0.039	2.211	993.1
64	0.85	733.1	907.1	2.248	0.134	6.777	0.136	4.809	2.683	0.031	2.576	0.039	2.217	978.1

********** STEADY STATE TEST B **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.04	657.5	914.7	2.79	0.184	2.86	0.20	6.58	2.44	987.5
14	1.04	630.4	897.5	2.98	0.214	3.06	0.24	6.58	2.49	915.7
16	1.04	641.3	898.7	2.88	0.193	2.96	0.21	6.58	2.47	945.0
16	1.04	657.1	898.7	2.74	0.179	2.81	0.20	6.58	2.44	986.3
18	1.04	644.8	903.2	2.87	0.179	2.94	0.20	6.58	2.46	954.2
18	1.04	637.1	903.2	2.94	0.189	3.01	0.21	6.58	2.48	933.5
18	1.04	639.9	903.2	2.91	0.182	2.98	0.20	6.58	2.47	941.1
20	1.04	590.9	916.2	3.51	0.221	3.61	0.26	6.58	2.60	811.0
20	1.04	642.4	916.2	2.93	0.199	3.00	0.22	6.58	2.47	948.0
20	1.04	638.9	916.2	2.96	0.191	3.04	0.21	6.58	2.48	938.4
21	1.04	619.9	872.3	3.00	0.183	3.09	0.21	6.58	2.52	887.9
34	1.04	674.2	919.9	2.67	0.172	2.73	0.19	6.58	2.41	1032.6
37	1.04	637.1	908.0	2.95	0.189	3.03	0.21	6.58	2.48	933.7
38	1.04	645.2	909.0	2.88	0.186	2.95	0.21	6.58	2.46	955.3
42	1.04	656.4	906.9	2.78	0.251	2.84	0.27	6.58	2.44	984.5
42	1.04	664.0	906.9	2.71	0.175	2.78	0.19	6.58	2.43	1005.0
45	1.04	647.3	920.9	2.90	0.195	2.97	0.22	6.58	2.46	961.1
45	1.04	639.1	920.9	2.98	0.199	3.05	0.22	6.58	2.48	938.9
45	1.04	646.5	920.9	2.91	0.192	2.98	0.21	6.58	2.46	958.8
47	1.04	649.1	913.1	2.86	0.188	2.93	0.21	6.58	2.46	965.9
50	1.04	664.2	896.0	2.68	0.167	2.74	0.18	6.58	2.43	1005.6
58	1.04	671.8	922.2	2.69	0.174	2.76	0.19	6.58	2.42	1026.2
60	1.04	667.0	907.1	2.69	0.182	2.75	0.20	6.58	2.43	1013.1
64	1.04	683.2	908.2	2.57	0.160	2.63	0.18	6.58	2.40	1057.0
64	1.04	684.4	908.2	2.56	0.160	2.62	0.18	6.58	2.40	1060.4

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL H														
56	0.38	745.8	907.2	2.180	0.133	4.075	0.115	2.888	1.903	0.041	1.661	0.046	1.882	541.5
LEVEL Y														
56	0.40	662.1	907.6	2.730	0.189	4.172	0.115	2.978	1.986	0.042	1.744	0.048	1.978	444.3
LEVEL E1														
1	0.68	769.9	912.8	2.073	0.130	5.860	0.128	4.145	2.452	0.035	2.304	0.042	2.076	860.1
14	0.68	735.6	896.5	2.208	0.145	5.860	0.128	4.155	2.470	0.036	2.322	0.043	2.104	792.2
38	0.68	741.8	908.4	2.204	0.132	5.860	0.128	4.153	2.466	0.035	2.319	0.043	2.099	804.3
50	0.68	714.6	896.0	2.327	0.147	5.860	0.128	4.162	2.483	0.036	2.335	0.043	2.124	751.5
LEVEL E2														
21	0.71	718.1	905.9	2.332	0.138	5.987	0.130	4.254	2.515	0.035	2.373	0.043	2.137	781.5
60	0.71	725.9	904.9	2.283	0.143	5.987	0.130	4.252	2.509	0.035	2.368	0.043	2.129	797.3
LEVEL E3														
14	0.73	739.3	896.5	2.188	0.147	6.136	0.133	4.352	2.539	0.035	2.405	0.043	2.135	852.7
17	0.73	733.5	900.5	2.230	0.142	6.136	0.133	4.354	2.543	0.035	2.409	0.042	2.140	840.6
34	0.73	748.4	919.9	2.196	0.143	6.136	0.133	4.350	2.534	0.035	2.400	0.042	2.127	871.8
37	0.73	754.6	907.3	2.135	0.128	6.136	0.133	4.348	2.530	0.034	2.397	0.042	2.121	884.7
38	0.73	745.0	908.4	2.187	0.131	6.136	0.133	4.351	2.536	0.034	2.402	0.042	2.130	864.6
50	0.73	731.2	896.0	2.231	0.145	6.136	0.133	4.355	2.544	0.035	2.410	0.042	2.142	835.8
60	0.73	733.1	904.9	2.243	0.139	6.136	0.133	4.354	2.543	0.035	2.409	0.042	2.140	839.8
LEVEL E6														
60	0.79	662.4	904.9	2.719	0.170	6.448	0.134	4.606	2.673	0.034	2.554	0.042	2.263	750.3
LEVEL E7														
1	0.81	682.0	913.2	2.591	0.169	6.551	0.134	4.668	2.677	0.034	2.562	0.041	2.247	811.9
34	0.81	651.7	920.2	2.857	0.190	6.551	0.134	4.685	2.707	0.035	2.592	0.042	2.293	746.5
37	0.81	671.9	907.6	2.652	0.163	6.551	0.134	4.673	2.686	0.033	2.572	0.041	2.262	789.7
50	0.81	640.1	896.3	2.887	0.185	6.551	0.134	4.692	2.721	0.035	2.606	0.042	2.313	721.1
LEVEL E8														
1	0.83	689.6	913.7	2.538	0.164	6.686	0.135	4.760	2.698	0.033	2.589	0.040	2.254	856.5
14	0.83	686.1	897.3	2.517	0.161	6.686	0.135	4.761	2.701	0.033	2.592	0.040	2.259	848.4
34	0.83	662.5	920.7	2.766	0.181	6.686	0.135	4.774	2.724	0.034	2.614	0.041	2.292	795.3
37	0.83	677.6	908.1	2.610	0.161	6.686	0.135	4.766	2.709	0.033	2.599	0.040	2.270	829.2
38	0.83	686.7	909.2	2.546	0.155	6.686	0.135	4.761	2.701	0.032	2.591	0.040	2.258	849.9
LEVEL F1														
17	0.88	683.2	901.3	2.549	0.152	6.949	0.137	4.952	2.751	0.032	2.649	0.041	2.295	900.0
21	0.88	665.7	906.7	2.698	0.167	6.949	0.137	4.962	2.768	0.033	2.666	0.042	2.320	858.8
34	0.88	675.8	920.7	2.659	0.172	6.949	0.137	4.956	2.758	0.034	2.656	0.042	2.305	882.8
37	0.88	689.5	908.1	2.523	0.155	6.949	0.137	4.949	2.745	0.033	2.643	0.041	2.287	914.5
50	0.88	673.9	896.8	2.604	0.159	6.949	0.137	4.957	2.759	0.033	2.658	0.041	2.308	878.3
LEVEL F2														
1	0.90	700.9	915.4	2.465	0.152	7.082	0.139	5.038	2.754	0.034	2.654	0.044	2.289	974.1
14	0.90	679.2	899.4	2.573	0.176	7.082	0.139	5.049	2.773	0.036	2.674	0.045	2.317	921.2
17	0.90	683.5	903.2	2.552	0.152	7.082	0.139	5.046	2.769	0.034	2.669	0.044	2.311	931.7
34	0.90	687.7	922.7	2.577	0.166	7.082	0.139	5.044	2.765	0.035	2.666	0.044	2.305	941.9
38	0.90	704.1	911.1	2.433	0.147	7.082	0.139	5.036	2.752	0.034	2.652	0.043	2.285	981.8
50	0.90	680.1	898.7	2.564	0.158	7.082	0.139	5.048	2.772	0.034	2.673	0.044	2.316	923.5
LEVEL F3														
14	0.93	678.6	896.8	2.570	0.167	7.214	0.141	5.143	2.788	0.040	2.688	0.052	2.334	953.3
17	0.93	678.0	900.8	2.586	0.155	7.214	0.141	5.143	2.788	0.039	2.689	0.051	2.335	951.8
21	0.93	673.2	906.2	2.637	0.158	7.214	0.141	5.146	2.793	0.039	2.694	0.051	2.342	939.9
34	0.93	700.5	920.2	2.481	0.159	7.214	0.141	5.131	2.768	0.039	2.669	0.051	2.305	1007.2
60	0.93	676.9	905.1	2.606	0.176	7.214	0.141	5.143	2.789	0.041	2.690	0.052	2.336	949.0

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F4														
6C	0.95	558.2	904.9	3.958	0.269	7.336	0.143	5.346	2.990	0.063	2.891	0.077	2.652	687.4
LEVEL F5														
21	0.97	571.8	905.9	3.740	0.235	7.425	0.146	5.393	2.953	0.099	2.850	0.114	2.610	740.7
60	0.97	607.7	904.9	3.254	0.210	7.425	0.146	5.351	2.881	0.098	2.778	0.111	2.497	830.1
LEVEL F6														
1	0.98	630.6	912.9	3.033	0.220	7.519	0.169	5.396	2.833	0.098	2.721	0.174	2.456	910.2
17	0.98	627.1	900.6	3.028	0.193	7.519	0.169	5.399	2.838	0.104	2.725	0.169	2.463	901.2
37	0.98	607.9	907.3	3.260	0.211	7.519	0.169	5.417	2.867	0.103	2.755	0.173	2.509	852.2
38	0.98	607.8	908.4	3.265	0.206	7.519	0.169	5.417	2.867	0.105	2.755	0.171	2.509	851.9
50	0.98	633.3	896.3	2.952	0.190	7.519	0.169	5.394	2.829	0.104	2.717	0.168	2.450	917.2
60	0.98	633.8	904.9	2.975	0.189	7.519	0.169	5.394	2.828	0.104	2.716	0.167	2.449	918.6
LEVEL F7														
14	1.00	614.8	897.3	3.146	0.214	7.608	0.274	5.472	2.792	0.090	2.654	0.165	2.503	891.3
17	1.00	634.8	900.5	2.950	0.183	7.608	0.274	5.455	2.764	0.095	2.626	0.157	2.458	943.8
21	1.00	608.3	906.7	3.254	0.202	7.608	0.274	5.479	2.802	0.095	2.664	0.161	2.519	874.4
37	1.00	617.4	909.3	3.159	0.204	7.608	0.274	5.470	2.788	0.093	2.650	0.162	2.496	898.3
38	1.00	626.5	909.1	3.062	0.191	7.608	0.274	5.462	2.775	0.095	2.637	0.159	2.475	922.0
50	1.00	643.8	896.8	2.854	0.183	7.608	0.274	5.448	2.753	0.093	2.615	0.158	2.440	967.4
60	1.00	643.2	905.6	2.888	0.184	7.608	0.274	5.448	2.753	0.094	2.616	0.157	2.441	965.9

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F8										
1	1.02	662.9	914.7	2.74	0.177	2.78	0.19	6.96	2.42	1010.8
17	1.02	638.0	901.5	2.92	0.179	2.97	0.19	6.96	2.47	945.1
21	1.02	613.1	906.9	3.20	0.197	3.25	0.22	6.96	2.52	879.0
34	1.02	657.9	921.0	2.81	0.184	2.84	0.20	6.96	2.43	998.2
37	1.02	632.2	908.3	3.00	0.189	3.05	0.20	6.96	2.48	929.6
50	1.02	657.8	897.0	2.73	0.173	2.77	0.18	6.96	2.43	997.9
60	1.02	661.7	905.9	2.73	0.170	2.76	0.18	6.96	2.42	1007.4

STEADY STATE TEST C

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST C **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.463E+05 LBM/SQFT H UNC. MASS FLUX 5.561E+03 LBM/SQFT H PRESSURE 1805.3 PSI UNC. PRESSURE 6.00 PSI
334.24 KG/SQM S 7.5465 KG/SQM S 12.46 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	1.817	572.2	0.029	9.05	1240.5	671.7	58.07	32.259	621.4	327.8	0.445	0.2	.8116	.0361
F	1.812	570.9	0.032	10.24	1303.3	706.6	44.15	24.530	646.8	341.9	18.810	10.5	1.0668	.0426
G	1.805	568.5	0.037	11.80	1350.5	732.8	53.99	29.995	777.7	414.6	28.859	16.0	1.3196	.0488
E1	1.804	568.4	0.018	5.53	1271.5	689.0	86.47	48.036	621.4	327.8	0.445	0.2	.8523	.0372
E2	1.776	559.5	0.055	17.34	1270.7	688.5	47.08	26.154	621.4	327.8	0.445	0.2	.8816	.0381
E3	1.807	569.2	0.018	5.57	1281.8	694.6	44.50	24.724	621.4	327.8	0.445	0.2	.9160	.0392
E6	1.762	555.0	0.068	21.54	1245.0	674.2	57.63	32.016	621.4	327.8	0.445	0.2	.9888	.0408
E7	1.814	571.4	0.021	6.50	1256.8	680.8	38.66	21.478	625.9	330.3	13.994	7.8	1.0131	.0413
E8	1.817	572.3	0.016	5.11	1283.1	695.4	25.64	14.245	637.7	336.9	16.990	9.4	1.0450	.0420
F1	1.794	565.3	0.043	13.41	1305.3	707.7	18.30	10.168	666.2	352.6	20.130	11.2	1.1077	.0436
F2	1.809	570.0	0.019	5.96	1330.4	721.7	25.10	13.946	680.4	360.5	21.257	11.8	1.1396	.0446
F3	1.792	564.6	0.042	13.08	1329.3	721.1	37.67	20.926	695.8	369.1	23.197	12.9	1.1716	.0455
F4	1.761	554.8	0.068	21.53	1178.3	637.2	4.95	2.750	711.3	377.7	25.437	14.1	1.2010	.0464
F5	1.776	559.5	0.055	17.35	1231.3	666.6	49.58	27.547	723.5	384.5	25.768	14.3	1.2226	.0467
F6	1.795	565.5	0.038	11.89	1289.2	698.8	31.45	17.470	737.2	392.1	26.276	14.6	1.2456	.0472
F7	1.794	565.0	0.034	10.81	1302.7	706.3	40.85	22.696	748.4	398.3	26.586	14.8	1.2673	.0476
F8	1.802	567.5	0.037	11.68	1346.1	730.4	49.64	27.580	765.2	407.7	27.385	15.2	1.2979	.0483

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test C

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST C **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E														
2	0.81	701.0	569.4	1.526	0.090	3.489	0.081	2.513	1.558	0.020	1.273	0.021	1.260	401.2
3	0.81	626.6	581.3	1.946	0.118	3.489	0.081	2.535	1.602	0.022	1.311	0.022	1.324	320.5
4	0.81	656.1	576.1	1.755	0.103	3.489	0.081	2.525	1.582	0.021	1.293	0.022	1.294	352.0
7	0.81	683.9	558.5	1.568	0.093	3.489	0.081	2.517	1.566	0.021	1.280	0.021	1.272	382.5
7	0.81	687.2	558.5	1.554	0.092	3.489	0.081	2.516	1.565	0.021	1.279	0.021	1.269	385.8
10	0.81	652.7	564.0	1.736	0.102	3.489	0.081	2.526	1.584	0.021	1.295	0.022	1.297	348.6
12	0.81	641.3	582.0	1.857	0.111	3.489	0.081	2.529	1.591	0.021	1.301	0.022	1.308	336.3
13	0.81	652.4	577.6	1.779	0.108	3.489	0.081	2.526	1.584	0.021	1.295	0.022	1.298	348.2
13	0.81	654.6	577.6	1.767	0.106	3.489	0.081	2.525	1.583	0.021	1.294	0.022	1.296	350.6
15	0.81	634.4	604.6	1.972	0.118	3.489	0.081	2.532	1.596	0.021	1.306	0.022	1.315	328.8
15	0.81	640.0	604.6	1.936	0.115	3.489	0.081	2.530	1.592	0.021	1.302	0.022	1.310	334.9
16	0.81	699.8	563.3	1.514	0.089	3.489	0.081	2.513	1.559	0.020	1.273	0.021	1.261	399.8
16	0.81	694.7	563.3	1.535	0.090	3.489	0.081	2.514	1.561	0.020	1.275	0.021	1.264	394.2
24	0.81	686.7	568.5	1.584	0.094	3.489	0.081	2.516	1.565	0.021	1.279	0.021	1.270	385.2
24	0.81	667.6	568.5	1.673	0.109	3.489	0.081	2.521	1.575	0.021	1.287	0.022	1.284	364.7
26	0.81	638.1	575.0	1.853	0.109	3.489	0.081	2.531	1.594	0.021	1.303	0.022	1.312	332.8
26	0.81	644.4	575.0	1.816	0.107	3.489	0.081	2.528	1.589	0.021	1.300	0.022	1.305	339.7
26	0.81	642.6	575.0	1.827	0.108	3.489	0.081	2.529	1.590	0.021	1.301	0.022	1.307	337.7
29	0.81	642.3	568.5	1.807	0.106	3.489	0.081	2.529	1.591	0.021	1.301	0.022	1.307	337.4
29	0.81	640.6	568.5	1.818	0.108	3.489	0.081	2.530	1.592	0.021	1.302	0.022	1.309	335.5
29	0.81	641.3	568.5	1.814	0.107	3.489	0.081	2.529	1.591	0.021	1.301	0.022	1.308	336.3
30	0.81	640.3	565.2	1.808	0.107	3.489	0.081	2.530	1.592	0.021	1.302	0.022	1.309	335.3
30	0.81	645.4	565.2	1.780	0.105	3.489	0.081	2.528	1.589	0.021	1.299	0.022	1.304	340.8
31	0.81	640.2	572.5	1.833	0.108	3.489	0.081	2.530	1.592	0.021	1.302	0.022	1.309	335.1
33	0.81	702.9	574.8	1.532	0.090	3.489	0.081	2.512	1.557	0.020	1.272	0.021	1.259	403.4
33	0.81	694.9	574.8	1.566	0.094	3.489	0.081	2.514	1.561	0.021	1.275	0.021	1.264	394.5
33	0.81	689.7	574.8	1.588	0.094	3.489	0.081	2.515	1.564	0.021	1.277	0.021	1.268	388.6
35	0.81	643.6	576.9	1.827	0.111	3.489	0.081	2.529	1.590	0.021	1.300	0.022	1.306	338.8
42	0.81	644.4	568.9	1.797	0.111	3.489	0.081	2.528	1.589	0.021	1.300	0.022	1.305	339.7
44	0.81	636.9	555.9	1.798	0.108	3.489	0.081	2.531	1.594	0.021	1.304	0.022	1.313	331.6
45	0.81	653.3	581.7	1.787	0.107	3.489	0.081	2.526	1.584	0.021	1.295	0.022	1.297	349.2
45	0.81	662.9	581.7	1.736	0.104	3.489	0.081	2.523	1.578	0.021	1.290	0.022	1.288	359.5
49	0.81	692.4	571.5	1.567	0.092	3.489	0.081	2.515	1.562	0.020	1.276	0.021	1.266	391.7
49	0.81	704.9	571.5	1.515	0.088	3.489	0.081	2.512	1.557	0.020	1.271	0.021	1.257	405.6
49	0.81	698.9	571.5	1.540	0.091	3.489	0.081	2.513	1.559	0.020	1.274	0.021	1.261	398.9
51	0.81	616.1	571.1	1.981	0.121	3.489	0.081	2.539	1.611	0.022	1.318	0.022	1.337	309.4
51	0.81	620.4	571.1	1.952	0.120	3.489	0.081	2.537	1.607	0.022	1.315	0.022	1.331	314.1
53	0.81	662.9	566.2	1.690	0.101	3.489	0.081	2.523	1.578	0.021	1.290	0.022	1.288	359.5
53	0.81	657.4	566.2	1.718	0.104	3.489	0.081	2.524	1.581	0.021	1.292	0.022	1.293	353.4
58	0.81	690.2	571.4	1.577	0.093	3.489	0.081	2.515	1.563	0.020	1.277	0.021	1.267	389.2
58	0.81	688.0	571.4	1.586	0.095	3.489	0.081	2.516	1.564	0.021	1.278	0.021	1.269	386.7
59	0.81	693.7	565.0	1.544	0.091	3.489	0.081	2.514	1.562	0.020	1.276	0.021	1.265	393.0
59	0.81	688.0	565.0	1.569	0.092	3.489	0.081	2.516	1.564	0.021	1.278	0.021	1.269	386.7
59	0.81	686.3	565.0	1.576	0.093	3.489	0.081	2.516	1.565	0.021	1.279	0.021	1.270	384.9
61	0.81	696.7	568.5	1.541	0.090	3.489	0.081	2.514	1.560	0.020	1.275	0.021	1.263	396.4
61	0.81	709.6	568.5	1.489	0.087	3.489	0.081	2.511	1.554	0.020	1.270	0.021	1.254	410.8
61	0.81	709.9	568.5	1.488	0.086	3.489	0.081	2.511	1.554	0.020	1.270	0.021	1.254	411.1
62	0.81	714.6	574.3	1.485	0.086	3.489	0.081	2.510	1.552	0.020	1.268	0.021	1.251	416.4
63	0.81	703.9	583.3	1.551	0.090	3.489	0.081	2.512	1.557	0.020	1.272	0.021	1.258	404.5
63	0.81	710.4	583.3	1.525	0.089	3.489	0.081	2.511	1.554	0.020	1.269	0.021	1.254	411.7
64	0.81	757.4	571.1	1.329	0.077	3.489	0.081	2.502	1.537	0.020	1.255	0.021	1.229	464.5
64	0.81	745.1	571.1	1.369	0.079	3.489	0.081	2.504	1.541	0.020	1.258	0.021	1.235	450.4

********** STEADY STATE TEST C **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F										
1	1.07	719.0	571.8	1.46	0.087	1.52	0.10	3.24	1.32	536.9
3	1.07	711.2	583.1	1.52	0.089	1.58	0.10	3.24	1.32	526.0
4	1.07	716.5	577.7	1.49	0.086	1.54	0.10	3.24	1.32	533.4
7	1.07	725.2	559.8	1.41	0.083	1.46	0.10	3.24	1.31	545.5
7	1.07	719.3	559.8	1.43	0.084	1.48	0.10	3.24	1.31	537.4
10	1.07	697.4	565.0	1.53	0.091	1.59	0.11	3.24	1.33	506.9
10	1.07	699.5	565.0	1.52	0.091	1.58	0.11	3.24	1.33	509.8
10	1.07	693.3	565.0	1.55	0.093	1.61	0.11	3.24	1.33	501.5
13	1.07	708.6	578.7	1.52	0.089	1.58	0.10	3.24	1.32	522.4
13	1.07	704.3	578.7	1.54	0.093	1.60	0.11	3.24	1.32	516.4
14	1.07	683.0	564.1	1.59	0.093	1.65	0.11	3.24	1.34	487.6
15	1.07	703.8	606.1	1.61	0.094	1.67	0.11	3.24	1.32	515.7
16	1.07	712.8	563.6	1.46	0.086	1.52	0.10	3.24	1.32	528.2
17	1.07	699.0	567.3	1.53	0.088	1.59	0.10	3.24	1.33	509.1
18	1.07	639.1	568.8	1.83	0.109	1.91	0.13	3.24	1.38	428.3
20	1.07	665.9	568.2	1.68	0.098	1.75	0.12	3.24	1.35	464.2
21	1.07	676.4	569.2	1.63	0.103	1.70	0.12	3.24	1.35	478.5
28	1.07	707.8	564.1	1.48	0.086	1.54	0.10	3.24	1.32	521.3
28	1.07	698.3	564.1	1.52	0.089	1.58	0.10	3.24	1.33	508.1
28	1.07	701.7	564.1	1.51	0.088	1.57	0.10	3.24	1.33	512.9
31	1.07	696.8	573.5	1.55	0.092	1.62	0.11	3.24	1.33	506.0
31	1.07	699.7	573.5	1.54	0.090	1.60	0.11	3.24	1.33	510.1
34	1.07	701.4	579.0	1.55	0.092	1.61	0.11	3.24	1.33	512.4
37	1.07	684.6	573.4	1.61	0.103	1.67	0.12	3.24	1.34	489.7
38	1.07	706.3	573.3	1.51	0.089	1.57	0.10	3.24	1.32	519.3
42	1.07	707.7	570.0	1.50	0.090	1.56	0.10	3.24	1.32	521.2
45	1.07	699.2	582.8	1.57	0.091	1.63	0.11	3.24	1.33	509.3
45	1.07	703.3	582.8	1.55	0.090	1.61	0.11	3.24	1.33	515.1
53	1.07	716.9	585.5	1.50	0.089	1.56	0.10	3.24	1.32	534.0
59	1.07	707.9	565.9	1.49	0.087	1.55	0.10	3.24	1.32	521.5
59	1.07	705.3	565.9	1.50	0.087	1.56	0.10	3.24	1.32	517.8
59	1.07	712.1	565.9	1.47	0.088	1.53	0.10	3.24	1.32	527.2
60	1.07	728.2	571.0	1.43	0.085	1.48	0.10	3.24	1.31	549.8
64	1.07	764.8	572.2	1.31	0.076	1.35	0.09	3.24	1.29	601.0
64	1.07	769.4	572.2	1.30	0.075	1.34	0.08	3.24	1.29	607.6
64	1.07	767.8	572.2	1.30	0.075	1.34	0.08	3.24	1.29	605.3
LEVEL G										
1	1.32	719.9	572.6	1.46	0.087	1.88	0.15	2.18	1.38	497.0
14	1.32	687.8	564.8	1.57	0.096	2.07	0.18	2.18	1.40	448.0
16	1.32	746.4	562.5	1.34	0.080	1.70	0.13	2.18	1.36	537.9
16	1.32	747.4	562.5	1.34	0.079	1.69	0.13	2.18	1.36	539.5
18	1.32	725.5	567.8	1.43	0.083	1.83	0.14	2.18	1.37	505.5
18	1.32	705.3	567.8	1.50	0.088	1.95	0.16	2.18	1.39	474.6
18	1.32	722.8	567.8	1.44	0.083	1.84	0.15	2.18	1.37	501.2
20	1.32	662.1	567.1	1.70	0.099	2.29	0.20	2.18	1.42	408.8
20	1.32	706.0	567.1	1.50	0.090	1.95	0.16	2.18	1.39	475.4
20	1.32	720.7	567.1	1.44	0.085	1.85	0.15	2.18	1.38	498.0
21	1.32	705.7	569.1	1.51	0.087	1.96	0.16	2.18	1.39	474.9
34	1.32	787.0	577.7	1.26	0.074	1.55	0.11	2.18	1.34	601.3
37	1.32	709.6	573.9	1.50	0.088	1.95	0.16	2.18	1.38	481.0
38	1.32	720.8	574.2	1.46	0.086	1.88	0.15	2.18	1.38	498.1
42	1.32	778.7	568.9	1.26	0.085	1.56	0.13	2.18	1.35	588.1
42	1.32	781.4	568.9	1.25	0.073	1.55	0.12	2.18	1.34	592.4
45	1.32	720.0	581.7	1.48	0.088	1.90	0.16	2.18	1.38	497.1
45	1.32	725.5	581.7	1.46	0.087	1.87	0.15	2.18	1.37	505.5
45	1.32	724.5	581.7	1.47	0.087	1.88	0.15	2.18	1.37	504.0
47	1.32	742.6	574.4	1.38	0.082	1.75	0.14	2.18	1.36	532.0
50	1.32	774.1	562.1	1.26	0.073	1.56	0.12	2.18	1.35	580.8
58	1.32	750.1	570.6	1.35	0.079	1.70	0.13	2.18	1.36	543.5
60	1.32	749.0	569.9	1.35	0.081	1.70	0.13	2.18	1.36	542.1
64	1.32	761.3	571.1	1.32	0.077	1.65	0.12	2.18	1.35	561.1
64	1.32	758.7	571.1	1.33	0.077	1.66	0.13	2.18	1.35	556.9

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E1														
1	0.85	743.7	570.7	1.372	0.081	3.609	0.082	2.583	1.567	0.019	1.284	0.020	1.246	472.1
38	0.85	669.6	572.4	1.675	0.098	3.609	0.082	2.600	1.600	0.020	1.312	0.021	1.293	386.8
50	0.85	653.7	562.1	1.725	0.104	3.609	0.082	2.605	1.609	0.020	1.321	0.021	1.307	369.2
LEVEL E2														
21	0.88	670.6	569.1	1.660	0.096	3.696	0.084	2.661	1.615	0.020	1.327	0.021	1.300	405.1
60	0.88	718.5	569.9	1.459	0.086	3.696	0.084	2.649	1.592	0.019	1.307	0.021	1.267	461.5
LEVEL E3														
14	0.92	653.4	563.5	1.731	0.107	3.796	0.085	2.739	1.639	0.022	1.349	0.024	1.325	405.0
17	0.92	688.1	566.2	1.571	0.095	3.796	0.085	2.728	1.619	0.022	1.332	0.024	1.296	447.0
34	0.92	705.7	577.7	1.529	0.093	3.796	0.085	2.724	1.611	0.022	1.325	0.024	1.284	468.7
37	0.92	697.7	572.6	1.548	0.090	3.796	0.085	2.726	1.615	0.022	1.328	0.024	1.289	458.9
38	0.92	696.4	572.4	1.553	0.090	3.796	0.085	2.726	1.615	0.022	1.328	0.024	1.290	457.3
50	0.92	685.3	562.1	1.572	0.096	3.796	0.085	2.729	1.621	0.022	1.333	0.024	1.298	443.5
60	0.92	735.9	569.9	1.396	0.082	3.796	0.085	2.717	1.598	0.021	1.314	0.023	1.266	506.0
LEVEL E6														
60	0.99	696.9	570.3	1.545	0.091	4.006	0.111	2.878	1.605	0.063	1.310	0.072	1.310	509.6

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL E7										
1	1.01	712.3	571.3	1.49	0.088	1.50	0.09	3.91	1.31	540.9
34	1.01	674.2	578.3	1.67	0.100	1.68	0.11	3.91	1.33	489.4
37	1.01	672.4	573.2	1.66	0.098	1.68	0.11	3.91	1.33	487.0
50	1.01	664.2	562.7	1.67	0.099	1.68	0.11	3.91	1.34	476.0
LEVEL E8										
1	1.05	718.7	571.6	1.46	0.087	1.50	0.10	3.47	1.31	541.0
14	1.05	691.8	564.4	1.55	0.092	1.59	0.10	3.47	1.33	504.3
34	1.05	692.8	578.6	1.58	0.095	1.63	0.11	3.47	1.33	505.6
37	1.05	679.7	573.5	1.63	0.095	1.67	0.11	3.47	1.34	488.0
38	1.05	693.8	573.3	1.57	0.091	1.61	0.10	3.47	1.33	506.9
LEVEL F1										
17	1.11	713.8	566.9	1.47	0.085	1.57	0.10	2.90	1.33	521.4
21	1.11	691.1	569.8	1.57	0.092	1.68	0.11	2.90	1.34	489.6
34	1.11	721.6	578.4	1.47	0.087	1.57	0.11	2.90	1.32	532.2
37	1.11	705.6	573.4	1.52	0.088	1.62	0.11	2.90	1.33	510.0
50	1.11	708.5	562.8	1.48	0.086	1.58	0.10	2.90	1.33	514.2
LEVEL F2										
1	1.14	727.4	572.1	1.43	0.084	1.56	0.10	2.70	1.33	535.1
14	1.14	697.2	564.6	1.53	0.093	1.68	0.12	2.70	1.35	491.8
17	1.14	716.8	567.4	1.46	0.084	1.59	0.11	2.70	1.33	519.6
34	1.14	737.4	578.9	1.41	0.083	1.54	0.10	2.70	1.32	549.6
38	1.14	729.9	573.6	1.43	0.083	1.55	0.10	2.70	1.33	538.7
50	1.14	721.4	563.3	1.43	0.083	1.56	0.10	2.70	1.33	526.3
LEVEL F3										
14	1.17	702.8	563.9	1.50	0.090	1.69	0.12	2.55	1.35	494.7
17	1.17	712.0	566.5	1.47	0.085	1.65	0.11	2.55	1.35	508.2
21	1.17	699.3	569.4	1.53	0.088	1.72	0.12	2.55	1.35	489.6
34	1.17	754.4	578.0	1.35	0.080	1.50	0.10	2.55	1.32	569.6
60	1.17	723.4	570.2	1.44	0.087	1.61	0.12	2.55	1.34	524.4
LEVEL F4										
60	1.20	635.2	570.0	1.85	0.110	2.21	0.18	2.44	1.42	393.6
LEVEL F5										
21	1.22	634.8	569.1	1.85	0.108	2.27	0.19	2.37	1.43	388.7
60	1.22	684.0	569.9	1.60	0.094	1.90	0.15	2.37	1.38	459.7
LEVEL F6										
1	1.25	686.4	571.4	1.59	0.098	1.94	0.16	2.31	1.38	458.9
17	1.25	696.7	566.8	1.54	0.090	1.86	0.14	2.31	1.37	474.2
37	1.25	681.5	573.1	1.62	0.095	1.98	0.16	2.31	1.39	451.9
38	1.25	680.8	573.1	1.62	0.095	1.99	0.16	2.31	1.39	450.8
50	1.25	726.7	563.6	1.41	0.083	1.68	0.12	2.31	1.35	518.6
60	1.25	713.7	570.6	1.48	0.086	1.77	0.13	2.31	1.36	499.6
LEVEL F7										
14	1.27	681.6	564.2	1.59	0.096	1.99	0.16	2.26	1.39	448.1
17	1.27	713.1	566.8	1.47	0.085	1.80	0.14	2.26	1.37	495.0
21	1.27	678.3	569.7	1.63	0.094	2.03	0.16	2.26	1.39	443.5
37	1.27	696.0	573.3	1.56	0.091	1.93	0.15	2.26	1.38	469.5
38	1.27	697.3	573.0	1.55	0.090	1.92	0.15	2.26	1.38	471.5
50	1.27	744.4	562.7	1.35	0.079	1.63	0.12	2.26	1.35	542.5
60	1.27	728.8	570.5	1.42	0.083	1.73	0.13	2.26	1.36	518.5

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F8										
1	1.30	720.8	572.5	1.46	0.086	1.83	0.14	2.21	1.37	501.9
17	1.30	724.8	567.7	1.43	0.083	1.79	0.14	2.21	1.37	507.8
21	1.30	692.9	570.6	1.56	0.090	2.00	0.16	2.21	1.39	459.8
34	1.30	771.8	579.2	1.30	0.077	1.59	0.12	2.21	1.34	580.0
37	1.30	709.0	574.1	1.51	0.088	1.91	0.15	2.21	1.38	483.8
50	1.30	763.5	563.6	1.29	0.075	1.58	0.12	2.21	1.35	566.9
60	1.30	746.4	571.4	1.36	0.079	1.69	0.13	2.21	1.36	540.8

STEADY STATE TEST D

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST D **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.813E+05 LBM/SQFT H UNC. MASS FLUX 8.660E+03 LBM/SQFT H PRESSURE 1847.3 PSI UNC. PRESSURE 6.00 PSI
517.47 KG/SQM S 11.7514 KG/SQM S 12.75 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.225	700.9	0.030	9.58	1253.8	679.1	50.83	28.240	624.5	329.5	0.443	0.2	.6436	.0301
F	2.219	698.9	0.037	11.60	1255.2	679.9	40.65	22.583	624.5	329.5	0.443	0.2	.8486	.0352
G	2.212	696.8	0.051	16.15	1205.5	652.3	33.96	18.864	642.9	339.7	15.689	8.7	1.0516	.0402
E1	2.209	695.8	0.026	8.28	1287.3	697.7	62.40	34.669	624.5	329.5	0.443	0.2	.6764	.0309
E2	2.175	685.1	0.065	20.58	1275.4	691.1	35.72	19.846	624.5	329.5	0.443	0.2	.6999	.0316
E3	2.215	697.7	0.022	7.08	1301.4	705.6	24.87	13.819	624.5	329.5	0.443	0.2	.7275	.0325
E6	2.159	680.1	0.082	25.89	1197.0	647.6	42.00	23.335	624.5	329.5	0.443	0.2	.7860	.0338
E7	2.218	698.5	0.026	8.11	1215.0	657.5	37.20	20.665	624.5	329.5	0.443	0.2	.8055	.0342
E8	2.225	700.9	0.015	4.65	1235.4	668.9	33.18	18.431	624.5	329.5	0.443	0.2	.8312	.0348
F1	2.193	690.9	0.050	15.70	1246.3	674.9	14.18	7.876	624.5	329.5	0.443	0.2	.8814	.0361
F2	2.213	697.2	0.022	7.05	1269.1	687.6	26.83	14.906	624.5	329.5	0.443	0.2	.9071	.0368
F3	2.193	690.9	0.048	15.17	1259.1	682.1	21.43	11.908	624.5	329.5	0.443	0.2	.9328	.0376
F4	2.158	679.7	0.082	25.88	1057.9	570.2	4.88	2.711	624.5	329.5	0.443	0.2	.9564	.0382
F5	2.175	685.1	0.065	20.58	1109.5	598.9	25.04	13.910	624.5	329.5	0.443	0.2	.9738	.0386
F6	2.195	691.4	0.046	14.40	1161.8	628.0	12.46	6.920	624.5	329.5	0.443	0.2	.9922	.0389
F7	2.195	691.4	0.042	13.25	1170.3	632.7	16.78	9.324	627.5	331.1	13.230	7.4	1.0096	.0393
F8	2.199	692.7	0.044	13.79	1197.9	648.0	25.87	14.373	636.6	336.2	13.876	7.7	1.0342	.0398

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test D

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST D **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E														
2	0.64	692.3	696.9	1.921	0.116	4.351	0.101	3.104	1.952	0.030	1.703	0.034	1.681	488.6
3	0.64	592.4	711.5	2.706	0.174	4.351	0.101	3.149	2.042	0.033	1.786	0.037	1.823	355.5
4	0.64	651.4	705.8	2.193	0.131	4.351	0.101	3.118	1.981	0.031	1.730	0.035	1.726	433.6
7	0.64	666.4	686.5	2.038	0.125	4.351	0.101	3.112	1.969	0.031	1.719	0.035	1.708	453.4
7	0.64	664.9	686.5	2.047	0.125	4.351	0.101	3.113	1.970	0.031	1.720	0.035	1.710	451.4
10	0.64	664.5	690.6	2.062	0.123	4.351	0.101	3.113	1.971	0.031	1.720	0.034	1.710	450.8
12	0.64	674.8	712.2	2.063	0.125	4.351	0.101	3.109	1.963	0.031	1.714	0.034	1.699	464.8
13	0.64	673.3	706.6	2.055	0.127	4.351	0.101	3.110	1.964	0.031	1.715	0.034	1.700	462.9
13	0.64	675.9	706.6	2.040	0.124	4.351	0.101	3.109	1.963	0.031	1.713	0.034	1.697	466.4
15	0.64	669.4	731.8	2.153	0.130	4.351	0.101	3.111	1.967	0.031	1.717	0.034	1.704	457.5
15	0.64	674.3	731.8	2.123	0.127	4.351	0.101	3.110	1.964	0.031	1.714	0.034	1.699	464.1
16	0.64	706.1	690.6	1.834	0.109	4.351	0.101	3.100	1.944	0.030	1.696	0.034	1.669	507.3
16	0.64	699.4	690.6	1.867	0.111	4.351	0.101	3.102	1.948	0.030	1.700	0.034	1.675	498.1
20	0.64	644.1	710.5	2.259	0.137	4.351	0.101	3.121	1.987	0.031	1.735	0.035	1.735	423.6
20	0.64	654.2	710.5	2.188	0.134	4.351	0.101	3.117	1.978	0.031	1.727	0.035	1.722	437.1
24	0.64	666.1	696.0	2.068	0.127	4.351	0.101	3.112	1.969	0.031	1.719	0.035	1.708	453.0
24	0.64	646.1	696.0	2.198	0.155	4.351	0.101	3.120	1.985	0.033	1.734	0.036	1.733	426.4
26	0.64	668.7	702.7	2.072	0.123	4.351	0.101	3.112	1.968	0.031	1.718	0.034	1.705	456.5
26	0.64	668.9	702.7	2.070	0.123	4.351	0.101	3.111	1.967	0.031	1.717	0.034	1.705	456.9
26	0.64	670.1	702.7	2.064	0.123	4.351	0.101	3.111	1.967	0.031	1.717	0.034	1.704	458.4
29	0.64	668.6	695.3	2.050	0.121	4.351	0.101	3.112	1.968	0.030	1.718	0.034	1.705	456.4
29	0.64	659.6	695.3	2.106	0.127	4.351	0.101	3.115	1.974	0.031	1.724	0.035	1.716	444.4
29	0.64	663.6	695.3	2.081	0.124	4.351	0.101	3.113	1.971	0.031	1.721	0.034	1.711	449.5
30	0.64	653.0	691.8	2.139	0.128	4.351	0.101	3.117	1.979	0.031	1.728	0.035	1.724	435.8
30	0.64	657.4	691.8	2.110	0.127	4.351	0.101	3.116	1.976	0.031	1.725	0.035	1.718	441.5
31	0.64	667.9	700.9	2.071	0.124	4.351	0.101	3.112	1.968	0.031	1.718	0.034	1.706	455.5
33	0.64	694.4	703.3	1.928	0.115	4.351	0.101	3.103	1.951	0.030	1.702	0.034	1.679	491.2
33	0.64	685.4	703.3	1.976	0.122	4.351	0.101	3.106	1.956	0.031	1.707	0.034	1.688	479.4
33	0.64	680.2	703.3	2.006	0.121	4.351	0.101	3.108	1.960	0.030	1.710	0.034	1.693	472.3
35	0.64	673.2	706.1	2.055	0.127	4.351	0.101	3.110	1.964	0.031	1.715	0.034	1.700	462.6
42	0.64	664.3	695.4	2.077	0.132	4.351	0.101	3.113	1.971	0.031	1.720	0.035	1.710	450.5
44	0.64	643.7	685.0	2.181	0.135	4.351	0.101	3.121	1.987	0.031	1.735	0.035	1.736	423.1
45	0.64	643.9	713.2	2.269	0.140	4.351	0.101	3.121	1.987	0.031	1.735	0.035	1.736	423.4
45	0.64	656.2	713.2	2.183	0.136	4.351	0.101	3.116	1.977	0.031	1.726	0.035	1.720	439.8
49	0.64	697.2	699.2	1.902	0.113	4.351	0.101	3.102	1.949	0.030	1.701	0.034	1.677	495.0
49	0.64	710.4	699.2	1.836	0.109	4.351	0.101	3.099	1.942	0.030	1.694	0.034	1.665	513.3
49	0.64	703.4	699.2	1.870	0.113	4.351	0.101	3.100	1.946	0.030	1.697	0.034	1.671	503.6
51	0.64	647.1	698.6	2.200	0.136	4.351	0.101	3.120	1.984	0.031	1.733	0.035	1.731	427.8
51	0.64	647.7	698.6	2.195	0.138	4.351	0.101	3.120	1.984	0.031	1.732	0.035	1.730	428.6
53	0.64	687.9	696.2	1.943	0.119	4.351	0.101	3.105	1.955	0.030	1.706	0.034	1.685	482.5
53	0.64	682.6	696.2	1.972	0.122	4.351	0.101	3.107	1.958	0.031	1.709	0.034	1.691	475.5
58	0.64	697.5	700.0	1.902	0.114	4.351	0.101	3.102	1.949	0.030	1.701	0.034	1.676	495.4
58	0.64	692.6	700.0	1.928	0.119	4.351	0.101	3.104	1.952	0.030	1.703	0.034	1.681	489.0
59	0.64	702.7	692.5	1.856	0.111	4.351	0.101	3.101	1.946	0.030	1.698	0.034	1.672	502.7
59	0.64	695.2	692.5	1.894	0.113	4.351	0.101	3.103	1.950	0.030	1.702	0.034	1.679	492.2
59	0.64	694.0	692.5	1.900	0.114	4.351	0.101	3.103	1.951	0.030	1.702	0.034	1.680	490.6
61	0.64	704.8	696.7	1.857	0.110	4.351	0.101	3.100	1.945	0.030	1.697	0.034	1.670	505.5
61	0.64	716.2	696.7	1.802	0.106	4.351	0.101	3.097	1.939	0.030	1.691	0.034	1.661	521.4
61	0.64	719.2	696.7	1.788	0.105	4.351	0.101	3.096	1.937	0.030	1.690	0.034	1.658	525.5
62	0.64	721.4	702.6	1.793	0.105	4.351	0.101	3.096	1.936	0.030	1.689	0.034	1.657	528.6
63	0.64	704.6	715.0	1.907	0.112	4.351	0.101	3.100	1.945	0.030	1.697	0.034	1.670	505.2
63	0.64	710.3	715.0	1.878	0.112	4.351	0.101	3.099	1.942	0.030	1.694	0.034	1.665	513.2
64	0.64	757.9	699.9	1.634	0.095	4.351	0.101	3.087	1.920	0.030	1.674	0.033	1.631	579.3
64	0.64	743.5	699.9	1.691	0.099	4.351	0.101	3.090	1.926	0.030	1.679	0.033	1.641	558.9
LEVEL F														
1	0.85	691.3	699.6	1.934	0.120	5.247	0.109	3.735	2.177	0.026	1.954	0.030	1.780	640.2
3	0.85	686.3	713.5	2.000	0.120	5.247	0.109	3.737	2.181	0.026	1.958	0.030	1.785	631.6
4	0.85	696.6	707.4	1.927	0.114	5.247	0.109	3.733	2.174	0.026	1.951	0.030	1.775	649.4
7	0.85	699.2	687.6	1.860	0.114	5.247	0.109	3.732	2.172	0.026	1.950	0.030	1.773	653.8
7	0.85	689.7	687.6	1.909	0.115	5.247	0.109	3.736	2.179	0.026	1.955	0.030	1.782	637.5
10	0.85	669.0	691.0	2.036	0.126	5.247	0.109	3.744	2.194	0.026	1.970	0.030	1.804	601.9
10	0.85	667.3	691.0	2.046	0.128	5.247	0.109	3.745	2.195	0.027	1.971	0.031	1.806	599.0
10	0.85	666.7	691.0	2.049	0.128	5.247	0.109	3.745	2.196	0.027	1.972	0.031	1.807	598.0
13	0.85	678.3	707.6	2.029	0.122	5.247	0.109	3.740	2.187	0.026	1.963	0.030	1.794	617.9
13	0.85	675.9	707.6	2.043	0.128	5.247	0.109	3.741	2.188	0.026	1.965	0.030	1.796	613.8
14	0.85	645.2	693.0	2.195	0.133	5.247	0.109	3.755	2.214	0.027	1.989	0.031	1.835	562.1
15	0.85	671.6	732.3	2.141	0.128	5.247	0.109	3.743	2.192	0.026	1.968	0.030	1.801	606.4
16	0.85	683.2	690.6	1.953	0.118	5.247	0.109	3.738	2.183	0.026	1.960	0.030	1.788	626.2
17	0.85	668.6	691.8	2.040	0.120	5.247	0.109	3.744	2.194	0.026	1.970	0.030	1.805	601.3
18	0.85	620.1	695.0	2.392	0.148	5.247	0.109	3.769	2.241	0.028	2.014	0.032	1.874	520.0

********** STEADY STATE TEST D **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
20	0.85	648.0	711.4	2.234	0.132	5.247	0.109	3.754	2.212	0.026	1.987	0.030	1.831	566.8
21	0.85	656.4	696.1	2.129	0.142	5.247	0.109	3.749	2.204	0.028	1.980	0.031	1.820	581.2
28	0.85	695.5	690.0	1.885	0.111	5.247	0.109	3.733	2.175	0.026	1.952	0.030	1.776	647.5
28	0.85	682.7	690.0	1.954	0.116	5.247	0.109	3.738	2.183	0.026	1.960	0.030	1.789	625.4
28	0.85	682.6	690.0	1.954	0.116	5.247	0.109	3.738	2.184	0.026	1.960	0.030	1.789	625.3
31	0.85	673.5	701.8	2.040	0.124	5.247	0.109	3.742	2.190	0.026	1.967	0.030	1.799	609.6
31	0.85	673.4	701.8	2.041	0.122	5.247	0.109	3.742	2.190	0.026	1.967	0.030	1.799	609.4
34	0.85	663.1	706.0	2.116	0.130	5.247	0.109	3.746	2.199	0.026	1.974	0.030	1.811	592.2
37	0.85	670.6	701.6	2.057	0.140	5.247	0.109	3.743	2.193	0.027	1.969	0.031	1.802	604.6
38	0.85	688.3	703.1	1.960	0.119	5.247	0.109	3.736	2.180	0.026	1.956	0.030	1.783	635.0
42	0.85	677.9	696.3	1.999	0.125	5.247	0.109	3.740	2.187	0.026	1.963	0.030	1.794	617.1
45	0.85	676.1	713.9	2.060	0.122	5.247	0.109	3.741	2.188	0.026	1.965	0.030	1.796	614.0
45	0.85	679.6	713.9	2.040	0.121	5.247	0.109	3.739	2.186	0.026	1.962	0.030	1.792	620.0
53	0.85	684.6	714.6	2.013	0.122	5.247	0.109	3.737	2.182	0.026	1.959	0.030	1.787	628.7
59	0.85	674.8	692.2	2.005	0.120	5.247	0.109	3.741	2.189	0.026	1.966	0.030	1.798	611.8
59	0.85	677.8	692.2	1.987	0.118	5.247	0.109	3.740	2.187	0.026	1.963	0.030	1.794	617.0
59	0.85	682.6	692.2	1.961	0.122	5.247	0.109	3.738	2.184	0.026	1.960	0.030	1.789	625.2
60	0.85	694.9	699.8	1.915	0.118	5.247	0.109	3.734	2.175	0.026	1.952	0.030	1.777	646.5
64	0.85	727.4	700.8	1.761	0.103	5.247	0.109	3.723	2.156	0.025	1.934	0.029	1.748	702.4
64	0.85	740.4	700.8	1.706	0.100	5.247	0.109	3.719	2.149	0.025	1.928	0.029	1.738	725.3
64	0.85	735.3	700.8	1.727	0.101	5.247	0.109	3.721	2.151	0.025	1.930	0.029	1.742	716.2

********** STEADY STATE TEST D **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.05	660.1	699.3	2.12	0.131	2.18	0.15	4.92	1.91	717.2
14	1.05	638.0	693.1	2.25	0.148	2.32	0.17	4.92	1.94	673.2
16	1.05	656.7	689.7	2.11	0.132	2.18	0.15	4.92	1.91	710.3
16	1.05	670.6	689.7	2.02	0.124	2.08	0.14	4.92	1.90	738.6
18	1.05	644.4	693.9	2.20	0.133	2.28	0.15	4.92	1.93	686.2
18	1.05	636.7	693.9	2.26	0.139	2.34	0.16	4.92	1.94	670.5
18	1.05	639.6	693.9	2.24	0.135	2.31	0.16	4.92	1.94	676.4
20	1.05	594.2	710.5	2.68	0.162	2.79	0.20	4.92	2.03	585.8
20	1.05	645.4	710.5	2.25	0.143	2.32	0.16	4.92	1.93	688.1
20	1.05	644.5	710.5	2.26	0.138	2.33	0.16	4.92	1.93	686.3
21	1.05	631.7	665.5	2.20	0.130	2.28	0.15	4.92	1.95	660.4
34	1.05	672.7	705.0	2.05	0.126	2.12	0.14	4.92	1.89	742.9
37	1.05	644.9	701.8	2.23	0.135	2.30	0.16	4.92	1.93	687.1
38	1.05	654.2	702.4	2.16	0.132	2.23	0.15	4.92	1.92	705.3
42	1.05	656.7	695.4	2.13	0.165	2.19	0.18	4.92	1.91	710.3
42	1.05	662.9	695.4	2.09	0.128	2.15	0.15	4.92	1.91	723.1
45	1.05	650.5	713.4	2.22	0.140	2.30	0.16	4.92	1.92	698.5
45	1.05	643.7	713.4	2.27	0.143	2.35	0.16	4.92	1.93	684.6
45	1.05	649.6	713.4	2.23	0.139	2.30	0.16	4.92	1.92	696.6
47	1.05	655.2	704.2	2.16	0.134	2.23	0.15	4.92	1.92	707.4
50	1.05	661.1	686.4	2.07	0.124	2.14	0.14	4.92	1.91	719.3
58	1.05	658.4	699.2	2.13	0.131	2.19	0.15	4.92	1.91	713.9
60	1.05	664.7	698.7	2.08	0.132	2.15	0.15	4.92	1.90	726.7
64	1.05	688.9	701.1	1.95	0.117	2.01	0.13	4.92	1.87	776.4
64	1.05	690.9	701.1	1.94	0.116	2.00	0.13	4.92	1.87	780.5

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E1														
1	0.68	737.3	698.7	1.714	0.104	4.497	0.103	3.187	1.970	0.029	1.728	0.033	1.659	572.5
38	0.68	683.3	702.2	1.985	0.118	4.497	0.103	3.202	2.000	0.030	1.756	0.034	1.705	495.5
50	0.68	672.6	686.4	2.001	0.123	4.497	0.103	3.206	2.007	0.030	1.763	0.034	1.716	480.6
LEVEL E2														
21	0.70	677.7	696.0	1.999	0.117	4.602	0.104	3.280	2.033	0.029	1.792	0.033	1.723	503.7
60	0.70	713.9	698.0	1.816	0.110	4.602	0.104	3.269	2.011	0.029	1.771	0.033	1.689	556.3
LEVEL E3														
17	0.73	689.4	692.0	1.923	0.119	4.723	0.106	3.361	2.058	0.029	1.821	0.033	1.724	539.9
34	0.73	718.2	705.1	1.814	0.113	4.723	0.106	3.352	2.041	0.029	1.806	0.033	1.698	583.0
37	0.73	699.4	701.8	1.897	0.112	4.723	0.106	3.358	2.052	0.029	1.816	0.033	1.715	554.8
38	0.73	704.0	702.3	1.876	0.110	4.723	0.106	3.357	2.049	0.029	1.813	0.033	1.710	561.4
50	0.73	696.4	686.6	1.871	0.117	4.723	0.106	3.359	2.054	0.029	1.817	0.033	1.717	550.2
60	0.73	725.9	698.1	1.761	0.106	4.723	0.106	3.350	2.037	0.029	1.802	0.032	1.692	594.8
LEVEL E6														
60	0.79	664.1	698.4	2.088	0.126	4.978	0.108	3.555	2.140	0.028	1.910	0.032	1.780	544.2
LEVEL E7														
1	0.81	683.7	699.3	1.974	0.122	5.062	0.108	3.603	2.144	0.027	1.917	0.031	1.767	589.9
34	0.81	647.7	705.6	2.217	0.139	5.062	0.108	3.618	2.173	0.028	1.944	0.032	1.810	531.9
37	0.81	662.8	702.3	2.107	0.126	5.062	0.108	3.611	2.160	0.027	1.932	0.031	1.790	556.1
50	0.81	635.8	687.0	2.243	0.138	5.062	0.108	3.624	2.185	0.028	1.955	0.032	1.827	512.7
LEVEL E8														
1	0.83	691.5	699.5	1.932	0.119	5.172	0.108	3.680	2.163	0.026	1.938	0.030	1.771	624.8
14	0.83	643.8	693.6	2.207	0.137	5.172	0.108	3.700	2.201	0.027	1.974	0.031	1.828	545.6
34	0.83	658.8	705.8	2.144	0.133	5.172	0.108	3.693	2.187	0.027	1.961	0.031	1.808	569.8
37	0.83	670.8	702.4	2.058	0.123	5.172	0.108	3.688	2.178	0.026	1.952	0.030	1.793	590.0
38	0.83	679.6	703.0	2.008	0.119	5.172	0.108	3.684	2.171	0.026	1.946	0.030	1.784	604.7
LEVEL F1														
17	0.88	682.4	692.4	1.962	0.115	5.387	0.110	3.836	2.208	0.026	1.987	0.031	1.804	653.5
21	0.88	665.8	696.5	2.071	0.124	5.387	0.110	3.843	2.221	0.026	1.999	0.031	1.823	624.8
34	0.88	676.6	705.5	2.033	0.125	5.387	0.110	3.838	2.212	0.026	1.991	0.031	1.811	643.5
37	0.88	685.3	702.2	1.974	0.117	5.387	0.110	3.835	2.206	0.026	1.985	0.031	1.801	658.7
50	0.88	668.2	686.9	2.029	0.120	5.387	0.110	3.842	2.219	0.026	1.997	0.031	1.820	628.9
LEVEL F2														
1	0.91	703.3	699.9	1.873	0.112	5.495	0.112	3.907	2.209	0.027	1.989	0.033	1.796	716.7
14	0.91	667.9	693.7	2.050	0.131	5.495	0.112	3.921	2.234	0.029	2.013	0.034	1.833	652.0
17	0.91	684.3	692.9	1.953	0.114	5.495	0.112	3.914	2.222	0.028	2.001	0.033	1.815	681.8
34	0.91	689.1	706.0	1.964	0.120	5.495	0.112	3.912	2.218	0.028	1.998	0.033	1.810	690.6
38	0.91	705.4	703.2	1.871	0.110	5.495	0.112	3.906	2.208	0.027	1.988	0.033	1.794	720.7
50	0.91	675.6	687.4	1.987	0.118	5.495	0.112	3.918	2.228	0.028	2.007	0.033	1.824	665.9
LEVEL F3														
14	0.93	669.1	692.9	2.040	0.126	5.603	0.113	3.996	2.244	0.034	2.022	0.041	1.843	678.5
17	0.93	679.6	691.9	1.977	0.116	5.603	0.113	3.991	2.236	0.033	2.014	0.041	1.831	697.3
21	0.93	673.4	696.1	2.024	0.119	5.603	0.113	3.994	2.241	0.033	2.019	0.041	1.838	686.4
34	0.93	702.2	705.1	1.892	0.115	5.603	0.113	3.982	2.220	0.033	1.999	0.041	1.808	740.0
60	0.93	679.3	698.1	1.996	0.126	5.603	0.113	3.991	2.236	0.034	2.014	0.041	1.831	697.2
LEVEL F4														
60	0.96	572.2	698.0	2.876	0.181	5.702	0.115	4.136	2.368	0.063	2.136	0.067	2.037	522.9
LEVEL F5														
21	0.97	583.3	696.0	2.743	0.165	5.775	0.129	4.180	2.342	0.083	2.108	0.125	2.015	559.1
60	0.97	609.9	698.0	2.489	0.153	5.775	0.129	4.157	2.303	0.082	2.071	0.123	1.954	608.9

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
1	0.99	637.5	698.7	2.269	0.150	5.852	0.166	4.193	2.246	0.082	2.007	0.117	1.914	679.8
17	0.99	627.9	691.8	2.318	0.141	5.852	0.166	4.199	2.256	0.086	2.017	0.115	1.930	661.7
37	0.99	620.4	701.6	2.412	0.148	5.852	0.166	4.204	2.265	0.086	2.025	0.116	1.943	647.1
38	0.99	619.9	702.2	2.418	0.146	5.852	0.166	4.204	2.265	0.086	2.025	0.115	1.944	646.3
50	0.99	629.8	686.4	2.286	0.140	5.852	0.166	4.197	2.254	0.085	2.015	0.115	1.927	665.3
60	0.99	635.8	698.0	2.279	0.139	5.852	0.166	4.194	2.248	0.086	2.009	0.114	1.917	676.4

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F7										
14	1.01	622.2	692.9	2.37	0.150	2.38	0.16	5.79	1.95	660.7
17	1.01	636.4	691.8	2.25	0.135	2.27	0.15	5.79	1.92	688.5
21	1.01	617.4	696.1	2.42	0.144	2.43	0.16	5.79	1.96	651.4
37	1.01	629.9	702.4	2.34	0.143	2.35	0.16	5.79	1.93	675.9
38	1.01	637.5	702.3	2.28	0.137	2.29	0.15	5.79	1.92	690.7
50	1.01	640.8	686.4	2.21	0.135	2.22	0.15	5.79	1.92	697.3
60	1.01	645.1	698.0	2.21	0.135	2.22	0.15	5.79	1.91	705.6
LEVEL F8										
1	1.03	665.6	699.4	2.08	0.127	2.12	0.14	5.17	1.89	733.4
17	1.03	639.3	692.2	2.23	0.133	2.28	0.15	5.17	1.93	680.4
21	1.03	623.3	696.3	2.37	0.141	2.43	0.16	5.17	1.96	648.7
34	1.03	659.8	705.3	2.14	0.133	2.18	0.15	5.17	1.90	721.7
37	1.03	642.7	702.0	2.24	0.135	2.29	0.15	5.17	1.93	687.3
50	1.03	654.0	686.7	2.12	0.128	2.16	0.14	5.17	1.91	710.1
60	1.03	660.8	698.3	2.11	0.127	2.15	0.14	5.17	1.90	723.9

STEADY STATE TEST E

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HOB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST E **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 4.370E+05 LBM/SQFT H
593.04 KG/SQM S

UNC. MASS FLUX 9.951E+03 LBM/SQFT H
13.5033 KG/SQM S

PRESSURE 1908.0 PSI
13.16 MPA

UNC. PRESSURE 6.00 PSI
C.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.287	720.4	0.034	10.75	1234.7	668.5	46.72	25.956	629.0	332.0	0.443	0.2	.5757	.0282
F	2.275	716.8	0.040	12.68	1220.4	660.5	39.99	22.218	629.0	332.0	0.443	0.2	.7637	.0329
G	2.260	712.0	0.052	16.34	1155.5	624.5	29.19	16.215	629.0	332.0	0.443	0.2	.9495	.0375
E1	2.260	712.0	0.022	7.04	1260.0	682.6	61.40	34.114	629.0	332.0	0.443	0.2	.6058	.0290
E2	2.221	699.6	0.069	21.84	1251.2	677.6	30.09	16.719	629.0	332.0	0.443	0.2	.6274	.0297
E3	2.264	713.0	0.021	6.54	1270.7	688.5	22.75	12.639	629.0	332.0	0.443	0.2	.6528	.0305
E6	2.201	693.2	0.085	26.67	1160.6	627.3	35.50	19.720	629.0	332.0	0.443	0.2	.7063	.0317
E7	2.269	714.7	0.025	8.01	1181.3	638.8	37.09	20.603	629.0	332.0	0.443	0.2	.7242	.0320
E8	2.278	717.5	0.012	3.78	1211.5	655.6	22.90	12.724	629.0	332.0	0.443	0.2	.7477	.0325
F1	2.241	706.0	0.054	16.89	1210.1	654.8	16.16	8.977	629.0	332.0	0.443	0.2	.7937	.0337
F2	2.264	713.1	0.022	6.80	1228.4	665.0	28.10	15.610	629.0	332.0	0.443	0.2	.8172	.0344
F3	2.243	706.4	0.053	16.67	1218.6	659.6	18.96	10.535	629.0	332.0	0.443	0.2	.8407	.0351
F5	2.220	699.2	0.069	21.82	1054.1	568.1	18.46	10.258	629.0	332.0	0.443	0.2	.8783	.0360
F6	2.242	706.2	0.047	14.88	1111.1	599.8	14.60	8.110	629.0	332.0	0.443	0.2	.8951	.0363
F7	2.242	706.2	0.043	13.51	1118.1	603.8	14.17	7.872	629.0	332.0	0.443	0.2	.9111	.0366
F8	2.247	707.9	0.047	14.83	1144.1	618.1	24.09	13.385	629.0	332.0	0.443	0.2	.9336	.0371

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test E

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST E **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E														
2	0.58	680.3	722.4	2.074	0.126	4.705	0.111	3.312	2.096	0.035	1.850	0.040	1.843	502.2
3	0.58	620.2	737.7	2.560	0.163	4.705	0.111	3.339	2.151	0.036	1.901	0.041	1.931	417.5
4	0.58	658.3	732.7	2.246	0.135	4.705	0.111	3.320	2.113	0.035	1.866	0.040	1.870	471.1
7	0.58	645.0	702.1	2.243	0.139	4.705	0.111	3.326	2.125	0.036	1.877	0.040	1.889	452.2
7	0.58	645.2	702.1	2.242	0.138	4.705	0.111	3.326	2.125	0.035	1.877	0.040	1.889	452.5
10	0.58	665.8	716.4	2.146	0.129	4.705	0.111	3.317	2.107	0.035	1.861	0.040	1.860	481.9
12	0.58	660.3	727.7	2.216	0.135	4.705	0.111	3.319	2.112	0.035	1.865	0.040	1.867	474.0
13	0.58	665.7	723.0	2.167	0.135	4.705	0.111	3.317	2.107	0.035	1.861	0.040	1.861	481.7
13	0.58	668.3	723.0	2.150	0.132	4.705	0.111	3.316	2.105	0.035	1.859	0.040	1.857	485.2
15	0.58	654.8	752.5	2.331	0.143	4.705	0.111	3.322	2.116	0.035	1.869	0.040	1.875	466.1
15	0.58	660.7	752.5	2.290	0.139	4.705	0.111	3.319	2.111	0.035	1.864	0.040	1.867	474.5
16	0.58	691.0	706.6	1.968	0.118	4.705	0.111	3.308	2.089	0.034	1.843	0.039	1.831	517.6
16	0.58	684.5	706.6	2.005	0.120	4.705	0.111	3.310	2.093	0.034	1.848	0.039	1.838	508.2
20	0.58	656.2	723.2	2.231	0.135	4.705	0.111	3.321	2.115	0.035	1.868	0.040	1.873	468.1
20	0.58	664.9	723.2	2.172	0.133	4.705	0.111	3.317	2.108	0.035	1.861	0.040	1.861	480.6
24	0.58	627.1	711.8	2.413	0.151	4.705	0.111	3.335	2.143	0.036	1.894	0.041	1.918	427.2
24	0.58	607.2	711.8	2.587	0.194	4.705	0.111	3.347	2.167	0.040	1.916	0.044	1.956	399.7
26	0.58	647.0	720.6	2.288	0.138	4.705	0.111	3.325	2.123	0.035	1.876	0.040	1.886	455.0
26	0.58	654.9	720.6	2.232	0.133	4.705	0.111	3.322	2.116	0.035	1.869	0.040	1.875	466.2
26	0.58	652.0	720.6	2.252	0.135	4.705	0.111	3.323	2.119	0.035	1.871	0.040	1.879	462.1
29	0.58	635.5	711.6	2.345	0.140	4.705	0.111	3.331	2.134	0.035	1.886	0.040	1.904	438.9
29	0.58	630.8	711.6	2.382	0.146	4.705	0.111	3.333	2.139	0.036	1.890	0.041	1.912	432.5
29	0.58	633.6	711.6	2.359	0.142	4.705	0.111	3.332	2.136	0.036	1.888	0.041	1.907	436.5
30	0.58	655.3	706.8	2.186	0.131	4.705	0.111	3.321	2.116	0.035	1.869	0.040	1.874	466.9
30	0.58	662.0	706.8	2.142	0.129	4.705	0.111	3.319	2.110	0.035	1.863	0.040	1.865	476.4
31	0.58	650.4	717.5	2.254	0.136	4.705	0.111	3.324	2.120	0.035	1.873	0.040	1.881	459.8
33	0.58	695.1	720.5	1.985	0.119	4.705	0.111	3.307	2.086	0.034	1.841	0.039	1.827	523.4
33	0.58	685.5	720.5	2.038	0.126	4.705	0.111	3.310	2.092	0.035	1.847	0.040	1.837	509.6
33	0.58	680.3	720.5	2.069	0.126	4.705	0.111	3.312	2.096	0.035	1.850	0.040	1.843	502.1
35	0.58	664.4	723.6	2.177	0.136	4.705	0.111	3.318	2.108	0.035	1.862	0.040	1.862	479.8
42	0.58	651.4	713.5	2.234	0.144	4.705	0.111	3.323	2.119	0.036	1.872	0.041	1.880	461.3
44	0.58	654.4	727.6	2.257	0.141	4.705	0.111	3.322	2.117	0.035	1.869	0.040	1.875	465.6
45	0.58	634.9	726.3	2.397	0.150	4.705	0.111	3.331	2.135	0.036	1.886	0.041	1.905	438.1
45	0.58	647.3	726.3	2.304	0.145	4.705	0.111	3.325	2.123	0.036	1.875	0.040	1.886	455.4
49	0.58	682.9	715.8	2.040	0.122	4.705	0.111	3.311	2.094	0.035	1.849	0.039	1.840	505.8
49	0.58	694.1	715.8	1.977	0.118	4.705	0.111	3.307	2.087	0.034	1.842	0.039	1.828	522.0
49	0.58	687.7	715.8	2.013	0.123	4.705	0.111	3.309	2.091	0.035	1.846	0.039	1.835	512.7
51	0.58	649.8	724.0	2.278	0.142	4.705	0.111	3.324	2.121	0.035	1.873	0.040	1.882	459.0
51	0.58	649.7	724.0	2.279	0.144	4.705	0.111	3.324	2.121	0.036	1.873	0.040	1.882	458.8
53	0.58	688.8	740.5	2.075	0.128	4.705	0.111	3.309	2.090	0.035	1.845	0.040	1.833	514.4
53	0.58	683.2	740.5	2.109	0.131	4.705	0.111	3.311	2.094	0.035	1.848	0.040	1.840	506.3
58	0.58	686.4	726.4	2.049	0.123	4.705	0.111	3.309	2.092	0.035	1.846	0.039	1.836	511.0
58	0.58	681.8	726.4	2.076	0.130	4.705	0.111	3.311	2.095	0.035	1.849	0.040	1.841	504.3
59	0.58	692.5	718.6	1.993	0.120	4.705	0.111	3.307	2.088	0.034	1.843	0.039	1.830	519.7
59	0.58	685.3	718.6	2.034	0.123	4.705	0.111	3.310	2.093	0.035	1.847	0.039	1.837	509.3
59	0.58	683.8	718.6	2.043	0.123	4.705	0.111	3.310	2.094	0.035	1.848	0.039	1.839	507.1
61	0.58	690.1	710.4	1.984	0.118	4.705	0.111	3.308	2.089	0.034	1.844	0.039	1.832	516.3
61	0.58	699.8	710.4	1.931	0.114	4.705	0.111	3.305	2.083	0.034	1.838	0.039	1.822	530.4
61	0.58	702.6	710.4	1.917	0.113	4.705	0.111	3.304	2.081	0.034	1.837	0.039	1.819	534.4
62	0.58	702.6	716.6	1.934	0.114	4.705	0.111	3.304	2.081	0.034	1.837	0.039	1.819	534.3
63	0.58	690.8	729.5	2.033	0.120	4.705	0.111	3.308	2.089	0.034	1.844	0.039	1.831	517.3
63	0.58	694.8	729.5	2.011	0.121	4.705	0.111	3.307	2.086	0.034	1.841	0.039	1.827	523.1
64	0.58	737.6	714.9	1.763	0.104	4.705	0.111	3.294	2.062	0.034	1.818	0.039	1.789	585.1
64	0.58	723.2	714.9	1.827	0.108	4.705	0.111	3.298	2.069	0.034	1.825	0.039	1.801	563.9
LEVEL F														
1	0.76	669.7	716.7	2.122	0.134	5.665	0.119	3.979	2.373	0.031	2.165	0.036	1.964	620.3
3	0.76	672.6	739.4	2.171	0.131	5.665	0.119	3.978	2.370	0.031	2.163	0.036	1.960	625.5
4	0.76	681.8	733.6	2.097	0.125	5.665	0.119	3.974	2.362	0.030	2.155	0.036	1.949	641.2
7	0.76	679.1	703.0	2.025	0.125	5.665	0.119	3.975	2.365	0.031	2.157	0.036	1.952	636.7
7	0.76	668.8	703.0	2.087	0.127	5.665	0.119	3.980	2.373	0.031	2.166	0.036	1.965	618.7
10	0.76	654.3	716.2	2.222	0.140	5.665	0.119	3.987	2.387	0.032	2.179	0.037	1.985	593.0
10	0.76	652.2	716.2	2.237	0.142	5.665	0.119	3.988	2.389	0.032	2.181	0.037	1.988	589.1
10	0.76	651.7	716.2	2.241	0.142	5.665	0.119	3.988	2.390	0.032	2.181	0.037	1.989	588.3
13	0.76	658.4	722.9	2.215	0.134	5.665	0.119	3.985	2.383	0.031	2.175	0.036	1.979	600.3
13	0.76	655.2	722.9	2.237	0.142	5.665	0.119	3.986	2.386	0.032	2.178	0.037	1.984	594.5
14	0.76	599.3	710.0	2.656	0.166	5.665	0.119	4.023	2.456	0.033	2.245	0.038	2.089	497.9
15	0.76	649.9	752.6	2.368	0.143	5.665	0.119	3.989	2.391	0.031	2.183	0.036	1.992	585.1
16	0.76	664.3	706.5	2.126	0.129	5.665	0.119	3.982	2.377	0.031	2.170	0.036	1.971	610.7
17	0.76	650.2	708.4	2.227	0.131	5.665	0.119	3.989	2.391	0.031	2.183	0.036	1.991	585.6
18	0.76	606.3	712.1	2.596	0.163	5.665	0.119	4.017	2.445	0.033	2.234	0.038	2.072	509.6

********** STEADY STATE TEST E **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
20	0.76	638.8	723.1	2.357	0.141	5.665	0.119	3.995	2.403	0.031	2.194	0.036	2.009	565.9
21	0.76	640.8	711.9	2.305	0.156	5.665	0.119	3.994	2.401	0.033	2.192	0.038	2.006	569.5
28	0.76	675.3	706.5	2.058	0.122	5.665	0.119	3.977	2.368	0.030	2.160	0.036	1.956	630.3
28	0.76	664.1	706.5	2.128	0.127	5.665	0.119	3.982	2.378	0.031	2.170	0.036	1.971	610.2
28	0.76	663.9	706.5	2.129	0.128	5.665	0.119	3.982	2.378	0.031	2.170	0.036	1.971	609.9
31	0.76	655.1	717.6	2.221	0.136	5.665	0.119	3.986	2.386	0.031	2.178	0.036	1.984	594.4
31	0.76	655.3	717.6	2.219	0.134	5.665	0.119	3.986	2.386	0.031	2.178	0.036	1.983	594.8
34	0.76	642.8	723.2	2.327	0.145	5.665	0.119	3.993	2.399	0.032	2.190	0.037	2.003	573.0
37	0.76	653.3	714.7	2.224	0.155	5.665	0.119	3.987	2.388	0.033	2.180	0.038	1.986	591.2
38	0.76	665.6	715.2	2.144	0.131	5.665	0.119	3.981	2.376	0.031	2.169	0.036	1.969	612.9
42	0.76	658.3	713.5	2.187	0.138	5.665	0.119	3.985	2.383	0.032	2.175	0.037	1.979	600.0
45	0.76	657.4	726.6	2.233	0.134	5.665	0.119	3.985	2.384	0.031	2.176	0.036	1.980	598.5
45	0.76	659.9	726.6	2.216	0.133	5.665	0.119	3.984	2.381	0.031	2.174	0.036	1.977	602.9
53	0.76	669.8	740.4	2.192	0.134	5.665	0.119	3.979	2.372	0.031	2.165	0.036	1.964	620.4
59	0.76	656.2	718.0	2.215	0.134	5.665	0.119	3.986	2.385	0.031	2.177	0.036	1.982	596.2
59	0.76	661.0	718.0	2.182	0.130	5.665	0.119	3.983	2.380	0.031	2.173	0.036	1.975	604.8
59	0.76	664.3	718.0	2.161	0.137	5.665	0.119	3.982	2.377	0.031	2.170	0.036	1.971	610.7
60	0.76	671.4	712.7	2.100	0.131	5.665	0.119	3.978	2.371	0.031	2.164	0.036	1.961	623.4
64	0.76	702.9	716.5	1.932	0.114	5.665	0.119	3.965	2.347	0.030	2.140	0.035	1.925	679.1
64	0.76	716.2	716.5	1.865	0.110	5.665	0.119	3.960	2.338	0.030	2.132	0.035	1.912	703.2
64	0.76	710.7	716.5	1.892	0.111	5.665	0.119	3.962	2.341	0.030	2.135	0.035	1.917	693.1
LEVEL G														
1	0.95	636.8	716.5	2.351	0.149	6.577	0.126	4.640	2.560	0.050	2.367	0.061	2.119	734.8
14	0.95	616.4	710.0	2.496	0.168	6.577	0.126	4.655	2.587	0.052	2.393	0.062	2.159	692.0
16	0.95	622.6	705.5	2.428	0.155	6.577	0.126	4.650	2.578	0.051	2.385	0.061	2.146	704.8
16	0.95	638.4	705.5	2.303	0.144	6.577	0.126	4.639	2.558	0.050	2.365	0.061	2.116	738.2
18	0.95	617.7	711.5	2.490	0.152	6.577	0.126	4.654	2.585	0.051	2.391	0.061	2.156	694.7
18	0.95	614.3	711.5	2.520	0.157	6.577	0.126	4.657	2.590	0.051	2.396	0.062	2.163	687.6
18	0.95	612.4	711.5	2.538	0.155	6.577	0.126	4.658	2.593	0.051	2.399	0.061	2.167	683.5
20	0.95	575.1	722.8	2.973	0.183	6.577	0.126	4.696	2.660	0.053	2.464	0.064	2.269	606.5
20	0.95	628.1	722.8	2.441	0.158	6.577	0.126	4.646	2.571	0.051	2.377	0.061	2.135	716.5
20	0.95	622.4	722.8	2.489	0.154	6.577	0.126	4.650	2.579	0.051	2.385	0.061	2.146	704.6
21	0.95	605.9	680.8	2.485	0.148	6.577	0.126	4.664	2.603	0.051	2.408	0.062	2.182	670.0
34	0.95	634.7	722.7	2.388	0.150	6.577	0.126	4.641	2.563	0.050	2.369	0.061	2.122	730.3
37	0.95	621.2	714.7	2.471	0.153	6.577	0.126	4.651	2.580	0.051	2.386	0.061	2.148	702.0
38	0.95	627.4	714.8	2.420	0.150	6.577	0.126	4.646	2.572	0.051	2.378	0.061	2.136	715.1
42	0.95	622.8	713.1	2.452	0.202	6.577	0.126	4.650	2.578	0.055	2.384	0.064	2.145	705.3
42	0.95	626.6	713.1	2.421	0.152	6.577	0.126	4.647	2.573	0.051	2.379	0.061	2.138	713.2
45	0.95	627.2	726.3	2.461	0.159	6.577	0.126	4.647	2.572	0.051	2.379	0.061	2.137	714.5
45	0.95	618.8	726.3	2.533	0.163	6.577	0.126	4.653	2.584	0.051	2.390	0.062	2.154	696.9
45	0.95	626.3	726.3	2.468	0.156	6.577	0.126	4.647	2.573	0.051	2.380	0.061	2.138	712.6
47	0.95	622.0	716.7	2.471	0.156	6.577	0.126	4.651	2.579	0.051	2.385	0.061	2.147	703.7
50	0.95	620.9	703.5	2.435	0.149	6.577	0.126	4.651	2.581	0.051	2.387	0.061	2.149	701.3
58	0.95	629.3	725.0	2.438	0.154	6.577	0.126	4.645	2.570	0.051	2.376	0.061	2.132	719.1
60	0.95	633.8	711.7	2.358	0.153	6.577	0.126	4.642	2.564	0.051	2.370	0.061	2.124	728.6
64	0.95	659.0	714.8	2.186	0.133	6.577	0.126	4.626	2.536	0.049	2.343	0.060	2.082	781.9
64	0.95	662.7	714.8	2.162	0.131	6.577	0.126	4.623	2.532	0.049	2.340	0.060	2.077	789.9

********** STEADY STATE TEST E **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E1														
1	0.61	721.2	716.8	1.842	0.113	4.862	0.113	3.397	2.118	0.034	1.880	0.039	1.818	580.9
38	0.61	670.1	715.3	2.116	0.126	4.862	0.113	3.415	2.152	0.034	1.912	0.039	1.871	505.0
50	0.61	656.4	703.9	2.170	0.135	4.862	0.113	3.421	2.163	0.035	1.923	0.040	1.889	485.3
LEVEL E2														
21	0.63	670.3	712.3	2.105	0.124	4.974	0.114	3.495	2.185	0.034	1.950	0.039	1.884	520.1
60	0.63	696.8	712.1	1.952	0.119	4.974	0.114	3.485	2.166	0.034	1.932	0.039	1.854	560.1
LEVEL E3														
17	0.65	682.6	708.8	2.022	0.126	5.104	0.117	3.581	2.213	0.034	1.984	0.039	1.884	556.3
34	0.65	699.2	723.1	1.969	0.124	5.104	0.117	3.575	2.202	0.034	1.973	0.039	1.866	582.6
37	0.65	675.4	715.1	2.083	0.124	5.104	0.117	3.584	2.219	0.034	1.990	0.039	1.893	545.2
38	0.65	688.4	715.2	2.007	0.119	5.104	0.117	3.579	2.209	0.033	1.980	0.039	1.878	565.4
50	0.65	677.7	703.9	2.036	0.129	5.104	0.117	3.583	2.217	0.034	1.988	0.039	1.890	548.6
60	0.65	707.5	712.1	1.896	0.115	5.104	0.117	3.572	2.196	0.033	1.968	0.039	1.858	595.8
LEVEL E6														
60	0.71	641.3	712.1	2.302	0.140	5.377	0.118	3.794	2.326	0.033	2.106	0.038	1.972	528.7
LEVEL E7														
1	0.72	663.1	716.7	2.165	0.135	5.467	0.118	3.844	2.329	0.032	2.113	0.037	1.950	577.5
34	0.72	630.4	723.1	2.423	0.155	5.467	0.118	3.862	2.362	0.033	2.145	0.039	2.001	522.9
37	0.72	646.5	715.1	2.274	0.137	5.467	0.118	3.852	2.345	0.032	2.129	0.038	1.974	549.7
50	0.72	615.3	703.8	2.485	0.155	5.467	0.118	3.871	2.381	0.034	2.163	0.039	2.029	497.7
LEVEL E8														
1	0.75	670.1	716.7	2.120	0.132	5.585	0.118	3.922	2.353	0.031	2.142	0.037	1.954	607.5
34	0.75	639.4	723.1	2.352	0.148	5.585	0.118	3.938	2.383	0.032	2.171	0.037	1.999	554.7
37	0.75	654.1	715.1	2.220	0.134	5.585	0.118	3.930	2.367	0.031	2.156	0.037	1.976	580.3
38	0.75	658.8	715.2	2.189	0.131	5.585	0.118	3.928	2.363	0.031	2.152	0.036	1.969	588.1
LEVEL F1														
17	0.79	663.4	708.5	2.138	0.126	5.815	0.120	4.088	2.413	0.030	2.211	0.035	1.989	634.3
21	0.79	649.0	712.0	2.246	0.136	5.815	0.120	4.095	2.428	0.030	2.224	0.036	2.010	607.9
34	0.79	654.8	722.8	2.239	0.140	5.815	0.120	4.092	2.422	0.031	2.219	0.036	2.002	618.6
37	0.79	667.7	714.8	2.130	0.128	5.815	0.120	4.086	2.409	0.030	2.207	0.035	1.983	642.1
50	0.79	644.9	703.5	2.249	0.135	5.815	0.120	4.098	2.432	0.030	2.229	0.036	2.017	600.4
LEVEL F2														
1	0.82	681.8	717.0	2.050	0.123	5.931	0.122	4.163	2.423	0.029	2.224	0.035	1.979	689.5
14	0.82	643.8	710.3	2.278	0.149	5.931	0.122	4.183	2.459	0.031	2.259	0.036	2.032	619.4
17	0.82	665.0	708.9	2.129	0.125	5.931	0.122	4.171	2.437	0.029	2.238	0.035	2.001	658.3
34	0.82	666.1	723.2	2.165	0.134	5.931	0.122	4.170	2.436	0.030	2.237	0.035	1.999	660.3
38	0.82	682.2	715.3	2.043	0.121	5.931	0.122	4.163	2.422	0.029	2.224	0.034	1.979	690.2
50	0.82	651.1	703.9	2.206	0.133	5.931	0.122	4.178	2.451	0.030	2.252	0.035	2.021	632.9
LEVEL F3														
14	0.84	644.7	710.0	2.270	0.142	6.047	0.124	4.262	2.482	0.030	2.285	0.036	2.044	641.9
17	0.84	660.5	708.4	2.157	0.127	6.047	0.124	4.253	2.465	0.029	2.269	0.035	2.020	671.5
21	0.84	654.4	711.9	2.208	0.130	6.047	0.124	4.257	2.471	0.029	2.275	0.035	2.029	660.3
34	0.84	675.8	722.7	2.102	0.130	6.047	0.124	4.246	2.451	0.029	2.256	0.035	1.999	700.4
60	0.84	656.7	711.7	2.192	0.141	6.047	0.124	4.255	2.469	0.030	2.273	0.035	2.026	664.6
LEVEL F5														
21	0.88	557.1	711.9	3.163	0.194	6.231	0.125	4.475	2.664	0.034	2.467	0.040	2.291	508.8
60	0.88	577.4	711.7	2.900	0.183	6.231	0.125	4.450	2.617	0.033	2.421	0.039	2.219	548.0
LEVEL F6														
1	0.90	615.8	716.3	2.524	0.171	6.313	0.125	4.473	2.564	0.034	2.371	0.040	2.130	637.8
17	0.90	602.1	708.4	2.623	0.163	6.313	0.125	4.485	2.585	0.032	2.391	0.039	2.161	610.7
37	0.90	596.3	714.7	2.705	0.169	6.313	0.125	4.490	2.594	0.033	2.401	0.039	2.175	599.2
38	0.90	596.5	714.8	2.703	0.166	6.313	0.125	4.490	2.594	0.032	2.400	0.039	2.175	599.6

********** STEADY STATE TEST E **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
50	0.90	593.3	703.5	2.692	0.170	6.313	0.125	4.493	2.600	0.033	2.406	0.039	2.183	593.3
60	0.90	602.7	711.7	2.630	0.163	6.313	0.125	4.484	2.584	0.032	2.390	0.039	2.159	611.8
LEVEL F7														
14	0.91	592.4	710.0	2.727	0.177	6.391	0.125	4.546	2.611	0.036	2.418	0.043	2.195	605.3
17	0.91	608.6	708.4	2.562	0.155	6.391	0.125	4.531	2.585	0.033	2.392	0.041	2.154	637.8
21	0.91	594.1	711.9	2.717	0.164	6.391	0.125	4.544	2.609	0.034	2.415	0.041	2.190	608.7
37	0.91	604.6	715.0	2.624	0.163	6.391	0.125	4.534	2.591	0.034	2.398	0.041	2.164	629.7
38	0.91	613.1	714.8	2.543	0.154	6.391	0.125	4.527	2.578	0.033	2.385	0.040	2.144	647.0
50	0.91	602.8	703.5	2.597	0.163	6.391	0.125	4.536	2.594	0.034	2.401	0.041	2.168	626.3
60	0.91	613.3	711.7	2.530	0.157	6.391	0.125	4.527	2.577	0.033	2.385	0.041	2.143	647.4
LEVEL F8														
1	0.93	642.8	716.5	2.306	0.143	6.500	0.125	4.584	2.550	0.038	2.358	0.048	2.100	731.0
17	0.93	609.8	708.4	2.550	0.154	6.500	0.125	4.609	2.593	0.039	2.400	0.048	2.165	662.8
21	0.93	599.2	711.9	2.664	0.160	6.500	0.125	4.619	2.610	0.039	2.417	0.049	2.190	641.7
34	0.93	622.4	722.7	2.489	0.158	6.500	0.125	4.599	2.575	0.039	2.383	0.049	2.138	688.7
37	0.93	617.3	714.7	2.505	0.153	6.500	0.125	4.603	2.582	0.039	2.390	0.048	2.148	678.1
50	0.93	614.7	703.5	2.489	0.154	6.500	0.125	4.605	2.586	0.039	2.393	0.049	2.154	672.7
60	0.93	629.1	711.7	2.395	0.146	6.500	0.125	4.594	2.566	0.039	2.374	0.048	2.124	702.6

STEADY STATE TEST F

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST F **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.881E+05 LBM/SQFT H — 255.26 KG/SQM S

UNC. MASS FLUX 4.250E+03 LBM/SQFT H — 5.7674 KG/SQM S

PRESSURE 1829.6 PSI — 12.62 MPA

UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.223	385.2	0.026	8.17	1099.3	593.3	50.81	28.227	623.2	328.8	0.443	0.2	.9454	.0388
G	1.224	385.7	0.020	6.40	1172.8	634.1	41.10	22.836	697.7	370.2	21.885	12.2	1.1750	.0445
E6	1.218	383.7	0.000	0.00	1068.2	576.0	0.00	0.000	623.2	328.8	0.443	0.2	.8746	.0372
E7	1.228	386.9	0.000	0.00	1146.5	619.5	0.00	0.000	623.2	328.8	0.443	0.2	.8967	.0377
E8	1.237	389.7	0.012	3.77	1109.5	598.9	76.51	42.505	623.2	328.8	0.443	0.2	.9257	.0383
F1	1.212	381.7	0.031	9.86	1087.1	586.5	22.50	12.502	623.2	328.8	0.443	0.2	.9824	.0398
F2	1.223	385.2	0.014	4.30	1125.6	607.9	48.78	27.102	627.2	331.0	13.237	7.4	1.0114	.0406
F3	1.211	381.6	0.031	9.82	1129.9	610.3	37.58	20.879	637.5	336.7	15.754	8.8	1.0404	.0415
F4	1.220	384.4	0.000	0.00	1055.0	568.7	0.00	0.000	648.0	342.6	17.781	9.9	1.0671	.0423
F5	1.199	377.6	0.040	12.54	1059.4	571.1	36.36	20.199	656.6	347.3	19.060	10.6	1.0868	.0426
F6	1.211	381.3	0.026	8.21	1119.8	604.6	30.40	16.891	666.3	352.7	19.579	10.9	1.1077	.0430
F7	1.210	381.1	0.024	7.43	1123.9	606.9	25.00	13.890	676.0	358.1	20.181	11.2	1.1274	.0434
F8	1.215	382.7	0.027	8.57	1162.5	628.4	36.23	20.128	688.3	364.9	20.990	11.7	1.1553	.0440

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test F

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST F **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
1	0.95	633.8	387.1	1.269	0.075	3.177	0.067	2.283	1.392	0.026	1.080	0.027	1.106	303.8
3	0.95	601.7	393.5	1.442	0.084	3.177	0.067	2.296	1.416	0.026	1.099	0.027	1.140	273.1
4	0.95	615.2	391.0	1.365	0.079	3.177	0.067	2.290	1.405	0.026	1.091	0.027	1.124	286.0
7	0.95	618.2	375.7	1.298	0.076	3.177	0.067	2.289	1.403	0.026	1.089	0.027	1.121	288.8
7	0.95	611.8	375.7	1.328	0.078	3.177	0.067	2.291	1.407	0.026	1.093	0.027	1.128	282.8
10	0.95	580.9	381.3	1.513	0.090	3.177	0.067	2.306	1.435	0.027	1.116	0.028	1.169	253.5
10	0.95	582.6	381.3	1.503	0.090	3.177	0.067	2.305	1.434	0.027	1.114	0.028	1.166	255.1
10	0.95	579.2	381.3	1.523	0.091	3.177	0.067	2.307	1.437	0.027	1.117	0.028	1.171	251.9
13	0.95	579.5	391.3	1.561	0.092	3.177	0.067	2.307	1.437	0.027	1.117	0.028	1.171	252.1
13	0.95	573.5	391.3	1.599	0.096	3.177	0.067	2.310	1.443	0.027	1.122	0.028	1.180	246.4
15	0.95	569.9	396.0	1.643	0.097	3.177	0.067	2.312	1.447	0.027	1.125	0.028	1.187	243.1
16	0.95	608.3	379.6	1.358	0.079	3.177	0.067	2.293	1.410	0.026	1.095	0.027	1.132	279.5
17	0.95	579.7	383.4	1.528	0.089	3.177	0.067	2.306	1.437	0.027	1.117	0.028	1.170	252.3
18	0.95	555.8	384.8	1.695	0.101	3.177	0.067	2.321	1.465	0.028	1.140	0.029	1.213	229.8
28	0.95	584.1	381.3	1.494	0.087	3.177	0.067	2.304	1.432	0.027	1.113	0.028	1.164	256.6
28	0.95	576.7	381.3	1.538	0.090	3.177	0.067	2.308	1.440	0.027	1.119	0.028	1.175	249.4
28	0.95	575.7	381.3	1.545	0.091	3.177	0.067	2.309	1.441	0.027	1.120	0.028	1.177	248.4
31	0.95	571.8	387.4	1.594	0.095	3.177	0.067	2.311	1.445	0.027	1.124	0.028	1.183	244.8
31	0.95	576.0	387.4	1.567	0.092	3.177	0.067	2.308	1.441	0.027	1.120	0.028	1.176	248.8
32	0.95	631.4	401.0	1.325	0.077	3.177	0.067	2.284	1.393	0.026	1.081	0.027	1.108	301.4
34	0.95	577.9	392.4	1.575	0.094	3.177	0.067	2.307	1.438	0.027	1.118	0.028	1.173	250.6
37	0.95	562.1	385.1	1.651	0.104	3.177	0.067	2.317	1.457	0.028	1.133	0.029	1.201	235.8
38	0.95	563.2	384.9	1.642	0.098	3.177	0.067	2.316	1.456	0.027	1.132	0.028	1.199	236.8
42	0.95	586.3	386.2	1.499	0.090	3.177	0.067	2.303	1.430	0.027	1.111	0.028	1.161	258.7
45	0.95	566.3	392.5	1.652	0.097	3.177	0.067	2.314	1.452	0.027	1.129	0.028	1.193	239.7
45	0.95	568.8	392.5	1.635	0.096	3.177	0.067	2.313	1.449	0.027	1.126	0.028	1.188	242.1
53	0.95	587.8	397.1	1.533	0.090	3.177	0.067	2.302	1.428	0.027	1.110	0.028	1.158	260.1
59	0.95	596.3	383.3	1.433	0.084	3.177	0.067	2.298	1.420	0.026	1.103	0.027	1.147	267.9
59	0.95	596.0	383.3	1.435	0.083	3.177	0.067	2.298	1.421	0.026	1.104	0.027	1.147	267.6
59	0.95	603.2	383.3	1.397	0.083	3.177	0.067	2.295	1.414	0.026	1.098	0.027	1.138	274.5
60	0.95	615.2	384.4	1.342	0.079	3.177	0.067	2.290	1.405	0.026	1.091	0.027	1.124	286.0
64	0.95	653.1	384.3	1.185	0.068	3.177	0.067	2.277	1.380	0.026	1.071	0.026	1.090	322.3
64	0.95	662.3	384.3	1.152	0.066	3.177	0.067	2.275	1.375	0.025	1.067	0.026	1.083	331.3
64	0.95	658.5	384.3	1.166	0.067	3.177	0.067	2.276	1.377	0.025	1.068	0.026	1.085	327.5

********** STEADY STATE TEST F **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.18	650.2	387.1	1.20	0.070	1.38	0.10	2.07	1.13	320.1
14	1.18	609.7	381.0	1.36	0.081	1.59	0.13	2.07	1.17	276.0
16	1.18	649.6	379.6	1.18	0.069	1.36	0.10	2.07	1.13	319.4
16	1.18	658.4	379.6	1.15	0.067	1.32	0.10	2.07	1.13	328.9
18	1.18	628.2	384.8	1.29	0.074	1.49	0.11	2.07	1.15	296.1
18	1.18	617.7	384.8	1.33	0.078	1.55	0.12	2.07	1.17	284.5
18	1.18	624.1	384.8	1.30	0.076	1.52	0.12	2.07	1.16	291.6
20	1.18	574.4	387.1	1.58	0.092	1.90	0.16	2.07	1.22	237.9
20	1.18	617.3	387.1	1.34	0.080	1.57	0.12	2.07	1.17	284.0
20	1.18	621.6	387.1	1.32	0.077	1.54	0.12	2.07	1.16	288.8
21	1.18	608.2	385.3	1.38	0.080	1.62	0.13	2.07	1.18	274.3
32	1.18	666.8	401.0	1.19	0.069	1.35	0.10	2.07	1.12	338.4
34	1.18	651.0	392.4	1.22	0.071	1.40	0.10	2.07	1.13	321.0
37	1.18	619.4	385.1	1.33	0.077	1.55	0.12	2.07	1.16	286.4
38	1.18	623.4	384.9	1.31	0.076	1.52	0.12	2.07	1.16	291.0
42	1.18	646.2	386.2	1.22	0.078	1.40	0.11	2.07	1.14	315.6
42	1.18	650.2	386.2	1.20	0.070	1.38	0.10	2.07	1.13	320.1
45	1.18	627.3	392.5	1.31	0.078	1.53	0.12	2.07	1.16	295.1
45	1.18	623.8	392.5	1.33	0.078	1.55	0.12	2.07	1.16	291.3
45	1.18	625.6	392.5	1.32	0.078	1.54	0.12	2.07	1.16	293.2
47	1.18	624.9	386.5	1.31	0.077	1.52	0.12	2.07	1.16	292.6
50	1.18	641.3	381.2	1.22	0.071	1.41	0.10	2.07	1.14	310.3
58	1.18	643.7	387.8	1.23	0.072	1.42	0.11	2.07	1.14	312.7
60	1.18	649.2	384.4	1.20	0.071	1.38	0.10	2.07	1.14	318.9
64	1.18	675.9	384.3	1.11	0.064	1.26	0.09	2.07	1.12	348.2
64	1.18	678.1	384.3	1.10	0.063	1.25	0.09	2.07	1.11	350.7

********** STEADY STATE TEST F **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E6														
60	0.87	576.0	383.7	1.552	0.091	3.009	0.066	2.189	1.420	0.018	1.102	0.018	1.162	222.3
LEVEL E7														
1	0.90	619.5	386.9	1.331	0.078	3.062	0.066	2.206	1.390	0.017	1.079	0.018	1.110	269.3
LEVEL E8														
1	0.93	629.0	387.1	1.289	0.076	3.131	0.066	2.252	1.392	0.020	1.081	0.021	1.107	290.5
34	0.93	568.9	392.4	1.634	0.098	3.131	0.066	2.280	1.446	0.021	1.125	0.022	1.184	234.6
LEVEL F1														
17	0.98	600.7	383.4	1.410	0.081	3.265	0.077	2.359	1.409	0.053	1.089	0.064	1.149	288.9
21	0.98	567.1	385.3	1.617	0.095	3.265	0.077	2.377	1.443	0.053	1.117	0.067	1.199	256.0
34	0.98	599.6	392.4	1.449	0.086	3.265	0.077	2.360	1.410	0.052	1.090	0.065	1.150	287.8
37	0.98	586.2	385.1	1.496	0.087	3.265	0.077	2.367	1.422	0.053	1.100	0.065	1.168	274.6
5C	0.98	583.7	381.2	1.495	0.087	3.265	0.077	2.368	1.424	0.053	1.102	0.066	1.172	272.2

********** STEADY STATE TEST F **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F2										
1	1.01	654.3	387.1	1.19	0.069	1.20	0.07	3.24	1.10	354.1
14	1.01	571.6	381.0	1.57	0.095	1.58	0.11	3.24	1.20	270.0
17	1.01	608.8	383.4	1.37	0.079	1.38	0.09	3.24	1.14	307.7
34	1.01	613.9	392.4	1.38	0.081	1.39	0.09	3.24	1.14	312.5
38	1.01	602.3	385.9	1.41	0.082	1.42	0.09	3.24	1.15	301.0
50	1.01	596.6	381.2	1.42	0.083	1.44	0.09	3.24	1.16	295.2
LEVEL F3										
14	1.04	584.3	381.0	1.49	0.088	1.54	0.11	2.88	1.18	275.1
17	1.04	610.7	383.4	1.36	0.078	1.40	0.09	2.88	1.15	301.9
21	1.04	589.4	385.3	1.48	0.086	1.52	0.10	2.88	1.18	280.3
34	1.04	630.1	392.4	1.30	0.076	1.34	0.09	2.88	1.13	321.8
60	1.04	636.3	384.4	1.25	0.074	1.28	0.08	2.88	1.12	328.3
LEVEL F4										
60	1.07	568.7	384.4	1.60	0.094	1.70	0.13	2.65	1.21	253.6
LEVEL F5										
21	1.09	551.2	385.3	1.73	0.101	1.89	0.15	2.50	1.25	231.5
60	1.09	591.6	384.4	1.46	0.086	1.57	0.12	2.50	1.18	273.0
LEVEL F6										
1	1.11	633.9	387.1	1.27	0.076	1.38	0.10	2.37	1.14	313.1
17	1.11	605.0	383.4	1.39	0.081	1.52	0.11	2.37	1.17	282.8
37	1.11	589.4	385.1	1.48	0.087	1.63	0.12	2.37	1.19	266.5
38	1.11	588.3	384.9	1.48	0.086	1.63	0.12	2.37	1.19	265.5
50	1.11	601.6	381.2	1.40	0.082	1.53	0.11	2.37	1.17	279.2
60	1.11	620.1	384.4	1.32	0.077	1.44	0.10	2.37	1.15	298.5
LEVEL F7										
14	1.13	592.6	381.0	1.44	0.086	1.62	0.13	2.26	1.19	266.0
17	1.13	615.3	383.4	1.34	0.077	1.49	0.11	2.26	1.16	289.7
21	1.13	589.5	385.3	1.48	0.086	1.66	0.13	2.26	1.19	262.9
37	1.13	603.1	385.1	1.40	0.082	1.57	0.12	2.26	1.17	277.1
38	1.13	603.2	384.9	1.40	0.081	1.57	0.12	2.26	1.17	277.2
50	1.13	614.0	381.2	1.34	0.078	1.49	0.11	2.26	1.16	288.3
60	1.13	633.2	384.4	1.26	0.073	1.40	0.10	2.26	1.14	308.6
LEVEL F8										
1	1.16	657.4	387.1	1.18	0.068	1.32	0.09	2.14	1.13	330.4
17	1.16	622.0	383.4	1.31	0.075	1.49	0.11	2.14	1.16	291.8
21	1.16	600.2	385.3	1.42	0.082	1.64	0.13	2.14	1.18	268.7
34	1.16	644.2	392.4	1.24	0.073	1.41	0.10	2.14	1.14	315.9
37	1.16	615.8	385.1	1.34	0.078	1.54	0.12	2.14	1.16	285.1
50	1.16	630.2	381.2	1.26	0.074	1.44	0.11	2.14	1.15	300.7
60	1.16	647.9	384.4	1.20	0.070	1.36	0.10	2.14	1.13	319.8

STEADY STATE TEST G

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST G **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX	1.835E+05	LBM/SQFT H	UNC. MASS FLUX	4.149E+03	LBM/SQFT H	PRESSURE	1817.6	PSI	UNC. PRESSURE 6.00 PSI
	248.97	KG/SQM S		5.6307	KG/SQM S		12.54	MPA	0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.038	326.9	0.016	5.18	1077.5	581.2	27.47	15.262	622.3	328.3	0.443	0.2	.9953	.0387
F6	1.038	327.0	0.000	0.00	1047.2	564.3	0.00	0.000	622.3	328.3	0.443	0.2	.9371	.0374
F8	1.037	326.6	0.005	1.66	1067.9	575.8	39.74	22.077	622.3	328.3	0.443	0.2	.9782	.0383

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test G

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	2/6
F4	1/2
F5	2/3
F6	2/7
F7	2/8
F8	All dry

********** STEADY STATE TEST G **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL G														
1	1.00	586.0	327.8	1.272	0.075	3.205	0.101	2.329	1.374	0.054	1.051	0.060	1.147	272.2
16	1.00	569.1	321.8	1.336	0.079	3.205	0.101	2.338	1.391	0.054	1.065	0.062	1.173	256.0
16	1.00	582.3	321.8	1.267	0.074	3.205	0.101	2.330	1.377	0.054	1.054	0.061	1.152	268.8
32	1.00	584.6	338.3	1.320	0.078	3.205	0.101	2.329	1.375	0.054	1.052	0.061	1.149	271.0
58	1.00	562.5	328.1	1.401	0.083	3.205	0.101	2.342	1.399	0.054	1.071	0.062	1.185	249.5
60	1.00	563.3	325.5	1.385	0.082	3.205	0.101	2.342	1.398	0.054	1.071	0.063	1.183	250.3
64	1.00	598.7	325.9	1.205	0.070	3.205	0.101	2.322	1.362	0.054	1.042	0.059	1.130	284.7
64	1.00	602.9	325.9	1.187	0.069	3.205	0.101	2.321	1.359	0.054	1.039	0.059	1.125	289.0

********** STEADY STATE TEST G **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
1	0.94	564.3	327.0	1.385	0.083	3.072	0.061	2.247	1.421	0.023	1.100	0.024	1.170	228.5
LEVEL F8														
1	0.98	591.4	327.8	1.246	0.073	3.166	0.069	2.299	1.388	0.052	1.069	0.064	1.136	270.4
60	0.98	560.2	325.4	1.403	0.082	3.166	0.069	2.317	1.422	0.052	1.097	0.066	1.186	240.8

STEADY STATE TEST H

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST H **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.887E+05 LBM/SQFT H UNC. MASS FLUX 4.216E+03 LBM/SQFT H PRESSURE 1288.9 PSI UNC. PRESSURE 6.00 PSI
256.06 KG/SQM S 5.7217 KG/SQM S 8.89 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.342	422.6	0.027	8.56	1150.3	621.6	73.03	40.570	576.0	302.6	0.597	0.3	.8787	.0345
G	1.338	421.4	0.026	8.29	1300.7	705.1	48.67	27.038	629.8	332.4	25.473	14.2	1.0884	.0396
E6	1.312	413.3	0.000	0.00	1121.7	605.7	0.00	0.000	576.0	302.6	0.597	0.3	.8142	.0330
E7	1.353	426.1	0.019	6.05	1089.1	587.6	132.49	73.607	576.0	302.6	0.597	0.3	.8343	.0334
E8	1.362	429.1	0.013	4.20	1185.2	641.0	88.25	49.026	576.0	302.6	0.597	0.3	.8608	.0340
F1	1.323	416.7	0.040	12.55	1148.7	620.7	33.58	18.655	576.0	302.6	0.597	0.3	.9126	.0353
F2	1.340	422.1	0.020	6.44	1204.9	652.0	66.57	36.985	576.0	302.6	0.597	0.3	.9391	.0361
F3	1.322	416.5	0.043	13.66	1209.0	654.2	51.76	28.754	576.0	302.6	0.597	0.3	.9655	.0369
F4	1.278	402.6	0.049	15.37	1095.0	590.9	69.30	38.498	576.0	302.6	0.597	0.3	.9898	.0376
F5	1.298	408.9	0.049	15.40	1149.3	621.1	49.06	27.257	578.3	303.8	24.472	13.6	1.0079	.0379
F6	1.317	414.7	0.036	11.24	1225.0	663.1	46.61	25.895	590.6	310.7	21.888	12.2	1.0269	.0383
F7	1.315	414.1	0.031	9.90	1234.5	668.4	38.80	21.557	603.2	317.7	24.788	13.8	1.0450	.0386
F8	1.327	418.0	0.039	12.21	1285.1	696.5	46.54	25.853	618.8	326.3	25.132	14.0	1.0704	.0392

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test H

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	3/5
F	All dry

********** STEADY STATE TEST H **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.88	654.4	437.6	1.244	0.072	2.253	0.048	1.755	1.121	0.014	0.895	0.015	1.001	273.1
4	0.88	662.7	434.7	1.207	0.069	2.253	0.048	1.753	1.118	0.013	0.893	0.014	0.997	280.4
7	0.88	656.8	412.8	1.166	0.068	2.253	0.048	1.754	1.120	0.014	0.895	0.015	1.000	275.3
7	0.88	648.1	412.8	1.195	0.069	2.253	0.048	1.756	1.123	0.014	0.897	0.015	1.005	267.5
10	0.88	628.4	424.1	1.302	0.076	2.253	0.048	1.759	1.130	0.014	0.903	0.015	1.016	250.4
10	0.88	633.2	424.1	1.283	0.075	2.253	0.048	1.758	1.128	0.014	0.902	0.015	1.013	254.6
10	0.88	626.8	424.1	1.308	0.077	2.253	0.048	1.760	1.131	0.014	0.904	0.015	1.017	249.0
13	0.88	605.4	428.2	1.414	0.082	2.253	0.048	1.764	1.140	0.014	0.912	0.015	1.033	230.8
13	0.88	600.3	428.2	1.438	0.085	2.253	0.048	1.765	1.143	0.014	0.914	0.015	1.037	226.5
15	0.88	584.8	433.9	1.537	0.090	2.253	0.048	1.769	1.151	0.014	0.921	0.015	1.050	213.4
16	0.88	655.4	416.4	1.180	0.068	2.253	0.048	1.754	1.120	0.013	0.895	0.015	1.001	274.0
17	0.88	600.5	423.0	1.420	0.082	2.253	0.048	1.765	1.143	0.014	0.914	0.015	1.036	226.7
18	0.88	606.4	422.6	1.391	0.082	2.253	0.048	1.764	1.140	0.014	0.911	0.015	1.032	231.6
18	0.88	592.3	422.6	1.458	0.086	2.253	0.048	1.767	1.147	0.014	0.917	0.015	1.043	219.6
20	0.88	569.4	426.6	1.599	0.093	2.253	0.048	1.774	1.160	0.014	0.929	0.015	1.065	200.9
21	0.88	564.2	421.5	1.611	0.099	2.253	0.048	1.776	1.164	0.015	0.931	0.015	1.071	196.7
28	0.88	595.7	420.6	1.435	0.083	2.253	0.048	1.767	1.145	0.014	0.916	0.015	1.040	222.5
28	0.88	590.4	420.6	1.461	0.085	2.253	0.048	1.768	1.148	0.014	0.918	0.015	1.045	218.2
28	0.88	589.5	420.6	1.466	0.085	2.253	0.048	1.768	1.148	0.014	0.918	0.015	1.046	217.4
31	0.88	602.0	423.9	1.416	0.083	2.253	0.048	1.765	1.142	0.014	0.913	0.015	1.035	228.0
31	0.88	606.4	423.9	1.395	0.081	2.253	0.048	1.764	1.140	0.014	0.911	0.015	1.032	231.6
32	0.88	642.2	426.0	1.254	0.072	2.253	0.048	1.757	1.125	0.014	0.899	0.015	1.008	262.5
34	0.88	618.8	432.1	1.366	0.080	2.253	0.048	1.761	1.134	0.014	0.907	0.015	1.023	242.4
38	0.88	559.4	414.4	1.613	0.095	2.253	0.048	1.777	1.167	0.014	0.934	0.015	1.077	192.7
42	0.88	623.4	425.2	1.325	0.078	2.253	0.048	1.760	1.132	0.014	0.905	0.015	1.020	246.2
45	0.88	568.7	421.9	1.586	0.093	2.253	0.048	1.774	1.161	0.014	0.929	0.015	1.066	200.3
45	0.88	570.1	421.9	1.577	0.092	2.253	0.048	1.774	1.160	0.014	0.928	0.015	1.065	201.5
53	0.88	629.4	440.6	1.348	0.079	2.253	0.048	1.759	1.130	0.014	0.903	0.015	1.016	251.3
59	0.88	662.2	425.9	1.184	0.068	2.253	0.048	1.753	1.118	0.013	0.893	0.014	0.997	279.9
59	0.88	654.4	425.9	1.211	0.070	2.253	0.048	1.755	1.121	0.013	0.895	0.014	1.001	273.1
59	0.88	669.1	425.9	1.162	0.068	2.253	0.048	1.752	1.116	0.013	0.892	0.014	0.994	285.9
60	0.88	659.5	413.5	1.158	0.067	2.253	0.048	1.754	1.119	0.014	0.894	0.015	0.998	277.7
64	0.88	691.0	415.2	1.069	0.061	2.253	0.048	1.749	1.110	0.013	0.886	0.014	0.984	305.5
64	0.88	706.5	415.2	1.028	0.059	2.253	0.048	1.747	1.106	0.013	0.883	0.014	0.978	319.5
64	0.88	696.9	415.2	1.053	0.060	2.253	0.048	1.748	1.108	0.013	0.885	0.014	0.981	310.7

********** STEADY STATE TEST H **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.09	722.6	427.0	1.02	0.059	1.09	0.08	1.96	1.01	389.3
3	1.09	722.1	438.4	1.05	0.060	1.13	0.08	1.96	1.01	388.7
14	1.09	666.7	417.1	1.15	0.068	1.25	0.09	1.96	1.03	330.2
16	1.09	731.2	417.6	0.97	0.056	1.05	0.07	1.96	1.01	398.1
16	1.09	739.2	417.6	0.96	0.055	1.03	0.07	1.96	1.00	406.8
18	1.09	703.3	423.0	1.06	0.060	1.14	0.08	1.96	1.02	368.6
18	1.09	690.8	423.0	1.09	0.063	1.18	0.08	1.96	1.02	355.5
18	1.09	705.8	423.0	1.05	0.060	1.13	0.08	1.96	1.02	371.1
20	1.09	639.8	427.0	1.27	0.073	1.39	0.10	1.96	1.05	302.4
20	1.09	687.8	427.0	1.11	0.065	1.20	0.09	1.96	1.02	352.3
20	1.09	693.5	427.0	1.09	0.063	1.18	0.08	1.96	1.02	358.3
21	1.09	679.9	421.9	1.12	0.064	1.21	0.09	1.96	1.03	344.0
32	1.09	720.6	426.3	1.02	0.059	1.10	0.08	1.96	1.01	387.0
34	1.09	734.3	432.5	1.00	0.058	1.08	0.07	1.96	1.01	401.5
37	1.09	672.1	414.1	1.12	0.065	1.22	0.09	1.96	1.03	336.0
38	1.09	690.4	414.5	1.07	0.062	1.16	0.08	1.96	1.02	355.0
42	1.09	725.9	425.5	1.01	0.063	1.08	0.08	1.96	1.01	392.5
42	1.09	735.5	425.5	0.98	0.057	1.06	0.07	1.96	1.01	402.7
45	1.09	684.7	422.1	1.10	0.064	1.20	0.09	1.96	1.03	348.9
45	1.09	685.6	422.1	1.10	0.064	1.20	0.08	1.96	1.02	349.8
45	1.09	685.3	422.1	1.10	0.064	1.20	0.08	1.96	1.02	349.6
47	1.09	687.3	415.9	1.08	0.063	1.17	0.08	1.96	1.02	351.7
50	1.09	725.9	420.4	0.99	0.057	1.07	0.07	1.96	1.01	392.5
58	1.09	740.6	431.5	0.99	0.057	1.06	0.07	1.96	1.00	408.3
60	1.09	720.2	414.2	0.99	0.058	1.07	0.07	1.96	1.01	386.6
64	1.09	737.6	416.0	0.96	0.055	1.03	0.07	1.96	1.00	405.0
64	1.09	739.6	416.0	0.95	0.055	1.02	0.07	1.96	1.00	407.2

********** STEADY STATE TEST H **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E6														
60	0.81	605.7	413.3	1.363	0.079	2.130	0.047	1.670	1.117	0.013	0.890	0.014	1.020	207.3
LEVEL E7														
1	0.83	670.8	426.2	1.157	0.067	2.168	0.047	1.687	1.101	0.013	0.878	0.013	0.984	268.0
34	0.83	561.1	432.1	1.672	0.100	2.168	0.047	1.710	1.151	0.014	0.919	0.014	1.066	178.6
50	0.83	531.0	420.0	1.839	0.110	2.168	0.047	1.722	1.175	0.014	0.940	0.015	1.107	155.5
LEVEL E8														
1	0.86	675.7	426.2	1.142	0.066	2.218	0.047	1.725	1.109	0.013	0.885	0.014	0.987	283.4
34	0.86	606.3	432.1	1.423	0.084	2.218	0.047	1.737	1.134	0.013	0.907	0.014	1.028	224.4
LEVEL F1														
17	0.91	637.4	423.0	1.263	0.072	2.316	0.048	1.808	1.133	0.016	0.906	0.018	1.017	273.7
21	0.91	606.2	421.5	1.388	0.081	2.316	0.048	1.815	1.147	0.016	0.917	0.018	1.039	246.3
34	0.91	647.9	432.1	1.251	0.073	2.316	0.048	1.806	1.130	0.016	0.903	0.018	1.011	283.0
37	0.91	600.5	414.1	1.390	0.081	2.316	0.048	1.816	1.149	0.016	0.919	0.018	1.043	241.3
38	0.91	611.5	414.4	1.341	0.077	2.316	0.048	1.813	1.144	0.016	0.915	0.018	1.035	251.1
50	0.91	634.2	420.0	1.266	0.073	2.316	0.048	1.809	1.135	0.016	0.907	0.018	1.019	271.0
LEVEL F2														
1	0.94	714.1	426.3	1.036	0.059	2.366	0.049	1.834	1.112	0.021	0.887	0.024	0.986	358.8
14	0.94	601.9	417.1	1.393	0.083	2.366	0.049	1.854	1.150	0.022	0.918	0.025	1.047	255.0
17	0.94	652.8	423.0	1.208	0.069	2.366	0.049	1.843	1.129	0.022	0.901	0.024	1.014	301.1
34	0.94	660.9	432.1	1.206	0.070	2.366	0.049	1.842	1.127	0.022	0.899	0.024	1.009	308.5
38	0.94	632.1	414.4	1.258	0.072	2.366	0.049	1.847	1.137	0.022	0.907	0.024	1.026	282.0
50	0.94	649.9	420.0	1.209	0.070	2.366	0.049	1.844	1.130	0.022	0.902	0.024	1.015	298.3
LEVEL F3														
14	0.97	616.6	417.1	1.328	0.078	2.415	0.050	1.890	1.139	0.054	0.906	0.048	1.041	282.0
17	0.97	655.6	423.0	1.198	0.069	2.415	0.050	1.882	1.124	0.054	0.893	0.047	1.017	318.9
21	0.97	637.2	421.5	1.260	0.072	2.415	0.050	1.886	1.130	0.054	0.899	0.047	1.028	301.1
34	0.97	680.6	432.1	1.143	0.066	2.415	0.050	1.878	1.116	0.053	0.887	0.047	1.005	342.7
60	0.97	693.8	413.5	1.057	0.062	2.415	0.050	1.876	1.113	0.053	0.884	0.047	0.999	355.3
LEVEL F4														
60	0.99	618.1	413.5	1.310	0.076	2.461	0.066	1.925	1.119	0.055	0.883	0.061	1.045	296.7

********** STEADY STATE TEST H **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F5										
21	1.01	598.4	421.5	1.42	0.082	1.43	0.11	2.47	1.06	284.2
60	1.01	651.3	413.5	1.19	0.068	1.19	0.08	2.47	1.03	336.0
LEVEL F6										
1	1.03	698.2	426.2	1.08	0.063	1.10	0.07	2.32	1.01	378.8
17	1.03	659.7	423.0	1.18	0.068	1.21	0.08	2.32	1.03	339.8
37	1.03	633.7	414.1	1.25	0.072	1.28	0.09	2.32	1.04	314.1
38	1.03	638.2	414.4	1.23	0.071	1.27	0.09	2.32	1.04	318.3
50	1.03	679.2	420.0	1.12	0.064	1.14	0.08	2.32	1.02	359.2
60	1.03	689.0	413.5	1.07	0.061	1.09	0.07	2.32	1.01	369.3
LEVEL F7										
14	1.04	647.8	417.1	1.21	0.071	1.26	0.09	2.18	1.04	322.0
17	1.04	675.7	423.0	1.13	0.065	1.18	0.08	2.18	1.02	350.0
21	1.04	654.1	421.5	1.20	0.069	1.25	0.09	2.18	1.03	328.4
37	1.04	651.4	411.8	1.18	0.068	1.23	0.09	2.18	1.03	325.7
38	1.04	658.7	414.4	1.16	0.067	1.22	0.09	2.18	1.03	332.8
50	1.04	695.4	420.2	1.07	0.062	1.11	0.08	2.18	1.01	370.3
60	1.04	705.3	413.5	1.03	0.059	1.07	0.07	2.18	1.01	380.9
LEVEL F8										
1	1.07	724.2	427.0	1.01	0.058	1.07	0.07	2.03	1.01	394.3
17	1.07	684.1	423.2	1.11	0.063	1.18	0.08	2.03	1.02	351.8
21	1.07	671.8	421.7	1.14	0.065	1.22	0.09	2.03	1.03	339.2
34	1.07	721.2	432.3	1.03	0.060	1.09	0.07	2.03	1.01	391.0
37	1.07	665.9	414.3	1.14	0.066	1.22	0.09	2.03	1.03	333.0
50	1.07	715.8	420.2	1.02	0.058	1.08	0.07	2.03	1.01	385.1
60	1.07	719.1	413.7	0.99	0.057	1.05	0.07	2.03	1.01	388.7

STEADY STATE TEST I

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST I **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.674E+05 LBM/SQFT H UNC. MASS FLUX 6.019E+03 LBM/SQFT H PRESSURE 1331.5 PSI UNC. PRESSURE 6.00 PSI
362.83 KG/SQM S 8.1678 KG/SQM S 9.19 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.785	562.2	0.037	11.78	1153.5	623.4	75.73	42.070	580.3	304.9	0.597	0.3	.8885	.0333
G	1.772	558.1	0.045	14.31	1272.2	689.3	47.47	26.372	633.4	334.4	24.747	13.7	1.0874	.0382
E6	1.743	549.1	0.000	0.00	1136.8	614.1	0.00	0.000	580.3	304.9	0.597	0.3	.8272	.0320
E7	1.791	564.2	0.037	11.52	1099.6	593.4	8.63	4.793	580.3	304.9	0.597	0.3	.8463	.0324
E8	1.784	561.9	0.047	14.72	1078.2	581.5	97.65	54.251	580.3	304.9	0.597	0.3	.8714	.0329
F1	1.756	553.3	0.051	15.92	1152.2	622.6	37.24	20.687	580.3	304.9	0.597	0.3	.9206	.0342
F2	1.775	559.1	0.024	7.47	1196.0	647.0	38.23	21.238	580.3	304.9	0.597	0.3	.9458	.0349
F3	1.755	552.9	0.055	17.42	1209.6	654.6	49.83	27.682	580.3	304.9	0.597	0.3	.9709	.0357
F4	1.699	535.2	0.063	19.74	1082.6	584.0	66.82	37.123	580.3	304.9	0.597	0.3	.9940	.0363
F5	1.725	543.4	0.063	19.97	1128.3	609.4	49.51	27.505	584.3	307.1	20.798	11.6	1.0111	.0366
F6	1.750	551.2	0.047	14.86	1195.2	646.6	38.82	21.565	594.9	313.1	21.457	11.9	1.0291	.0370
F7	1.748	550.5	0.040	12.62	1209.3	654.4	39.90	22.166	605.8	319.1	24.173	13.4	1.0462	.0373
F8	1.762	555.1	0.050	15.83	1254.5	679.5	45.22	25.125	622.6	328.4	24.543	13.6	1.0703	.0378

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test I

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	6/7
E6	1/2
E7	2/4
E8	3/5
F	All dry

********** STEADY STATE TEST I **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.89	602.1	582.1	1.959	0.117	3.068	0.061	2.394	1.477	0.019	1.269	0.021	1.358	341.3
4	0.89	609.9	578.4	1.897	0.112	3.068	0.061	2.392	1.472	0.018	1.265	0.021	1.350	350.8
7	0.89	594.2	550.9	1.904	0.115	3.068	0.061	2.397	1.482	0.019	1.274	0.022	1.367	332.2
7	0.89	585.9	550.9	1.960	0.118	3.068	0.061	2.400	1.488	0.019	1.279	0.022	1.377	322.6
10	0.89	633.7	565.0	1.718	0.104	3.068	0.061	2.385	1.459	0.018	1.253	0.021	1.328	379.1
10	0.89	635.9	565.0	1.707	0.103	3.068	0.061	2.384	1.458	0.018	1.252	0.021	1.327	381.8
10	0.89	631.9	565.0	1.728	0.105	3.068	0.061	2.385	1.460	0.018	1.254	0.021	1.330	376.9
13	0.89	623.9	568.1	1.781	0.105	3.068	0.061	2.387	1.464	0.018	1.257	0.021	1.337	367.1
13	0.89	615.8	568.1	1.827	0.111	3.068	0.061	2.390	1.468	0.019	1.261	0.021	1.344	357.6
15	0.89	603.1	587.9	1.972	0.117	3.068	0.061	2.394	1.476	0.019	1.269	0.021	1.357	342.5
16	0.89	657.2	553.2	1.570	0.092	3.068	0.061	2.379	1.448	0.018	1.243	0.021	1.311	407.3
18	0.89	607.7	561.1	1.854	0.112	3.068	0.061	2.392	1.473	0.019	1.266	0.021	1.352	348.1
18	0.89	588.3	561.1	1.980	0.119	3.068	0.061	2.399	1.486	0.019	1.278	0.022	1.374	225.4
20	0.89	530.2	566.6	2.515	0.151	3.068	0.061	2.428	1.543	0.020	1.329	0.023	1.470	258.2
20	0.89	586.5	566.6	2.012	0.118	3.068	0.061	2.400	1.488	0.019	1.279	0.022	1.376	323.3
28	0.89	580.7	557.5	2.022	0.119	3.068	0.061	2.402	1.492	0.019	1.283	0.022	1.384	316.4
28	0.89	578.6	557.5	2.037	0.121	3.068	0.061	2.403	1.494	0.019	1.284	0.022	1.386	313.8
28	0.89	573.3	557.5	2.077	0.124	3.068	0.061	2.405	1.498	0.019	1.288	0.022	1.394	307.5
31	0.89	616.8	562.4	1.803	0.108	3.068	0.061	2.389	1.468	0.018	1.261	0.021	1.343	358.8
31	0.89	622.3	562.4	1.772	0.105	3.068	0.061	2.388	1.465	0.018	1.258	0.021	1.338	365.1
32	0.89	653.3	566.8	1.627	0.095	3.068	0.061	2.380	1.449	0.018	1.244	0.021	1.313	402.5
34	0.89	627.3	572.3	1.775	0.106	3.068	0.061	2.386	1.462	0.018	1.256	0.021	1.334	371.3
38	0.89	598.8	551.5	1.876	0.112	3.068	0.061	2.395	1.479	0.019	1.271	0.022	1.362	337.4
42	0.89	634.5	564.1	1.712	0.104	3.068	0.061	2.384	1.458	0.018	1.252	0.021	1.328	380.0
45	0.89	588.1	561.1	1.982	0.117	3.068	0.061	2.399	1.487	0.019	1.278	0.022	1.374	325.1
45	0.89	590.7	561.1	1.964	0.116	3.068	0.061	2.398	1.485	0.019	1.276	0.022	1.371	327.9
53	0.89	643.7	584.6	1.726	0.103	3.068	0.061	2.382	1.454	0.018	1.248	0.021	1.320	391.3
59	0.89	671.9	565.9	1.542	0.090	3.068	0.061	2.376	1.442	0.018	1.237	0.021	1.301	425.6
59	0.89	667.6	565.9	1.560	0.091	3.068	0.061	2.377	1.443	0.018	1.239	0.021	1.304	420.2
59	0.89	678.9	565.9	1.513	0.091	3.068	0.061	2.374	1.439	0.018	1.235	0.021	1.296	433.9
60	0.89	668.3	549.3	1.512	0.090	3.068	0.061	2.377	1.443	0.018	1.239	0.021	1.303	421.1
64	0.89	700.7	553.4	1.398	0.081	3.068	0.061	2.370	1.431	0.018	1.228	0.021	1.284	461.1
64	0.89	719.4	553.4	1.335	0.077	3.068	0.061	2.367	1.426	0.018	1.223	0.020	1.275	484.5
64	0.89	708.8	553.4	1.370	0.079	3.068	0.061	2.369	1.429	0.018	1.226	0.021	1.280	471.3

********** STEADY STATE TEST I **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.09	694.7	569.1	1.46	0.086	1.58	0.11	2.62	1.34	517.9
3	1.09	693.1	583.0	1.50	0.087	1.63	0.11	2.62	1.34	515.5
14	1.09	654.0	553.6	1.59	0.097	1.73	0.13	2.62	1.37	460.2
16	1.09	714.6	554.7	1.35	0.080	1.46	0.10	2.62	1.33	547.2
16	1.09	721.6	554.7	1.33	0.078	1.43	0.10	2.62	1.33	557.2
18	1.09	684.1	561.1	1.48	0.086	1.61	0.11	2.62	1.35	502.7
18	1.09	672.0	561.1	1.53	0.090	1.66	0.12	2.62	1.36	485.5
18	1.09	686.7	561.1	1.47	0.085	1.59	0.11	2.62	1.35	506.5
20	1.09	625.8	566.6	1.77	0.103	1.94	0.15	2.62	1.39	420.5
20	1.09	671.4	566.6	1.55	0.093	1.68	0.12	2.62	1.36	484.6
20	1.09	675.8	566.6	1.53	0.090	1.66	0.12	2.62	1.36	491.0
21	1.09	660.5	533.1	1.50	0.086	1.64	0.12	2.62	1.37	468.8
32	1.09	704.6	566.8	1.42	0.083	1.53	0.11	2.62	1.34	532.5
34	1.09	717.1	572.3	1.39	0.082	1.50	0.10	2.62	1.33	550.5
37	1.09	659.0	550.5	1.55	0.091	1.70	0.12	2.62	1.37	467.0
38	1.09	676.8	551.6	1.48	0.087	1.61	0.12	2.62	1.35	492.5
42	1.09	707.3	564.1	1.40	0.095	1.51	0.12	2.62	1.34	536.4
42	1.09	718.7	564.1	1.36	0.080	1.47	0.10	2.62	1.33	553.0
45	1.09	672.6	561.5	1.53	0.091	1.66	0.12	2.62	1.36	486.4
45	1.09	673.7	561.5	1.52	0.090	1.66	0.12	2.62	1.36	487.9
45	1.09	674.5	561.5	1.52	0.090	1.65	0.12	2.62	1.36	489.1
47	1.09	676.8	553.0	1.49	0.088	1.62	0.12	2.62	1.35	492.5
50	1.09	717.9	556.0	1.35	0.078	1.45	0.10	2.62	1.33	551.8
58	1.09	722.9	572.4	1.37	0.080	1.47	0.10	2.62	1.33	558.7
60	1.09	705.2	550.2	1.37	0.082	1.48	0.11	2.62	1.34	533.3
64	1.09	726.2	554.0	1.32	0.076	1.41	0.10	2.62	1.33	563.7
64	1.09	730.4	554.0	1.30	0.076	1.40	0.10	2.62	1.33	570.0

********** STEADY STATE TEST I **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E6														
60	0.83	614.1	549.1	1.776	0.105	2.911	0.060	2.270	1.443	0.017	1.236	0.019	1.327	320.8
LEVEL E7														
34	0.85	596.8	572.3	1.961	0.120	2.960	0.060	2.312	1.463	0.018	1.256	0.020	1.351	311.3
50	0.85	590.1	556.0	1.950	0.117	2.960	0.060	2.314	1.468	0.018	1.260	0.020	1.359	303.8
LEVEL E8														
34	0.87	619.9	572.3	1.817	0.110	3.024	0.061	2.355	1.460	0.018	1.254	0.020	1.335	352.2
38	0.87	543.2	551.5	2.315	0.139	3.024	0.061	2.386	1.521	0.019	1.309	0.021	1.437	264.4
LEVEL F1														
17	0.92	616.2	561.5	1.804	0.105	3.149	0.062	2.453	1.476	0.022	1.267	0.026	1.354	378.6
21	0.92	595.5	559.9	1.927	0.114	3.149	0.062	2.460	1.489	0.022	1.279	0.027	1.376	353.4
34	0.92	652.0	572.3	1.649	0.098	3.149	0.062	2.443	1.457	0.022	1.251	0.026	1.324	423.3
37	0.92	605.1	550.5	1.834	0.108	3.149	0.062	2.457	1.482	0.022	1.273	0.026	1.365	365.3
38	0.92	622.7	551.5	1.736	0.101	3.149	0.062	2.451	1.472	0.022	1.264	0.026	1.348	386.8
50	0.92	647.3	556.0	1.624	0.095	3.149	0.062	2.444	1.459	0.022	1.253	0.026	1.327	417.4
LEVEL F2														
1	0.95	664.9	559.8	1.555	0.091	3.212	0.063	2.489	1.452	0.030	1.244	0.036	1.322	458.8
14	0.95	609.7	553.5	1.816	0.112	3.212	0.063	2.504	1.480	0.031	1.269	0.037	1.368	387.5
17	0.95	641.9	561.5	1.666	0.096	3.212	0.063	2.495	1.462	0.031	1.253	0.036	1.339	428.6
34	0.95	665.9	572.3	1.585	0.094	3.212	0.063	2.489	1.452	0.030	1.244	0.036	1.321	460.2
38	0.95	641.3	551.4	1.640	0.096	3.212	0.063	2.495	1.463	0.031	1.254	0.036	1.339	427.8
50	0.95	658.3	556.0	1.573	0.092	3.212	0.063	2.491	1.455	0.030	1.247	0.036	1.327	450.1
LEVEL F3														
14	0.97	623.4	553.5	1.738	0.104	3.275	0.066	2.549	1.464	0.068	1.250	0.079	1.362	423.4
17	0.97	648.2	561.5	1.636	0.095	3.275	0.066	2.542	1.452	0.069	1.239	0.078	1.341	456.0
21	0.97	630.2	559.9	1.722	0.100	3.275	0.066	2.547	1.461	0.069	1.247	0.079	1.356	432.5
34	0.97	684.2	572.3	1.509	0.089	3.275	0.066	2.534	1.437	0.068	1.226	0.077	1.317	505.0
60	0.97	691.0	549.1	1.422	0.085	3.275	0.066	2.533	1.435	0.068	1.224	0.077	1.313	513.9
LEVEL F4														
60	0.99	610.3	549.1	1.798	0.106	3.333	0.098	2.598	1.442	0.070	1.219	0.085	1.382	423.2

********** STEADY STATE TEST I **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F5										
21	1.01	583.0	559.9	2.01	0.118	2.03	0.15	3.31	1.42	393.1
60	1.01	637.9	549.1	1.65	0.097	1.66	0.11	3.31	1.36	468.1
LEVEL F6										
1	1.03	658.2	568.2	1.61	0.099	1.65	0.12	3.10	1.35	488.8
17	1.03	638.2	561.5	1.68	0.099	1.73	0.12	3.10	1.37	460.6
37	1.03	621.0	550.5	1.74	0.103	1.79	0.13	3.10	1.38	437.2
38	1.03	626.7	551.5	1.71	0.100	1.76	0.12	3.10	1.38	445.2
50	1.03	671.7	556.2	1.52	0.089	1.55	0.10	3.10	1.34	508.1
60	1.03	674.6	549.1	1.49	0.087	1.52	0.10	3.10	1.34	511.8
LEVEL F7										
14	1.05	635.1	553.5	1.68	0.101	1.75	0.13	2.93	1.37	449.3
17	1.05	655.6	561.5	1.60	0.093	1.67	0.12	2.93	1.36	478.1
21	1.05	635.4	559.9	1.69	0.098	1.77	0.13	2.93	1.37	449.9
37	1.05	636.7	550.5	1.66	0.098	1.73	0.13	2.93	1.37	451.7
38	1.05	647.4	551.5	1.61	0.094	1.68	0.12	2.93	1.36	466.9
50	1.05	686.7	556.5	1.46	0.085	1.51	0.10	2.93	1.34	522.3
60	1.05	689.9	549.1	1.43	0.083	1.48	0.10	2.93	1.34	527.0
LEVEL F8										
1	1.07	694.6	569.0	1.46	0.086	1.55	0.11	2.72	1.34	524.3
17	1.07	664.2	561.7	1.56	0.091	1.67	0.12	2.72	1.36	480.8
21	1.07	652.1	560.1	1.61	0.093	1.73	0.12	2.72	1.37	463.5
34	1.07	704.7	572.5	1.43	0.085	1.52	0.11	2.72	1.33	539.0
37	1.07	652.7	550.7	1.58	0.092	1.70	0.12	2.72	1.37	464.3
50	1.07	706.4	556.2	1.39	0.081	1.47	0.10	2.72	1.33	541.6
60	1.07	704.5	549.4	1.37	0.080	1.46	0.10	2.72	1.33	538.8

STEADY STATE TEST J

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST J **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.393E+05 LBM/SQFT H 731.82 KG/SQM S

UNC. MASS FLUX 1.229E+04 LBM/SQFT H 16.6829 KG/SQM S

PRESSURE 1937.3 PSI 13.37 MPA

UNC. PRESSURE 6.00 PSI 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.457	774.0	0.036	11.22	1200.0	649.2	49.80	27.667	631.2	333.2	0.443	0.2	.4889	.0256
F	2.451	771.9	0.046	14.44	1191.7	644.6	40.73	22.625	631.2	333.2	0.443	0.2	.6547	.0297
G	2.435	766.9	0.054	17.13	1117.0	603.1	29.78	16.542	631.2	333.2	0.443	0.2	.8188	.0337
E1	2.439	768.3	0.023	7.33	1230.6	666.2	52.74	29.303	631.2	333.2	0.443	0.2	.5154	.0263
E2	2.391	753.2	0.075	23.65	1230.9	666.4	29.15	16.193	631.2	333.2	0.443	0.2	.5344	.0268
E3	2.439	768.4	0.024	7.50	1246.6	675.1	28.70	15.944	631.2	333.2	0.443	0.2	.5568	.0275
E6	2.367	745.7	0.089	28.05	1137.3	614.4	35.21	19.563	631.2	333.2	0.443	0.2	.6041	.0286
E7	2.448	771.1	0.028	8.67	1138.2	614.9	45.59	25.326	631.2	333.2	0.443	0.2	.6198	.0289
E8	2.457	774.0	0.015	4.73	1175.3	635.5	28.47	15.817	631.2	333.2	0.443	0.2	.6406	.0294
F1	2.416	761.2	0.060	18.75	1173.6	634.5	27.23	15.129	631.2	333.2	0.443	0.2	.6812	.0304
F2	2.442	769.2	0.025	7.88	1197.5	647.8	26.28	14.603	631.2	333.2	0.443	0.2	.7019	.0310
F3	2.417	761.2	0.059	18.48	1189.1	643.2	16.97	9.425	631.2	333.2	0.443	0.2	.7227	.0316
F5	2.430	765.6	0.000	0.00	1035.9	558.1	0.00	0.000	631.2	333.2	0.443	0.2	.7558	.0324
F6	2.412	759.8	0.055	17.39	1068.3	576.0	29.63	16.459	631.2	333.2	0.443	0.2	.7707	.0326
F7	2.416	761.0	0.047	14.71	1071.9	578.1	18.75	10.417	631.2	333.2	0.443	0.2	.7848	.0329
F8	2.423	763.3	0.052	16.46	1103.7	595.7	27.94	15.520	631.2	333.2	0.443	0.2	.8047	.0334

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test J

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST J **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E														
2	0.49	670.7	776.8	2.302	0.142	5.127	0.125	3.584	2.284	0.041	2.061	0.048	2.096	541.0
4	0.49	640.8	788.0	2.562	0.157	5.127	0.125	3.599	2.312	0.041	2.088	0.048	2.143	495.5
7	0.49	643.4	756.0	2.437	0.154	5.127	0.125	3.597	2.310	0.041	2.085	0.049	2.139	499.6
7	0.49	645.6	756.0	2.420	0.151	5.127	0.125	3.596	2.307	0.041	2.083	0.048	2.135	502.5
10	0.49	655.7	771.2	2.391	0.146	5.127	0.125	3.591	2.297	0.041	2.074	0.048	2.118	518.0
12	0.49	646.1	783.5	2.504	0.156	5.127	0.125	3.596	2.307	0.041	2.083	0.048	2.134	503.3
13	0.49	656.9	779.0	2.406	0.153	5.127	0.125	3.591	2.296	0.041	2.073	0.048	2.117	519.8
13	0.49	657.2	779.0	2.404	0.150	5.127	0.125	3.590	2.296	0.041	2.072	0.048	2.116	520.3
15	0.49	652.3	815.6	2.556	0.159	5.127	0.125	3.593	2.301	0.041	2.077	0.048	2.124	512.7
15	0.49	658.6	815.6	2.507	0.154	5.127	0.125	3.590	2.295	0.041	2.071	0.048	2.114	522.3
16	0.49	646.5	762.2	2.433	0.150	5.127	0.125	3.596	2.306	0.041	2.082	0.048	2.134	503.9
16	0.49	642.6	762.2	2.463	0.151	5.127	0.125	3.598	2.310	0.041	2.086	0.048	2.140	498.3
18	0.49	574.6	766.3	3.174	0.214	5.127	0.125	3.646	2.409	0.046	2.180	0.053	2.307	397.0
20	0.49	637.7	776.7	2.551	0.157	5.127	0.125	3.600	2.316	0.041	2.091	0.049	2.149	491.2
20	0.49	646.0	776.7	2.483	0.155	5.127	0.125	3.596	2.307	0.041	2.083	0.048	2.134	503.1
26	0.49	624.3	776.2	2.666	0.164	5.127	0.125	3.608	2.331	0.042	2.106	0.049	2.175	470.9
26	0.49	641.2	776.2	2.520	0.153	5.127	0.125	3.598	2.312	0.041	2.087	0.048	2.143	496.2
26	0.49	635.9	776.2	2.565	0.156	5.127	0.125	3.601	2.318	0.041	2.093	0.049	2.152	488.4
28	0.49	586.7	760.0	2.998	0.187	5.127	0.125	3.635	2.387	0.044	2.158	0.051	2.269	414.5
28	0.49	587.2	760.0	2.993	0.195	5.127	0.125	3.635	2.386	0.044	2.158	0.051	2.267	415.6
29	0.49	602.4	766.3	2.846	0.174	5.127	0.125	3.622	2.361	0.043	2.134	0.050	2.225	438.5
29	0.49	601.8	766.3	2.853	0.180	5.127	0.125	3.623	2.362	0.043	2.135	0.050	2.227	437.6
29	0.49	602.9	766.3	2.841	0.176	5.127	0.125	3.622	2.360	0.043	2.133	0.050	2.224	438.9
30	0.49	645.9	760.8	2.433	0.147	5.127	0.125	3.596	2.307	0.041	2.083	0.048	2.134	503.1
30	0.49	651.9	760.8	2.387	0.145	5.127	0.125	3.593	2.301	0.041	2.077	0.048	2.124	512.2
31	0.49	641.6	772.1	2.504	0.153	5.127	0.125	3.598	2.312	0.041	2.087	0.048	2.142	496.7
33	0.49	679.7	775.0	2.237	0.136	5.127	0.125	3.581	2.276	0.040	2.054	0.047	2.084	554.8
33	0.49	669.8	775.0	2.303	0.145	5.127	0.125	3.585	2.285	0.041	2.062	0.048	2.097	539.5
33	0.49	663.9	775.0	2.344	0.145	5.127	0.125	3.587	2.290	0.041	2.067	0.048	2.106	530.5
35	0.49	653.2	778.9	2.435	0.155	5.127	0.125	3.592	2.300	0.041	2.076	0.048	2.122	514.1
42	0.49	633.4	768.4	2.560	0.170	5.127	0.125	3.603	2.321	0.042	2.096	0.049	2.157	484.6
44	0.49	651.9	765.9	2.403	0.151	5.127	0.125	3.593	2.301	0.041	2.077	0.048	2.125	512.1
45	0.49	634.2	780.7	2.594	0.165	5.127	0.125	3.602	2.320	0.042	2.095	0.049	2.156	485.8
45	0.49	649.4	780.7	2.469	0.157	5.127	0.125	3.594	2.303	0.041	2.079	0.048	2.129	508.4
49	0.49	652.2	771.7	2.419	0.148	5.127	0.125	3.593	2.301	0.041	2.077	0.048	2.124	512.6
49	0.49	669.8	771.7	2.293	0.139	5.127	0.125	3.585	2.285	0.041	2.062	0.048	2.097	539.6
49	0.49	657.1	771.7	2.383	0.149	5.127	0.125	3.590	2.296	0.041	2.072	0.048	2.116	520.0
51	0.49	632.3	779.6	2.606	0.166	5.127	0.125	3.603	2.322	0.042	2.097	0.049	2.159	483.0
51	0.49	632.6	779.6	2.604	0.169	5.127	0.125	3.603	2.321	0.042	2.097	0.049	2.159	483.4
53	0.49	660.3	779.1	2.382	0.150	5.127	0.125	3.589	2.293	0.041	2.070	0.048	2.111	524.9
53	0.49	652.7	779.1	2.439	0.156	5.127	0.125	3.593	2.300	0.041	2.076	0.048	2.123	513.4
58	0.49	668.6	781.9	2.331	0.143	5.127	0.125	3.585	2.286	0.041	2.063	0.048	2.099	537.7
58	0.49	666.4	781.9	2.346	0.150	5.127	0.125	3.586	2.287	0.041	2.064	0.048	2.102	534.4
59	0.49	679.6	773.4	2.233	0.137	5.127	0.125	3.581	2.276	0.040	2.054	0.047	2.084	554.7
59	0.49	672.4	773.4	2.280	0.140	5.127	0.125	3.584	2.282	0.041	2.060	0.048	2.094	543.5
59	0.49	668.8	773.4	2.305	0.141	5.127	0.125	3.585	2.285	0.041	2.062	0.048	2.099	538.0
61	0.49	641.7	766.8	2.485	0.153	5.127	0.125	3.598	2.311	0.041	2.087	0.048	2.142	496.9
61	0.49	644.7	766.8	2.462	0.150	5.127	0.125	3.597	2.308	0.041	2.084	0.048	2.137	501.4
61	0.49	646.7	766.8	2.446	0.148	5.127	0.125	3.595	2.306	0.041	2.082	0.048	2.133	504.2
62	0.49	685.8	771.5	2.188	0.130	5.127	0.125	3.578	2.272	0.040	2.049	0.047	2.076	564.1
63	0.49	678.7	784.2	2.270	0.135	5.127	0.125	3.581	2.277	0.040	2.055	0.047	2.085	553.3
63	0.49	679.9	784.2	2.262	0.137	5.127	0.125	3.581	2.276	0.040	2.054	0.047	2.084	555.1
64	0.49	726.8	768.2	1.952	0.116	5.127	0.125	3.564	2.244	0.039	2.023	0.046	2.031	628.3
64	0.49	709.7	768.2	2.040	0.122	5.127	0.125	3.570	2.255	0.040	2.033	0.047	2.048	601.3
LEVEL F														
3	0.65	656.8	795.9	2.459	0.151	6.170	0.132	4.310	2.613	0.038	2.448	0.046	2.242	642.9
4	0.65	669.0	789.0	2.350	0.142	6.170	0.132	4.303	2.601	0.037	2.435	0.045	2.223	665.8
7	0.65	666.7	756.6	2.269	0.143	6.170	0.132	4.304	2.603	0.038	2.438	0.045	2.227	661.5
7	0.65	657.2	756.6	2.335	0.144	6.170	0.132	4.310	2.613	0.038	2.447	0.046	2.242	643.5
10	0.65	634.6	770.7	2.557	0.165	6.170	0.132	4.323	2.640	0.039	2.473	0.047	2.283	601.9
10	0.65	633.3	770.7	2.568	0.168	6.170	0.132	4.324	2.641	0.039	2.475	0.047	2.285	599.4
10	0.65	633.7	770.7	2.565	0.167	6.170	0.132	4.324	2.641	0.039	2.475	0.047	2.285	600.1
13	0.65	641.3	779.0	2.529	0.156	6.170	0.132	4.319	2.631	0.038	2.465	0.046	2.270	614.0
13	0.65	635.3	779.0	2.579	0.169	6.170	0.132	4.323	2.639	0.039	2.472	0.047	2.281	602.8
15	0.65	634.1	815.4	2.711	0.167	6.170	0.132	4.324	2.640	0.039	2.474	0.046	2.284	600.9
16	0.65	652.7	763.0	2.388	0.148	6.170	0.132	4.312	2.618	0.038	2.452	0.046	2.249	635.0
17	0.65	632.7	762.4	2.545	0.152	6.170	0.132	4.325	2.642	0.038	2.476	0.046	2.286	598.4
18	0.65	597.4	766.7	2.902	0.187	6.170	0.132	4.353	2.696	0.041	2.529	0.049	2.371	533.4
20	0.65	624.8	776.7	2.663	0.161	6.170	0.132	4.330	2.653	0.039	2.486	0.046	2.303	583.6
21	0.65	585.8	768.0	3.041	0.221	6.170	0.132	4.364	2.718	0.045	2.551	0.052	2.406	512.0

********** STEADY STATE TEST J **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
28	0.65	663.5	760.4	2.302	0.138	6.170	0.132	4.306	2.606	0.037	2.441	0.045	2.232	655.4
28	0.65	651.2	760.4	2.391	0.145	6.170	0.132	4.313	2.620	0.038	2.454	0.046	2.252	632.3
28	0.65	651.8	760.4	2.387	0.145	6.170	0.132	4.313	2.619	0.038	2.453	0.046	2.251	633.3
31	0.65	635.4	772.3	2.555	0.160	6.170	0.132	4.323	2.638	0.039	2.472	0.046	2.281	603.1
31	0.65	636.6	772.3	2.546	0.157	6.170	0.132	4.322	2.637	0.039	2.471	0.046	2.279	605.2
34	0.65	622.5	780.9	2.699	0.173	6.170	0.132	4.332	2.656	0.040	2.489	0.047	2.308	579.3
37	0.65	639.3	770.2	2.516	0.182	6.170	0.132	4.320	2.634	0.041	2.468	0.048	2.274	610.3
38	0.65	641.3	771.5	2.504	0.157	6.170	0.132	4.319	2.631	0.039	2.465	0.046	2.270	614.0
42	0.65	638.4	768.4	2.517	0.164	6.170	0.132	4.321	2.635	0.039	2.469	0.047	2.275	608.7
45	0.65	637.1	780.5	2.568	0.157	6.170	0.132	4.322	2.636	0.038	2.470	0.046	2.278	606.2
45	0.65	641.9	780.5	2.529	0.154	6.170	0.132	4.319	2.630	0.038	2.464	0.046	2.269	615.1
53	0.65	650.8	798.8	2.515	0.158	6.170	0.132	4.313	2.620	0.038	2.454	0.046	2.253	631.4
59	0.65	639.2	772.7	2.526	0.156	6.170	0.132	4.320	2.634	0.038	2.468	0.046	2.274	610.0
59	0.65	642.3	772.7	2.500	0.152	6.170	0.132	4.318	2.630	0.038	2.464	0.046	2.268	615.9
59	0.65	648.3	772.7	2.453	0.159	6.170	0.132	4.315	2.623	0.039	2.457	0.046	2.257	626.7
60	0.65	657.3	766.3	2.364	0.151	6.170	0.132	4.310	2.613	0.038	2.447	0.046	2.241	643.8
64	0.65	685.8	770.1	2.184	0.131	6.170	0.132	4.295	2.585	0.037	2.420	0.045	2.199	697.3
64	0.65	701.3	770.1	2.092	0.124	6.170	0.132	4.288	2.573	0.037	2.408	0.044	2.180	726.7
64	0.65	694.4	770.1	2.132	0.127	6.170	0.132	4.291	2.578	0.037	2.413	0.044	2.188	713.4
LEVEL G														
14	0.82	598.3	764.8	2.885	0.203	7.160	0.139	5.045	2.946	0.040	2.830	0.047	2.495	669.8
16	0.82	604.3	762.0	2.811	0.185	7.160	0.139	5.038	2.935	0.038	2.818	0.045	2.478	682.6
16	0.82	622.7	762.0	2.632	0.170	7.160	0.139	5.021	2.904	0.036	2.787	0.043	2.431	723.5
18	0.82	601.4	766.3	2.857	0.178	7.160	0.139	5.041	2.940	0.036	2.824	0.044	2.486	676.2
18	0.82	599.9	766.3	2.873	0.184	7.160	0.139	5.043	2.943	0.037	2.826	0.045	2.490	672.9
18	0.82	592.6	766.3	2.955	0.186	7.160	0.139	5.051	2.958	0.037	2.841	0.045	2.512	657.5
20	0.82	556.6	776.7	3.478	0.219	7.160	0.139	5.099	3.048	0.040	2.932	0.048	2.651	578.0
20	0.82	609.3	776.7	2.813	0.189	7.160	0.139	5.034	2.926	0.038	2.809	0.045	2.464	693.7
20	0.82	604.4	776.7	2.864	0.182	7.160	0.139	5.038	2.935	0.037	2.818	0.044	2.477	683.0
21	0.82	586.4	743.8	2.938	0.179	7.160	0.139	5.058	2.971	0.036	2.854	0.044	2.532	643.9
34	0.82	604.6	780.7	2.877	0.187	7.160	0.139	5.038	2.935	0.037	2.818	0.045	2.477	683.2
37	0.82	599.0	770.2	2.898	0.184	7.160	0.139	5.044	2.945	0.037	2.828	0.044	2.493	671.4
38	0.82	604.8	771.4	2.841	0.182	7.160	0.139	5.038	2.934	0.037	2.817	0.044	2.476	683.7
42	0.82	595.6	768.4	2.929	0.262	7.160	0.139	5.048	2.952	0.050	2.835	0.056	2.503	663.7
42	0.82	596.6	768.4	2.918	0.190	7.160	0.139	5.046	2.950	0.038	2.833	0.045	2.500	665.9
45	0.82	608.1	780.5	2.839	0.190	7.160	0.139	5.035	2.928	0.038	2.811	0.045	2.467	691.1
45	0.82	597.9	780.5	2.949	0.196	7.160	0.139	5.045	2.947	0.038	2.830	0.046	2.496	668.9
45	0.82	607.8	780.5	2.842	0.186	7.160	0.139	5.035	2.929	0.037	2.812	0.045	2.468	690.5
47	0.82	601.2	772.8	2.884	0.188	7.160	0.139	5.042	2.941	0.038	2.824	0.045	2.486	675.7
50	0.82	589.9	759.9	2.961	0.188	7.160	0.139	5.054	2.963	0.037	2.847	0.045	2.521	651.6
58	0.82	604.9	780.4	2.873	0.187	7.160	0.139	5.038	2.934	0.037	2.817	0.045	2.476	684.0
60	0.82	610.9	765.6	2.757	0.185	7.160	0.139	5.032	2.923	0.038	2.806	0.045	2.460	697.3
64	0.82	639.6	768.4	2.508	0.156	7.160	0.139	5.008	2.879	0.035	2.762	0.042	2.394	761.3
64	0.82	644.8	768.4	2.466	0.153	7.160	0.139	5.004	2.873	0.034	2.755	0.042	2.384	773.0

********** STEADY STATE TEST J **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E1														
1	0.52	692.3	773.5	2.154	0.135	5.297	0.126	3.683	2.321	0.040	2.108	0.047	2.087	592.7
38	0.52	671.9	771.4	2.278	0.137	5.297	0.126	3.692	2.337	0.040	2.124	0.047	2.113	560.1
5C	0.52	634.5	759.9	2.522	0.161	5.297	0.126	3.710	2.375	0.042	2.159	0.049	2.174	501.7
LEVEL E2														
21	0.53	665.3	768.0	2.313	0.137	5.419	0.128	3.779	2.382	0.040	2.174	0.047	2.137	563.5
60	0.53	683.1	765.6	2.188	0.136	5.419	0.128	3.772	2.366	0.040	2.160	0.047	2.113	592.8
LEVEL E3														
17	0.56	676.0	762.4	2.224	0.142	5.560	0.130	3.872	2.416	0.040	2.217	0.048	2.139	597.9
34	0.56	672.8	780.7	2.299	0.150	5.560	0.130	3.874	2.419	0.041	2.220	0.048	2.143	592.6
37	0.56	657.3	770.2	2.377	0.144	5.560	0.130	3.881	2.434	0.040	2.234	0.048	2.167	566.5
38	0.56	687.6	771.4	2.177	0.130	5.560	0.130	3.867	2.406	0.040	2.208	0.047	2.124	617.3
50	0.56	658.9	759.9	2.333	0.153	5.560	0.130	3.880	2.432	0.041	2.232	0.048	2.164	569.2
60	0.56	698.1	765.6	2.098	0.129	5.560	0.130	3.863	2.398	0.040	2.200	0.047	2.111	635.1
LEVEL E6														
60	0.60	628.2	765.6	2.595	0.161	5.857	0.131	4.110	2.557	0.040	2.373	0.048	2.257	552.6
LEVEL E7														
1	0.62	649.8	773.5	2.443	0.156	5.955	0.131	4.162	2.560	0.039	2.382	0.047	2.228	601.8
34	0.62	603.1	780.7	2.893	0.192	5.955	0.131	4.194	2.623	0.042	2.444	0.050	2.328	518.8
37	0.62	615.4	770.2	2.729	0.169	5.955	0.131	4.185	2.604	0.040	2.425	0.048	2.297	540.9
50	0.62	591.2	759.9	2.946	0.190	5.955	0.131	4.205	2.644	0.042	2.464	0.050	2.361	498.1
LEVEL E8														
1	0.64	655.8	773.5	2.398	0.152	6.083	0.132	4.245	2.590	0.039	2.420	0.046	2.233	628.7
34	0.64	617.5	780.7	2.746	0.179	6.083	0.132	4.270	2.638	0.040	2.467	0.048	2.308	558.6
37	0.64	636.6	770.2	2.538	0.155	6.083	0.132	4.257	2.612	0.039	2.441	0.046	2.267	593.6
38	0.64	632.1	771.4	2.581	0.157	6.083	0.132	4.260	2.618	0.039	2.447	0.047	2.276	585.2
LEVEL F1														
17	0.68	645.9	762.4	2.438	0.145	6.333	0.134	4.428	2.671	0.037	2.514	0.045	2.281	644.5
21	0.68	610.9	768.0	2.765	0.172	6.333	0.134	4.454	2.719	0.039	2.561	0.047	2.356	578.0
34	0.68	634.5	780.7	2.591	0.166	6.333	0.134	4.436	2.685	0.039	2.528	0.046	2.303	622.5
37	0.68	654.7	770.2	2.396	0.145	6.333	0.134	4.423	2.660	0.037	2.504	0.045	2.265	661.5
50	0.68	627.2	759.9	2.585	0.158	6.333	0.134	4.441	2.695	0.038	2.537	0.046	2.318	608.5
LEVEL F2														
1	0.70	668.7	774.0	2.307	0.141	6.459	0.135	4.505	2.679	0.037	2.529	0.044	2.259	707.8
14	0.70	631.7	765.1	2.563	0.172	6.459	0.135	4.528	2.722	0.039	2.572	0.047	2.324	634.5
17	0.70	647.0	762.8	2.431	0.144	6.459	0.135	4.518	2.703	0.037	2.553	0.045	2.295	664.7
34	0.70	644.9	781.1	2.506	0.160	6.459	0.135	4.519	2.706	0.038	2.555	0.045	2.298	660.6
38	0.70	660.8	771.8	2.356	0.142	6.459	0.135	4.509	2.687	0.037	2.537	0.044	2.271	692.1
50	0.70	633.8	760.3	2.529	0.155	6.459	0.135	4.526	2.720	0.038	2.569	0.045	2.320	638.6
LEVEL F3														
14	0.72	638.4	764.8	2.506	0.160	6.585	0.137	4.608	2.746	0.038	2.603	0.046	2.326	665.8
17	0.72	642.9	762.4	2.462	0.147	6.585	0.137	4.605	2.741	0.037	2.597	0.044	2.317	674.8
21	0.72	628.7	768.0	2.599	0.156	6.585	0.137	4.616	2.760	0.037	2.616	0.045	2.346	646.1
34	0.72	656.4	780.7	2.416	0.153	6.585	0.137	4.597	2.725	0.037	2.581	0.045	2.293	701.4
6C	0.72	643.4	765.6	2.468	0.163	6.585	0.137	4.605	2.740	0.038	2.596	0.046	2.316	675.8
EVEL F5														
60	0.76	558.1	765.6	3.405	0.222	6.785	0.138	4.836	2.954	0.043	2.820	0.050	2.594	532.1
LEVEL F6														
1	0.77	601.4	773.5	2.884	0.203	6.874	0.138	4.847	2.876	0.041	2.746	0.048	2.450	634.1
17	0.77	585.7	762.4	3.019	0.192	6.874	0.138	4.864	2.907	0.039	2.777	0.047	2.499	600.9
38	0.77	559.5	771.4	3.409	0.217	6.874	0.138	4.898	2.972	0.041	2.843	0.049	2.600	546.6
50	0.77	562.6	759.9	3.313	0.219	6.874	0.138	4.894	2.964	0.042	2.834	0.050	2.587	553.0
60	0.77	582.1	765.6	3.076	0.197	6.874	0.138	4.868	2.915	0.039	2.785	0.047	2.511	593.3

********** STEADY STATE TEST J **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F7														
14	0.78	560.3	764.8	3.367	0.231	6.958	0.139	4.957	2.990	0.044	2.865	0.051	2.608	559.4
17	0.78	590.6	762.4	2.963	0.184	6.958	0.139	4.918	2.917	0.038	2.791	0.045	2.494	623.1
21	0.78	572.9	768.0	3.204	0.198	6.958	0.139	4.939	2.957	0.039	2.832	0.046	2.556	586.2
37	0.78	574.4	770.3	3.193	0.205	6.958	0.139	4.937	2.953	0.040	2.828	0.047	2.550	589.5
38	0.78	585.1	771.4	3.063	0.191	6.958	0.139	4.924	2.929	0.038	2.803	0.046	2.512	611.4
50	0.78	572.4	759.9	3.176	0.208	6.958	0.139	4.940	2.958	0.041	2.833	0.048	2.558	585.3
60	0.78	591.1	765.6	2.969	0.190	6.958	0.139	4.917	2.916	0.038	2.790	0.046	2.492	624.2
LEVEL F8														
1	0.80	629.4	773.6	2.612	0.166	7.077	0.139	4.966	2.876	0.036	2.755	0.043	2.407	726.1
17	0.80	590.4	762.4	2.964	0.182	7.077	0.139	5.003	2.944	0.037	2.824	0.044	2.510	640.9
21	0.80	580.1	768.0	3.111	0.191	7.077	0.139	5.015	2.967	0.037	2.847	0.045	2.545	618.8
34	0.80	591.6	780.7	3.021	0.201	7.077	0.139	5.001	2.942	0.039	2.821	0.046	2.506	643.6
37	0.80	592.7	770.2	2.968	0.186	7.077	0.139	5.000	2.939	0.037	2.819	0.045	2.503	646.0
50	0.80	584.2	759.9	3.028	0.195	7.077	0.139	5.010	2.958	0.039	2.837	0.046	2.531	627.3
60	0.80	605.8	765.6	2.809	0.176	7.077	0.139	4.987	2.914	0.036	2.794	0.044	2.464	674.6

STEADY STATE TEST K

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST K **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.663E+05 LBM/SQFT H UNC. MASS FLUX 3.686E+03 LBM/SQFT H PRESSURE 634.8 PSI UNC. PRESSURE 6.00 PSI
225.73 KG/SQM S 5.0023 KG/SQM S 4.38 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.432	451.0	0.029	9.07	1198.3	648.3	108.90	60.500	492.3	256.0	1.042	0.6	.8918	.0335
G	1.422	447.9	0.037	11.73	1402.2	761.6	37.65	20.918	597.6	314.6	43.002	23.9	1.1010	.0386
E7	1.441	453.9	0.029	9.20	1132.1	611.5	28.57	15.871	492.3	256.0	1.042	0.6	.8475	.0325
E8	1.462	460.4	0.000	0.00	1230.1	665.9	0.00	0.000	492.3	256.0	1.042	0.6	.8739	.0331
F1	1.411	444.4	0.042	13.36	1227.9	664.7	64.25	35.693	492.3	256.0	1.042	0.6	.9256	.0344
F2	1.419	447.0	0.020	6.38	1273.1	689.8	46.28	25.710	492.3	256.0	1.042	0.6	.9520	.0351
F3	1.411	444.3	0.046	14.55	1307.9	709.2	46.85	26.029	492.3	256.0	1.042	0.6	.9784	.0360
F4	1.364	429.8	0.054	17.11	1157.1	625.4	67.46	37.477	494.2	257.1	36.769	20.4	1.0027	.0366
F5	1.385	436.3	0.053	16.55	1236.9	669.7	43.41	24.119	512.5	267.3	33.027	18.3	1.0207	.0369
F6	1.409	443.7	0.042	13.09	1320.1	716.0	40.46	22.479	532.2	278.2	39.110	21.7	1.0397	.0373
F7	1.404	442.2	0.034	10.66	1347.3	731.1	42.91	23.839	550.7	288.5	39.933	22.2	1.0577	.0376
F8	1.420	447.4	0.043	13.44	1397.5	759.0	49.47	27.485	579.0	304.2	41.339	23.0	1.0831	.0382

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test K

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	2/4
E8	4/5
F	All dry

********** STEADY STATE TEST K **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.89	603.2	468.9	1.351	0.078	1.462	0.031	1.236	0.838	0.015	0.687	0.017	0.856	195.4
4	0.89	554.2	466.8	1.565	0.091	1.462	0.031	1.242	0.850	0.015	0.698	0.017	0.880	161.4
7	0.89	534.8	441.9	1.585	0.094	1.462	0.031	1.245	0.857	0.015	0.704	0.018	0.892	148.3
7	0.89	510.8	441.9	1.735	0.103	1.462	0.031	1.249	0.866	0.015	0.712	0.018	0.910	132.6
10	0.89	688.2	455.4	1.054	0.061	1.462	0.031	1.229	0.823	0.014	0.675	0.017	0.830	257.7
10	0.89	689.4	455.4	1.051	0.061	1.462	0.031	1.229	0.823	0.014	0.675	0.017	0.830	258.7
10	0.89	684.5	455.4	1.063	0.062	1.462	0.031	1.229	0.824	0.014	0.675	0.017	0.831	254.8
13	0.89	659.5	456.4	1.131	0.065	1.462	0.031	1.231	0.827	0.014	0.678	0.017	0.837	236.1
13	0.89	654.1	456.4	1.147	0.067	1.462	0.031	1.231	0.828	0.015	0.679	0.017	0.839	232.3
15	0.89	636.5	443.9	1.167	0.067	1.462	0.031	1.233	0.831	0.015	0.682	0.017	0.844	219.2
16	0.89	672.2	445.3	1.070	0.061	1.462	0.031	1.230	0.825	0.014	0.677	0.017	0.834	245.6
18	0.89	656.7	451.0	1.126	0.065	1.462	0.031	1.231	0.828	0.014	0.679	0.017	0.838	234.3
18	0.89	651.4	451.0	1.141	0.066	1.462	0.031	1.231	0.829	0.015	0.680	0.017	0.840	230.2
20	0.89	582.9	455.6	1.394	0.080	1.462	0.031	1.238	0.842	0.015	0.691	0.017	0.865	181.0
20	0.89	635.7	455.6	1.200	0.069	1.462	0.031	1.233	0.831	0.015	0.682	0.017	0.845	218.9
21	0.89	624.9	449.3	1.218	0.072	1.462	0.031	1.234	0.833	0.015	0.684	0.017	0.848	211.1
28	0.89	625.5	448.7	1.214	0.070	1.462	0.031	1.234	0.833	0.015	0.683	0.017	0.848	211.5
28	0.89	623.6	448.7	1.221	0.070	1.462	0.031	1.234	0.833	0.015	0.684	0.017	0.849	210.0
28	0.89	620.8	448.7	1.230	0.071	1.462	0.031	1.234	0.834	0.015	0.684	0.017	0.850	207.9
31	0.89	649.0	452.2	1.151	0.066	1.462	0.031	1.232	0.829	0.015	0.680	0.017	0.840	228.4
31	0.89	652.9	452.2	1.139	0.065	1.462	0.031	1.231	0.828	0.015	0.679	0.017	0.839	231.4
32	0.89	589.7	454.4	1.362	0.079	1.462	0.031	1.237	0.841	0.015	0.690	0.017	0.862	186.0
34	0.89	678.6	460.5	1.090	0.063	1.462	0.031	1.229	0.824	0.014	0.676	0.017	0.832	250.6
37	0.89	553.0	442.4	1.490	0.092	1.462	0.031	1.242	0.851	0.015	0.699	0.018	0.881	160.5
38	0.89	594.4	442.3	1.307	0.076	1.462	0.031	1.237	0.840	0.015	0.689	0.017	0.860	189.2
42	0.89	677.9	453.5	1.075	0.062	1.462	0.031	1.230	0.825	0.014	0.676	0.017	0.832	250.0
45	0.89	618.4	450.2	1.242	0.071	1.462	0.031	1.234	0.834	0.015	0.685	0.017	0.851	206.2
45	0.89	620.3	450.2	1.236	0.071	1.462	0.031	1.234	0.834	0.015	0.684	0.017	0.850	207.6
53	0.89	688.0	469.9	1.088	0.063	1.462	0.031	1.229	0.823	0.014	0.675	0.017	0.830	257.6
59	0.89	732.3	455.8	0.957	0.055	1.462	0.031	1.227	0.818	0.014	0.671	0.017	0.821	291.6
59	0.89	723.2	455.8	0.976	0.056	1.462	0.031	1.227	0.819	0.014	0.671	0.017	0.823	284.6
59	0.89	733.6	455.8	0.954	0.055	1.462	0.031	1.226	0.818	0.014	0.671	0.017	0.821	292.3
60	0.89	706.4	442.3	0.982	0.057	1.462	0.031	1.228	0.821	0.014	0.673	0.017	0.826	271.4
64	0.89	741.7	445.5	0.917	0.052	1.462	0.031	1.226	0.817	0.014	0.670	0.017	0.819	298.8
64	0.89	758.4	445.5	0.887	0.050	1.462	0.031	1.225	0.816	0.014	0.669	0.017	0.817	312.1
64	0.89	750.6	445.5	0.901	0.051	1.462	0.031	1.226	0.817	0.014	0.669	0.017	0.818	306.0

********** STEADY STATE TEST K **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.10	755.2	458.6	0.92	0.053	1.04	0.08	1.32	0.85	346.3
3	1.10	774.1	468.9	0.91	0.052	1.02	0.08	1.32	0.85	363.5
14	1.10	730.4	445.9	0.94	0.055	1.07	0.09	1.32	0.85	323.7
16	1.10	784.1	445.2	0.84	0.049	0.95	0.07	1.32	0.84	373.1
16	1.10	789.5	445.2	0.83	0.048	0.94	0.07	1.32	0.84	378.0
18	1.10	768.3	451.0	0.88	0.050	0.99	0.08	1.32	0.85	358.4
18	1.10	754.8	451.0	0.90	0.052	1.02	0.08	1.32	0.85	345.9
18	1.10	775.2	451.0	0.87	0.049	0.98	0.08	1.32	0.85	364.6
20	1.10	706.3	455.6	1.01	0.058	1.16	0.10	1.32	0.86	301.9
20	1.10	754.6	455.6	0.91	0.053	1.04	0.08	1.32	0.85	345.7
20	1.10	765.4	455.6	0.89	0.051	1.01	0.08	1.32	0.85	355.6
21	1.10	749.1	449.3	0.91	0.052	1.03	0.08	1.32	0.85	340.5
32	1.10	772.3	454.4	0.88	0.050	0.99	0.08	1.32	0.85	361.8
37	1.10	740.3	443.0	0.91	0.052	1.04	0.08	1.32	0.85	332.6
38	1.10	758.2	443.8	0.88	0.050	1.00	0.08	1.32	0.85	349.1
45	1.10	755.9	450.2	0.90	0.052	1.02	0.08	1.32	0.85	347.0
45	1.10	754.9	450.2	0.90	0.052	1.02	0.08	1.32	0.85	346.0
45	1.10	752.6	450.2	0.91	0.052	1.03	0.08	1.32	0.85	343.8
47	1.10	760.1	444.0	0.88	0.050	1.00	0.08	1.32	0.85	350.9
60	1.10	785.3	441.9	0.83	0.048	0.94	0.07	1.32	0.84	374.3
64	1.10	792.9	444.2	0.83	0.047	0.93	0.07	1.32	0.84	381.2
64	1.10	793.1	444.2	0.83	0.047	0.93	0.07	1.32	0.84	381.4

********** STEADY STATE TEST K **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E7														
34	0.85	622.7	460.4	1.256	0.073	1.406	0.031	1.186	0.832	0.011	0.685	0.013	0.842	191.7
50	0.85	600.3	447.4	1.300	0.075	1.406	0.031	1.188	0.837	0.011	0.689	0.013	0.850	176.4
LEVEL E8														
34	0.87	665.9	460.4	1.123	0.065	1.440	0.031	1.211	0.827	0.013	0.679	0.015	0.833	232.9
LEVEL F1														
17	0.93	604.0	452.0	1.299	0.074	1.505	0.032	1.271	0.833	0.020	0.681	0.024	0.861	209.9
21	0.93	661.1	449.3	1.109	0.064	1.505	0.032	1.266	0.823	0.020	0.672	0.023	0.842	253.3
34	0.93	710.3	460.4	1.013	0.058	1.505	0.032	1.263	0.816	0.020	0.666	0.023	0.830	292.2
37	0.93	652.3	441.9	1.115	0.064	1.505	0.032	1.267	0.824	0.020	0.673	0.023	0.845	246.6
38	0.93	658.5	442.3	1.099	0.063	1.505	0.032	1.266	0.823	0.020	0.672	0.023	0.843	251.5
50	0.93	705.4	447.4	0.995	0.057	1.505	0.032	1.263	0.817	0.020	0.667	0.023	0.831	288.2
LEVEL F2														
1	0.95	669.8	443.3	1.071	0.061	1.538	0.032	1.294	0.813	0.031	0.660	0.035	0.844	274.3
14	0.95	667.5	444.6	1.081	0.063	1.538	0.032	1.294	0.814	0.031	0.660	0.035	0.845	272.4
17	0.95	674.2	450.0	1.076	0.061	1.538	0.032	1.294	0.813	0.031	0.659	0.035	0.843	278.0
34	0.95	724.4	458.3	0.978	0.056	1.538	0.032	1.291	0.807	0.030	0.654	0.035	0.832	319.0
38	0.95	682.8	440.3	1.032	0.059	1.538	0.032	1.293	0.812	0.031	0.658	0.035	0.841	284.8
50	0.95	720.1	445.4	0.960	0.055	1.538	0.032	1.291	0.807	0.030	0.655	0.035	0.833	315.2
LEVEL F3														
14	0.98	685.4	444.6	1.036	0.060	1.571	0.033	1.321	0.794	0.059	0.637	0.066	0.844	301.7
17	0.98	690.0	452.0	1.042	0.059	1.571	0.033	1.320	0.793	0.060	0.636	0.066	0.843	305.6
21	0.98	693.7	449.3	1.027	0.058	1.571	0.033	1.320	0.793	0.060	0.636	0.066	0.842	308.8
34	0.98	746.0	460.4	0.940	0.054	1.571	0.033	1.317	0.788	0.059	0.632	0.065	0.832	353.7
60	0.98	737.7	441.9	0.917	0.053	1.571	0.033	1.318	0.788	0.059	0.632	0.066	0.833	346.6

********** STEADY STATE TEST K **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F4										
60	1.00	651.9	441.9	1.12	0.064	1.12	0.09	1.60	0.86	289.3
LEVEL F5										
21	1.02	648.7	449.3	1.14	0.065	1.18	0.09	1.53	0.86	280.6
60	1.02	696.1	441.9	1.00	0.057	1.03	0.07	1.53	0.85	321.6
LEVEL F6										
1	1.04	717.8	459.1	0.99	0.058	1.04	0.08	1.45	0.85	333.6
17	1.04	702.3	453.0	1.01	0.058	1.07	0.08	1.45	0.85	319.9
37	1.04	695.7	442.2	1.01	0.058	1.06	0.08	1.45	0.85	314.3
38	1.04	698.3	442.8	1.00	0.057	1.05	0.08	1.45	0.85	316.7
50	1.04	752.3	448.6	0.90	0.052	0.95	0.07	1.45	0.84	364.6
60	1.04	741.6	442.4	0.91	0.052	0.95	0.07	1.45	0.84	355.0
LEVEL F7										
14	1.06	709.9	444.6	0.98	0.056	1.06	0.08	1.41	0.85	320.6
17	1.06	721.8	452.7	0.97	0.055	1.04	0.08	1.41	0.85	331.1
21	1.06	719.1	449.3	0.97	0.055	1.04	0.08	1.41	0.85	328.6
37	1.06	715.8	441.9	0.96	0.055	1.03	0.08	1.41	0.85	326.0
38	1.06	721.4	442.3	0.95	0.054	1.02	0.08	1.41	0.85	330.8
50	1.06	774.1	447.4	0.86	0.049	0.92	0.07	1.41	0.84	378.6
60	1.06	763.6	441.9	0.87	0.050	0.93	0.07	1.41	0.84	368.8
LEVEL F8										
1	1.08	754.7	460.1	0.92	0.053	1.02	0.08	1.35	0.85	351.2
17	1.08	734.1	453.2	0.95	0.054	1.05	0.08	1.35	0.85	332.7
21	1.08	741.4	450.5	0.93	0.053	1.03	0.08	1.35	0.85	339.2
34	1.08	793.2	461.6	0.86	0.049	0.94	0.07	1.35	0.84	386.8
37	1.08	733.1	443.1	0.93	0.053	1.03	0.08	1.35	0.85	331.8
50	1.08	796.4	448.6	0.83	0.047	0.91	0.07	1.35	0.84	389.9
60	1.08	782.8	443.1	0.84	0.048	0.93	0.07	1.35	0.84	377.2

STEADY STATE TEST L

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST L **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.882E+05 LBM/SQFT H — 526.73 KG/SQM S
UNC. MASS FLUX 8.711E+03 LBM/SQFT H — 11.8214 KG/SQM S
PRESSURE 1202.5 PSI — 8.30 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.487	783.3	0.047	14.95	1229.7	665.7	92.74	51.523	567.4	297.8	0.621	0.3	.8214	.0308
G	2.473	779.1	0.061	19.11	1313.1	712.1	44.80	24.889	570.5	299.5	19.280	10.7	1.0054	.0353
E3	2.464	776.1	0.049	15.38	1132.4	611.7	30.17	16.761	567.4	297.8	0.621	0.3	.7122	.0284
E6	2.435	767.0	0.000	0.00	1213.0	656.4	0.00	0.000	567.4	297.8	0.621	0.3	.7647	.0296
E7	2.492	785.0	0.051	16.15	1202.6	650.7	13.93	7.739	567.4	297.8	0.621	0.3	.7824	.0299
E8	2.476	779.8	0.046	14.44	1180.4	638.4	67.45	37.472	567.4	297.8	0.621	0.3	.8056	.0304
F1	2.451	772.2	0.068	21.49	1251.2	677.7	36.51	20.284	567.4	297.8	0.621	0.3	.8512	.0316
F2	2.473	778.9	0.029	9.24	1270.6	688.5	47.08	26.155	567.4	297.8	0.621	0.3	.8744	.0323
F3	2.449	771.6	0.075	23.62	1292.3	700.5	53.83	29.904	567.4	297.8	0.621	0.3	.8977	.0330
F4	2.373	747.4	0.088	27.73	1115.4	602.2	67.03	37.241	567.4	297.8	0.621	0.3	.9191	.0336
F5	2.409	758.8	0.088	27.84	1164.9	629.7	49.20	27.334	567.4	297.8	0.621	0.3	.9348	.0338
F6	2.446	770.5	0.067	20.98	1234.4	668.3	38.19	21.219	567.4	297.8	0.621	0.3	.9516	.0341
F7	2.442	769.1	0.055	17.45	1251.1	677.6	37.52	20.846	567.4	297.8	0.621	0.3	.9674	.0345
F8	2.462	775.5	0.068	21.55	1294.4	701.7	44.50	24.725	567.4	297.8	0.621	0.3	.9896	.0350

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test L

T/C Level	(# wet T/C)/(Total # T/C)
E1	All wet
E2	1/3
E3	4/7
E6	1/2
E7	2/4
E8	2/5
F	All dry

********** STEADY STATE TEST L **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.82	632.6	815.0	2.435	0.149	3.642	0.073	2.880	1.766	0.021	1.651	0.025	1.696	492.9
4	0.82	646.0	810.0	2.326	0.140	3.642	0.073	2.876	1.759	0.020	1.644	0.025	1.684	513.9
7	0.82	602.6	772.3	2.534	0.161	3.642	0.073	2.890	1.786	0.021	1.670	0.026	1.730	446.4
7	0.82	595.1	772.3	2.598	0.162	3.642	0.073	2.893	1.791	0.021	1.675	0.026	1.739	435.0
10	0.82	683.6	790.4	2.049	0.127	3.642	0.073	2.867	1.742	0.020	1.627	0.025	1.654	573.8
10	0.82	687.8	790.4	2.027	0.127	3.642	0.073	2.866	1.740	0.020	1.625	0.024	1.651	580.2
10	0.82	680.9	790.4	2.063	0.129	3.642	0.073	2.868	1.743	0.020	1.628	0.025	1.656	569.4
13	0.82	682.4	792.2	2.060	0.124	3.642	0.073	2.868	1.742	0.020	1.627	0.024	1.655	571.9
13	0.82	675.4	792.2	2.098	0.132	3.642	0.073	2.869	1.745	0.020	1.630	0.025	1.660	561.0
15	0.82	668.3	771.8	2.083	0.124	3.642	0.073	2.871	1.748	0.020	1.633	0.024	1.665	549.4
16	0.82	706.4	773.2	1.892	0.113	3.642	0.073	2.863	1.733	0.020	1.618	0.024	1.639	610.9
17	0.82	577.8	782.9	2.796	0.168	3.642	0.073	2.900	1.805	0.021	1.689	0.026	1.764	408.5
18	0.82	644.6	783.5	2.259	0.140	3.642	0.073	2.877	1.760	0.021	1.644	0.025	1.685	512.1
18	0.82	615.2	783.5	2.469	0.153	3.642	0.073	2.886	1.777	0.021	1.661	0.025	1.715	466.2
20	0.82	570.6	792.1	2.904	0.177	3.642	0.073	2.904	1.812	0.021	1.696	0.026	1.776	397.7
20	0.82	635.9	792.1	2.342	0.139	3.642	0.073	2.879	1.764	0.020	1.649	0.025	1.693	498.3
21	0.82	536.2	781.4	3.278	0.238	3.642	0.073	2.923	1.850	0.026	1.733	0.029	1.844	346.1
28	0.82	638.2	777.2	2.284	0.136	3.642	0.073	2.879	1.763	0.020	1.648	0.025	1.691	501.8
28	0.82	641.6	777.2	2.261	0.135	3.642	0.073	2.878	1.761	0.020	1.646	0.025	1.688	507.2
28	0.82	631.3	777.2	2.330	0.141	3.642	0.073	2.881	1.767	0.020	1.652	0.025	1.698	490.9
31	0.82	674.3	785.3	2.086	0.126	3.642	0.073	2.869	1.745	0.020	1.630	0.024	1.661	559.2
31	0.82	678.3	785.3	2.064	0.124	3.642	0.073	2.868	1.744	0.020	1.629	0.024	1.658	565.7
32	0.82	714.2	790.3	1.898	0.112	3.642	0.073	2.861	1.730	0.020	1.616	0.024	1.635	623.7
34	0.82	680.4	798.2	2.086	0.128	3.642	0.073	2.868	1.743	0.020	1.628	0.024	1.656	568.7
37	0.82	633.2	770.7	2.298	0.160	3.642	0.073	2.880	1.766	0.022	1.651	0.026	1.696	493.8
38	0.82	664.6	773.5	2.109	0.129	3.642	0.073	2.872	1.750	0.020	1.635	0.025	1.668	543.4
42	0.82	692.9	785.0	1.987	0.124	3.642	0.073	2.865	1.738	0.020	1.623	0.024	1.648	588.6
45	0.82	642.5	782.4	2.270	0.136	3.642	0.073	2.877	1.761	0.020	1.646	0.025	1.687	508.8
45	0.82	646.1	782.4	2.246	0.135	3.642	0.073	2.876	1.759	0.020	1.644	0.025	1.684	514.1
53	0.82	704.8	815.7	2.004	0.121	3.642	0.073	2.863	1.733	0.020	1.619	0.024	1.640	608.2
59	0.82	718.6	790.1	1.878	0.112	3.642	0.073	2.861	1.729	0.020	1.614	0.024	1.632	631.0
59	0.82	715.2	790.1	1.893	0.111	3.642	0.073	2.861	1.730	0.020	1.615	0.024	1.634	625.4
59	0.82	726.6	790.1	1.843	0.114	3.642	0.073	2.859	1.726	0.020	1.612	0.024	1.628	643.8
60	0.82	720.0	767.0	1.817	0.111	3.642	0.073	2.860	1.728	0.020	1.614	0.024	1.631	632.9
64	0.82	743.7	771.5	1.730	0.101	3.642	0.073	2.857	1.721	0.020	1.607	0.024	1.619	672.0
64	0.82	768.1	771.5	1.641	0.096	3.642	0.073	2.853	1.715	0.019	1.600	0.024	1.608	713.1
64	0.82	761.6	771.5	1.664	0.097	3.642	0.073	2.854	1.716	0.019	1.602	0.024	1.611	702.1

********** STEADY STATE TEST L **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.01	721.7	793.9	1.87	0.114	1.88	0.12	4.08	1.72	846.6
3	1.01	714.2	814.5	1.96	0.116	1.96	0.13	4.08	1.72	831.4
14	1.01	682.1	775.8	2.02	0.130	2.03	0.14	4.08	1.74	767.3
16	1.01	731.7	773.2	1.78	0.109	1.79	0.12	4.08	1.71	867.0
16	1.01	744.8	773.2	1.73	0.104	1.74	0.11	4.08	1.70	893.6
18	1.01	696.9	781.8	1.96	0.116	1.97	0.13	4.08	1.73	796.9
18	1.01	688.4	781.8	2.00	0.121	2.01	0.13	4.08	1.74	780.0
18	1.01	702.6	781.8	1.93	0.114	1.94	0.13	4.08	1.73	808.2
20	1.01	655.9	792.1	2.21	0.131	2.22	0.15	4.08	1.76	715.9
20	1.01	704.7	792.1	1.95	0.120	1.95	0.13	4.08	1.73	812.5
20	1.01	706.3	792.1	1.94	0.117	1.95	0.13	4.08	1.73	815.6
21	1.01	684.7	753.2	1.95	0.113	1.96	0.13	4.08	1.74	772.5
32	1.01	731.7	790.3	1.82	0.109	1.83	0.12	4.08	1.71	866.9
34	1.01	737.3	796.4	1.81	0.109	1.82	0.12	4.08	1.71	878.3
37	1.01	683.2	771.4	2.00	0.120	2.01	0.13	4.08	1.74	769.6
38	1.01	695.5	774.6	1.95	0.117	1.96	0.13	4.08	1.73	794.0
42	1.01	726.7	785.0	1.83	0.138	1.84	0.15	4.08	1.71	856.8
42	1.01	740.6	785.0	1.77	0.107	1.78	0.12	4.08	1.71	885.0
45	1.01	698.3	782.4	1.95	0.120	1.96	0.13	4.08	1.73	799.6
45	1.01	696.5	782.4	1.96	0.120	1.97	0.13	4.08	1.73	796.0
45	1.01	699.2	782.4	1.95	0.119	1.96	0.13	4.08	1.73	801.5
47	1.01	698.9	773.5	1.93	0.118	1.94	0.13	4.08	1.73	800.8
50	1.01	739.6	773.5	1.75	0.103	1.76	0.11	4.08	1.71	882.9
58	1.01	741.4	798.7	1.80	0.109	1.81	0.12	4.08	1.71	886.8
60	1.01	727.4	767.0	1.79	0.111	1.79	0.12	4.08	1.71	858.3
64	1.01	747.9	771.5	1.71	0.101	1.72	0.11	4.08	1.70	900.0
64	1.01	753.3	771.5	1.69	0.100	1.70	0.11	4.08	1.70	911.1

********** STEADY STATE TEST L **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E3														
34	0.71	597.0	793.5	2.652	0.179	3.279	0.072	2.606	1.701	0.023	1.573	0.027	1.683	365.9
50	0.71	608.1	770.7	2.484	0.165	3.279	0.072	2.602	1.694	0.023	1.566	0.027	1.670	380.8
60	0.71	629.9	764.2	2.301	0.143	3.279	0.072	2.596	1.681	0.022	1.553	0.026	1.646	410.4
LEVEL E6														
60	0.76	656.4	767.0	2.139	0.129	3.455	0.072	2.727	1.713	0.021	1.592	0.025	1.648	484.6
LEVEL E7														
34	0.78	656.2	796.4	2.222	0.139	3.514	0.072	2.772	1.727	0.021	1.608	0.025	1.656	497.7
50	0.78	645.2	773.5	2.227	0.136	3.514	0.072	2.775	1.732	0.021	1.614	0.025	1.666	481.4
LEVEL E8														
34	0.81	675.9	796.4	2.106	0.130	3.590	0.073	2.827	1.734	0.020	1.618	0.024	1.652	547.6
37	0.81	600.9	769.9	2.540	0.155	3.590	0.073	2.849	1.776	0.021	1.659	0.025	1.724	431.8
38	0.81	638.2	773.2	2.271	0.136	3.590	0.073	2.837	1.753	0.020	1.636	0.025	1.683	488.8
LEVEL F1														
17	0.85	664.1	782.9	2.137	0.125	3.740	0.074	2.947	1.767	0.021	1.654	0.025	1.682	568.5
21	0.85	644.8	781.6	2.252	0.136	3.740	0.074	2.952	1.777	0.021	1.663	0.026	1.699	537.3
34	0.85	698.7	796.4	1.987	0.122	3.740	0.074	2.939	1.753	0.020	1.639	0.025	1.657	626.4
37	0.85	668.2	769.9	2.079	0.124	3.740	0.074	2.946	1.765	0.021	1.652	0.025	1.679	575.3
38	0.85	682.9	773.2	2.008	0.119	3.740	0.074	2.942	1.759	0.020	1.646	0.025	1.668	600.2
50	0.85	702.7	773.5	1.911	0.113	3.740	0.074	2.938	1.751	0.020	1.638	0.025	1.655	633.2
LEVEL F2														
1	0.87	676.2	773.8	2.045	0.123	3.815	0.075	3.006	1.772	0.022	1.660	0.027	1.684	612.4
14	0.87	643.6	774.2	2.239	0.145	3.815	0.075	3.014	1.788	0.022	1.675	0.028	1.711	556.9
17	0.87	687.3	782.7	2.009	0.117	3.815	0.075	3.003	1.768	0.021	1.655	0.027	1.676	631.3
34	0.87	713.2	796.2	1.917	0.117	3.815	0.075	2.998	1.758	0.021	1.645	0.027	1.659	676.5
38	0.87	698.8	773.0	1.928	0.114	3.815	0.075	3.001	1.763	0.021	1.651	0.027	1.668	651.3
50	0.87	711.7	773.4	1.869	0.110	3.815	0.075	2.998	1.759	0.021	1.646	0.027	1.660	673.8
LEVEL F3														
14	0.90	665.9	773.8	2.102	0.130	3.891	0.077	3.067	1.785	0.024	1.672	0.031	1.702	617.7
17	0.90	690.3	782.9	1.995	0.117	3.891	0.077	3.061	1.774	0.023	1.661	0.030	1.684	661.1
21	0.90	673.3	781.6	2.081	0.122	3.891	0.077	3.065	1.782	0.024	1.668	0.030	1.697	630.8
34	0.90	736.6	796.4	1.815	0.110	3.891	0.077	3.053	1.758	0.023	1.645	0.030	1.657	743.8
60	0.90	734.1	767.0	1.758	0.110	3.891	0.077	3.053	1.759	0.023	1.646	0.030	1.658	739.2
LEVEL F4														
60	0.92	628.6	767.0	2.319	0.141	3.960	0.077	3.132	1.809	0.028	1.694	0.037	1.746	573.6
LEVEL F5														
21	0.93	602.5	781.6	2.565	0.153	4.010	0.077	3.182	1.827	0.034	1.710	0.044	1.784	545.5
60	0.93	657.2	767.0	2.134	0.128	4.010	0.077	3.164	1.794	0.033	1.677	0.043	1.727	641.5
LEVEL F6														
1	0.95	676.7	794.8	2.098	0.137	4.064	0.077	3.202	1.782	0.044	1.663	0.056	1.719	696.4
17	0.95	658.2	784.0	2.176	0.131	4.064	0.077	3.207	1.790	0.044	1.671	0.057	1.734	662.3
37	0.95	647.7	770.2	2.201	0.133	4.064	0.077	3.210	1.796	0.044	1.676	0.057	1.743	643.2
38	0.95	644.6	774.0	2.232	0.133	4.064	0.077	3.211	1.797	0.044	1.678	0.057	1.746	637.5
50	0.95	696.8	775.1	1.943	0.117	4.064	0.077	3.197	1.774	0.044	1.655	0.056	1.704	734.4
60	0.95	694.1	767.8	1.937	0.115	4.064	0.077	3.198	1.775	0.044	1.656	0.056	1.706	729.3
LEVEL F7														
14	0.97	661.1	774.2	2.131	0.133	4.114	0.078	3.244	1.781	0.089	1.658	0.089	1.738	686.2
17	0.97	676.5	783.8	2.070	0.123	4.114	0.078	3.240	1.774	0.090	1.651	0.088	1.726	715.2
21	0.97	659.3	782.0	2.163	0.127	4.114	0.078	3.244	1.782	0.090	1.658	0.089	1.739	683.0
37	0.97	661.6	770.0	2.116	0.127	4.114	0.078	3.244	1.781	0.090	1.657	0.089	1.737	687.2
38	0.97	668.6	773.6	2.087	0.124	4.114	0.078	3.242	1.778	0.090	1.654	0.089	1.732	700.2
50	0.97	711.7	774.0	1.870	0.112	4.114	0.078	3.232	1.761	0.089	1.637	0.088	1.702	781.1
60	0.97	707.9	767.4	1.871	0.111	4.114	0.078	3.232	1.762	0.089	1.639	0.088	1.704	773.8

********** STEADY STATE TEST L **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F8														
1	0.99	721.9	795.3	1.875	0.113	4.185	0.101	3.287	1.728	0.090	1.593	0.117	1.706	832.8
17	0.99	680.5	784.3	2.049	0.121	4.185	0.101	3.296	1.743	0.091	1.608	0.118	1.733	751.6
21	0.99	675.1	783.0	2.076	0.122	4.185	0.101	3.298	1.745	0.091	1.610	0.118	1.737	741.6
34	0.99	721.2	797.8	1.884	0.115	4.185	0.101	3.287	1.728	0.090	1.593	0.117	1.706	831.5
37	0.99	677.7	771.3	2.030	0.121	4.185	0.101	3.297	1.744	0.091	1.609	0.118	1.735	746.7
50	0.99	729.7	774.9	1.794	0.107	4.185	0.101	3.286	1.725	0.090	1.591	0.116	1.701	848.4
60	0.99	725.6	768.3	1.796	0.106	4.185	0.101	3.287	1.727	0.090	1.592	0.116	1.704	840.1

STEADY STATE TEST M

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB	- CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT	TSAT	- SATURATION TEMPERATURE
HDB	- DITTUS-BOELTER HEAT TRANSFER COEFFICIENT	TSRF(TSURF)	- SURFACE TEMPERATURE
HDR	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT	TF	- EQUILIBRIUM FLUID TEMPERATURE
HDRPW	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER	UHDR	- UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HEXP	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)	UHEXP	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HEXPS	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)	UHEXPS	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HG57	- GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT	UHG57	- UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59	- GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT	UHG59	- UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q	- HEAT FLUX	UNC	- UNCERTAINTY
QGD	- GROENEVELD-DELORME HEAT FLUX	UTF	- UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
SDTSRF	- CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE	UX	- UNCERTAINTY, QUALITY
SDQ	- CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX	X	- QUALITY
TBULK	- BULK VAPOR TEMPERATURE		

********** STEADY STATE TEST M **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 4.838E+05 LBM/SQFT H
656.51 KG/SQM S

UNC. MASS FLUX 1.090E+04 LBM/SQFT H
14.7924 KG/SQM S

PRESSURE 1242.1 PSI
8.57 MPA

UNC. PRESSURE 6.00 PSI
0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.811	885.3	0.053	16.84	1272.0	689.2	66.76	37.087	571.4	300.0	0.597	0.3	.7677	.0287
G	2.791	879.1	0.068	21.48	1282.3	695.0	40.26	22.367	571.4	300.0	0.597	0.3	.9364	.0328
E2	2.730	860.0	0.000	0.00	1143.8	618.0	0.00	0.000	571.4	300.0	0.597	0.3	.6449	.0258
E3	2.788	878.2	0.055	17.40	1203.5	651.2	6.33	3.518	571.4	300.0	0.597	0.3	.6673	.0265
E6	2.677	843.3	0.098	30.96	1181.7	639.1	33.23	18.463	571.4	300.0	0.597	0.3	.7156	.0275
E7	2.794	880.1	0.051	15.94	1179.0	637.6	58.56	32.532	571.4	300.0	0.597	0.3	.7318	.0279
E8	2.796	880.7	0.050	15.79	1230.2	666.0	26.39	14.661	571.4	300.0	0.597	0.3	.7531	.0283
F1	2.768	872.0	0.077	24.13	1283.4	695.6	36.78	20.433	571.4	300.0	0.597	0.3	.7950	.0294
F2	2.796	880.9	0.031	9.71	1295.4	702.2	48.29	26.829	571.4	300.0	0.597	0.3	.8163	.0300
F3	2.764	870.8	0.084	26.55	1301.1	705.4	49.01	27.229	571.4	300.0	0.597	0.3	.8376	.0307
F4	2.677	843.3	0.098	30.96	1092.1	589.3	46.74	25.967	571.4	300.0	0.597	0.3	.8572	.0312
F5	2.718	856.1	0.099	31.07	1137.8	614.7	44.28	24.599	571.4	300.0	0.597	0.3	.8717	.0315
F6	2.760	869.5	0.075	23.52	1205.4	652.2	37.20	20.667	571.4	300.0	0.597	0.3	.8870	.0318
F7	2.759	869.2	0.062	19.65	1221.0	660.9	30.78	17.099	571.4	300.0	0.597	0.3	.9015	.0320
F8	2.777	874.9	0.077	24.15	1264.3	684.9	39.69	22.049	571.4	300.0	0.597	0.3	.9219	.0325

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test M

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	53/60
E1	1/4
E2	2/3
E3	3/7
E6	0.2
E7	1/4
E8	2/5
F	All dry

********** STEADY STATE TEST M **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.77	673.1	921.7	2.471	0.151	4.224	0.084	3.309	2.014	0.024	1.957	0.030	1.937	644.8
4	0.77	672.4	915.5	2.458	0.149	4.224	0.084	3.309	2.015	0.024	1.958	0.030	1.938	643.7
7	0.77	676.5	874.5	2.323	0.147	4.224	0.084	3.308	2.012	0.024	1.955	0.030	1.934	651.3
7	0.77	675.1	874.5	2.331	0.144	4.224	0.084	3.308	2.013	0.024	1.956	0.030	1.935	648.7
10	0.77	684.0	893.8	2.327	0.148	4.224	0.084	3.306	2.009	0.024	1.952	0.030	1.928	665.5
10	0.77	691.6	893.8	2.283	0.146	4.224	0.084	3.304	2.005	0.024	1.948	0.030	1.921	679.3
10	0.77	684.2	893.8	2.326	0.150	4.224	0.084	3.306	2.009	0.024	1.952	0.030	1.927	665.8
13	0.77	706.5	894.5	2.200	0.133	4.224	0.084	3.301	1.999	0.023	1.941	0.029	1.910	707.2
13	0.77	698.4	894.5	2.245	0.144	4.224	0.084	3.303	2.002	0.024	1.945	0.030	1.916	691.9
15	0.77	677.8	871.8	2.307	0.139	4.224	0.084	3.308	2.012	0.024	1.955	0.030	1.933	653.8
16	0.77	713.1	874.1	2.116	0.129	4.224	0.084	3.299	1.996	0.023	1.939	0.029	1.906	719.8
17	0.77	682.2	885.2	2.316	0.137	4.224	0.084	3.307	2.010	0.023	1.953	0.029	1.929	662.0
18	0.77	647.6	885.3	2.547	0.161	4.224	0.084	3.316	2.029	0.024	1.972	0.030	1.962	598.2
18	0.77	613.6	885.3	2.823	0.180	4.224	0.084	3.329	2.052	0.025	1.996	0.031	2.003	536.7
20	0.77	584.6	895.4	3.146	0.194	4.224	0.084	3.342	2.078	0.025	2.022	0.031	2.048	486.5
20	0.77	648.8	895.4	2.567	0.154	4.224	0.084	3.316	2.028	0.024	1.971	0.030	1.960	600.5
21	0.77	618.2	881.5	2.771	0.198	4.224	0.084	3.327	2.049	0.026	1.992	0.032	1.997	545.0
28	0.77	695.2	879.9	2.227	0.133	4.224	0.084	3.303	2.004	0.023	1.946	0.029	1.919	685.6
28	0.77	683.8	879.9	2.292	0.138	4.224	0.084	3.306	2.009	0.024	1.952	0.030	1.928	665.2
28	0.77	681.8	879.9	2.304	0.139	4.224	0.084	3.307	2.010	0.024	1.953	0.030	1.929	661.4
31	0.77	677.7	886.7	2.347	0.145	4.224	0.084	3.308	2.012	0.024	1.955	0.030	1.933	653.6
31	0.77	682.8	886.7	2.316	0.141	4.224	0.084	3.306	2.009	0.024	1.952	0.030	1.929	663.3
32	0.77	724.6	891.5	2.099	0.124	4.224	0.084	3.297	1.991	0.023	1.934	0.029	1.898	742.0
34	0.77	683.7	901.3	2.349	0.147	4.224	0.084	3.306	2.009	0.024	1.952	0.030	1.928	665.0
37	0.77	664.9	869.9	2.384	0.171	4.224	0.084	3.311	2.019	0.025	1.962	0.031	1.944	629.6
38	0.77	692.2	874.9	2.231	0.138	4.224	0.084	3.304	2.005	0.024	1.948	0.030	1.921	680.4
42	0.77	694.4	886.8	2.248	0.144	4.224	0.084	3.304	2.004	0.024	1.947	0.030	1.919	684.2
45	0.77	685.4	884.3	2.295	0.137	4.224	0.084	3.306	2.008	0.024	1.951	0.029	1.926	668.1
45	0.77	692.2	884.3	2.255	0.135	4.224	0.084	3.304	2.005	0.023	1.948	0.029	1.921	680.4
53	0.77	720.1	922.0	2.195	0.135	4.224	0.084	3.298	1.993	0.023	1.936	0.029	1.901	733.3
59	0.77	716.9	893.4	2.143	0.129	4.224	0.084	3.299	1.994	0.023	1.937	0.029	1.903	727.1
59	0.77	711.6	893.4	2.171	0.129	4.224	0.084	3.300	1.997	0.023	1.939	0.029	1.907	717.0
59	0.77	724.4	893.4	2.105	0.134	4.224	0.084	3.297	1.992	0.023	1.934	0.029	1.898	741.5
60	0.77	726.8	866.6	2.030	0.126	4.224	0.084	3.297	1.991	0.023	1.933	0.029	1.896	746.3
64	0.77	751.3	871.5	1.931	0.114	4.224	0.084	3.292	1.982	0.023	1.925	0.029	1.882	792.7
64	0.77	768.2	871.5	1.861	0.109	4.224	0.084	3.290	1.977	0.023	1.919	0.029	1.873	825.7
64	0.77	769.8	871.5	1.855	0.109	4.224	0.084	3.289	1.977	0.023	1.919	0.029	1.873	828.9
LEVEL G														
1	0.94	715.3	895.4	2.156	0.135	4.892	0.089	3.821	2.090	0.038	2.042	0.052	2.003	944.6
3	0.94	702.2	919.0	2.285	0.138	4.892	0.089	3.825	2.095	0.038	2.047	0.052	2.013	914.6
14	0.94	678.4	876.7	2.317	0.155	4.892	0.089	3.831	2.107	0.039	2.059	0.053	2.033	860.8
16	0.94	707.0	872.7	2.144	0.136	4.892	0.089	3.823	2.093	0.038	2.045	0.052	2.009	925.6
16	0.94	725.9	872.7	2.049	0.126	4.892	0.089	3.819	2.085	0.038	2.037	0.052	1.996	969.0
18	0.94	680.2	882.5	2.321	0.140	4.892	0.089	3.831	2.106	0.038	2.058	0.052	2.031	864.8
18	0.94	676.8	882.5	2.342	0.144	4.892	0.089	3.832	2.108	0.039	2.060	0.052	2.034	857.3
18	0.94	684.8	882.5	2.293	0.138	4.892	0.089	3.829	2.104	0.038	2.056	0.052	2.027	875.3
20	0.94	640.1	894.0	2.629	0.158	4.892	0.089	3.844	2.130	0.039	2.083	0.053	2.072	775.4
20	0.94	693.2	894.0	2.273	0.144	4.892	0.089	3.827	2.100	0.038	2.052	0.052	2.020	894.3
20	0.94	688.7	894.0	2.300	0.142	4.892	0.089	3.828	2.102	0.038	2.054	0.052	2.024	884.0
21	0.94	666.2	850.6	2.323	0.137	4.892	0.089	3.835	2.114	0.039	2.066	0.053	2.044	833.5
32	0.94	719.1	890.1	2.124	0.130	4.892	0.089	3.820	2.088	0.038	2.040	0.052	2.000	953.3
34	0.94	713.7	898.4	2.172	0.135	4.892	0.089	3.822	2.090	0.038	2.042	0.052	2.004	940.9
37	0.94	669.3	870.7	2.358	0.144	4.892	0.089	3.834	2.112	0.039	2.064	0.053	2.041	840.3
38	0.94	678.9	874.5	2.308	0.142	4.892	0.089	3.831	2.107	0.039	2.059	0.052	2.032	862.0
42	0.94	702.1	885.4	2.202	0.180	4.892	0.089	3.825	2.095	0.039	2.047	0.053	2.013	914.5
42	0.94	713.4	885.4	2.142	0.132	4.892	0.089	3.822	2.090	0.038	2.042	0.052	2.004	940.3
45	0.94	686.7	882.9	2.283	0.144	4.892	0.089	3.829	2.103	0.039	2.055	0.052	2.025	879.6
45	0.94	682.4	882.9	2.309	0.145	4.892	0.089	3.830	2.105	0.039	2.057	0.052	2.029	869.8
45	0.94	685.9	882.9	2.288	0.143	4.892	0.089	3.829	2.103	0.039	2.055	0.052	2.026	877.7
47	0.94	679.5	872.3	2.299	0.144	4.892	0.089	3.831	2.106	0.039	2.059	0.052	2.032	863.3
50	0.94	706.1	872.6	2.149	0.130	4.892	0.089	3.824	2.094	0.038	2.046	0.052	2.010	923.5
58	0.94	715.8	902.1	2.169	0.134	4.892	0.089	3.821	2.089	0.038	2.041	0.052	2.003	945.9
60	0.94	706.9	865.2	2.126	0.137	4.892	0.089	3.823	2.093	0.038	2.045	0.052	2.009	925.5
64	0.94	730.6	870.1	2.021	0.122	4.892	0.089	3.818	2.084	0.038	2.035	0.052	1.992	979.8
64	0.94	738.0	870.1	1.987	0.120	4.892	0.089	3.816	2.081	0.038	2.033	0.052	1.988	997.0

********** STEADY STATE TEST M **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E2														
60	0.64	618.0	860.0	2.704	0.175	3.720	0.080	2.934	1.909	0.027	1.824	0.033	1.919	451.3
LEVEL E3														
34	0.67	655.2	897.8	2.527	0.169	3.814	0.082	2.995	1.914	0.026	1.835	0.032	1.892	526.2
50	0.67	649.3	872.1	2.496	0.166	3.814	0.082	2.997	1.918	0.026	1.838	0.032	1.898	516.5
60	0.67	648.9	864.7	2.478	0.156	3.814	0.082	2.997	1.918	0.026	1.839	0.032	1.898	515.8
LEVEL E6														
60	0.72	652.1	865.2	2.457	0.151	4.012	0.083	3.152	1.972	0.025	1.905	0.031	1.925	560.7
LEVEL E7														
34	0.73	658.2	898.4	2.508	0.161	4.078	0.083	3.201	1.986	0.025	1.922	0.031	1.929	585.1
37	0.73	600.1	869.3	2.897	0.180	4.078	0.083	3.222	2.027	0.025	1.963	0.031	2.000	484.2
5C	0.73	654.4	872.6	2.462	0.153	4.078	0.083	3.203	1.989	0.025	1.925	0.030	1.933	578.2
LEVEL E8														
34	0.75	679.4	898.8	2.369	0.150	4.165	0.083	3.263	1.997	0.024	1.937	0.030	1.923	642.7
37	0.75	650.3	869.6	2.482	0.151	4.165	0.083	3.271	2.013	0.024	1.953	0.030	1.950	589.6
38	0.75	668.3	873.7	2.372	0.143	4.165	0.083	3.266	2.003	0.024	1.943	0.030	1.933	622.6
LEVEL F1														
17	0.79	702.5	884.3	2.197	0.129	4.334	0.085	3.387	2.025	0.023	1.972	0.029	1.929	729.0
21	0.79	653.3	882.0	2.497	0.153	4.334	0.085	3.400	2.050	0.024	1.998	0.030	1.972	634.2
34	0.79	694.8	898.9	2.277	0.143	4.334	0.085	3.389	2.028	0.023	1.976	0.030	1.935	713.8
37	0.79	689.8	869.8	2.231	0.134	4.334	0.085	3.390	2.030	0.023	1.978	0.029	1.939	704.2
38	0.79	704.3	873.8	2.161	0.129	4.334	0.085	3.387	2.024	0.023	1.971	0.029	1.928	732.6
50	0.79	714.6	873.2	2.106	0.125	4.334	0.085	3.384	2.020	0.023	1.967	0.029	1.921	752.9
LEVEL F2														
1	0.82	713.1	881.8	2.134	0.129	4.419	0.086	3.454	2.037	0.023	1.988	0.030	1.935	775.7
14	0.82	648.4	875.3	2.512	0.168	4.419	0.086	3.471	2.070	0.025	2.021	0.031	1.991	648.6
17	0.82	708.6	883.8	2.163	0.127	4.419	0.086	3.455	2.039	0.023	1.990	0.030	1.938	766.4
34	0.82	707.6	898.4	2.204	0.137	4.419	0.086	3.455	2.040	0.023	1.990	0.030	1.939	764.5
38	0.82	713.4	873.3	2.112	0.125	4.419	0.086	3.454	2.037	0.023	1.988	0.030	1.935	776.3
50	0.82	722.1	872.6	2.068	0.123	4.419	0.086	3.452	2.034	0.023	1.984	0.029	1.929	793.3
LEVEL F3														
14	0.84	671.3	874.3	2.355	0.149	4.504	0.087	3.530	2.073	0.024	2.026	0.031	1.981	716.4
17	0.84	703.7	883.8	2.189	0.129	4.504	0.087	3.522	2.057	0.023	2.010	0.030	1.954	781.8
21	0.84	674.0	881.5	2.357	0.139	4.504	0.087	3.529	2.071	0.024	2.024	0.031	1.979	721.9
34	0.84	732.8	898.4	2.076	0.128	4.504	0.087	3.515	2.045	0.023	1.998	0.030	1.934	841.2
60	0.84	728.0	865.2	2.022	0.129	4.504	0.087	3.516	2.047	0.024	2.000	0.030	1.937	831.6
LEVEL F4														
60	0.86	607.6	865.2	2.813	0.176	4.582	0.088	3.616	2.128	0.026	2.084	0.033	2.068	614.0
LEVEL F5														
21	0.87	587.4	881.5	3.067	0.187	4.639	0.088	3.673	2.155	0.026	2.113	0.035	2.110	590.8
60	0.87	635.2	865.2	2.581	0.159	4.639	0.088	3.651	2.115	0.026	2.072	0.034	2.040	686.6
LEVEL F6														
1	0.89	670.5	896.2	2.419	0.164	4.699	0.088	3.686	2.101	0.027	2.057	0.036	2.012	777.7
17	0.89	653.4	885.2	2.505	0.154	4.699	0.088	3.691	2.111	0.027	2.067	0.035	2.029	741.6
37	0.89	626.2	869.5	2.665	0.165	4.699	0.088	3.702	2.129	0.027	2.086	0.036	2.060	685.6
38	0.89	623.2	874.1	2.704	0.165	4.699	0.088	3.703	2.131	0.027	2.088	0.036	2.064	680.0
50	0.89	670.3	874.0	2.360	0.145	4.699	0.088	3.686	2.101	0.027	2.057	0.035	2.012	777.4
60	0.89	671.7	866.0	2.330	0.142	4.699	0.088	3.686	2.100	0.026	2.056	0.035	2.011	780.2
LEVEL F7														
14	0.90	644.2	875.8	2.545	0.164	4.756	0.088	3.738	2.122	0.029	2.078	0.039	2.047	740.0
17	0.90	669.7	885.0	2.394	0.144	4.756	0.088	3.729	2.107	0.028	2.062	0.038	2.021	794.7

********** STEADY STATE TEST M **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F7														
21	0.90	648.4	883.1	2.535	0.152	4.756	0.088	3.736	2.119	0.028	2.075	0.038	2.042	749.0
37	0.90	642.1	870.5	2.544	0.157	4.756	0.088	3.739	2.123	0.029	2.080	0.039	2.049	735.7
38	0.90	651.8	874.8	2.487	0.150	4.756	0.088	3.735	2.117	0.029	2.073	0.038	2.039	756.2
50	0.90	682.3	874.9	2.288	0.141	4.756	0.088	3.726	2.100	0.028	2.056	0.038	2.009	821.8
60	0.90	686.1	866.7	2.245	0.137	4.756	0.088	3.725	2.098	0.028	2.054	0.038	2.006	830.1
LEVEL F8														
1	0.92	718.0	896.9	2.146	0.132	4.836	0.089	3.781	2.088	0.032	2.042	0.044	1.993	930.8
17	0.92	671.0	885.2	2.386	0.142	4.836	0.089	3.794	2.110	0.033	2.065	0.045	2.032	825.8
21	0.92	660.2	882.9	2.451	0.146	4.836	0.089	3.797	2.117	0.033	2.071	0.045	2.042	802.0
34	0.92	697.1	899.8	2.266	0.142	4.836	0.089	3.786	2.097	0.033	2.051	0.044	2.009	883.7
37	0.92	662.0	870.7	2.405	0.146	4.836	0.089	3.797	2.115	0.033	2.070	0.045	2.041	806.0
50	0.92	698.0	874.0	2.196	0.134	4.836	0.089	3.786	2.097	0.033	2.051	0.044	2.008	885.8
60	0.92	704.7	866.6	2.142	0.129	4.836	0.089	3.784	2.094	0.033	2.048	0.044	2.003	900.8

STEADY STATE TEST N

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST N **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.941E+05 LBM/SQFT H UNC. MASS FLUX 1.339E+04 LBM/SQFT H PRESSURE 1234.2 PSI UNC. PRESSURE 6.00 PSI
806.19 KG/SQM S 18.1759 KG/SQM S 8.52 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	3.016	949.9	0.057	18.05	1203.8	651.3	57.05	31.695	570.6	299.6	0.597	0.3	.6681	.0254
G	3.000	944.9	0.075	23.67	1235.3	668.8	45.44	25.243	570.6	299.6	0.597	0.3	.8152	.0290
E3	2.990	941.9	0.054	17.04	1165.2	629.9	15.77	8.761	570.6	299.6	0.597	0.3	.5808	.0235
E7	3.018	950.7	0.058	18.35	1121.1	605.4	49.21	27.341	570.6	299.6	0.597	0.3	.6369	.0247
E8	3.016	949.9	0.062	19.47	1193.0	645.4	47.02	26.124	570.6	299.6	0.597	0.3	.6555	.0251
F1	2.964	933.7	0.085	26.67	1243.6	673.5	18.48	10.266	570.6	299.6	0.597	0.3	.6919	.0261
F2	2.945	927.6	0.039	12.25	1267.1	686.5	11.06	6.143	570.6	299.6	0.597	0.3	.7105	.0266
F3	2.970	935.6	0.087	27.34	1223.8	662.5	110.80	61.557	570.6	299.6	0.597	0.3	.7291	.0272
F5	2.957	931.5	0.000	0.00	983.9	529.2	0.00	0.000	570.6	299.6	0.597	0.3	.7588	.0278
F6	2.960	932.5	0.093	29.23	1130.8	610.8	33.55	18.640	570.6	299.6	0.597	0.3	.7721	.0281
F7	2.960	932.5	0.064	20.25	1136.4	613.9	55.99	31.106	570.6	299.6	0.597	0.3	.7848	.0283
F8	2.980	938.8	0.079	24.87	1206.1	652.6	38.95	21.638	570.6	299.6	0.597	0.3	.8026	.0287

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

T/C Level	Test N (# wet T/C)/(Total # T/C)
E2	All wet
E3	4/7
E6	1/2
E7	2/4
E8	3/5
F	All dry

********** STEADY STATE TEST N **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.67	646.9	990.0	2.850	0.179	4.479	0.089	3.521	2.206	0.028	2.211	0.036	2.205	635.2
4	0.67	648.6	982.1	2.814	0.174	4.479	0.089	3.520	2.205	0.028	2.210	0.036	2.203	638.5
7	0.67	598.1	937.2	3.140	0.210	4.479	0.089	3.540	2.245	0.030	2.252	0.038	2.275	541.6
7	0.67	596.9	937.2	3.152	0.205	4.479	0.089	3.541	2.246	0.030	2.253	0.038	2.277	539.3
10	0.67	662.6	957.7	2.638	0.172	4.479	0.089	3.516	2.196	0.028	2.200	0.036	2.187	666.4
10	0.67	679.3	957.7	2.522	0.165	4.479	0.089	3.511	2.186	0.028	2.190	0.036	2.170	699.0
10	0.67	660.2	957.7	2.656	0.176	4.479	0.089	3.516	2.197	0.028	2.202	0.036	2.190	661.6
13	0.67	669.1	959.3	2.596	0.161	4.479	0.089	3.514	2.192	0.028	2.196	0.036	2.180	679.4
13	0.67	661.3	959.3	2.652	0.176	4.479	0.089	3.516	2.197	0.028	2.201	0.036	2.188	663.8
15	0.67	658.2	936.4	2.611	0.159	4.479	0.089	3.517	2.199	0.028	2.203	0.036	2.192	657.6
16	0.67	654.2	939.4	2.649	0.167	4.479	0.089	3.518	2.201	0.028	2.206	0.036	2.196	649.7
17	0.67	655.9	947.1	2.658	0.159	4.479	0.089	3.518	2.200	0.028	2.205	0.036	2.194	653.1
18	0.67	625.3	948.6	2.912	0.190	4.479	0.089	3.529	2.221	0.029	2.227	0.037	2.233	595.7
18	0.67	594.4	948.6	3.217	0.212	4.479	0.089	3.542	2.248	0.030	2.255	0.038	2.281	534.6
20	0.67	552.1	960.6	3.804	0.242	4.479	0.089	3.567	2.299	0.031	2.309	0.039	2.374	457.3
20	0.67	631.4	960.6	2.895	0.176	4.479	0.089	3.526	2.217	0.028	2.222	0.036	2.224	605.6
28	0.67	630.4	941.1	2.845	0.174	4.479	0.089	3.527	2.217	0.028	2.223	0.036	2.226	603.7
28	0.67	636.4	941.1	2.794	0.172	4.479	0.089	3.524	2.213	0.028	2.218	0.036	2.218	615.6
28	0.67	637.3	941.1	2.787	0.173	4.479	0.089	3.524	2.212	0.028	2.218	0.036	2.217	617.3
31	0.67	643.7	951.4	2.765	0.176	4.479	0.089	3.522	2.208	0.028	2.213	0.036	2.209	629.4
31	0.67	646.9	951.4	2.739	0.171	4.479	0.089	3.521	2.206	0.028	2.211	0.036	2.205	635.3
32	0.67	663.9	957.4	2.628	0.160	4.479	0.089	3.515	2.195	0.028	2.200	0.036	2.186	669.2
34	0.67	674.9	966.5	2.575	0.164	4.479	0.089	3.512	2.189	0.028	2.193	0.036	2.174	690.7
37	0.67	617.2	933.2	2.938	0.225	4.479	0.089	3.532	2.228	0.031	2.234	0.039	2.244	577.8
38	0.67	658.0	936.9	2.614	0.165	4.479	0.089	3.517	2.199	0.028	2.203	0.036	2.192	657.3
42	0.67	669.2	950.1	2.570	0.169	4.479	0.089	3.514	2.192	0.028	2.196	0.036	2.180	679.7
45	0.67	649.6	948.0	2.709	0.166	4.479	0.089	3.520	2.204	0.028	2.209	0.036	2.202	640.5
45	0.67	655.2	948.0	2.666	0.163	4.479	0.089	3.518	2.200	0.028	2.205	0.036	2.195	651.6
53	0.67	687.6	990.1	2.552	0.161	4.479	0.089	3.509	2.182	0.028	2.186	0.036	2.162	715.5
59	0.67	675.6	959.4	2.552	0.157	4.479	0.089	3.512	2.188	0.028	2.193	0.036	2.174	691.9
59	0.67	657.2	959.4	2.683	0.164	4.479	0.089	3.517	2.199	0.028	2.204	0.036	2.193	655.6
59	0.67	684.8	959.4	2.490	0.164	4.479	0.089	3.509	2.183	0.028	2.187	0.036	2.165	710.0
60	0.67	677.2	934.2	2.474	0.159	4.479	0.089	3.511	2.187	0.028	2.192	0.036	2.172	694.6
64	0.67	699.7	938.4	2.345	0.141	4.479	0.089	3.506	2.176	0.027	2.180	0.035	2.152	740.1
64	0.67	712.9	938.4	2.270	0.136	4.479	0.089	3.503	2.170	0.027	2.173	0.035	2.141	766.5
64	0.67	689.5	938.4	2.406	0.144	4.479	0.089	3.508	2.181	0.027	2.185	0.035	2.161	719.5
LEVEL G														
1	0.82	702.8	961.0	2.383	0.152	5.181	0.095	4.053	2.344	0.026	2.391	0.035	2.260	929.5
3	0.82	662.0	991.4	2.735	0.170	5.181	0.095	4.065	2.368	0.027	2.416	0.035	2.301	834.3
14	0.82	656.4	941.6	2.638	0.182	5.181	0.095	4.067	2.371	0.028	2.420	0.036	2.307	821.3
16	0.82	680.2	939.4	2.468	0.160	5.181	0.095	4.059	2.357	0.027	2.404	0.035	2.281	875.6
16	0.82	711.2	939.4	2.282	0.143	5.181	0.095	4.051	2.340	0.026	2.386	0.035	2.253	949.5
18	0.82	661.2	946.5	2.617	0.161	5.181	0.095	4.066	2.368	0.027	2.416	0.035	2.302	832.3
18	0.82	659.8	946.5	2.627	0.165	5.181	0.095	4.066	2.369	0.027	2.417	0.036	2.303	829.2
18	0.82	664.5	946.5	2.594	0.159	5.181	0.095	4.065	2.366	0.027	2.414	0.035	2.298	840.1
20	0.82	619.2	960.6	3.005	0.184	5.181	0.095	4.083	2.400	0.027	2.450	0.036	2.357	736.0
20	0.82	670.9	960.6	2.587	0.169	5.181	0.095	4.062	2.362	0.027	2.410	0.036	2.291	855.1
20	0.82	664.9	960.6	2.629	0.165	5.181	0.095	4.064	2.366	0.027	2.414	0.035	2.297	841.0
21	0.82	640.7	912.7	2.676	0.160	5.181	0.095	4.074	2.383	0.027	2.432	0.036	2.327	784.6
32	0.82	714.0	957.4	2.310	0.143	5.181	0.095	4.050	2.339	0.026	2.385	0.035	2.251	956.3
34	0.82	672.5	963.7	2.584	0.165	5.181	0.095	4.062	2.361	0.027	2.409	0.035	2.289	858.9
37	0.82	643.9	934.0	2.712	0.170	5.181	0.095	4.072	2.380	0.027	2.429	0.036	2.322	792.2
38	0.82	653.4	936.8	2.647	0.167	5.181	0.095	4.069	2.373	0.027	2.422	0.036	2.311	814.3
42	0.82	661.3	950.1	2.627	0.231	5.181	0.095	4.066	2.368	0.030	2.416	0.039	2.301	832.6
42	0.82	670.7	950.1	2.560	0.163	5.181	0.095	4.062	2.362	0.027	2.410	0.035	2.291	854.7
45	0.82	657.9	950.1	2.651	0.174	5.181	0.095	4.067	2.370	0.027	2.419	0.036	2.305	824.7
45	0.82	650.6	950.1	2.707	0.176	5.181	0.095	4.070	2.375	0.027	2.424	0.036	2.314	807.6
45	0.82	653.6	950.1	2.684	0.173	5.181	0.095	4.069	2.373	0.027	2.422	0.036	2.310	814.6
47	0.82	658.7	940.0	2.617	0.168	5.181	0.095	4.067	2.370	0.027	2.418	0.036	2.304	826.6
50	0.82	651.5	937.7	2.664	0.166	5.181	0.095	4.069	2.375	0.027	2.423	0.036	2.313	809.8
58	0.82	675.8	970.0	2.578	0.165	5.181	0.095	4.061	2.359	0.027	2.407	0.035	2.286	866.1
60	0.82	679.2	933.8	2.460	0.163	5.181	0.095	4.060	2.357	0.027	2.404	0.036	2.282	873.3
64	0.82	713.2	938.4	2.269	0.139	5.181	0.095	4.050	2.339	0.026	2.385	0.035	2.251	954.3
64	0.82	730.5	938.4	2.178	0.133	5.181	0.095	4.046	2.332	0.026	2.377	0.035	2.238	996.2

********** STEADY STATE TEST N **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E3														
34	0.58	637.8	961.3	2.842	0.197	4.048	0.088	3.189	2.078	0.031	2.048	0.039	2.147	543.4
50	0.58	631.4	935.4	2.819	0.195	4.048	0.088	3.191	2.082	0.031	2.053	0.039	2.155	532.6
60	0.58	620.5	929.1	2.895	0.189	4.048	0.088	3.195	2.090	0.031	2.061	0.039	2.169	514.0
LEVEL E7														
34	0.64	624.7	963.7	2.964	0.198	4.326	0.089	3.409	2.176	0.030	2.170	0.038	2.208	565.7
50	0.64	586.1	937.7	3.273	0.216	4.326	0.089	3.426	2.210	0.031	2.206	0.039	2.271	494.9
LEVEL E8														
34	0.66	663.8	963.7	2.645	0.171	4.417	0.089	3.469	2.177	0.028	2.177	0.036	2.176	656.7
38	0.66	626.9	936.2	2.860	0.176	4.417	0.089	3.482	2.202	0.029	2.203	0.037	2.221	586.2
LEVEL F1														
17	0.69	686.3	947.1	2.449	0.145	4.594	0.091	3.601	2.215	0.027	2.227	0.035	2.182	738.8
34	0.69	679.0	963.7	2.540	0.163	4.594	0.091	3.603	2.219	0.028	2.231	0.036	2.189	724.2
37	0.69	658.4	933.2	2.601	0.159	4.594	0.091	3.609	2.231	0.028	2.244	0.036	2.210	681.7
38	0.69	678.1	936.2	2.473	0.149	4.594	0.091	3.603	2.219	0.027	2.232	0.035	2.190	722.3
50	0.69	674.7	937.7	2.500	0.152	4.594	0.091	3.604	2.221	0.027	2.234	0.035	2.193	715.3
LEVEL F2														
1	0.71	682.3	938.2	2.451	0.151	4.684	0.092	3.674	2.241	0.027	2.260	0.035	2.201	751.7
17	0.71	693.4	925.8	2.351	0.139	4.684	0.092	3.671	2.235	0.027	2.254	0.035	2.190	775.4
34	0.71	684.6	942.0	2.447	0.155	4.684	0.092	3.673	2.240	0.027	2.259	0.035	2.198	756.6
38	0.71	692.6	915.1	2.328	0.140	4.684	0.092	3.671	2.236	0.027	2.254	0.035	2.191	773.7
50	0.71	679.8	916.6	2.411	0.147	4.684	0.092	3.674	2.243	0.027	2.261	0.035	2.203	746.4
LEVEL F3														
14	0.73	544.8	939.8	3.832	0.270	4.773	0.093	3.808	2.394	0.033	2.426	0.041	2.447	492.4
17	0.73	696.0	947.1	2.389	0.142	4.773	0.093	3.738	2.257	0.027	2.281	0.035	2.202	801.7
21	0.73	644.9	947.2	2.742	0.165	4.773	0.093	3.754	2.287	0.027	2.313	0.036	2.255	692.9
34	0.73	704.9	963.7	2.377	0.151	4.773	0.093	3.736	2.253	0.027	2.277	0.035	2.194	821.4
60	0.73	699.9	931.5	2.326	0.153	4.773	0.093	3.737	2.255	0.027	2.279	0.035	2.198	810.4
LEVEL F5														
60	0.76	529.2	931.5	4.057	0.276	4.914	0.094	3.937	2.458	0.033	2.502	0.041	2.523	486.7
LEVEL F6														
1	0.77	612.3	961.0	3.073	0.222	4.978	0.094	3.933	2.363	0.029	2.403	0.038	2.336	672.3
17	0.77	622.6	947.9	2.934	0.186	4.978	0.094	3.928	2.354	0.027	2.394	0.036	2.320	694.6
50	0.77	612.2	937.7	2.999	0.193	4.978	0.094	3.933	2.363	0.028	2.404	0.036	2.336	672.0
60	0.77	627.2	931.5	2.843	0.178	4.978	0.094	3.926	2.350	0.027	2.390	0.036	2.313	704.7
LEVEL F7														
14	0.78	550.1	940.2	3.753	0.265	5.038	0.094	4.017	2.451	0.032	2.500	0.040	2.479	553.3
17	0.78	645.2	947.7	2.742	0.168	5.038	0.094	3.964	2.350	0.027	2.392	0.035	2.298	758.5
21	0.78	618.8	947.5	2.968	0.181	5.038	0.094	3.975	2.371	0.027	2.414	0.036	2.335	699.8
37	0.78	596.7	933.3	3.141	0.201	5.038	0.094	3.986	2.392	0.028	2.436	0.037	2.372	652.5
38	0.78	612.0	936.5	2.997	0.186	5.038	0.094	3.978	2.377	0.027	2.420	0.036	2.346	685.4
50	0.78	627.6	938.2	2.860	0.183	5.038	0.094	3.971	2.363	0.027	2.406	0.036	2.322	719.1
60	0.78	648.6	931.8	2.670	0.167	5.038	0.094	3.963	2.347	0.027	2.389	0.035	2.294	766.0
LEVEL F8														
1	0.80	695.6	961.7	2.429	0.153	5.122	0.095	4.014	2.337	0.026	2.381	0.035	2.258	896.7
17	0.80	648.1	947.8	2.719	0.165	5.122	0.095	4.030	2.365	0.027	2.411	0.035	2.309	787.2
21	0.80	638.7	947.8	2.794	0.168	5.122	0.095	4.034	2.372	0.027	2.419	0.035	2.321	766.5
34	0.80	653.2	964.3	2.727	0.178	5.122	0.095	4.028	2.362	0.027	2.408	0.036	2.302	799.0
37	0.80	631.1	933.8	2.817	0.175	5.122	0.095	4.037	2.378	0.027	2.425	0.036	2.331	749.1
50	0.80	642.9	938.4	2.733	0.172	5.122	0.095	4.032	2.369	0.027	2.415	0.036	2.315	776.0
60	0.80	673.5	932.1	2.493	0.153	5.122	0.095	4.021	2.349	0.026	2.394	0.035	2.280	845.2

STEADY STATE TEST 0

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST 0 **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.261E+05 LBM/SQFT H — 306.80 KG/SQM S
UNC. MASS FLUX 5.042E+03 LBM/SQFT H — 6.8414 KG/SQM S
PRESSURE 866.7 PSI — 5.98 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.709	538.5	0.033	10.49	1236.0	669.3	72.41	40.227	527.4	275.5	0.824	0.5	.8907	.0321
G	1.700	535.6	0.042	13.35	1379.6	749.0	44.33	24.629	604.4	318.3	34.045	18.9	1.0875	.0369
E6	1.674	527.4	0.000	0.00	1206.8	653.0	0.00	0.000	527.4	275.5	0.824	0.5	.8300	.0308
E7	1.719	541.5	0.034	10.73	1189.1	643.2	11.17	6.207	527.4	275.5	0.824	0.5	.8489	.0311
E8	1.700	535.5	0.037	11.78	1182.7	639.6	51.63	28.684	527.4	275.5	0.824	0.5	.8738	.0317
F1	1.685	530.7	0.049	15.49	1259.6	682.3	28.18	15.657	527.4	275.5	0.824	0.5	.9225	.0329
F2	1.700	535.5	0.023	7.33	1278.2	692.7	45.35	25.195	527.4	275.5	0.824	0.5	.9474	.0337
F3	1.683	530.1	0.054	16.91	1315.0	713.1	45.99	25.551	527.4	275.5	0.824	0.5	.9722	.0344
F4	1.630	513.4	0.063	19.86	1160.2	627.1	58.05	32.252	527.4	275.5	0.824	0.5	.9951	.0351
F5	1.653	520.8	0.061	19.07	1233.3	667.7	45.30	25.168	535.7	280.2	29.017	16.1	1.0120	.0353
F6	1.682	529.9	0.049	15.35	1298.8	704.1	33.49	18.608	551.3	288.9	29.231	16.2	1.0299	.0357
F7	1.677	528.1	0.039	12.33	1318.2	714.9	38.00	21.111	567.4	297.8	32.602	18.1	1.0468	.0360
F8	1.694	533.7	0.050	15.65	1363.9	740.3	43.83	24.349	588.5	309.5	33.619	18.7	1.0706	.0365

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test 0

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST 0 **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.89	637.7	559.9	1.546	0.090	2.115	0.042	1.736	1.107	0.016	0.947	0.019	1.097	308.8
4	0.89	623.7	557.4	1.601	0.093	2.115	0.042	1.738	1.111	0.016	0.951	0.019	1.104	295.3
7	0.89	618.1	528.3	1.543	0.091	2.115	0.042	1.739	1.113	0.016	0.953	0.019	1.107	289.6
7	0.89	604.3	528.3	1.607	0.095	2.115	0.042	1.741	1.117	0.016	0.957	0.020	1.116	276.4
10	0.89	682.7	543.4	1.335	0.078	2.115	0.042	1.730	1.096	0.016	0.938	0.019	1.078	354.2
10	0.89	679.6	543.4	1.345	0.079	2.115	0.042	1.731	1.097	0.016	0.938	0.019	1.079	351.4
10	0.89	678.7	543.4	1.348	0.080	2.115	0.042	1.731	1.097	0.016	0.938	0.019	1.079	350.5
13	0.89	672.8	544.1	1.370	0.079	2.115	0.042	1.731	1.098	0.016	0.940	0.019	1.081	344.3
13	0.89	669.2	544.1	1.382	0.082	2.115	0.042	1.732	1.099	0.016	0.940	0.019	1.083	340.5
15	0.89	662.4	529.2	1.368	0.079	2.115	0.042	1.733	1.101	0.016	0.942	0.019	1.086	333.5
16	0.89	690.8	532.6	1.282	0.074	2.115	0.042	1.729	1.094	0.016	0.936	0.019	1.075	362.5
17	0.89	569.6	539.5	1.835	0.107	2.115	0.042	1.748	1.131	0.017	0.969	0.020	1.140	242.9
18	0.89	653.2	538.8	1.427	0.084	2.115	0.042	1.734	1.103	0.016	0.944	0.019	1.090	324.7
18	0.89	634.5	538.8	1.501	0.088	2.115	0.042	1.736	1.108	0.016	0.948	0.019	1.099	305.9
20	0.89	591.3	543.7	1.722	0.100	2.115	0.042	1.743	1.122	0.016	0.961	0.020	1.124	263.7
20	0.89	652.2	543.7	1.443	0.083	2.115	0.042	1.734	1.103	0.016	0.944	0.019	1.090	323.7
21	0.89	644.4	535.7	1.452	0.089	2.115	0.042	1.735	1.105	0.016	0.946	0.019	1.094	315.7
28	0.89	679.9	535.3	1.324	0.076	2.115	0.042	1.731	1.097	0.016	0.938	0.019	1.079	351.7
28	0.89	669.9	535.3	1.357	0.078	2.115	0.042	1.732	1.099	0.016	0.940	0.019	1.082	341.3
28	0.89	673.5	535.3	1.345	0.078	2.115	0.042	1.731	1.098	0.016	0.939	0.019	1.081	345.0
31	0.89	671.4	539.0	1.362	0.079	2.115	0.042	1.732	1.098	0.016	0.940	0.019	1.082	342.9
31	0.89	675.6	539.0	1.347	0.078	2.115	0.042	1.731	1.098	0.016	0.939	0.019	1.080	347.2
32	0.89	657.8	544.1	1.423	0.082	2.115	0.042	1.733	1.102	0.016	0.943	0.019	1.088	329.1
34	0.89	680.2	549.6	1.358	0.079	2.115	0.042	1.731	1.097	0.016	0.938	0.019	1.078	352.0
37	0.89	640.2	528.9	1.451	0.090	2.115	0.042	1.735	1.106	0.016	0.947	0.019	1.096	311.3
38	0.89	658.9	529.3	1.381	0.081	2.115	0.042	1.733	1.101	0.016	0.943	0.019	1.087	330.3
42	0.89	683.8	541.2	1.326	0.078	2.115	0.042	1.730	1.096	0.016	0.937	0.019	1.077	355.5
45	0.89	652.6	537.3	1.425	0.082	2.115	0.042	1.734	1.103	0.016	0.944	0.019	1.090	324.1
45	0.89	656.8	537.3	1.409	0.081	2.115	0.042	1.733	1.102	0.016	0.943	0.019	1.088	328.0
53	0.89	704.1	560.8	1.309	0.076	2.115	0.042	1.728	1.092	0.016	0.934	0.019	1.070	376.7
59	0.89	718.1	544.3	1.230	0.071	2.115	0.042	1.727	1.089	0.016	0.932	0.019	1.066	391.3
59	0.89	709.6	544.3	1.254	0.072	2.115	0.042	1.728	1.091	0.016	0.933	0.019	1.068	382.6
59	0.89	724.4	544.3	1.213	0.071	2.115	0.042	1.726	1.088	0.016	0.931	0.019	1.064	397.8
60	0.89	713.4	528.6	1.207	0.070	2.115	0.042	1.727	1.090	0.016	0.932	0.019	1.067	386.3
64	0.89	736.7	531.4	1.152	0.066	2.115	0.042	1.725	1.086	0.016	0.929	0.019	1.060	411.1
64	0.89	757.7	531.4	1.102	0.063	2.115	0.042	1.724	1.083	0.016	0.926	0.019	1.055	433.2
64	0.89	745.9	531.4	1.130	0.065	2.115	0.042	1.725	1.085	0.016	0.928	0.019	1.058	420.7

********** STEADY STATE TEST 0 **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.09	739.9	547.6	1.18	0.069	1.30	0.10	1.89	1.10	474.6
3	1.09	751.1	559.8	1.18	0.068	1.29	0.09	1.89	1.10	488.8
14	1.09	710.2	531.6	1.22	0.073	1.36	0.11	1.89	1.11	438.1
16	1.09	758.5	531.5	1.10	0.064	1.21	0.09	1.89	1.10	497.8
16	1.09	769.0	531.5	1.08	0.062	1.18	0.08	1.89	1.10	510.8
18	1.09	744.5	538.4	1.15	0.066	1.26	0.09	1.89	1.10	480.4
18	1.09	728.6	538.4	1.19	0.069	1.31	0.10	1.89	1.11	460.3
18	1.09	745.2	538.4	1.15	0.066	1.26	0.09	1.89	1.10	481.3
20	1.09	690.9	543.4	1.31	0.075	1.46	0.11	1.89	1.12	414.9
20	1.09	738.2	543.4	1.17	0.069	1.29	0.10	1.89	1.10	472.5
20	1.09	749.3	543.4	1.15	0.066	1.26	0.09	1.89	1.10	486.5
21	1.09	722.1	516.9	1.16	0.066	1.28	0.10	1.89	1.11	452.6
32	1.09	751.9	543.9	1.14	0.066	1.25	0.09	1.89	1.10	489.4
34	1.09	788.6	549.1	1.07	0.062	1.17	0.08	1.89	1.09	535.5
37	1.09	726.1	529.5	1.18	0.068	1.30	0.10	1.89	1.11	457.6
38	1.09	735.7	530.7	1.15	0.067	1.27	0.09	1.89	1.11	469.3
42	1.09	782.7	541.0	1.07	0.068	1.16	0.09	1.89	1.09	528.4
42	1.09	788.9	541.0	1.05	0.061	1.15	0.08	1.89	1.09	536.0
45	1.09	740.7	537.1	1.15	0.067	1.27	0.09	1.89	1.10	475.6
45	1.09	738.1	537.1	1.16	0.067	1.28	0.09	1.89	1.10	472.2
45	1.09	738.9	537.1	1.16	0.067	1.28	0.09	1.89	1.10	473.3
47	1.09	733.6	529.9	1.16	0.067	1.28	0.09	1.89	1.11	466.6
50	1.09	779.7	533.9	1.06	0.061	1.16	0.08	1.89	1.09	524.5
58	1.09	778.8	549.1	1.09	0.063	1.19	0.09	1.89	1.09	523.4
60	1.09	765.1	527.4	1.08	0.063	1.18	0.09	1.89	1.10	505.8
64	1.09	773.3	531.2	1.07	0.061	1.17	0.08	1.89	1.10	516.4
64	1.09	778.0	531.2	1.06	0.061	1.16	0.08	1.89	1.09	522.3

********** STEADY STATE TEST 0 **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E6														
60	0.83	653.0	527.4	1.397	0.081	2.004	0.042	1.645	1.091	0.013	0.934	0.015	1.075	291.6
LEVEL E7														
34	0.85	647.6	549.1	1.476	0.087	2.039	0.042	1.673	1.098	0.014	0.940	0.016	1.082	295.9
50	0.85	638.8	533.9	1.470	0.086	2.039	0.042	1.674	1.100	0.014	0.942	0.016	1.086	287.3
LEVEL E8														
34	0.87	671.3	549.1	1.387	0.081	2.084	0.042	1.706	1.097	0.015	0.939	0.017	1.078	332.3
37	0.87	615.5	528.0	1.553	0.090	2.084	0.042	1.714	1.112	0.015	0.952	0.018	1.105	277.8
38	0.87	632.0	529.3	1.485	0.086	2.084	0.042	1.711	1.107	0.015	0.948	0.018	1.096	293.8
LEVEL F1														
17	0.92	668.4	539.3	1.373	0.079	2.172	0.043	1.778	1.099	0.021	0.938	0.025	1.090	359.8
21	0.92	668.7	535.7	1.363	0.079	2.172	0.043	1.778	1.099	0.021	0.938	0.025	1.090	360.2
34	0.92	709.8	549.1	1.264	0.074	2.172	0.043	1.774	1.091	0.021	0.931	0.025	1.075	403.8
37	0.92	671.9	528.0	1.332	0.077	2.172	0.043	1.778	1.098	0.021	0.937	0.025	1.089	363.6
38	0.92	677.7	529.3	1.316	0.076	2.172	0.043	1.777	1.097	0.021	0.936	0.025	1.087	369.5
50	0.92	696.6	533.9	1.268	0.073	2.172	0.043	1.775	1.093	0.021	0.933	0.025	1.080	389.7
LEVEL F2														
1	0.95	655.9	532.4	1.400	0.081	2.217	0.044	1.818	1.097	0.030	0.933	0.036	1.102	364.0
14	0.95	674.8	530.5	1.329	0.079	2.217	0.044	1.816	1.093	0.030	0.929	0.035	1.094	384.5
17	0.95	693.1	539.0	1.291	0.074	2.217	0.044	1.814	1.089	0.030	0.926	0.035	1.087	404.6
34	0.95	726.7	548.7	1.216	0.071	2.217	0.044	1.811	1.083	0.029	0.920	0.035	1.076	442.0
38	0.95	694.4	529.0	1.263	0.073	2.217	0.044	1.814	1.089	0.030	0.926	0.035	1.087	406.1
50	0.95	711.2	533.6	1.225	0.070	2.217	0.044	1.812	1.086	0.030	0.923	0.035	1.081	424.6
LEVEL F3														
14	0.97	685.7	530.1	1.293	0.076	2.261	0.045	1.850	1.078	0.067	0.910	0.078	1.095	414.1
17	0.97	699.2	539.3	1.273	0.073	2.261	0.045	1.848	1.075	0.068	0.908	0.078	1.091	429.7
21	0.97	694.2	535.7	1.280	0.073	2.261	0.045	1.849	1.076	0.068	0.909	0.078	1.092	423.9
34	0.97	750.4	549.1	1.156	0.067	2.261	0.045	1.844	1.067	0.067	0.900	0.077	1.076	489.0
60	0.97	737.0	527.4	1.143	0.067	2.261	0.045	1.845	1.069	0.067	0.902	0.077	1.079	473.2
LEVEL F4														
60	1.00	649.9	527.4	1.409	0.082	2.302	0.070	1.888	1.051	0.066	0.874	0.078	1.116	390.8

********** STEADY STATE TEST 0 **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F5										
21	1.01	642.4	535.7	1.46	0.084	1.48	0.11	2.28	1.12	388.1
60	1.01	692.7	527.4	1.26	0.073	1.28	0.09	2.28	1.10	446.8
LEVEL F6										
1	1.03	702.1	548.2	1.29	0.077	1.33	0.10	2.15	1.10	450.8
17	1.03	693.9	540.4	1.29	0.075	1.33	0.09	2.15	1.11	440.9
37	1.03	690.7	528.6	1.27	0.074	1.32	0.09	2.15	1.11	437.0
38	1.03	685.2	529.9	1.29	0.074	1.34	0.09	2.15	1.11	430.4
50	1.03	728.4	535.2	1.18	0.068	1.22	0.08	2.15	1.09	482.2
60	1.03	732.1	528.0	1.16	0.066	1.19	0.08	2.15	1.09	486.7
LEVEL F7										
14	1.05	692.8	530.3	1.27	0.074	1.34	0.10	2.05	1.11	432.8
17	1.05	712.2	540.1	1.24	0.071	1.30	0.09	2.05	1.10	456.1
21	1.05	698.5	535.9	1.27	0.073	1.34	0.10	2.05	1.11	439.4
37	1.05	706.9	528.0	1.22	0.071	1.29	0.09	2.05	1.11	449.7
38	1.05	703.1	529.5	1.24	0.071	1.31	0.10	2.05	1.11	444.9
50	1.05	746.4	534.1	1.13	0.065	1.19	0.08	2.05	1.09	497.5
60	1.05	748.7	527.6	1.12	0.064	1.17	0.08	2.05	1.09	500.4
LEVEL F8										
1	1.07	743.3	548.8	1.17	0.068	1.27	0.09	1.95	1.10	484.1
17	1.07	718.3	540.5	1.22	0.070	1.32	0.10	1.95	1.11	453.6
21	1.07	715.1	536.9	1.22	0.070	1.32	0.10	1.95	1.11	449.5
34	1.07	770.6	550.3	1.11	0.065	1.19	0.09	1.95	1.09	517.9
37	1.07	721.9	529.2	1.19	0.068	1.28	0.09	1.95	1.11	457.7
50	1.07	769.2	535.1	1.08	0.062	1.16	0.08	1.95	1.09	516.2
60	1.07	763.5	528.6	1.08	0.062	1.16	0.08	1.95	1.09	508.9

STEADY STATE TEST P

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST P **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.834E+05 LBM/SQFT H UNC. MASS FLUX 8.583E+03 LBM/SQFT H PRESSURE 874.3 PSI UNC. PRESSURE 6.00 PSI
520.23 KG/SQM S 11.6476 KG/SQM S 6.03 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.612	822.7	0.051	16.07	1288.1	698.2	66.96	37.198	528.4	276.1	0.824	0.5	.8405	.0294
G	2.580	812.8	0.061	19.16	1362.7	739.6	44.58	24.769	541.3	283.3	26.746	14.9	1.0175	.0338
E3	2.585	814.3	0.048	15.25	1133.7	612.4	146.71	81.506	528.4	276.1	0.824	0.5	.7351	.0271
E6	2.489	784.1	0.097	30.45	1222.6	661.7	48.86	27.145	528.4	276.1	0.824	0.5	.7858	.0282
E7	2.595	817.3	0.047	14.87	1236.1	669.3	33.25	18.473	528.4	276.1	0.824	0.5	.8028	.0285
E8	2.594	817.2	0.047	14.94	1272.8	689.7	25.54	14.191	528.4	276.1	0.824	0.5	.8253	.0290
F1	2.570	809.5	0.072	22.64	1316.8	714.1	29.66	16.480	528.4	276.1	0.824	0.5	.8692	.0302
F2	2.605	820.6	0.037	11.64	1329.7	721.3	47.79	26.552	528.4	276.1	0.824	0.5	.8916	.0308
F3	2.569	809.2	0.079	24.84	1364.8	740.8	46.59	25.883	528.4	276.1	0.824	0.5	.9141	.0315
F4	2.489	784.1	0.097	30.45	1162.8	628.6	51.34	28.520	528.4	276.1	0.824	0.5	.9347	.0321
F5	2.526	795.8	0.094	29.55	1219.3	660.0	50.96	28.309	528.4	276.1	0.824	0.5	.9498	.0323
F6	2.568	809.0	0.072	22.55	1293.1	700.9	36.63	20.350	528.4	276.1	0.824	0.5	.9658	.0326
F7	2.566	808.4	0.059	18.54	1311.8	711.3	41.73	23.185	528.4	276.1	0.824	0.5	.9810	.0329
FE	2.570	809.6	0.073	22.86	1357.8	736.9	49.09	27.273	529.0	276.5	28.043	15.6	1.0024	.0334

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test P

T/C Level	(# wet T/C)/(Total # T/C)
E	All wet
E1	3/4
E2	3/3
E3	4/7
E6	0/2
E7	1/4
E8	2/5
F	All dry

********** STEADY STATE TEST P **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.84	667.3	857.1	2.191	0.132	3.099	0.060	2.540	1.572	0.019	1.505	0.025	1.594	546.9
4	0.84	678.3	853.1	2.121	0.126	3.099	0.060	2.538	1.569	0.019	1.502	0.025	1.587	564.0
7	0.84	649.3	811.6	2.175	0.135	3.099	0.060	2.543	1.578	0.019	1.512	0.025	1.605	518.2
7	0.84	647.2	811.6	2.187	0.133	3.099	0.060	2.544	1.579	0.019	1.512	0.025	1.607	515.3
10	0.84	711.8	830.9	1.907	0.117	3.099	0.060	2.534	1.559	0.019	1.492	0.024	1.570	617.9
10	0.84	718.6	830.9	1.878	0.116	3.099	0.060	2.533	1.557	0.019	1.491	0.024	1.567	628.5
10	0.84	711.9	830.9	1.907	0.118	3.099	0.060	2.534	1.559	0.019	1.492	0.024	1.570	618.1
13	0.84	709.1	829.9	1.917	0.114	3.099	0.060	2.534	1.560	0.019	1.493	0.024	1.571	613.5
13	0.84	704.7	829.9	1.937	0.121	3.099	0.060	2.535	1.561	0.019	1.494	0.024	1.573	606.2
15	0.84	706.8	807.2	1.874	0.110	3.099	0.060	2.534	1.560	0.019	1.494	0.024	1.572	609.7
16	0.84	716.7	812.8	1.845	0.110	3.099	0.060	2.533	1.558	0.019	1.491	0.024	1.568	625.4
17	0.84	645.2	822.4	2.228	0.131	3.099	0.060	2.544	1.580	0.019	1.513	0.025	1.608	512.1
18	0.84	663.1	820.8	2.121	0.130	3.099	0.060	2.541	1.573	0.019	1.507	0.025	1.596	540.1
18	0.84	632.6	820.8	2.303	0.141	3.099	0.060	2.547	1.585	0.019	1.518	0.025	1.617	492.7
20	0.84	590.2	831.8	2.649	0.159	3.099	0.060	2.557	1.605	0.020	1.539	0.025	1.655	428.2
20	0.84	661.6	831.8	2.158	0.127	3.099	0.060	2.541	1.574	0.019	1.507	0.025	1.597	537.6
21	0.84	666.0	819.6	2.102	0.140	3.099	0.060	2.540	1.573	0.019	1.506	0.025	1.594	544.7
28	0.84	724.6	815.5	1.819	0.106	3.099	0.060	2.532	1.556	0.019	1.489	0.024	1.565	637.8
28	0.84	705.8	815.5	1.898	0.112	3.099	0.060	2.534	1.561	0.019	1.494	0.024	1.573	608.1
28	0.84	709.5	815.5	1.882	0.111	3.099	0.060	2.534	1.560	0.019	1.493	0.024	1.571	614.1
31	0.84	709.8	821.1	1.893	0.113	3.099	0.060	2.534	1.560	0.019	1.493	0.024	1.571	614.6
31	0.84	713.1	821.1	1.879	0.111	3.099	0.060	2.533	1.559	0.019	1.492	0.024	1.570	620.0
32	0.84	665.7	830.9	2.133	0.126	3.099	0.060	2.541	1.573	0.019	1.506	0.025	1.595	544.3
34	0.84	710.7	834.8	1.921	0.116	3.099	0.060	2.534	1.559	0.019	1.493	0.024	1.571	616.0
37	0.84	687.1	809.6	1.970	0.133	3.099	0.060	2.537	1.566	0.019	1.499	0.025	1.582	577.7
38	0.84	706.3	812.2	1.888	0.114	3.099	0.060	2.534	1.561	0.019	1.494	0.024	1.573	608.9
42	0.84	730.1	822.6	1.812	0.112	3.099	0.060	2.531	1.555	0.019	1.488	0.024	1.562	647.0
45	0.84	699.7	819.6	1.935	0.114	3.099	0.060	2.535	1.562	0.019	1.495	0.024	1.576	598.2
45	0.84	709.0	819.6	1.893	0.111	3.099	0.060	2.534	1.560	0.019	1.493	0.024	1.571	613.3
53	0.84	745.0	855.2	1.824	0.110	3.099	0.060	2.530	1.552	0.019	1.485	0.024	1.556	671.7
59	0.84	740.9	830.0	1.786	0.106	3.099	0.060	2.530	1.552	0.019	1.486	0.024	1.558	664.8
59	0.84	739.2	830.0	1.792	0.105	3.099	0.060	2.530	1.553	0.019	1.486	0.024	1.559	662.1
59	0.84	749.8	830.0	1.752	0.108	3.099	0.060	2.529	1.551	0.019	1.484	0.024	1.555	679.7
60	0.84	736.7	806.1	1.750	0.106	3.099	0.060	2.531	1.553	0.019	1.486	0.024	1.560	657.8
64	0.84	766.7	812.1	1.655	0.097	3.099	0.060	2.527	1.547	0.019	1.481	0.024	1.549	707.4

********** STEADY STATE TEST P **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.02	743.5	830.1	1.78	0.108	1.80	0.12	3.41	1.63	873.4
3	1.02	748.3	850.4	1.80	0.106	1.83	0.12	3.41	1.63	883.2
14	1.02	711.2	806.7	1.85	0.118	1.89	0.14	3.41	1.65	809.0
16	1.02	756.8	807.8	1.68	0.103	1.71	0.12	3.41	1.63	900.3
16	1.02	768.6	807.8	1.64	0.098	1.66	0.11	3.41	1.62	924.3
18	1.02	732.3	815.8	1.79	0.105	1.82	0.12	3.41	1.64	851.0
18	1.02	719.9	815.8	1.84	0.110	1.87	0.13	3.41	1.64	826.3
18	1.02	733.9	815.8	1.78	0.105	1.81	0.12	3.41	1.64	854.1
20	1.02	678.8	826.7	2.05	0.120	2.09	0.15	3.41	1.66	745.2
20	1.02	728.8	826.7	1.83	0.111	1.86	0.13	3.41	1.64	843.9
20	1.02	734.3	826.7	1.80	0.108	1.83	0.13	3.41	1.64	854.9
21	1.02	710.3	796.1	1.83	0.106	1.86	0.13	3.41	1.65	807.1
32	1.02	753.7	825.8	1.73	0.103	1.76	0.12	3.41	1.63	893.9
34	1.02	784.6	829.6	1.63	0.098	1.65	0.11	3.41	1.62	957.0
37	1.02	717.6	802.3	1.82	0.108	1.85	0.13	3.41	1.64	821.5
38	1.02	734.7	805.9	1.76	0.105	1.79	0.12	3.41	1.64	855.7
42	1.02	779.2	817.6	1.63	0.120	1.65	0.13	3.41	1.62	945.9
45	1.02	737.8	814.5	1.76	0.107	1.79	0.12	3.41	1.64	861.9
45	1.02	733.6	814.5	1.78	0.108	1.81	0.12	3.41	1.64	853.6
45	1.02	739.8	814.5	1.76	0.106	1.78	0.12	3.41	1.63	865.9
47	1.02	735.4	805.2	1.75	0.106	1.78	0.12	3.41	1.64	857.2
50	1.02	783.1	806.2	1.59	0.093	1.61	0.11	3.41	1.62	953.9
60	1.02	760.1	801.1	1.66	0.102	1.68	0.12	3.41	1.63	907.0

********** STEADY STATE TEST P **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E3														
34	0.74	649.7	831.7	2.227	0.144	2.799	0.058	2.300	1.520	0.018	1.446	0.023	1.557	434.2
50	0.74	668.6	808.2	2.060	0.131	2.799	0.058	2.297	1.514	0.018	1.440	0.022	1.545	460.2
60	0.74	518.9	803.1	3.308	0.222	2.799	0.058	2.337	1.598	0.021	1.524	0.025	1.703	264.8
LEVEL E6														
60	0.79	680.9	805.7	1.990	0.119	2.944	0.059	2.415	1.542	0.018	1.473	0.022	1.562	519.3
LEVEL E7														
34	0.80	684.1	834.3	2.045	0.126	2.993	0.059	2.452	1.550	0.018	1.482	0.023	1.567	538.6
37	0.80	648.6	806.8	2.166	0.129	2.993	0.059	2.458	1.562	0.018	1.494	0.023	1.589	485.2
50	0.80	675.2	810.8	2.032	0.123	2.993	0.059	2.453	1.553	0.018	1.485	0.023	1.572	524.9
LEVEL E8														
34	0.83	704.8	834.3	1.946	0.119	3.056	0.059	2.500	1.555	0.018	1.488	0.024	1.567	591.3
37	0.83	676.6	806.8	2.015	0.120	3.056	0.059	2.504	1.563	0.018	1.496	0.024	1.581	547.0
38	0.83	687.7	810.5	1.969	0.116	3.056	0.059	2.502	1.560	0.018	1.493	0.024	1.575	564.0
LEVEL F1														
17	0.87	696.6	822.0	1.955	0.114	3.179	0.061	2.602	1.572	0.021	1.505	0.027	1.590	622.8
21	0.87	688.1	819.2	1.989	0.118	3.179	0.061	2.604	1.574	0.021	1.507	0.027	1.595	609.0
34	0.87	731.6	834.3	1.832	0.111	3.179	0.061	2.598	1.563	0.021	1.496	0.027	1.574	681.8
37	0.87	713.7	806.8	1.844	0.109	3.179	0.061	2.600	1.567	0.021	1.500	0.027	1.582	651.7
38	0.87	715.9	810.5	1.843	0.108	3.179	0.061	2.600	1.567	0.021	1.500	0.027	1.581	655.5
50	0.87	730.2	810.8	1.786	0.105	3.179	0.061	2.598	1.563	0.020	1.496	0.027	1.575	679.4
LEVEL F2														
1	0.89	678.6	834.8	2.074	0.124	3.242	0.061	2.658	1.581	0.023	1.513	0.031	1.610	617.7
14	0.89	705.4	811.3	1.890	0.120	3.242	0.061	2.654	1.574	0.023	1.505	0.031	1.596	662.9
17	0.89	722.3	822.0	1.842	0.107	3.242	0.061	2.651	1.569	0.023	1.501	0.031	1.588	692.4
34	0.89	752.4	834.3	1.752	0.106	3.242	0.061	2.648	1.563	0.023	1.494	0.030	1.577	744.9
38	0.89	726.3	810.5	1.800	0.105	3.242	0.061	2.651	1.568	0.023	1.500	0.031	1.587	699.3
50	0.89	742.7	810.8	1.738	0.102	3.242	0.061	2.649	1.565	0.023	1.496	0.031	1.580	728.3
LEVEL F3														
14	0.91	718.9	811.3	1.832	0.112	3.304	0.062	2.702	1.571	0.027	1.500	0.036	1.600	713.0
17	0.91	726.3	822.0	1.826	0.106	3.304	0.062	2.701	1.569	0.027	1.498	0.036	1.596	725.8
21	0.91	712.1	819.2	1.879	0.109	3.304	0.062	2.703	1.573	0.027	1.502	0.036	1.603	700.8
34	0.91	777.8	834.3	1.663	0.100	3.304	0.062	2.695	1.559	0.027	1.488	0.036	1.578	819.2
60	0.91	760.7	805.7	1.663	0.103	3.304	0.062	2.697	1.562	0.027	1.491	0.036	1.583	787.9
LEVEL F4														
60	0.93	648.7	805.7	2.162	0.130	3.360	0.063	2.761	1.589	0.034	1.515	0.046	1.648	614.2
LEVEL F5														
21	0.95	629.6	819.2	2.318	0.137	3.402	0.063	2.799	1.591	0.044	1.513	0.058	1.670	597.7
60	0.95	685.6	805.7	1.968	0.117	3.402	0.063	2.788	1.571	0.043	1.493	0.057	1.632	697.4
LEVEL F6														
1	0.97	697.5	836.2	1.985	0.128	3.446	0.063	2.822	1.557	0.071	1.474	0.085	1.633	740.6
17	0.97	691.9	823.4	1.980	0.118	3.446	0.063	2.823	1.558	0.071	1.475	0.085	1.636	730.1
37	0.97	682.3	808.9	1.992	0.119	3.446	0.063	2.825	1.561	0.071	1.478	0.085	1.641	712.1
38	0.97	679.4	811.9	2.013	0.119	3.446	0.063	2.825	1.562	0.071	1.479	0.085	1.643	706.8
50	0.97	731.7	812.2	1.783	0.106	3.446	0.063	2.817	1.548	0.070	1.465	0.084	1.617	804.0
60	0.97	725.9	807.0	1.794	0.106	3.446	0.063	2.818	1.550	0.070	1.467	0.084	1.619	793.1
LEVEL F7														
14	0.98	691.3	813.6	1.960	0.121	3.487	0.068	2.857	1.540	0.096	1.449	0.128	1.642	748.1
17	0.98	709.1	824.5	1.904	0.112	3.487	0.068	2.854	1.536	0.096	1.445	0.126	1.633	782.0
21	0.98	687.4	821.5	1.997	0.117	3.487	0.068	2.857	1.541	0.097	1.451	0.127	1.645	740.6
37	0.98	695.9	808.9	1.927	0.115	3.487	0.068	2.856	1.539	0.096	1.448	0.127	1.640	756.9
38	0.98	702.4	812.7	1.906	0.112	3.487	0.068	2.855	1.537	0.096	1.446	0.126	1.637	769.3
50	0.98	750.1	813.0	1.715	0.102	3.487	0.068	2.849	1.526	0.096	1.436	0.125	1.616	861.6

********** STEADY STATE TEST P **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F7														
6C	0.98	742.4	807.9	1.733	0.102	3.487	0.068	2.849	1.528	0.096	1.437	0.125	1.619	846.5

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	LHEXP	HCB	HCB KW/M**2 C	QCC KW/M**2
LEVEL F8										
1	1.00	748.3	832.3	1.76	0.106	1.76	0.12	3.47	1.63	878.5
17	1.00	716.3	819.5	1.86	0.109	1.86	0.13	3.47	1.64	815.6
21	1.00	700.7	816.7	1.92	0.112	1.93	0.13	3.47	1.65	785.6
34	1.00	765.2	831.9	1.70	0.103	1.70	0.12	3.47	1.62	912.5
37	1.00	714.1	804.5	1.84	0.108	1.84	0.13	3.47	1.64	811.2
50	1.00	772.2	808.4	1.63	0.096	1.63	0.11	3.47	1.62	926.6
60	1.00	758.6	803.3	1.66	0.098	1.67	0.11	3.47	1.62	899.2

STEADY STATE TEST Q

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST Q **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.396E+05 LBM/SQFT H — 325.15 KG/SQM S
UNC. MASS FLUX 5.353E+03 LBM/SQFT H — 7.2644 KG/SQM S
PRESSURE 946.7 PSI — 6.53 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.811	570.6	0.030	9.34	1251.9	678.1	71.98	39.988	537.9	281.4	0.757	0.4	.9164	.0329
G	1.804	568.2	0.036	11.49	1383.8	751.3	46.04	25.579	637.2	336.5	35.118	19.5	1.1176	.0379
E2	1.783	561.5	0.000	0.00	1138.3	614.9	0.00	0.000	537.9	281.4	0.757	0.4	.7970	.0303
E6	1.745	549.8	0.066	20.75	1163.2	628.8	110.10	61.165	537.9	281.4	0.757	0.4	.8544	.0316
E7	1.801	567.5	0.026	8.09	1150.6	621.8	55.43	30.794	537.9	281.4	0.757	0.4	.8737	.0320
E8	1.805	568.7	0.016	5.10	1191.0	644.2	27.28	15.156	537.9	281.4	0.757	0.4	.8991	.0325
F1	1.786	562.5	0.046	14.45	1253.2	678.8	43.81	24.341	537.9	281.4	0.757	0.4	.9490	.0338
F2	1.796	565.8	0.020	6.25	1258.8	681.9	70.39	39.104	537.9	281.4	0.757	0.4	.9744	.0345
F3	1.787	563.0	0.046	14.37	1315.2	713.2	51.48	28.601	537.9	281.4	0.757	0.4	.9998	.0353
F4	1.745	549.8	0.066	20.75	1184.2	640.4	58.76	32.645	555.7	291.3	25.203	14.0	1.0232	.0360
F5	1.768	556.9	0.061	19.17	1245.8	674.7	54.03	30.016	569.7	299.1	29.816	16.6	1.0405	.0363
F6	1.788	563.1	0.041	13.00	1301.5	705.6	41.90	23.276	584.1	307.1	30.922	17.2	1.0587	.0366
F7	1.785	562.2	0.036	11.29	1325.8	719.1	41.77	23.208	598.8	315.2	32.458	18.0	1.0760	.0370
F8	1.797	566.2	0.041	13.05	1363.1	739.9	44.81	24.895	621.1	327.6	33.937	18.9	1.1004	.0375

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test Q

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	6/7
E6	0/2
E7	3/4
E8	1/5
F	All dry

********** STEADY STATE TEST Q **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.92	605.3	589.0	1.818	0.107	2.359	0.047	1.924	1.196	0.020	1.029	0.025	1.185	310.9
4	0.92	626.6	585.8	1.697	0.099	2.359	0.047	1.920	1.188	0.020	1.021	0.024	1.171	333.8
7	0.92	655.3	563.2	1.506	0.089	2.359	0.047	1.915	1.179	0.020	1.013	0.024	1.155	365.4
7	0.92	645.6	563.2	1.547	0.091	2.359	0.047	1.917	1.182	0.020	1.016	0.024	1.160	354.7
10	0.92	676.3	572.2	1.449	0.086	2.359	0.047	1.912	1.174	0.020	1.008	0.024	1.145	388.5
10	0.92	674.4	572.2	1.456	0.087	2.359	0.047	1.913	1.174	0.020	1.009	0.024	1.146	386.7
10	0.92	673.3	572.2	1.460	0.087	2.359	0.047	1.913	1.174	0.020	1.009	0.024	1.147	385.4
13	0.92	678.5	579.9	1.460	0.085	2.359	0.047	1.912	1.173	0.020	1.008	0.024	1.145	391.1
13	0.92	675.7	579.9	1.471	0.088	2.359	0.047	1.912	1.174	0.020	1.009	0.024	1.146	387.8
15	0.92	677.1	564.3	1.426	0.082	2.359	0.047	1.912	1.173	0.020	1.008	0.024	1.145	389.4
16	0.92	710.6	564.8	1.316	0.076	2.359	0.047	1.908	1.166	0.020	1.002	0.024	1.132	427.3
18	0.92	650.2	566.2	1.535	0.091	2.359	0.047	1.916	1.181	0.020	1.015	0.024	1.158	359.6
18	0.92	629.1	566.2	1.628	0.096	2.359	0.047	1.919	1.187	0.020	1.021	0.024	1.169	336.6
20	0.92	590.7	572.5	1.851	0.108	2.359	0.047	1.927	1.202	0.020	1.034	0.025	1.195	295.3
20	0.92	647.4	572.5	1.564	0.090	2.359	0.047	1.916	1.181	0.020	1.016	0.024	1.159	356.5
21	0.92	647.9	571.2	1.558	0.096	2.359	0.047	1.916	1.181	0.020	1.015	0.024	1.159	357.0
28	0.92	669.0	561.8	1.449	0.084	2.359	0.047	1.913	1.175	0.020	1.010	0.024	1.149	380.6
28	0.92	658.2	561.8	1.491	0.086	2.359	0.047	1.915	1.178	0.020	1.013	0.024	1.154	368.6
28	0.92	660.8	561.8	1.481	0.086	2.359	0.047	1.914	1.178	0.020	1.012	0.024	1.152	371.6
31	0.92	678.8	574.4	1.445	0.084	2.359	0.047	1.912	1.173	0.020	1.008	0.024	1.144	391.4
31	0.92	683.9	574.4	1.427	0.083	2.359	0.047	1.911	1.172	0.020	1.007	0.024	1.142	397.2
32	0.92	703.1	582.6	1.382	0.080	2.359	0.047	1.909	1.168	0.020	1.003	0.024	1.135	419.0
34	0.92	672.4	576.8	1.475	0.087	2.359	0.047	1.913	1.175	0.020	1.009	0.024	1.147	384.5
37	0.92	652.3	567.7	1.530	0.096	2.359	0.047	1.916	1.180	0.020	1.014	0.024	1.157	362.0
38	0.92	668.7	567.7	1.465	0.086	2.359	0.047	1.913	1.176	0.020	1.010	0.024	1.149	380.3
42	0.92	683.6	567.6	1.411	0.084	2.359	0.047	1.911	1.172	0.020	1.007	0.024	1.142	396.8
45	0.92	667.0	576.1	1.494	0.087	2.359	0.047	1.913	1.176	0.020	1.011	0.024	1.150	378.7
45	0.92	671.0	576.1	1.479	0.086	2.359	0.047	1.913	1.175	0.020	1.010	0.024	1.148	382.8
53	0.92	704.6	589.2	1.392	0.081	2.359	0.047	1.909	1.167	0.020	1.003	0.024	1.134	420.7
59	0.92	719.5	570.7	1.303	0.075	2.359	0.047	1.907	1.164	0.020	1.000	0.024	1.129	437.7
59	0.92	714.1	570.7	1.319	0.076	2.359	0.047	1.908	1.165	0.020	1.001	0.024	1.131	431.4
59	0.92	722.6	570.7	1.293	0.076	2.359	0.047	1.907	1.164	0.020	1.000	0.024	1.128	441.3
60	0.92	725.5	564.8	1.272	0.075	2.359	0.047	1.907	1.163	0.020	0.999	0.024	1.127	444.7
64	0.92	757.2	568.7	1.195	0.069	2.359	0.047	1.904	1.158	0.020	0.994	0.024	1.118	481.3
64	0.92	774.0	568.7	1.154	0.066	2.359	0.047	1.903	1.156	0.020	0.992	0.024	1.114	501.3
64	0.92	769.4	568.7	1.165	0.067	2.359	0.047	1.903	1.156	0.020	0.993	0.024	1.115	495.8

********** STEADY STATE TEST Q **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.12	717.9	574.9	1.32	0.077	1.51	0.12	1.95	1.18	467.1
3	1.12	745.5	588.5	1.27	0.073	1.44	0.11	1.95	1.17	503.6
14	1.12	715.3	564.4	1.30	0.078	1.49	0.12	1.95	1.18	463.6
16	1.12	771.6	564.0	1.15	0.067	1.30	0.10	1.95	1.16	538.3
16	1.12	780.3	564.0	1.13	0.066	1.27	0.09	1.95	1.16	550.4
18	1.12	736.4	565.2	1.24	0.071	1.41	0.11	1.95	1.17	491.3
18	1.12	721.3	565.2	1.28	0.074	1.47	0.11	1.95	1.18	471.8
18	1.12	738.1	565.2	1.24	0.071	1.41	0.11	1.95	1.17	493.5
20	1.12	687.4	571.7	1.41	0.081	1.63	0.13	1.95	1.19	427.7
20	1.12	733.6	571.7	1.26	0.074	1.44	0.11	1.95	1.17	487.9
20	1.12	746.1	571.7	1.23	0.071	1.40	0.11	1.95	1.17	504.4
21	1.12	726.8	570.7	1.28	0.073	1.46	0.11	1.95	1.18	479.2
32	1.12	765.7	581.8	1.20	0.069	1.36	0.10	1.95	1.16	530.3
34	1.12	777.1	575.6	1.16	0.067	1.31	0.10	1.95	1.16	545.9
37	1.12	734.3	565.6	1.25	0.072	1.42	0.11	1.95	1.17	488.9
38	1.12	745.0	567.1	1.22	0.071	1.39	0.11	1.95	1.17	502.9
42	1.12	775.4	566.8	1.15	0.075	1.29	0.10	1.95	1.16	543.6
42	1.12	788.4	566.8	1.12	0.065	1.25	0.09	1.95	1.16	561.1
45	1.12	751.2	575.3	1.22	0.071	1.39	0.11	1.95	1.17	511.3
45	1.12	746.9	575.3	1.24	0.072	1.40	0.11	1.95	1.17	505.5
45	1.12	746.4	575.3	1.24	0.072	1.40	0.11	1.95	1.17	504.8
47	1.12	746.1	568.0	1.22	0.071	1.39	0.11	1.95	1.17	504.4
50	1.12	785.1	559.7	1.11	0.064	1.25	0.09	1.95	1.16	556.9
58	1.12	779.1	576.6	1.16	0.067	1.30	0.10	1.95	1.16	548.7
60	1.12	769.8	564.0	1.15	0.068	1.30	0.10	1.95	1.16	536.0
64	1.12	781.7	567.9	1.14	0.065	1.28	0.09	1.95	1.16	552.2
64	1.12	784.7	567.9	1.13	0.065	1.27	0.09	1.95	1.16	556.5

********** STEADY STATE TEST Q **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E3														
60	0.80	614.9	561.5	1.683	0.100	2.122	0.046	1.730	1.164	0.014	1.000	0.015	1.147	258.5
LEVEL E6														
60	0.85	672.1	564.5	1.445	0.084	2.237	0.046	1.815	1.166	0.014	1.004	0.017	1.132	344.9
LEVEL E7														
34	0.87	641.3	576.1	1.601	0.095	2.275	0.046	1.850	1.179	0.015	1.016	0.018	1.152	324.3
37	0.87	586.3	566.1	1.857	0.109	2.275	0.046	1.860	1.200	0.016	1.034	0.019	1.188	268.0
50	0.87	637.8	560.1	1.572	0.092	2.275	0.046	1.850	1.180	0.015	1.016	0.018	1.153	320.6
LEVEL E8														
14	0.90	628.1	564.9	1.629	0.097	2.325	0.047	1.892	1.187	0.018	1.022	0.021	1.166	325.2
34	0.90	663.4	576.1	1.508	0.089	2.325	0.047	1.887	1.176	0.017	1.012	0.021	1.147	363.0
37	0.90	637.3	566.1	1.590	0.093	2.325	0.047	1.891	1.184	0.018	1.019	0.021	1.160	334.9
38	0.90	648.1	567.5	1.548	0.090	2.325	0.047	1.889	1.181	0.017	1.016	0.021	1.154	346.7
LEVEL F1														
17	0.95	634.1	566.4	1.606	0.093	2.423	0.047	1.970	1.181	0.032	1.011	0.038	1.175	362.8
21	0.95	669.8	571.2	1.470	0.085	2.423	0.047	1.964	1.171	0.031	1.002	0.037	1.156	404.0
34	0.95	695.6	576.1	1.391	0.082	2.423	0.047	1.961	1.164	0.031	0.996	0.037	1.146	434.3
37	0.95	681.7	566.1	1.414	0.082	2.423	0.047	1.963	1.168	0.031	0.999	0.037	1.151	418.1
50	0.95	698.6	560.1	1.343	0.077	2.423	0.047	1.960	1.164	0.031	0.996	0.037	1.145	437.5
LEVEL F2														
1	0.97	608.3	558.7	1.709	0.100	2.472	0.051	2.016	1.176	0.069	1.001	0.087	1.198	351.9
14	0.97	681.3	565.6	1.414	0.085	2.472	0.051	2.004	1.154	0.068	0.981	0.085	1.158	437.3
17	0.97	675.5	566.4	1.437	0.082	2.472	0.051	2.004	1.156	0.069	0.982	0.085	1.160	430.5
34	0.97	712.9	576.1	1.335	0.078	2.472	0.051	2.000	1.147	0.068	0.975	0.084	1.146	476.0
38	0.97	704.7	568.1	1.342	0.077	2.472	0.051	2.001	1.149	0.069	0.976	0.084	1.149	465.8
50	0.97	708.5	560.1	1.311	0.076	2.472	0.051	2.000	1.148	0.069	0.976	0.084	1.147	470.4
LEVEL F3														
14	1.00	688.8	564.9	1.386	0.082	2.521	0.093	2.042	1.087	0.062	0.900	0.079	1.161	467.0
17	1.00	682.8	566.4	1.411	0.081	2.521	0.093	2.043	1.088	0.062	0.901	0.078	1.164	459.4
21	1.00	694.8	571.2	1.381	0.079	2.521	0.093	2.041	1.086	0.062	0.899	0.078	1.159	474.5
34	1.00	734.4	576.1	1.272	0.074	2.521	0.093	2.037	1.079	0.062	0.893	0.078	1.145	524.4
60	1.00	753.9	564.5	1.195	0.071	2.521	0.093	2.035	1.076	0.062	0.890	0.078	1.139	549.3

********** STEADY STATE TEST Q **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F4										
60	1.02	663.5	564.5	1.48	0.086	1.52	0.11	2.39	1.18	434.5
LEVEL F5										
21	1.04	642.9	571.2	1.58	0.091	1.66	0.13	2.27	1.19	401.7
60	1.04	702.6	564.5	1.34	0.078	1.40	0.10	2.27	1.17	476.4
LEVEL F6										
1	1.06	683.5	576.3	1.43	0.087	1.53	0.12	2.17	1.18	445.1
17	1.06	681.4	567.4	1.42	0.082	1.52	0.11	2.17	1.18	442.3
37	1.06	701.1	567.3	1.35	0.078	1.44	0.11	2.17	1.17	467.5
38	1.06	689.9	568.5	1.39	0.080	1.48	0.11	2.17	1.18	453.3
50	1.06	732.1	561.7	1.25	0.072	1.32	0.09	2.17	1.16	507.6
60	1.06	739.9	565.4	1.23	0.071	1.31	0.09	2.17	1.16	517.6
LEVEL F7										
14	1.08	697.3	565.1	1.36	0.080	1.48	0.11	2.10	1.18	456.1
17	1.08	698.4	566.7	1.36	0.078	1.48	0.11	2.10	1.18	457.5
21	1.08	700.3	571.4	1.36	0.078	1.48	0.11	2.10	1.17	459.9
37	1.08	715.4	566.2	1.30	0.076	1.41	0.10	2.10	1.17	479.0
38	1.08	709.9	567.7	1.32	0.076	1.44	0.11	2.10	1.17	472.2
50	1.08	751.1	560.3	1.19	0.069	1.29	0.09	2.10	1.16	525.4
60	1.08	756.1	564.7	1.19	0.069	1.28	0.09	2.10	1.16	532.0
LEVEL F8										
1	1.10	724.1	577.2	1.30	0.076	1.46	0.11	2.00	1.17	481.0
17	1.10	710.3	568.2	1.32	0.076	1.48	0.11	2.00	1.18	462.5
21	1.10	715.6	573.0	1.32	0.076	1.48	0.11	2.00	1.18	469.6
34	1.10	761.7	578.0	1.20	0.070	1.33	0.10	2.00	1.16	530.6
37	1.10	730.0	567.9	1.27	0.073	1.41	0.11	2.00	1.17	488.5
50	1.10	773.1	561.9	1.14	0.066	1.26	0.09	2.00	1.16	545.6
60	1.10	770.1	566.3	1.16	0.067	1.28	0.09	2.00	1.16	541.6

STEADY STATE TEST R

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST R **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.676E+05 LBM/SQFT H — 363.11 KG/SQM S
UNC. MASS FLUX 5.976E+03 LBM/SQFT H — 8.1097 KG/SQM S
PRESSURE 952.4 PSI — 6.57 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.050	645.7	0.034	10.72	1305.5	707.9	60.91	33.837	538.6	281.8	0.757	0.4	.9254	.0334
G	2.039	642.1	0.047	14.73	1389.2	754.3	35.46	19.701	648.1	342.6	35.683	19.8	1.1296	.0384
E2	2.000	630.0	0.000	0.00	1110.6	599.6	0.00	0.000	538.6	281.8	0.757	0.4	.7771	.0298
E3	2.030	639.3	0.031	9.62	1118.7	604.1	111.06	61.702	538.6	281.8	0.757	0.4	.8042	.0307
E6	1.972	621.2	0.076	23.96	1241.3	672.2	69.86	38.812	538.6	281.8	0.757	0.4	.8625	.0320
E7	2.036	641.3	0.030	9.47	1232.7	667.4	18.21	10.119	538.6	281.8	0.757	0.4	.8821	.0324
E8	2.041	643.0	0.019	6.05	1266.9	686.4	14.65	8.141	538.6	281.8	0.757	0.4	.9079	.0330
F1	2.019	636.0	0.052	16.50	1322.2	717.1	23.44	13.023	538.6	281.8	0.757	0.4	.9585	.0343
F2	2.032	640.1	0.021	6.59	1336.9	725.3	35.33	19.629	538.6	281.8	0.757	0.4	.9843	.0350
F3	2.019	636.1	0.052	16.41	1371.9	744.7	51.99	28.884	545.2	285.4	26.838	14.9	1.0101	.0358
F4	1.972	621.2	0.076	23.96	1224.5	662.8	43.42	24.120	565.4	296.7	27.916	15.5	1.0338	.0364
F5	1.997	628.9	0.069	21.59	1284.4	696.1	56.96	31.645	578.9	304.1	30.544	17.0	1.0513	.0367
F6	2.017	635.4	0.047	14.80	1341.2	727.7	42.96	23.865	593.9	312.5	31.721	17.6	1.0698	.0371
F7	2.019	636.0	0.041	12.85	1362.8	739.6	44.79	24.881	609.2	321.0	33.182	18.4	1.0873	.0374
F8	2.027	638.5	0.051	16.02	1393.2	756.6	41.17	22.870	632.5	333.9	34.743	19.3	1.1121	.0380

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test R

T/C Level	(# wet T/C)/(Total # T/C)
E1	All wet
E2	2/3
E3	4/7
E6	0/2
E7	1/4
E8	1/5
F	All day

********** STEADY STATE TEST R **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.93	682.3	667.5	1.666	0.098	2.604	0.052	2.112	1.267	0.024	1.113	0.029	1.247	453.0
4	0.93	693.5	663.9	1.613	0.094	2.604	0.052	2.110	1.264	0.024	1.110	0.029	1.242	467.0
7	0.93	704.1	638.2	1.511	0.090	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.237	480.7
7	0.93	694.7	638.2	1.545	0.091	2.604	0.052	2.110	1.264	0.024	1.110	0.029	1.241	468.6
10	0.93	706.4	647.7	1.525	0.091	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.236	483.7
10	0.93	704.3	647.7	1.533	0.092	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.237	481.0
10	0.93	702.8	647.7	1.538	0.092	2.604	0.052	2.109	1.262	0.024	1.108	0.029	1.238	479.0
13	0.93	708.8	656.0	1.536	0.090	2.604	0.052	2.109	1.260	0.023	1.107	0.029	1.235	486.9
13	0.93	706.8	656.0	1.543	0.093	2.604	0.052	2.109	1.261	0.023	1.107	0.029	1.236	484.3
15	0.93	711.7	637.0	1.482	0.086	2.604	0.052	2.108	1.260	0.023	1.106	0.029	1.234	490.6
16	0.93	742.4	638.7	1.386	0.081	2.604	0.052	2.105	1.254	0.023	1.101	0.029	1.224	530.3
17	0.93	639.4	642.5	1.797	0.104	2.604	0.052	2.119	1.279	0.024	1.125	0.030	1.269	399.5
18	0.93	673.4	641.3	1.638	0.097	2.604	0.052	2.113	1.269	0.024	1.115	0.029	1.251	441.9
18	0.93	648.6	641.3	1.748	0.104	2.604	0.052	2.117	1.276	0.024	1.122	0.029	1.264	410.6
20	0.93	609.1	648.1	1.980	0.116	2.604	0.052	2.125	1.291	0.024	1.135	0.030	1.289	362.9
20	0.93	673.7	648.1	1.654	0.096	2.604	0.052	2.113	1.269	0.024	1.115	0.029	1.251	442.2
21	0.93	690.5	645.0	1.578	0.099	2.604	0.052	2.111	1.265	0.024	1.111	0.029	1.243	463.1
28	0.93	717.8	636.9	1.460	0.084	2.604	0.052	2.108	1.258	0.023	1.105	0.029	1.232	498.7
28	0.93	701.4	636.9	1.518	0.088	2.604	0.052	2.109	1.262	0.023	1.109	0.029	1.238	477.3
28	0.93	706.3	636.9	1.500	0.087	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.236	483.6
31	0.93	720.8	648.8	1.478	0.086	2.604	0.052	2.107	1.258	0.023	1.105	0.029	1.231	502.5
31	0.93	724.2	648.8	1.466	0.085	2.604	0.052	2.107	1.257	0.023	1.104	0.029	1.230	506.6
32	0.93	753.8	658.0	1.394	0.080	2.604	0.052	2.104	1.252	0.023	1.099	0.029	1.220	545.3
34	0.93	704.2	653.2	1.546	0.091	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.237	480.9
37	0.93	687.1	641.0	1.581	0.101	2.604	0.052	2.111	1.265	0.024	1.112	0.029	1.244	459.1
38	0.93	706.2	642.6	1.514	0.089	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.236	483.4
42	0.93	723.2	642.6	1.456	0.087	2.604	0.052	2.107	1.257	0.023	1.104	0.029	1.230	505.3
45	0.93	703.9	651.3	1.543	0.089	2.604	0.052	2.109	1.261	0.023	1.108	0.029	1.237	480.5
45	0.93	712.4	651.3	1.513	0.088	2.604	0.052	2.108	1.260	0.023	1.106	0.029	1.234	491.5
53	0.93	740.9	667.2	1.453	0.085	2.604	0.052	2.105	1.254	0.023	1.101	0.029	1.224	528.3
59	0.93	746.4	645.9	1.390	0.081	2.604	0.052	2.105	1.253	0.023	1.100	0.029	1.223	535.6
59	0.93	744.8	645.9	1.395	0.080	2.604	0.052	2.105	1.253	0.023	1.101	0.029	1.223	533.4
59	0.93	752.2	645.9	1.373	0.082	2.604	0.052	2.104	1.252	0.023	1.099	0.029	1.221	543.2
60	0.93	753.5	639.5	1.356	0.080	2.604	0.052	2.104	1.252	0.023	1.099	0.029	1.220	544.9
64	0.93	783.8	642.4	1.280	0.074	2.604	0.052	2.102	1.247	0.023	1.095	0.029	1.213	584.7

********** STEADY STATE TEST R **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.13	739.8	651.1	1.42	0.084	1.64	0.13	2.10	1.28	551.5
3	1.13	768.3	666.0	1.37	0.079	1.56	0.12	2.10	1.27	593.9
14	1.13	725.6	638.0	1.44	0.087	1.67	0.14	2.10	1.29	531.0
18	1.13	756.4	639.5	1.35	0.078	1.55	0.12	2.10	1.28	576.7
18	1.13	737.5	639.5	1.40	0.082	1.62	0.13	2.10	1.28	548.5
18	1.13	755.6	639.5	1.35	0.078	1.55	0.12	2.10	1.28	575.4
20	1.13	701.8	646.7	1.54	0.089	1.80	0.15	2.10	1.29	496.3
20	1.13	747.9	646.7	1.39	0.082	1.60	0.12	2.10	1.28	563.8
20	1.13	762.1	646.7	1.35	0.079	1.54	0.12	2.10	1.27	584.8
21	1.13	743.7	644.4	1.40	0.080	1.61	0.12	2.10	1.28	557.3
37	1.13	752.7	639.7	1.36	0.079	1.56	0.12	2.10	1.28	571.1
38	1.13	764.7	641.5	1.33	0.077	1.52	0.12	2.10	1.27	588.8
45	1.13	770.5	650.0	1.33	0.078	1.52	0.12	2.10	1.27	597.3
45	1.13	767.9	650.0	1.34	0.078	1.53	0.12	2.10	1.27	593.4
45	1.13	766.1	650.0	1.34	0.079	1.53	0.12	2.10	1.27	590.5
47	1.13	770.6	641.5	1.31	0.077	1.50	0.11	2.10	1.27	597.4
60	1.13	787.9	638.1	1.26	0.075	1.43	0.11	2.10	1.27	624.0

********** STEADY STATE TEST R **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E2														
60	0.78	599.6	630.0	1.983	0.121	2.281	0.050	1.864	1.255	0.015	1.102	0.017	1.252	267.4
LEVEL E3														
34	0.80	541.8	650.0	2.499	0.165	2.341	0.051	1.928	1.299	0.016	1.145	0.019	1.318	222.1
50	0.80	605.2	631.3	1.952	0.122	2.341	0.051	1.912	1.265	0.015	1.113	0.017	1.256	286.3
60	0.80	665.2	636.7	1.660	0.099	2.341	0.051	1.902	1.244	0.015	1.094	0.017	1.219	349.8
LEVEL E6														
60	0.86	699.6	638.1	1.527	0.089	2.468	0.051	2.003	1.256	0.016	1.106	0.019	1.221	427.8
LEVEL E7														
34	0.88	674.7	651.5	1.658	0.099	2.511	0.051	2.038	1.266	0.017	1.115	0.021	1.238	411.1
37	0.88	655.8	639.7	1.710	0.100	2.511	0.051	2.040	1.272	0.017	1.120	0.021	1.247	388.9
50	0.88	671.7	632.7	1.623	0.096	2.511	0.051	2.038	1.267	0.017	1.116	0.021	1.239	407.4
LEVEL E8														
14	0.91	684.6	638.4	1.585	0.094	2.566	0.052	2.082	1.266	0.020	1.114	0.025	1.241	442.6
34	0.91	696.2	651.9	1.573	0.094	2.566	0.052	2.080	1.264	0.020	1.112	0.025	1.236	456.9
37	0.91	676.6	640.1	1.621	0.095	2.566	0.052	2.083	1.269	0.020	1.116	0.025	1.244	432.5
38	0.91	688.2	641.9	1.579	0.092	2.566	0.052	2.081	1.266	0.020	1.113	0.025	1.239	447.2
LEVEL F1														
17	0.96	696.7	641.0	1.545	0.089	2.674	0.053	2.167	1.255	0.043	1.097	0.051	1.250	499.6
21	0.96	708.2	644.9	1.512	0.088	2.674	0.053	2.166	1.252	0.043	1.094	0.051	1.245	514.5
34	0.96	725.6	652.0	1.469	0.087	2.674	0.053	2.164	1.249	0.042	1.091	0.050	1.239	537.7
37	0.96	714.7	640.2	1.479	0.086	2.674	0.053	2.165	1.251	0.043	1.093	0.051	1.243	522.9
50	0.96	728.6	633.2	1.417	0.082	2.674	0.053	2.164	1.248	0.042	1.090	0.050	1.238	541.8
LEVEL F2														
1	0.98	697.3	634.5	1.527	0.089	2.729	0.059	2.212	1.233	0.073	1.067	0.089	1.257	523.8
14	0.98	708.7	639.9	1.499	0.091	2.729	0.059	2.211	1.230	0.073	1.065	0.089	1.252	539.4
17	0.98	720.3	640.5	1.460	0.084	2.729	0.059	2.209	1.228	0.074	1.063	0.088	1.248	555.6
34	0.98	745.8	651.5	1.404	0.083	2.729	0.059	2.207	1.223	0.073	1.059	0.088	1.239	591.3
38	0.98	738.4	641.5	1.405	0.081	2.729	0.059	2.207	1.224	0.073	1.060	0.088	1.242	580.8
50	0.98	741.1	632.7	1.377	0.080	2.729	0.059	2.207	1.224	0.073	1.059	0.088	1.241	584.7

********** STEADY STATE TEST R **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F3										
14	1.01	711.6	638.0	1.48	0.088	1.50	0.10	2.73	1.26	561.0
17	1.01	718.7	640.5	1.47	0.084	1.48	0.10	2.73	1.26	571.1
21	1.01	727.4	644.4	1.45	0.083	1.46	0.10	2.73	1.25	583.6
34	1.01	769.2	651.5	1.34	0.079	1.35	0.09	2.73	1.24	643.1
60	1.01	779.5	638.1	1.28	0.077	1.29	0.09	2.73	1.24	658.1
LEVEL F4										
60	1.03	679.9	638.1	1.60	0.094	1.67	0.12	2.52	1.28	504.4
LEVEL F5										
21	1.05	661.3	644.4	1.70	0.098	1.80	0.14	2.41	1.29	471.0
60	1.05	723.1	638.1	1.45	0.084	1.52	0.11	2.41	1.27	558.5
LEVEL F6										
1	1.07	703.0	651.1	1.55	0.095	1.67	0.13	2.31	1.28	522.2
17	1.07	706.8	640.5	1.51	0.088	1.62	0.12	2.31	1.28	527.8
37	1.07	720.6	639.7	1.46	0.085	1.57	0.11	2.31	1.27	547.3
38	1.07	710.0	641.5	1.50	0.087	1.61	0.12	2.31	1.28	532.4
50	1.07	757.5	632.7	1.33	0.077	1.42	0.10	2.31	1.26	600.9
60	1.07	760.2	638.1	1.33	0.077	1.43	0.10	2.31	1.26	605.0
LEVEL F7										
14	1.09	711.3	639.1	1.49	0.089	1.64	0.13	2.24	1.28	526.9
17	1.09	724.5	641.7	1.45	0.084	1.59	0.12	2.24	1.27	545.4
21	1.09	717.7	645.5	1.48	0.085	1.63	0.12	2.24	1.28	535.9
37	1.09	734.2	640.7	1.42	0.082	1.55	0.11	2.24	1.27	559.7
38	1.09	731.0	642.6	1.43	0.083	1.57	0.12	2.24	1.27	555.0
50	1.09	777.0	633.9	1.28	0.074	1.39	0.10	2.24	1.26	622.6
60	1.09	775.4	639.3	1.30	0.075	1.41	0.10	2.24	1.26	620.2
LEVEL F8										
1	1.11	747.9	651.1	1.40	0.082	1.57	0.12	2.14	1.27	569.7
17	1.11	737.9	640.5	1.40	0.081	1.59	0.12	2.14	1.28	555.1
21	1.11	731.8	644.4	1.43	0.082	1.62	0.12	2.14	1.28	546.5
34	1.11	787.8	651.5	1.29	0.076	1.44	0.11	2.14	1.26	629.5
37	1.11	747.9	639.7	1.37	0.079	1.55	0.12	2.14	1.27	569.7
60	1.11	788.9	638.1	1.26	0.073	1.40	0.10	2.14	1.26	631.2

STEADY STATE TEST T

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST T **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX	1.766E+05	LBM/SQFT H	UNC. MASS FLUX	4.001E+03	LBM/SQFT H	PRESSURE	1723.0	PSI	UNC. PRESSURE	6.00	PSI
	239.60	KG/SQM S		5.4292	KG/SQM S		11.89	MPA		0.041	MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.029	324.1	0.014	4.35	1068.3	576.1	39.17	21.759	624.0	329.2	15.766	8.8	1.0251	.0385
F6	1.030	324.4	0.000	0.00	1060.3	571.6	0.00	0.000	614.8	324.1	0.484	0.3	.9672	.0373
F7	1.014	319.5	0.000	0.00	1024.1	551.5	0.00	0.000	614.8	324.1	0.484	0.3	.9842	.0376
F8	1.027	323.4	0.006	1.75	1080.6	582.9	40.16	22.313	616.9	325.3	15.735	8.7	1.0081	.0381

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
LTF	DEG F	DEG C

Test T

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	1/3
F6	0/7
F7	1/8
F8	All dry

********** STEADY STATE TEST T **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.03	592.6	324.7	1.21	0.071	1.23	0.08	2.77	1.09	265.7
16	1.03	576.4	319.1	1.26	0.074	1.29	0.09	2.77	1.12	250.3
16	1.03	590.5	319.1	1.20	0.070	1.22	0.08	2.77	1.10	263.8
18	1.03	546.8	323.1	1.45	0.085	1.48	0.11	2.77	1.17	222.8
32	1.03	591.7	335.1	1.25	0.073	1.28	0.09	2.77	1.10	264.9
34	1.03	551.3	329.0	1.45	0.086	1.48	0.11	2.77	1.16	227.1
42	1.03	553.7	323.4	1.41	0.091	1.44	0.11	2.77	1.15	229.1
42	1.03	554.6	323.4	1.40	0.083	1.44	0.10	2.77	1.15	230.0
58	1.03	570.8	325.1	1.32	0.077	1.35	0.09	2.77	1.12	245.2
60	1.03	569.5	322.2	1.31	0.078	1.34	0.09	2.77	1.13	243.9
64	1.03	605.1	322.7	1.15	0.067	1.17	0.08	2.77	1.08	277.3
64	1.03	609.8	322.7	1.13	0.065	1.15	0.08	2.77	1.08	281.8

********** STEADY STATE TEST T **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
1	0.97	571.6	324.4	1.311	0.078	2.888	0.057	2.146	1.324	0.049	1.019	0.047	1.112	234.4
LEVEL F7														
60	0.98	551.5	319.5	1.405	0.082	2.924	0.066	2.183	1.338	0.052	1.027	0.065	1.149	223.0

********** STEADY STATE TEST T **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F8										
1	1.01	598.7	324.7	1.18	0.069	1.19	0.08	1.52	1.08	15.1
60	1.01	567.1	322.2	1.33	0.077	1.33	0.09	1.52	1.13	5.6

STEADY STATE TEST U

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HOB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTICNAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST U **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.778E+05 LBM/SQFT H UNC. MASS FLUX 4.028E+03 LBM/SQFT H PRESSURE 1694.4 PSI UNC. PRESSURE 6.00 PSI
241.22 KG/SQM S 5.4663 KG/SQM S 11.69 MPA C.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.030	324.3	0.014	4.33	1069.9	576.9	37.12	20.624	616.9	325.3	16.060	8.9	1.0132	.0379
F6	1.030	324.5	0.000	0.00	1054.7	568.5	0.00	0.000	612.5	322.8	0.484	0.3	.9563	.0367
F7	1.014	319.3	0.000	0.00	1021.5	550.1	0.00	0.000	612.5	322.8	0.484	0.3	.9730	.0370
F8	1.027	323.5	0.006	1.83	1077.2	581.0	38.11	21.174	612.5	322.8	0.484	0.3	.9965	.0375

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test U

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	2/3
F6	1/7
F7	1/8
F8	All dry

********** STEADY STATE TEST U **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.01	589.8	324.8	1.22	0.071	1.23	0.08	2.89	1.10	267.4
16	1.01	573.8	319.2	1.27	0.075	1.28	0.09	2.89	1.12	252.2
16	1.01	588.1	319.2	1.20	0.070	1.21	0.08	2.89	1.10	265.7
32	1.01	588.8	334.3	1.26	0.073	1.27	0.09	2.89	1.10	266.4
34	1.01	549.5	329.4	1.45	0.086	1.47	0.11	2.89	1.16	229.6
42	1.01	552.2	323.6	1.41	0.092	1.43	0.11	2.89	1.15	232.1
42	1.01	553.2	323.6	1.41	0.083	1.42	0.10	2.89	1.15	233.0
58	1.01	569.4	325.2	1.32	0.078	1.33	0.09	2.89	1.12	248.2
60	1.01	568.7	322.2	1.31	0.078	1.32	0.09	2.89	1.12	247.5
64	1.01	604.3	323.0	1.15	0.066	1.16	0.08	2.89	1.08	280.7
64	1.01	608.7	323.0	1.13	0.065	1.14	0.08	2.89	1.07	285.0

********** STEADY STATE TEST U **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
1	0.96	568.5	324.5	1.321	0.079	2.834	0.055	2.118	1.320	0.033	1.020	0.032	1.115	227.6
LEVEL F7														
60	0.97	550.1	319.3	1.406	0.082	2.869	0.060	2.154	1.336	0.052	1.031	0.065	1.149	217.5
LEVEL F8														
1	1.00	595.9	324.8	1.189	0.069	2.919	0.095	2.167	1.266	0.053	0.966	0.059	1.086	269.5
60	1.00	566.0	322.2	1.325	0.077	2.919	0.095	2.181	1.292	0.054	0.987	0.060	1.126	241.8

STEADY STATE TEST V

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST V **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX	1.835E+05	LBM/SQFT H	UNC. MASS FLUX	4.151E+03	LBM/SQFT H	PRESSURE	1744.6	PSI	UNC. PRESSURE 6.00 PSI
	249.03	KG/SQM S		5.6330	KG/SQM S		12.04	MPA	0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.039	327.2	0.016	5.05	1069.6	576.8	29.29	16.274	616.6	325.1	0.484	0.3	.9856	.0378
F6	1.033	325.5	0.000	0.00	1038.5	559.5	0.00	0.000	616.6	325.1	0.484	0.3	.9289	.0365
F8	1.035	326.1	0.009	2.75	1060.3	571.6	39.46	21.920	616.6	325.1	0.484	0.3	.9690	.0374

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test V

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	2/3
F6	4/7
F7	4/8
F8	All dry

********** STEADY STATE TEST V **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL G														
1	0.99	581.6	328.1	1.279	0.075	3.055	0.071	2.252	1.352	0.053	1.043	0.065	1.138	261.1
16	0.99	562.3	322.2	1.358	0.080	3.055	0.071	2.262	1.372	0.053	1.060	0.067	1.168	243.0
16	0.99	577.4	322.2	1.277	0.075	3.055	0.071	2.254	1.356	0.053	1.047	0.065	1.144	257.3
32	0.99	578.6	338.2	1.334	0.078	3.055	0.071	2.253	1.355	0.053	1.046	0.065	1.142	258.4
58	0.99	558.4	328.6	1.408	0.083	3.055	0.071	2.264	1.377	0.053	1.063	0.067	1.175	239.3
60	0.99	558.8	325.5	1.393	0.083	3.055	0.071	2.264	1.376	0.053	1.063	0.067	1.174	239.6
64	0.99	596.4	326.4	1.203	0.070	3.055	0.071	2.245	1.339	0.053	1.033	0.064	1.118	275.4
64	0.99	600.7	326.4	1.184	0.069	3.055	0.071	2.243	1.336	0.053	1.030	0.063	1.113	279.6

********** STEADY STATE TEST V **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F6														
1	0.93	559.5	325.5	1.389	0.084	2.929	0.058	2.174	1.385	0.021	1.077	0.022	1.162	218.2
LEVEL F8														
1	0.97	587.1	328.1	1.252	0.073	3.018	0.060	2.224	1.356	0.051	1.051	0.053	1.127	259.6
60	0.97	556.1	324.2	1.403	0.082	3.018	0.060	2.241	1.389	0.051	1.077	0.054	1.176	230.9

STEADY STATE TEST W

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST W **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.885E+05 LBM/SQFT H UNC. MASS FLUX 4.260E+03 LBM/SQFT H PRESSURE 1819.5 PSI UNC. PRESSURE 6.00 PSI
255.85 KG/SQM S 5.7812 KG/SQM S 12.55 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.223	385.4	0.026	8.34	1091.1	588.7	53.23	29.574	622.5	328.4	0.443	0.2	.9418	.0386
G	1.221	384.6	0.024	7.65	1164.9	629.7	41.20	22.887	695.1	368.7	21.851	12.1	1.1700	.0442
E6	1.218	383.6	0.000	0.00	1060.9	571.9	0.00	0.000	622.5	328.4	0.443	0.2	.8715	.0370
E7	1.228	387.0	0.000	0.00	1139.3	615.5	0.00	0.000	622.5	328.4	0.443	0.2	.8934	.0375
E8	1.238	389.9	0.012	3.74	1100.4	593.9	81.53	45.294	622.5	328.4	0.443	0.2	.9222	.0381
F1	1.212	381.9	0.032	9.93	1076.0	580.3	22.76	12.646	622.5	328.4	0.443	0.2	.9787	.0396
F2	1.223	385.1	0.014	4.33	1115.1	602.0	53.70	29.832	625.1	329.8	13.507	7.5	1.0075	.0404
F3	1.212	381.7	0.031	9.87	1120.2	604.9	38.65	21.472	635.3	335.5	15.235	8.5	1.0363	.0413
F4	1.221	384.5	0.000	0.00	1050.1	565.9	0.00	0.000	645.8	341.3	17.746	9.9	1.0628	.0420
F5	1.187	373.8	0.048	15.12	1073.0	578.7	26.30	14.614	654.3	346.0	18.947	10.5	1.0824	.0424
F6	1.211	381.5	0.026	8.28	1112.7	600.7	31.00	17.221	664.0	351.4	19.474	10.8	1.1032	.0427
F7	1.210	381.1	0.024	7.48	1116.3	602.7	24.97	13.873	673.5	356.7	20.075	11.2	1.1228	.0432
F8	1.216	382.9	0.027	8.63	1153.8	623.5	36.39	20.217	685.8	363.5	20.895	11.6	1.1504	.0438

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test W

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST W **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HC9	QGD KW/M**2
LEVEL F														
1	0.94	631.0	387.3	1.280	0.075	3.154	0.066	2.274	1.390	0.024	1.080	0.025	1.108	299.8
3	0.94	590.8	394.2	1.502	0.088	3.154	0.066	2.290	1.421	0.025	1.106	0.026	1.154	261.7
4	0.94	606.2	391.2	1.408	0.082	3.154	0.066	2.283	1.408	0.024	1.095	0.026	1.134	276.2
7	0.94	616.6	375.7	1.304	0.076	3.154	0.066	2.279	1.400	0.024	1.088	0.025	1.123	286.2
7	0.94	609.1	375.7	1.338	0.078	3.154	0.066	2.282	1.406	0.024	1.093	0.026	1.131	279.0
10	0.94	574.4	382.1	1.553	0.093	3.154	0.066	2.299	1.438	0.025	1.119	0.026	1.178	246.2
10	0.94	576.2	382.1	1.542	0.092	3.154	0.066	2.298	1.436	0.025	1.118	0.026	1.175	248.0
10	0.94	572.8	382.1	1.563	0.094	3.154	0.066	2.300	1.440	0.025	1.121	0.026	1.181	244.9
13	0.94	570.8	391.2	1.614	0.095	3.154	0.066	2.301	1.442	0.025	1.123	0.026	1.184	243.0
13	0.94	564.6	391.2	1.656	0.100	3.154	0.066	2.305	1.450	0.026	1.129	0.027	1.195	237.0
15	0.94	563.3	398.1	1.695	0.100	3.154	0.066	2.305	1.451	0.026	1.130	0.027	1.198	235.8
16	0.94	605.8	379.4	1.368	0.080	3.154	0.066	2.284	1.408	0.025	1.095	0.026	1.135	275.8
17	0.94	568.5	383.6	1.598	0.093	3.154	0.066	2.302	1.445	0.025	1.125	0.026	1.188	240.8
28	0.94	578.4	381.3	1.525	0.089	3.154	0.066	2.297	1.434	0.025	1.116	0.026	1.172	249.9
28	0.94	570.8	381.3	1.573	0.092	3.154	0.066	2.301	1.442	0.025	1.123	0.026	1.184	243.0
28	0.94	569.3	381.3	1.583	0.093	3.154	0.066	2.302	1.444	0.025	1.124	0.026	1.187	241.6
31	0.94	565.3	387.4	1.635	0.097	3.154	0.066	2.304	1.449	0.026	1.128	0.027	1.194	237.8
31	0.94	569.7	387.4	1.605	0.095	3.154	0.066	2.302	1.443	0.025	1.124	0.026	1.186	242.0
32	0.94	628.3	399.0	1.330	0.077	3.154	0.066	2.275	1.392	0.024	1.081	0.025	1.111	297.3
34	0.94	571.6	392.6	1.614	0.096	3.154	0.066	2.300	1.441	0.025	1.122	0.026	1.183	243.8
37	0.94	555.1	385.5	1.700	0.108	3.154	0.066	2.311	1.462	0.027	1.139	0.027	1.213	228.2
38	0.94	553.1	384.8	1.713	0.102	3.154	0.066	2.312	1.465	0.026	1.141	0.027	1.218	226.2
42	0.94	580.8	386.5	1.531	0.092	3.154	0.066	2.295	1.431	0.025	1.114	0.026	1.168	252.2
45	0.94	559.3	392.5	1.699	0.100	3.154	0.066	2.308	1.456	0.026	1.134	0.027	1.205	232.0
45	0.94	561.9	392.5	1.680	0.099	3.154	0.066	2.306	1.453	0.026	1.131	0.027	1.200	234.5
53	0.94	581.9	397.4	1.568	0.093	3.154	0.066	2.295	1.430	0.025	1.113	0.026	1.167	253.2
59	0.94	593.4	383.5	1.447	0.085	3.154	0.066	2.289	1.419	0.025	1.104	0.026	1.150	264.3
59	0.94	594.7	383.5	1.440	0.084	3.154	0.066	2.288	1.418	0.025	1.103	0.026	1.148	265.5
59	0.94	600.6	383.5	1.409	0.084	3.154	0.066	2.286	1.413	0.025	1.099	0.026	1.141	270.9
60	0.94	611.1	384.5	1.360	0.080	3.154	0.066	2.281	1.404	0.024	1.091	0.026	1.129	280.9
64	0.94	649.9	384.3	1.195	0.069	3.154	0.066	2.268	1.378	0.024	1.071	0.025	1.092	318.2
64	0.94	660.1	384.3	1.158	0.067	3.154	0.066	2.265	1.373	0.024	1.066	0.025	1.084	328.0
64	0.94	655.3	384.3	1.176	0.068	3.154	0.066	2.267	1.375	0.024	1.068	0.025	1.088	323.4

********** STEADY STATE TEST W **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.17	648.0	387.3	1.21	0.071	1.39	0.10	2.09	1.14	318.8
14	1.17	604.9	381.0	1.38	0.083	1.61	0.13	2.09	1.18	271.9
16	1.17	644.9	379.4	1.20	0.070	1.37	0.10	2.09	1.14	315.3
16	1.17	654.9	379.4	1.16	0.068	1.33	0.10	2.09	1.13	326.3
18	1.17	623.6	385.2	1.30	0.076	1.51	0.11	2.09	1.16	292.1
18	1.17	613.5	385.2	1.35	0.079	1.57	0.12	2.09	1.17	281.0
18	1.17	619.2	385.2	1.32	0.077	1.54	0.12	2.09	1.16	287.4
20	1.17	570.4	384.6	1.59	0.093	1.91	0.16	2.09	1.23	234.7
20	1.17	613.7	384.6	1.35	0.080	1.57	0.12	2.09	1.17	281.2
20	1.17	617.8	384.6	1.33	0.077	1.54	0.12	2.09	1.16	285.8
21	1.17	602.9	370.9	1.35	0.078	1.58	0.12	2.09	1.18	269.6
32	1.17	663.4	399.0	1.19	0.069	1.35	0.10	2.09	1.12	335.7
34	1.17	643.3	392.6	1.25	0.073	1.43	0.11	2.09	1.14	313.5
37	1.17	614.9	385.5	1.35	0.078	1.57	0.12	2.09	1.17	282.6
38	1.17	619.7	384.8	1.32	0.077	1.53	0.12	2.09	1.16	288.0
42	1.17	640.7	386.5	1.24	0.079	1.42	0.11	2.09	1.14	310.5
42	1.17	643.7	386.5	1.23	0.071	1.41	0.10	2.09	1.14	314.0
45	1.17	622.7	392.5	1.33	0.079	1.55	0.12	2.09	1.16	291.3
45	1.17	619.6	392.5	1.35	0.080	1.56	0.12	2.09	1.16	287.8
45	1.17	620.9	392.5	1.34	0.079	1.56	0.12	2.09	1.16	289.3
47	1.17	620.7	386.5	1.32	0.078	1.53	0.12	2.09	1.16	289.0
50	1.17	634.8	381.3	1.24	0.072	1.43	0.11	2.09	1.15	304.5
58	1.17	642.4	387.9	1.24	0.072	1.42	0.11	2.09	1.14	312.5
60	1.17	644.2	384.5	1.22	0.072	1.40	0.10	2.09	1.14	314.5
64	1.17	672.0	384.3	1.12	0.065	1.27	0.09	2.09	1.12	345.2
64	1.17	674.3	384.3	1.11	0.064	1.26	0.09	2.09	1.12	347.6

********** STEADY STATE TEST W **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E6														
60	0.87	571.9	383.6	1.575	0.093	2.988	0.065	2.180	1.419	0.018	1.103	0.018	1.168	217.7
LEVEL E7														
1	0.89	615.5	387.0	1.348	0.079	3.040	0.065	2.197	1.388	0.017	1.079	0.017	1.114	264.3
LEVEL E8														
1	0.92	625.9	387.3	1.302	0.076	3.108	0.066	2.242	1.390	0.019	1.080	0.020	1.109	286.0
34	0.92	561.8	392.6	1.682	0.101	3.108	0.066	2.272	1.450	0.021	1.129	0.021	1.196	226.8
LEVEL F1														
17	0.98	593.9	383.6	1.445	0.084	3.241	0.073	2.351	1.413	0.053	1.095	0.064	1.157	280.6
21	0.98	559.6	385.2	1.666	0.098	3.241	0.073	2.370	1.450	0.053	1.125	0.068	1.212	247.1
34	0.98	593.2	392.6	1.483	0.088	3.241	0.073	2.351	1.414	0.052	1.095	0.065	1.158	279.9
37	0.98	580.9	385.5	1.527	0.089	3.241	0.073	2.357	1.426	0.053	1.105	0.066	1.175	267.9
50	0.98	577.5	381.3	1.531	0.089	3.241	0.073	2.359	1.429	0.053	1.108	0.066	1.181	264.7

********** STEADY STATE TEST W **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F2										
1	1.01	652.6	387.3	1.19	0.069	1.20	0.07	3.29	1.10	354.3
14	1.01	560.7	381.0	1.64	0.100	1.65	0.11	3.29	1.22	261.0
17	1.01	604.3	383.6	1.39	0.080	1.40	0.09	3.29	1.15	304.7
34	1.01	607.1	392.6	1.41	0.083	1.42	0.09	3.29	1.15	307.6
38	1.01	597.0	384.8	1.43	0.083	1.44	0.09	3.29	1.16	297.7
50	1.01	590.6	381.3	1.45	0.085	1.46	0.10	3.29	1.17	291.1
LEVEL F3										
14	1.04	576.2	381.0	1.54	0.091	1.58	0.11	2.91	1.19	268.2
17	1.04	606.7	383.6	1.38	0.080	1.41	0.09	2.91	1.15	299.4
21	1.04	584.9	385.2	1.50	0.087	1.54	0.10	2.91	1.18	277.2
34	1.04	623.2	392.6	1.33	0.078	1.36	0.09	2.91	1.13	316.1
60	1.04	632.1	384.5	1.27	0.075	1.30	0.09	2.91	1.13	325.4
LEVEL F4										
60	1.06	565.9	384.5	1.62	0.096	1.71	0.13	2.67	1.22	252.2
LEVEL F5										
60	1.08	589.0	384.5	1.48	0.086	1.58	0.12	2.53	1.18	271.1
LEVEL F6										
1	1.10	630.9	387.3	1.28	0.076	1.39	0.10	2.39	1.14	310.7
17	1.10	601.2	383.6	1.41	0.082	1.54	0.11	2.39	1.17	279.6
37	1.10	585.2	385.5	1.50	0.088	1.65	0.12	2.39	1.19	263.0
38	1.10	584.6	384.8	1.50	0.088	1.65	0.12	2.39	1.20	262.5
50	1.10	595.2	381.3	1.43	0.084	1.56	0.12	2.39	1.18	273.4
60	1.10	616.4	384.5	1.33	0.078	1.45	0.10	2.39	1.15	295.6
LEVEL F7										
14	1.12	588.0	381.0	1.47	0.087	1.65	0.13	2.27	1.19	262.2
17	1.12	611.7	383.6	1.35	0.078	1.50	0.11	2.27	1.16	286.7
21	1.12	585.3	385.2	1.50	0.087	1.69	0.13	2.27	1.20	259.3
37	1.12	598.4	385.5	1.43	0.083	1.59	0.12	2.27	1.18	272.9
38	1.12	599.8	384.8	1.42	0.082	1.58	0.12	2.27	1.18	274.3
50	1.12	607.8	381.3	1.36	0.080	1.52	0.11	2.27	1.17	282.5
60	1.12	629.1	384.5	1.28	0.074	1.41	0.10	2.27	1.14	304.9
LEVEL F8										
1	1.15	655.2	387.3	1.19	0.069	1.33	0.09	2.15	1.13	329.0
17	1.15	618.2	383.6	1.32	0.076	1.51	0.11	2.15	1.16	288.7
21	1.15	594.9	385.2	1.45	0.084	1.66	0.13	2.15	1.19	263.8
34	1.15	636.2	392.6	1.28	0.075	1.44	0.11	2.15	1.14	308.2
37	1.15	610.8	385.5	1.36	0.079	1.56	0.12	2.15	1.17	281.0
50	1.15	623.6	381.3	1.29	0.075	1.47	0.11	2.15	1.16	294.7
60	1.15	643.3	384.5	1.22	0.071	1.37	0.10	2.15	1.14	315.9

STEADY STATE TEST X

FLUID CONDITIONS

CORRELATION COMPARISONS

SI UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST X **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.537E+05 LBM/SQFT H UNC. MASS FLUX 5.683E+03 LBM/SQFT H PRESSURE 871.5 PSI UNC. PRESSURE 6.00 PSI
344.32 KG/SQM S 7.7115 KG/SQM S 6.01 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.906	600.4	0.037	11.67	1272.9	689.7	63.76	35.421	528.0	275.9	0.824	0.5	.9309	.0322
G	1.868	588.5	0.046	14.36	1371.1	744.3	35.16	19.534	640.1	338.2	35.295	19.6	1.1255	.0370
E3	1.903	599.5	0.038	11.84	1076.5	580.6	37.05	20.585	528.0	275.9	0.824	0.5	.8147	.0296
E6	1.817	572.3	0.071	22.33	1183.6	640.1	61.31	34.059	528.0	275.9	0.824	0.5	.8706	.0308
E7	1.897	597.4	0.037	11.74	1199.5	648.9	35.40	19.668	528.0	275.9	0.824	0.5	.8894	.0312
E8	1.889	595.0	0.033	10.44	1220.9	660.8	29.00	16.110	528.0	275.9	0.824	0.5	.9141	.0318
F1	1.876	591.0	0.054	16.92	1284.0	695.9	26.82	14.900	528.0	275.9	0.824	0.5	.9626	.0330
F2	1.894	596.7	0.024	7.55	1299.7	704.6	45.11	25.063	528.0	275.9	0.824	0.5	.9873	.0337
F3	1.875	590.6	0.059	18.49	1333.8	723.5	49.64	27.578	536.4	280.6	27.746	15.4	1.0121	.0345
F4	1.817	572.3	0.071	22.33	1180.7	638.5	50.84	28.245	556.2	291.5	30.288	16.8	1.0347	.0351
F5	1.843	580.5	0.068	21.28	1244.6	674.0	48.51	26.952	572.0	300.3	32.139	17.9	1.0513	.0354
F6	1.875	590.7	0.054	17.06	1309.5	710.0	40.76	22.642	587.4	308.9	32.903	18.3	1.0689	.0357
F7	1.870	588.9	0.043	13.62	1333.0	723.1	43.63	24.241	602.7	317.4	33.132	18.4	1.0855	.0361
F8	1.889	595.0	0.055	17.27	1377.7	748.0	52.56	29.197	624.4	329.4	34.813	19.3	1.1089	.0366

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test X

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	4/7
E6	0/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST X **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL F														
3	0.93	660.2	624.8	1.626	0.095	2.405	0.046	1.973	1.193	0.025	1.042	0.030	1.198	405.3
4	0.93	664.7	621.8	1.599	0.093	2.405	0.046	1.972	1.192	0.025	1.041	0.030	1.195	410.8
7	0.93	661.0	590.5	1.533	0.091	2.405	0.046	1.973	1.193	0.025	1.042	0.030	1.197	406.3
7	0.93	650.9	590.5	1.575	0.093	2.405	0.046	1.974	1.195	0.025	1.044	0.030	1.202	394.5
10	0.93	694.5	606.7	1.449	0.086	2.405	0.046	1.968	1.185	0.024	1.035	0.030	1.183	446.4
10	0.93	690.8	606.7	1.462	0.087	2.405	0.046	1.969	1.185	0.024	1.035	0.030	1.184	441.8
10	0.93	688.9	606.7	1.469	0.087	2.405	0.046	1.969	1.186	0.025	1.036	0.030	1.185	439.6
13	0.93	686.7	606.7	1.477	0.086	2.405	0.046	1.969	1.186	0.024	1.036	0.030	1.186	437.2
13	0.93	684.8	606.7	1.484	0.089	2.405	0.046	1.970	1.187	0.025	1.037	0.030	1.187	434.8
15	0.93	682.3	590.5	1.453	0.084	2.405	0.046	1.970	1.187	0.025	1.037	0.030	1.188	431.8
16	0.93	707.9	592.8	1.372	0.080	2.405	0.046	1.967	1.182	0.024	1.032	0.030	1.178	462.9
17	0.93	638.7	601.2	1.657	0.096	2.405	0.046	1.976	1.199	0.025	1.048	0.030	1.208	380.2
18	0.93	662.2	600.6	1.555	0.092	2.405	0.046	1.972	1.192	0.025	1.042	0.030	1.197	407.7
18	0.93	643.8	600.6	1.633	0.096	2.405	0.046	1.975	1.197	0.025	1.046	0.030	1.206	386.3
20	0.93	598.1	606.8	1.883	0.110	2.405	0.046	1.983	1.213	0.025	1.060	0.031	1.234	332.9
20	0.93	662.6	606.8	1.569	0.091	2.405	0.046	1.972	1.192	0.025	1.042	0.030	1.196	408.2
21	0.93	661.3	597.0	1.549	0.096	2.405	0.046	1.973	1.192	0.025	1.042	0.030	1.197	406.7
28	0.93	699.8	596.5	1.407	0.081	2.405	0.046	1.968	1.184	0.024	1.034	0.030	1.181	453.0
28	0.93	687.2	596.5	1.450	0.084	2.405	0.046	1.969	1.186	0.024	1.036	0.030	1.186	437.8
28	0.93	691.2	596.5	1.436	0.083	2.405	0.046	1.969	1.185	0.024	1.035	0.030	1.184	442.3
31	0.93	694.7	600.7	1.434	0.084	2.405	0.046	1.968	1.185	0.024	1.035	0.030	1.183	446.6
31	0.93	696.7	600.7	1.427	0.083	2.405	0.046	1.968	1.184	0.024	1.034	0.030	1.182	449.1
32	0.93	676.3	606.2	1.514	0.088	2.405	0.046	1.971	1.189	0.025	1.038	0.030	1.190	424.8
34	0.93	692.6	611.7	1.468	0.086	2.405	0.046	1.969	1.185	0.024	1.035	0.030	1.184	444.0
37	0.93	663.2	589.5	1.522	0.096	2.405	0.046	1.972	1.192	0.025	1.041	0.030	1.196	409.0
38	0.93	678.2	590.6	1.468	0.086	2.405	0.046	1.970	1.188	0.025	1.038	0.030	1.189	427.1
42	0.93	709.4	601.9	1.389	0.082	2.405	0.046	1.967	1.182	0.024	1.032	0.030	1.177	464.8
45	0.93	678.7	598.7	1.486	0.086	2.405	0.046	1.970	1.188	0.025	1.038	0.030	1.189	427.8
45	0.93	685.6	598.7	1.461	0.085	2.405	0.046	1.969	1.187	0.024	1.036	0.030	1.186	435.9
53	0.93	726.4	624.9	1.387	0.081	2.405	0.046	1.965	1.178	0.024	1.029	0.030	1.172	485.5
59	0.93	729.9	606.4	1.336	0.077	2.405	0.046	1.965	1.178	0.024	1.028	0.030	1.171	489.5
59	0.93	725.7	606.4	1.348	0.078	2.405	0.046	1.965	1.179	0.024	1.029	0.030	1.172	484.7
59	0.93	735.7	606.4	1.319	0.078	2.405	0.046	1.964	1.177	0.024	1.028	0.030	1.169	496.8
60	0.93	724.0	588.6	1.314	0.077	2.405	0.046	1.965	1.179	0.024	1.029	0.030	1.173	482.6
64	0.93	754.1	592.7	1.240	0.071	2.405	0.046	1.963	1.174	0.024	1.025	0.030	1.164	520.0
64	0.93	775.3	592.7	1.187	0.068	2.405	0.046	1.961	1.171	0.024	1.022	0.030	1.159	546.6
64	0.93	766.4	592.7	1.208	0.069	2.405	0.046	1.962	1.172	0.024	1.023	0.030	1.161	535.7

********** STEADY STATE TEST X **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL G										
1	1.13	734.4	602.9	1.32	0.077	1.52	0.12	1.96	1.22	511.4
3	1.13	756.3	616.3	1.28	0.074	1.47	0.11	1.96	1.21	541.8
14	1.13	711.6	583.7	1.34	0.081	1.56	0.13	1.96	1.23	479.9
16	1.13	770.5	584.8	1.18	0.069	1.35	0.10	1.96	1.21	562.2
16	1.13	777.9	584.8	1.16	0.068	1.33	0.10	1.96	1.21	572.5
18	1.13	749.5	592.0	1.25	0.072	1.44	0.11	1.96	1.22	532.5
18	1.13	732.7	592.0	1.30	0.075	1.50	0.12	1.96	1.22	508.9
18	1.13	751.6	592.0	1.24	0.072	1.43	0.11	1.96	1.21	535.5
20	1.13	692.1	598.6	1.44	0.083	1.69	0.14	1.96	1.23	453.5
20	1.13	739.6	598.6	1.29	0.076	1.49	0.12	1.96	1.22	518.7
20	1.13	751.1	598.6	1.26	0.073	1.45	0.11	1.96	1.21	534.7
21	1.13	727.8	577.4	1.28	0.073	1.48	0.11	1.96	1.22	502.5
32	1.13	757.4	598.0	1.24	0.072	1.43	0.11	1.96	1.21	543.4
37	1.13	731.0	580.6	1.28	0.074	1.48	0.11	1.96	1.22	506.5
38	1.13	745.5	583.0	1.24	0.072	1.43	0.11	1.96	1.22	527.2
45	1.13	750.1	590.6	1.25	0.073	1.43	0.11	1.96	1.21	533.3
45	1.13	749.7	590.6	1.25	0.073	1.44	0.11	1.96	1.21	532.8
45	1.13	750.9	590.6	1.24	0.072	1.43	0.11	1.96	1.21	534.4
47	1.13	742.1	583.3	1.25	0.073	1.44	0.11	1.96	1.22	522.4
60	1.13	770.8	580.7	1.17	0.069	1.34	0.10	1.96	1.21	562.6

********** STEADY STATE TEST X **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG C	Q KW/M**2	HEXP	UHEXP	HDR KW/M**2 C	UHDR	HDRPW	HG57	UHG57	HG59 KW/M**2 C	UHG59	HCB	QGD KW/M**2
LEVEL E3														
34	0.81	566.1	607.9	2.095	0.133	2.172	0.045	1.801	1.210	0.015	1.062	0.017	1.227	236.1
50	0.81	595.2	591.1	1.852	0.115	2.172	0.045	1.795	1.197	0.014	1.050	0.017	1.204	264.5
LEVEL E6														
60	0.87	664.2	588.1	1.515	0.088	2.285	0.045	1.876	1.190	0.016	1.044	0.019	1.179	368.2
LEVEL E7														
34	0.89	664.1	610.6	1.573	0.094	2.322	0.045	1.905	1.193	0.017	1.046	0.021	1.184	380.2
37	0.89	626.7	588.0	1.676	0.098	2.322	0.045	1.911	1.204	0.017	1.056	0.021	1.204	338.9
50	0.89	656.0	593.7	1.562	0.092	2.322	0.045	1.906	1.195	0.017	1.048	0.021	1.188	371.2
LEVEL E8														
14	0.91	648.1	591.2	1.589	0.094	2.371	0.046	1.948	1.198	0.021	1.049	0.026	1.199	379.6
34	0.91	683.8	610.6	1.497	0.089	2.371	0.046	1.944	1.189	0.021	1.040	0.025	1.183	421.5
37	0.91	651.6	588.0	1.565	0.091	2.371	0.046	1.948	1.197	0.021	1.048	0.026	1.197	383.8
38	0.91	659.7	590.4	1.538	0.089	2.371	0.046	1.947	1.195	0.021	1.046	0.025	1.193	393.1
LEVEL F1														
17	0.96	681.2	600.6	1.482	0.085	2.467	0.047	2.022	1.177	0.047	1.021	0.054	1.197	456.2
21	0.96	679.4	597.0	1.479	0.086	2.467	0.047	2.022	1.177	0.047	1.022	0.054	1.198	454.0
34	0.96	717.8	610.6	1.382	0.081	2.467	0.047	2.018	1.169	0.046	1.014	0.053	1.183	502.3
37	0.96	690.1	588.0	1.420	0.082	2.467	0.047	2.021	1.175	0.047	1.019	0.054	1.193	467.6
38	0.96	689.5	590.4	1.428	0.082	2.467	0.047	2.021	1.175	0.047	1.020	0.054	1.193	466.8
50	0.96	712.1	593.7	1.361	0.078	2.467	0.047	2.018	1.170	0.046	1.015	0.053	1.185	495.0
LEVEL F2														
1	0.99	668.9	593.4	1.510	0.088	2.516	0.056	2.062	1.154	0.073	0.991	0.087	1.209	460.7
14	0.99	687.9	592.0	1.437	0.087	2.516	0.056	2.060	1.150	0.072	0.987	0.087	1.200	485.6
17	0.99	703.2	600.4	1.405	0.081	2.516	0.056	2.058	1.147	0.073	0.984	0.086	1.195	504.8
34	0.99	738.1	610.4	1.321	0.077	2.516	0.056	2.054	1.141	0.072	0.979	0.086	1.183	551.3
38	0.99	703.3	590.3	1.381	0.080	2.516	0.056	2.058	1.147	0.072	0.984	0.086	1.195	505.0
50	0.99	726.2	593.6	1.318	0.076	2.516	0.056	2.055	1.142	0.072	0.981	0.086	1.187	535.3

********** STEADY STATE TEST X **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG C	Q KW/M**2	HEXPS	UHEXPS	HEXP KW/M**2 C	UHEXP	HDB	HCB KW/M**2 C	QGD KW/M**2
LEVEL F3										
14	1.01	694.4	591.2	1.41	0.083	1.43	0.10	2.49	1.20	506.7
17	1.01	706.8	600.6	1.39	0.080	1.41	0.10	2.49	1.20	522.6
21	1.01	699.4	597.0	1.41	0.081	1.43	0.10	2.49	1.20	513.1
34	1.01	761.8	610.6	1.26	0.073	1.27	0.08	2.49	1.18	597.6
60	1.01	747.3	588.1	1.25	0.074	1.26	0.09	2.49	1.19	577.9
LEVEL F4										
60	1.03	658.4	588.1	1.54	0.090	1.60	0.12	2.32	1.23	448.5
LEVEL F5										
21	1.05	644.8	597.0	1.62	0.093	1.73	0.14	2.22	1.24	422.8
60	1.05	698.0	588.1	1.39	0.081	1.48	0.11	2.22	1.21	493.0
LEVEL F6										
1	1.07	689.0	611.6	1.48	0.090	1.61	0.13	2.14	1.22	472.5
17	1.07	697.5	602.3	1.43	0.083	1.55	0.12	2.14	1.22	483.6
37	1.07	696.7	589.0	1.40	0.081	1.52	0.11	2.14	1.22	482.5
38	1.07	693.7	591.4	1.42	0.082	1.54	0.12	2.14	1.22	478.8
50	1.07	745.8	594.7	1.27	0.073	1.36	0.10	2.14	1.20	549.2
60	1.07	737.4	589.0	1.28	0.074	1.37	0.10	2.14	1.20	537.3
LEVEL F7										
14	1.09	696.6	591.9	1.41	0.083	1.56	0.12	2.07	1.22	475.2
17	1.09	718.3	601.9	1.36	0.078	1.50	0.11	2.07	1.21	504.6
21	1.09	702.0	597.7	1.40	0.081	1.55	0.12	2.07	1.22	482.8
37	1.09	712.3	588.2	1.35	0.078	1.49	0.11	2.07	1.22	496.2
38	1.09	713.4	591.1	1.35	0.078	1.49	0.11	2.07	1.22	497.8
50	1.09	765.5	594.5	1.21	0.070	1.33	0.09	2.07	1.20	570.4
60	1.09	753.6	588.8	1.23	0.071	1.35	0.10	2.07	1.20	553.5
LEVEL F8										
1	1.11	737.9	612.5	1.33	0.077	1.50	0.11	2.00	1.21	522.6
17	1.11	723.9	602.5	1.34	0.077	1.53	0.12	2.00	1.22	503.3
21	1.11	718.1	598.9	1.35	0.078	1.54	0.12	2.00	1.22	495.5
34	1.11	786.8	612.5	1.20	0.070	1.34	0.10	2.00	1.20	591.3
37	1.11	727.4	589.8	1.31	0.075	1.48	0.11	2.00	1.22	508.1
50	1.11	789.1	595.6	1.16	0.067	1.30	0.09	2.00	1.20	594.1
60	1.11	769.8	589.9	1.19	0.069	1.34	0.10	2.00	1.21	567.2

Appendix D.2

STEADY STATE TESTS IN ENGLISH UNITS

STEADY STATE TEST B

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST B **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.253E+05 LBM/SQFT H UNC. MASS FLUX 1.205E+04 LBM/SQFT H PRESSURE 1849.4 PSI UNC. PRESSURE 6.00 PSI
712.89 KG/SQM S 16.3578 KG/SQM S 12.76 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
C	2.893	911.2	0.063	19.99	1322.6	717.3	58.12	32.292	624.7	329.6	0.443	0.2	.4663	.0246
E	2.900	913.5	0.041	13.07	1353.5	734.5	21.53	11.959	624.7	329.6	0.443	0.2	.6524	.0294
F	2.893	911.2	0.052	16.26	1262.3	683.8	38.30	21.280	624.7	329.6	0.443	0.2	.8465	.0343
G	2.874	905.2	0.061	19.20	1199.2	648.8	35.86	19.924	638.4	337.2	14.423	8.0	1.0387	.0391
H	2.880	907.2	0.000	0.00	1373.9	745.8	0.00	0.000	624.7	329.6	0.443	0.2	.3849	.0228
Y	2.881	907.6	0.000	0.00	1223.2	662.1	0.00	0.000	624.7	329.6	0.443	0.2	.4004	.0231
E1	2.868	903.4	0.027	8.48	1364.3	740.5	41.04	22.800	624.7	329.6	0.443	0.2	.6834	.0302
E2	2.823	889.3	0.089	27.88	1329.1	720.9	7.77	4.316	624.7	329.6	0.443	0.2	.7057	.0309
E3	2.872	904.8	0.026	8.28	1364.7	740.7	16.00	8.890	624.7	329.6	0.443	0.2	.7319	.0317
E6	2.797	881.1	0.107	33.77	1199.1	648.7	34.93	19.406	624.7	329.6	0.443	0.2	.7872	.0330
E7	2.887	909.3	0.032	10.09	1222.0	661.4	34.21	19.005	624.7	329.6	0.443	0.2	.8057	.0333
E8	2.888	909.8	0.027	8.56	1256.3	680.5	19.83	11.014	624.7	329.6	0.443	0.2	.8300	.0339
F1	2.853	898.6	0.068	21.52	1249.8	676.9	15.00	8.332	624.7	329.6	0.443	0.2	.8776	.0351
F2	2.884	908.4	0.031	9.63	1272.1	689.2	19.33	10.738	624.7	329.6	0.443	0.2	.9019	.0358
F3	2.850	897.7	0.068	21.31	1260.0	682.6	18.16	10.090	624.7	329.6	0.443	0.2	.9262	.0365
F4	2.797	881.1	0.107	33.77	1039.0	559.8	3.89	2.161	624.7	329.6	0.443	0.2	.9485	.0372
F5	2.823	889.3	0.089	27.88	1096.3	591.6	32.77	18.204	624.7	329.6	0.443	0.2	.9650	.0375
F6	2.851	898.2	0.060	18.91	1152.2	622.7	20.45	11.364	624.7	329.6	0.443	0.2	.9825	.0378
F7	2.850	897.9	0.054	16.94	1160.0	627.0	23.54	13.079	624.7	329.6	0.443	0.2	.9990	.0381
F8	2.862	901.7	0.061	19.10	1191.7	644.6	32.61	18.119	632.5	334.0	12.213	6.8	1.0222	.0387

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test B

T/C Level	(# wet T/C)/(Total # T/C)
C	All wet
U	4/5
S	5/5
H	5/6
Y	5/6
D	3/50
E	All dry

********** STEADY STATE TEST B **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F					BTU/H SQFT F					
LEVEL D														
2	0.47	1399.5	2.92	376.4	22.85	807.5	20.53	570.2	365.1	6.79	326.9	7.94	340.3	1.997
4	0.47	1381.1	2.96	390.9	23.77	807.5	20.53	570.6	365.9	6.81	327.6	7.96	341.6	1.949
8	0.47	1403.8	2.66	341.8	20.48	807.5	20.53	570.1	364.9	6.78	326.7	7.93	340.0	2.008
8	0.47	1390.8	2.66	347.6	21.66	807.5	20.53	570.4	365.5	6.81	327.2	7.96	340.9	1.974
9	0.47	1363.7	2.89	390.9	24.49	807.5	20.53	571.0	366.7	6.85	328.4	8.00	343.0	1.905
10	0.47	1288.3	2.89	435.9	26.37	807.5	20.53	573.0	370.8	6.92	332.2	8.09	349.9	1.709
10	0.47	1310.7	2.89	421.7	25.83	807.5	20.53	572.3	369.5	6.90	331.0	8.06	347.6	1.767
12	0.47	1337.5	2.94	412.1	25.03	807.5	20.53	571.6	368.0	6.86	329.6	8.02	345.2	1.836
13	0.47	1309.5	2.92	425.8	26.96	807.5	20.53	572.4	369.5	6.93	331.1	8.08	347.7	1.764
15	0.47	1351.6	3.04	418.3	25.07	807.5	20.53	571.3	367.3	6.83	329.0	7.99	344.0	1.873
16	0.47	1408.1	2.85	364.0	22.40	807.5	20.53	570.0	364.7	6.79	326.6	7.94	339.7	2.019
17	0.47	1351.7	2.86	393.2	24.26	807.5	20.53	571.3	367.3	6.85	328.9	8.00	344.0	1.873
18	0.47	1324.8	2.87	410.6	24.83	807.5	20.53	571.9	368.7	6.87	330.3	8.03	346.3	1.803
18	0.47	1346.8	2.87	398.1	24.03	807.5	20.53	571.4	367.5	6.84	329.2	8.00	344.4	1.861
20	0.47	1282.3	2.91	442.3	28.81	807.5	20.53	573.2	371.2	7.00	332.6	8.15	350.5	1.694
20	0.47	1294.2	2.91	434.4	26.10	807.5	20.53	572.8	370.4	6.90	331.9	8.07	349.3	1.725
20	0.47	1292.3	2.91	435.7	26.44	807.5	20.53	572.9	370.5	6.91	332.0	8.08	349.5	1.720
24	0.47	1088.3	2.86	618.0	41.14	807.5	20.53	582.3	390.1	7.65	350.4	8.81	383.2	1.213
25	0.47	1320.4	2.87	412.4	26.07	807.5	20.53	572.1	368.9	6.91	330.5	8.06	346.7	1.792
25	0.47	1331.7	2.87	405.8	25.54	807.5	20.53	571.8	368.3	6.89	329.9	8.04	345.7	1.821
26	0.47	1341.5	2.91	405.4	24.65	807.5	20.53	571.5	367.8	6.85	329.4	8.01	344.8	1.847
26	0.47	1342.8	2.91	404.7	24.38	807.5	20.53	571.5	367.7	6.84	329.4	8.00	344.7	1.850
26	0.47	1315.6	2.91	420.6	25.30	807.5	20.53	572.2	369.2	6.88	330.7	8.04	347.2	1.780
29	0.47	1319.6	2.87	412.6	24.79	807.5	20.53	572.1	369.0	6.87	330.5	8.03	346.8	1.790
29	0.47	1314.9	2.87	415.4	25.13	807.5	20.53	572.2	369.2	6.88	330.8	8.05	347.2	1.778
29	0.47	1307.9	2.87	419.6	25.16	807.5	20.53	572.4	369.6	6.88	331.1	8.05	347.9	1.760
30	0.47	1291.4	2.85	427.7	27.47	807.5	20.53	572.9	370.6	6.97	332.1	8.12	349.5	1.717
31	0.47	1290.8	2.89	434.1	26.78	807.5	20.53	572.9	370.6	6.93	332.1	8.09	349.6	1.716
35	0.47	1339.7	2.91	407.0	24.76	807.5	20.53	571.6	367.9	6.86	329.5	8.01	345.0	1.842
39	0.47	1341.3	2.88	401.7	25.39	807.5	20.53	571.5	367.8	6.88	329.4	8.03	344.8	1.846
42	0.47	1332.6	2.88	406.7	25.61	807.5	20.53	571.7	368.3	6.89	329.9	8.04	345.6	1.824
43	0.47	1317.8	2.97	428.5	28.41	807.5	20.53	572.1	369.1	6.96	330.6	8.10	347.0	1.785
43	0.47	1366.2	2.97	400.5	26.64	807.5	20.53	570.9	366.6	6.89	328.3	8.03	342.8	1.910
44	0.47	1151.5	2.93	556.8	36.11	807.5	20.53	578.4	382.0	7.31	342.7	8.48	369.0	1.367
45	0.47	1296.0	2.93	436.2	30.26	807.5	20.53	572.8	370.3	7.04	331.8	8.17	349.1	1.729
45	0.47	1259.5	2.93	461.2	29.23	807.5	20.53	573.9	372.7	7.01	334.0	8.17	353.0	1.638
49	0.47	1351.6	2.89	397.3	24.15	807.5	20.53	571.3	367.3	6.84	329.0	8.00	344.0	1.873
51	0.47	1314.7	2.92	423.6	26.48	807.5	20.53	572.2	369.2	6.91	330.8	8.07	347.2	1.777
55	0.47	1295.0	2.91	433.8	27.05	807.5	20.53	572.8	370.4	6.93	331.9	8.09	349.2	1.727
58	0.47	1378.0	2.93	388.7	23.49	807.5	20.53	570.6	366.0	6.81	327.8	7.96	341.9	1.941
58	0.47	1337.8	2.93	410.6	25.37	807.5	20.53	571.6	368.0	6.87	329.6	8.02	345.1	1.837
59	0.47	1366.6	2.90	390.7	23.93	807.5	20.53	570.9	366.6	6.83	328.3	7.98	342.8	1.911
LEVEL E														
2	0.65	1371.9	2.92	390.3	24.07	1002.0	22.31	712.1	426.1	6.33	398.4	7.63	366.3	2.481
3	0.65	1372.6	2.97	397.6	24.73	1002.0	22.31	712.1	426.0	6.34	398.4	7.63	366.2	2.483
4	0.65	1380.2	2.96	391.3	23.50	1002.0	22.31	711.9	425.6	6.30	398.0	7.60	365.6	2.507
7	0.65	1358.7	2.84	386.5	24.03	1002.0	22.31	712.5	426.8	6.35	399.1	7.65	367.4	2.436
7	0.65	1374.6	2.84	378.3	23.29	1002.0	22.31	712.0	425.9	6.33	398.2	7.62	366.1	2.490
10	0.65	1348.5	2.89	398.7	24.12	1002.0	22.31	712.8	427.4	6.34	399.7	7.64	368.3	2.402
12	0.65	1338.2	2.94	411.7	25.54	1002.0	22.31	713.1	428.0	6.38	400.3	7.68	369.2	2.368
13	0.65	1361.2	2.92	395.9	25.13	1002.0	22.31	712.4	426.7	6.37	399.0	7.66	367.2	2.445
13	0.65	1368.1	2.92	392.3	24.19	1002.0	22.31	712.2	426.3	6.33	398.6	7.63	366.6	2.468
15	0.65	1341.3	3.04	424.3	26.12	1002.0	22.31	713.0	427.8	6.37	400.1	7.67	369.0	2.378
15	0.65	1345.5	3.04	421.8	25.72	1002.0	22.31	712.9	427.6	6.35	399.8	7.65	368.6	2.392
16	0.65	1356.2	2.85	389.8	23.67	1002.0	22.31	712.5	426.9	6.33	399.2	7.64	367.6	2.428
16	0.65	1338.9	2.85	399.3	24.27	1002.0	22.31	713.1	428.0	6.35	400.2	7.66	369.2	2.370
20	0.65	1339.7	2.91	406.8	24.70	1002.0	22.31	713.1	427.9	6.35	400.2	7.66	369.1	2.373
20	0.65	1343.6	2.91	404.6	24.94	1002.0	22.31	712.9	427.7	6.36	399.9	7.67	368.7	2.386
24	0.65	1411.5	2.86	364.0	22.53	1002.0	22.31	711.0	424.1	6.29	396.4	7.58	363.2	2.612
24	0.65	1368.0	2.86	385.3	27.23	1002.0	22.31	712.2	426.3	6.49	398.6	7.75	366.6	2.468
26	0.65	1320.9	2.91	418.6	25.34	1002.0	22.31	713.7	429.1	6.37	401.3	7.68	370.9	2.310
26	0.65	1325.9	2.91	415.6	24.99	1002.0	22.31	713.5	428.8	6.36	401.0	7.67	370.4	2.327
26	0.65	1330.6	2.91	412.9	24.89	1002.0	22.31	713.3	428.5	6.36	400.7	7.67	370.0	2.342
28	0.65	1353.3	2.85	390.5	23.44	1002.0	22.31	712.6	427.1	6.32	399.4	7.63	367.9	2.418
28	0.65	1350.7	2.85	391.9	24.14	1002.0	22.31	712.7	427.3	6.35	399.5	7.66	368.1	2.409
29	0.65	1356.7	2.87	391.7	23.24	1002.0	22.31	712.5	426.9	6.31	399.2	7.62	367.6	2.430
29	0.65	1332.5	2.87	405.1	24.85	1002.0	22.31	713.3	428.3	6.37	400.6	7.68	369.8	2.349
29	0.65	1344.8	2.87	398.1	23.93	1002.0	22.31	712.9	427.6	6.34	399.9	7.64	368.6	2.390
30	0.65	1327.6	2.85	405.7	24.40	1002.0	22.31	713.4	428.6	6.36	400.9	7.67	370.2	2.332
30	0.65	1338.5	2.85	399.5	24.15	1002.0	22.31	713.1	428.0	6.35	400.2	7.66	369.2	2.369

********** STEADY STATE TEST B **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E														
31	0.65	1334.9	2.89	407.1	24.65	1002.0	22.31	713.2	428.2	6.36	400.5	7.66	369.5	2.357
33	0.65	1411.3	2.91	369.5	22.39	1002.0	22.31	711.0	424.1	6.27	396.4	7.57	363.2	2.611
33	0.65	1383.6	2.91	383.0	24.17	1002.0	22.31	711.8	425.5	6.34	397.8	7.63	365.3	2.519
33	0.65	1376.5	2.91	386.6	23.84	1002.0	22.31	712.0	425.8	6.32	398.1	7.62	365.9	2.496
35	0.65	1346.7	2.91	403.1	25.33	1002.0	22.31	712.8	427.5	6.38	399.8	7.68	368.5	2.396
42	0.65	1320.5	2.88	413.8	27.28	1002.0	22.31	713.7	429.1	6.48	401.3	7.76	370.9	2.309
44	0.65	1343.9	2.88	400.4	25.03	1002.0	22.31	712.9	427.7	6.38	399.9	7.68	368.7	2.387
45	0.65	1344.3	2.92	405.9	25.14	1002.0	22.31	712.9	427.6	6.37	399.9	7.67	368.7	2.388
45	0.65	1359.5	2.92	397.5	24.84	1002.0	22.31	712.4	426.8	6.36	399.1	7.65	367.3	2.439
49	0.65	1351.4	2.89	397.4	24.05	1002.0	22.31	712.7	427.2	6.34	399.5	7.64	368.0	2.412
49	0.65	1381.0	2.89	381.8	23.01	1002.0	22.31	711.8	425.6	6.30	397.9	7.60	365.5	2.510
49	0.65	1357.5	2.89	394.1	24.37	1002.0	22.31	712.5	426.9	6.35	399.2	7.65	367.5	2.432
51	0.65	1326.2	2.92	416.6	26.32	1002.0	22.31	713.5	428.7	6.42	401.0	7.71	370.4	2.328
51	0.65	1325.5	2.92	417.0	26.76	1002.0	22.31	713.5	428.8	6.43	401.0	7.73	370.4	2.325
53	0.65	1371.9	2.92	390.9	24.46	1002.0	22.31	712.1	426.1	6.34	398.4	7.64	366.3	2.481
53	0.65	1356.3	2.92	399.3	25.36	1002.0	22.31	712.5	426.9	6.38	399.2	7.67	367.6	2.428
58	0.65	1338.7	2.93	410.0	25.11	1002.0	22.31	713.1	428.0	6.36	400.2	7.67	369.2	2.369
58	0.65	1326.6	2.93	417.1	26.75	1002.0	22.31	713.5	428.7	6.43	401.0	7.73	370.3	2.329
59	0.65	1352.2	2.90	398.4	24.51	1002.0	22.31	712.7	427.2	6.35	399.5	7.65	368.0	2.415
59	0.65	1335.5	2.90	407.8	25.04	1002.0	22.31	713.2	428.2	6.37	400.4	7.67	369.5	2.359
59	0.65	1335.3	2.90	407.9	25.00	1002.0	22.31	713.2	428.2	6.37	400.4	7.67	369.5	2.358
61	0.65	1342.1	2.87	399.7	24.26	1002.0	22.31	713.0	427.8	6.35	400.0	7.66	368.9	2.381
61	0.65	1364.6	2.87	387.6	23.27	1002.0	22.31	712.3	426.5	6.31	398.8	7.62	366.9	2.456
61	0.65	1372.0	2.87	383.7	22.90	1002.0	22.31	712.1	426.1	6.30	398.4	7.60	366.3	2.481
62	0.65	1372.0	2.88	385.9	22.97	1002.0	22.31	712.1	426.1	6.30	398.4	7.60	366.3	2.481
63	0.65	1352.7	2.94	403.2	24.04	1002.0	22.31	712.6	427.1	6.32	399.4	7.63	367.9	2.416
63	0.65	1351.5	2.94	403.9	24.66	1002.0	22.31	712.7	427.2	6.34	399.5	7.65	368.0	2.412
64	0.65	1407.0	2.88	367.6	21.98	1002.0	22.31	711.1	424.3	6.27	396.6	7.57	363.5	2.597
LEVEL F														
1	0.85	1271.2	2.90	448.8	29.52	1195.3	23.93	851.4	479.1	5.84	460.3	7.16	399.8	2.777
3	0.85	1274.9	2.98	457.9	28.35	1195.3	23.93	851.2	478.8	5.70	460.0	7.05	399.3	2.792
4	0.85	1301.5	2.96	437.4	26.62	1195.3	23.93	850.0	476.7	5.63	457.9	6.98	396.1	2.901
7	0.85	1292.2	2.84	425.5	27.22	1195.3	23.93	850.4	477.4	5.74	458.6	7.06	397.2	2.863
7	0.85	1265.5	2.84	443.3	27.71	1195.3	23.93	851.7	479.6	5.74	460.8	7.08	400.5	2.754
10	0.85	1244.5	2.89	466.2	30.52	1195.3	23.93	852.7	481.5	5.89	462.7	7.21	403.3	2.668
10	0.85	1238.4	2.89	470.9	31.32	1195.3	23.93	853.1	482.1	5.95	463.3	7.26	404.2	2.644
10	0.85	1242.0	2.89	468.1	31.09	1195.3	23.93	852.9	481.7	5.93	462.9	7.25	403.7	2.658
13	0.85	1262.8	2.92	457.6	28.47	1195.3	23.93	851.8	479.8	5.74	461.0	7.08	400.8	2.743
13	0.85	1250.3	2.92	466.8	31.12	1195.3	23.93	852.4	480.9	5.92	462.2	7.23	402.5	2.692
14	0.85	1235.0	2.85	467.3	29.27	1195.3	23.93	853.2	482.4	5.81	463.6	7.15	404.7	2.630
15	0.85	1243.5	3.04	492.0	30.38	1195.3	23.93	852.8	481.6	5.76	462.8	7.11	403.5	2.664
16	0.85	1251.2	2.86	455.8	28.63	1195.3	23.93	852.4	480.9	5.78	462.1	7.12	402.4	2.696
17	0.85	1236.0	2.86	467.7	28.02	1195.3	23.93	853.2	482.3	5.71	463.5	7.07	404.5	2.634
18	0.85	1152.0	2.88	545.6	35.70	1195.3	23.93	858.6	492.1	6.21	473.3	7.54	419.4	2.300
20	0.85	1208.3	2.91	499.1	30.36	1195.3	23.93	854.8	485.1	5.80	466.4	7.16	408.8	2.525
21	0.85	1209.0	2.88	492.6	36.14	1195.3	23.93	854.7	485.1	6.34	466.3	7.61	408.7	2.528
28	0.85	1303.8	2.85	419.5	25.23	1195.3	23.93	849.9	476.5	5.61	457.7	6.96	395.9	2.910
28	0.85	1277.7	2.85	436.3	26.49	1195.3	23.93	851.1	478.6	5.66	459.8	7.01	399.0	2.803
28	0.85	1273.9	2.85	438.9	26.84	1195.3	23.93	851.3	478.9	5.68	460.1	7.03	399.4	2.788
31	0.85	1260.3	2.90	456.3	28.68	1195.3	23.93	851.9	480.0	5.76	461.2	7.10	401.2	2.732
31	0.85	1256.4	2.90	459.1	28.46	1195.3	23.93	852.1	480.4	5.74	461.6	7.09	401.7	2.717
34	0.85	1229.5	2.93	484.1	31.24	1195.3	23.93	853.5	482.9	5.89	464.1	7.23	405.5	2.608
37	0.85	1247.6	2.88	462.5	34.62	1195.3	23.93	852.6	481.2	6.24	462.4	7.50	402.9	2.681
38	0.85	1275.8	2.89	443.7	27.99	1195.3	23.93	851.2	478.7	5.74	459.9	7.08	399.2	2.796
42	0.85	1262.7	2.88	451.9	29.76	1195.3	23.93	851.8	479.8	5.86	461.0	7.18	400.9	2.742
45	0.85	1251.9	2.92	466.3	28.47	1195.3	23.93	852.4	480.8	5.72	462.0	7.07	402.3	2.698
45	0.85	1264.9	2.92	456.9	27.91	1195.3	23.93	851.7	479.6	5.70	460.8	7.05	400.6	2.751
53	0.85	1279.8	2.99	457.1	28.96	1195.3	23.93	851.0	478.4	5.74	459.6	7.08	398.7	2.812
59	0.85	1252.6	2.90	462.3	28.69	1195.3	23.93	852.3	480.7	5.75	461.9	7.10	402.2	2.701
59	0.85	1260.5	2.90	456.5	27.78	1195.3	23.93	851.9	480.0	5.70	461.2	7.05	401.1	2.733
59	0.85	1266.8	2.90	452.0	29.98	1195.3	23.93	851.6	479.5	5.86	460.7	7.18	400.3	2.759
60	0.85	1282.5	2.88	437.3	28.25	1195.3	23.93	850.9	478.2	5.77	459.4	7.10	398.4	2.823
64	0.85	1335.4	2.88	405.2	24.40	1195.3	23.93	848.7	474.3	5.57	455.4	6.91	392.5	3.041
64	0.85	1362.7	2.88	390.2	23.34	1195.3	23.93	847.7	472.5	5.53	453.7	6.87	389.9	3.153
64	0.85	1350.9	2.88	396.5	23.69	1195.3	23.93	848.1	473.2	5.54	454.4	6.88	391.0	3.105

********** STEADY STATE TEST B **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.04	1214.9	2.90	492.0	32.39	503.7	35.7	1160.7	430.6	3.135
14	1.04	1166.1	2.85	526.3	37.81	539.9	41.9	1160.7	439.8	2.907
16	1.04	1185.8	2.85	508.5	34.03	521.2	37.8	1160.7	435.8	3.000
16	1.04	1214.1	2.85	484.1	31.57	495.6	34.9	1160.7	430.7	3.131
18	1.04	1192.0	2.87	505.4	31.55	517.9	35.2	1160.7	434.7	3.029
18	1.04	1178.1	2.87	518.1	33.37	531.2	37.3	1160.7	437.3	2.964
18	1.04	1183.2	2.87	513.4	32.15	526.2	36.0	1160.7	436.3	2.988
20	1.04	1095.0	2.91	618.4	38.98	636.9	45.2	1160.7	457.9	2.574
20	1.04	1187.8	2.91	516.5	35.11	529.4	38.9	1160.7	435.4	3.009
20	1.04	1181.4	2.91	522.5	33.60	535.6	37.5	1160.7	436.7	2.979
21	1.04	1147.3	2.77	529.9	32.23	544.1	36.7	1160.7	443.9	2.819
34	1.04	1244.9	2.92	470.9	30.35	481.5	33.3	1160.7	425.9	3.278
37	1.04	1178.2	2.88	520.8	33.26	533.9	37.2	1160.7	437.3	2.964
38	1.04	1192.7	2.89	508.1	32.74	520.6	36.4	1160.7	434.5	3.033
42	1.04	1212.9	2.88	489.5	44.31	501.1	47.8	1160.7	430.9	3.125
42	1.04	1226.6	2.88	478.3	30.86	489.4	34.0	1160.7	428.7	3.190
45	1.04	1196.6	2.92	511.2	34.36	523.7	38.0	1160.7	433.8	3.051
45	1.04	1181.7	2.92	524.8	35.10	538.0	39.0	1160.7	436.6	2.981
45	1.04	1195.1	2.92	512.5	33.79	525.1	37.5	1160.7	434.1	3.044
47	1.04	1199.8	2.90	504.0	33.10	516.3	36.7	1160.7	433.2	3.066
50	1.04	1227.0	2.84	472.3	29.45	483.2	32.5	1160.7	428.6	3.192
58	1.04	1240.7	2.93	475.3	30.68	486.1	33.7	1160.7	426.5	3.258
60	1.04	1232.0	2.88	474.2	32.18	485.1	35.2	1160.7	427.8	3.216
64	1.04	1261.1	2.88	453.1	28.27	463.0	31.0	1160.7	423.5	3.356
64	1.04	1263.3	2.88	451.5	28.21	461.4	30.9	1160.7	423.2	3.366

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL H														
56	0.38	1373.9	2.88	384.4	23.52	718.7	20.24	509.4	335.7	7.15	293.0	8.18	331.8	1.719
LEVEL Y														
56	0.40	1223.2	2.88	481.4	33.25	735.8	20.20	525.3	350.2	7.40	307.7	8.44	348.9	1.411
LEVEL E1														
1	0.68	1417.2	2.90	365.7	22.99	1033.5	22.64	731.1	432.4	6.20	406.4	7.49	366.2	2.730
14	0.68	1355.5	2.85	389.4	25.58	1033.5	22.64	732.8	435.6	6.32	409.6	7.61	371.1	2.515
38	0.68	1366.6	2.88	388.7	23.31	1033.5	22.64	732.4	435.0	6.21	408.9	7.51	370.1	2.553
50	0.68	1317.7	2.84	410.5	25.89	1033.5	22.64	734.0	437.9	6.32	411.9	7.63	374.7	2.386
LEVEL E2														
21	0.71	1323.9	2.88	411.3	24.38	1056.0	22.95	750.3	443.5	6.18	418.6	7.50	376.9	2.481
60	0.71	1338.0	2.87	402.7	25.24	1056.0	22.95	749.9	442.6	6.23	417.7	7.53	375.5	2.531
LEVEL E3														
14	0.73	1362.2	2.85	385.9	25.85	1082.2	23.39	767.6	447.8	6.21	424.2	7.50	376.5	2.707
17	0.73	1351.7	2.86	393.2	25.09	1082.2	23.39	768.0	448.4	6.17	424.9	7.47	377.4	2.669
34	0.73	1378.6	2.92	387.4	25.17	1082.2	23.39	767.1	446.9	6.15	423.3	7.45	375.1	2.768
37	0.73	1389.7	2.88	376.5	22.61	1082.2	23.39	766.8	446.3	6.05	422.7	7.37	374.2	2.809
38	0.73	1372.4	2.88	385.7	23.07	1082.2	23.39	767.3	447.2	6.07	423.7	7.38	375.6	2.745
50	0.73	1347.5	2.84	393.5	25.53	1082.2	23.39	768.1	448.7	6.19	425.1	7.49	377.8	2.653
60	0.73	1351.0	2.87	395.5	24.60	1082.2	23.39	768.0	448.5	6.14	424.9	7.45	377.5	2.666
LEVEL E6														
60	0.79	1223.8	2.87	479.5	30.01	1137.2	23.66	812.4	471.4	6.07	450.4	7.38	399.1	2.382
LEVEL E7														
1	0.81	1259.0	2.90	457.0	29.77	1155.4	23.69	823.3	472.2	5.98	451.9	7.26	396.4	2.578
34	0.81	1204.5	2.92	503.9	33.49	1155.4	23.69	826.2	477.5	6.18	457.2	7.46	404.4	2.370
37	0.81	1240.8	2.88	467.7	28.83	1155.4	23.69	824.2	473.8	5.90	453.6	7.21	398.9	2.507
50	0.81	1183.5	2.85	509.2	32.67	1155.4	23.69	827.5	479.8	6.15	459.6	7.45	408.0	2.289
LEVEL E8														
1	0.83	1272.7	2.90	447.6	28.99	1179.2	23.81	839.5	475.9	5.84	456.6	7.14	397.5	2.719
14	0.83	1266.3	2.85	444.0	28.48	1179.2	23.81	839.8	476.4	5.83	457.1	7.13	398.3	2.693
34	0.83	1223.9	2.92	487.8	31.93	1179.2	23.81	842.0	480.4	5.98	461.1	7.28	404.3	2.525
37	0.83	1251.0	2.88	460.3	28.33	1179.2	23.81	840.5	477.8	5.77	458.4	7.10	400.4	2.632
38	0.83	1267.5	2.89	449.0	27.30	1179.2	23.81	839.7	476.3	5.72	457.0	7.05	398.2	2.698
LEVEL F1														
17	0.88	1261.2	2.86	449.5	26.84	1225.5	24.24	873.4	485.1	5.71	467.2	7.19	404.8	2.857
21	0.88	1229.7	2.88	475.8	29.50	1225.5	24.24	875.1	488.1	5.85	470.1	7.32	409.2	2.726
34	0.88	1247.9	2.92	469.0	30.42	1225.5	24.24	874.1	486.3	5.92	468.4	7.36	406.6	2.803
37	0.88	1272.5	2.88	445.0	27.25	1225.5	24.24	872.9	484.2	5.74	466.2	7.21	403.3	2.903
50	0.88	1244.5	2.85	459.3	28.04	1225.5	24.24	874.3	486.7	5.79	468.7	7.26	407.1	2.788
LEVEL F2														
1	0.90	1293.1	2.91	434.8	26.87	1249.0	24.55	888.5	485.8	6.01	468.1	7.68	403.6	3.092
14	0.90	1253.9	2.86	453.8	31.07	1249.0	24.55	890.4	489.1	6.31	471.5	7.93	408.6	2.925
17	0.90	1261.7	2.87	450.1	26.84	1249.0	24.55	890.0	488.4	6.00	470.8	7.69	407.6	2.958
34	0.90	1269.3	2.93	454.4	29.22	1249.0	24.55	889.6	487.7	6.13	470.1	7.78	406.6	2.990
38	0.90	1298.7	2.89	429.1	25.95	1249.0	24.55	888.2	485.3	5.97	467.7	7.64	403.0	3.117
50	0.90	1255.6	2.85	452.2	27.79	1249.0	24.55	890.3	489.0	6.07	471.4	7.74	408.4	2.932
LEVEL F3														
14	0.93	1252.9	2.85	453.2	29.41	1272.4	24.92	907.0	491.6	7.06	474.2	9.10	411.6	3.026
17	0.93	1251.8	2.86	456.0	27.33	1272.4	24.92	907.0	491.7	6.92	474.3	8.99	411.8	3.021
21	0.93	1243.2	2.88	465.1	27.84	1272.4	24.92	907.5	492.6	6.94	475.1	9.01	413.0	2.984
34	0.93	1292.3	2.92	437.6	27.99	1272.4	24.92	905.0	488.2	6.95	470.7	8.98	406.5	3.198
60	0.93	1249.8	2.87	459.7	31.03	1272.4	24.92	907.1	491.9	7.15	474.4	9.17	412.0	3.013

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F4														
60	0.95	1036.2	2.87	698.1	47.42	1293.8	25.18	942.8	527.3	11.04	509.9	13.58	467.8	2.182
LEVEL F5														
21	0.97	1060.7	2.88	659.6	41.51	1309.5	25.74	951.1	520.8	17.52	502.6	20.05	460.3	2.351
60	0.97	1125.2	2.87	573.9	37.02	1309.5	25.74	943.7	508.2	17.28	489.9	19.51	440.5	2.635
LEVEL F6														
1	0.98	1166.4	2.90	535.0	38.75	1326.1	29.78	951.7	499.6	17.28	479.8	30.70	433.1	2.889
17	0.98	1160.1	2.86	534.0	34.08	1326.1	29.78	952.3	500.5	18.34	480.7	29.72	434.4	2.861
37	0.98	1125.7	2.88	574.9	37.25	1326.1	29.78	955.3	505.6	18.17	485.8	30.43	442.5	2.705
38	0.98	1125.5	2.88	575.9	36.35	1326.1	29.78	955.4	505.6	18.45	485.9	30.16	442.5	2.704
50	0.98	1171.3	2.85	520.6	33.49	1326.1	29.78	951.3	499.0	18.28	479.2	29.63	432.1	2.912
60	0.98	1172.3	2.87	524.6	33.35	1326.1	29.78	951.3	498.8	18.38	479.0	29.51	431.9	2.916
LEVEL F7														
14	1.00	1138.0	2.85	554.9	37.67	1341.7	48.30	965.1	492.4	15.84	468.1	29.07	441.4	2.830
17	1.00	1174.1	2.86	520.3	32.23	1341.7	48.30	962.0	487.4	16.78	463.2	27.69	433.5	2.996
21	1.00	1126.3	2.88	573.8	35.58	1341.7	48.30	966.2	494.2	16.72	469.9	28.34	444.3	2.776
37	1.00	1142.8	2.89	557.2	35.90	1341.7	48.30	964.7	491.7	16.35	467.4	28.50	440.2	2.852
38	1.00	1159.1	2.89	540.1	33.72	1341.7	48.30	963.3	489.4	16.68	465.2	27.96	436.6	2.927
50	1.00	1190.2	2.85	503.4	32.29	1341.7	48.30	960.8	485.5	16.47	461.3	27.83	430.4	3.071
60	1.00	1189.2	2.87	509.3	32.42	1341.7	48.30	960.9	485.6	16.54	461.4	27.77	430.5	3.066

********** STEADY STATE TEST B **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F8										
1	1.02	1224.7	2.90	484.0	31.13	490.4	33.2	1227.7	427.2	3.209
17	1.02	1179.8	2.86	515.6	31.59	523.0	34.2	1227.7	435.2	3.000
21	1.02	1134.9	2.88	564.3	34.74	573.1	38.0	1227.7	445.1	2.791
34	1.02	1215.6	2.92	494.8	32.52	501.4	34.7	1227.7	428.7	3.169
37	1.02	1169.3	2.88	529.5	33.29	537.2	36.0	1227.7	437.3	2.951
50	1.02	1215.4	2.85	482.1	30.45	488.6	32.6	1227.7	428.8	3.168
60	1.02	1222.4	2.88	481.2	30.05	487.6	32.2	1227.7	427.6	3.198

STEADY STATE TEST C

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST C **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.463E+05 LBM/SQFT H UNC. MASS FLUX 5.561E+03 LBM/SQFT H PRESSURE 1805.3 PSI UNC. PRESSURE 6.00 PSI
334.24 KG/SQM S 7.5465 KG/SQM S 12.46 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	1.817	572.2	0.029	9.05	1240.5	671.7	58.07	32.259	621.4	327.8	0.445	0.2	.8116	.0361
F	1.812	570.9	0.032	10.24	1303.3	706.6	44.15	24.530	646.8	341.9	18.810	10.5	1.0668	.0426
G	1.805	568.5	0.037	11.80	1350.5	732.8	53.99	29.995	777.7	414.6	28.859	16.0	1.3196	.0488
E1	1.804	568.4	0.018	5.53	1271.5	689.0	86.47	48.036	621.4	327.8	0.445	0.2	.8523	.0372
E2	1.776	559.5	0.055	17.34	1270.7	688.5	47.08	26.154	621.4	327.8	0.445	0.2	.8816	.0381
E3	1.807	569.2	0.018	5.57	1281.8	694.6	44.50	24.724	621.4	327.8	0.445	0.2	.9160	.0392
E6	1.762	555.0	0.068	21.54	1245.0	674.2	57.63	32.016	621.4	327.8	0.445	0.2	.9888	.0408
E7	1.814	571.4	0.021	6.50	1256.8	680.8	38.66	21.478	625.9	330.3	13.994	7.8	1.0131	.0413
E8	1.817	572.3	0.016	5.11	1283.1	695.4	25.64	14.245	637.7	336.9	16.990	9.4	1.0450	.0420
F1	1.794	565.3	0.043	13.41	1305.3	707.7	18.30	10.168	666.2	352.6	20.130	11.2	1.1077	.0436
F2	1.809	570.0	0.019	5.96	1330.4	721.7	25.10	13.946	680.4	360.5	21.257	11.8	1.1396	.0446
F3	1.792	564.6	0.042	13.08	1329.3	721.1	37.67	20.926	695.8	369.1	23.197	12.9	1.1716	.0455
F4	1.761	554.8	0.068	21.53	1178.3	637.2	4.95	2.750	711.3	377.7	25.437	14.1	1.2010	.0464
F5	1.776	559.5	0.055	17.35	1231.3	666.6	49.58	27.547	723.5	384.5	25.768	14.3	1.2226	.0467
F6	1.795	565.5	0.038	11.89	1289.2	698.8	31.45	17.470	737.2	392.1	26.276	14.6	1.2456	.0472
F7	1.794	565.0	0.034	10.81	1302.7	706.3	40.85	22.696	748.4	398.3	26.586	14.8	1.2673	.0476
F8	1.802	567.5	0.037	11.68	1346.1	730.4	49.64	27.580	765.2	407.7	27.385	15.2	1.2979	.0483

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test C

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST C **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
						BTU/H SQFT F				BTU/H SQFT F				
LEVEL E														
2	0.81	1293.2	1.81	269.1	15.86	615.3	14.31	443.1	274.8	3.60	224.5	3.75	222.2	1.274
3	0.81	1159.2	1.85	343.1	20.85	615.3	14.31	447.1	282.6	3.79	231.1	3.93	233.5	1.018
4	0.81	1212.3	1.83	309.5	18.19	615.3	14.31	445.3	279.0	3.67	228.1	3.82	228.3	1.117
7	0.81	1262.5	1.77	276.6	16.42	615.3	14.31	443.9	276.3	3.63	225.7	3.78	224.3	1.214
7	0.81	1268.3	1.77	274.1	16.20	615.3	14.31	443.7	276.0	3.62	225.5	3.77	223.9	1.225
10	0.81	1206.3	1.79	306.1	18.04	615.3	14.31	445.5	279.3	3.68	228.4	3.83	228.8	1.107
12	0.81	1185.7	1.85	327.5	19.58	615.3	14.31	446.1	280.7	3.73	229.5	3.87	230.7	1.068
13	0.81	1205.7	1.83	313.8	19.00	615.3	14.31	445.5	279.4	3.72	228.4	3.86	228.8	1.105
13	0.81	1209.7	1.83	311.7	18.63	615.3	14.31	445.3	279.1	3.70	228.2	3.84	228.5	1.113
15	0.81	1173.3	1.92	347.8	20.83	615.3	14.31	446.6	281.5	3.75	230.2	3.89	232.0	1.044
15	0.81	1183.4	1.92	341.5	20.30	615.3	14.31	446.2	280.8	3.72	229.6	3.87	231.0	1.063
16	0.81	1291.0	1.79	267.1	15.64	615.3	14.31	443.2	274.9	3.60	224.6	3.75	222.3	1.269
16	0.81	1281.9	1.79	270.8	15.83	615.3	14.31	443.4	275.3	3.60	224.9	3.76	222.9	1.251
24	0.81	1267.4	1.80	279.4	16.59	615.3	14.31	443.8	276.0	3.63	225.5	3.78	223.9	1.223
24	0.81	1233.1	1.80	295.1	19.16	615.3	14.31	444.7	277.8	3.77	227.0	3.88	226.5	1.158
26	0.81	1180.0	1.83	326.8	19.28	615.3	14.31	446.3	281.1	3.72	229.8	3.87	231.3	1.057
26	0.81	1191.3	1.83	320.3	18.82	615.3	14.31	445.9	280.3	3.70	229.2	3.85	230.2	1.078
26	0.81	1188.1	1.83	322.1	18.98	615.3	14.31	446.0	280.5	3.70	229.4	3.85	230.5	1.072
29	0.81	1187.6	1.80	318.8	18.65	615.3	14.31	446.1	280.5	3.70	229.4	3.85	230.6	1.071
29	0.81	1184.4	1.80	320.6	19.03	615.3	14.31	446.2	280.8	3.72	229.6	3.87	230.9	1.065
29	0.81	1185.7	1.80	319.8	18.81	615.3	14.31	446.1	280.7	3.71	229.5	3.86	230.7	1.068
30	0.81	1184.0	1.79	318.9	18.78	615.3	14.31	446.2	280.8	3.71	229.6	3.86	230.9	1.064
30	0.81	1193.1	1.79	313.9	18.54	615.3	14.31	445.9	280.2	3.70	229.1	3.85	230.0	1.082
31	0.81	1183.8	1.82	323.2	19.11	615.3	14.31	446.2	280.8	3.71	229.6	3.86	230.9	1.064
33	0.81	1296.7	1.82	270.2	15.83	615.3	14.31	443.1	274.7	3.59	224.4	3.75	222.0	1.281
33	0.81	1282.3	1.82	276.1	16.49	615.3	14.31	443.4	275.3	3.62	224.9	3.77	222.9	1.252
33	0.81	1272.8	1.82	280.1	16.56	615.3	14.31	443.6	275.8	3.62	225.3	3.77	223.5	1.234
35	0.81	1189.9	1.83	322.2	19.57	615.3	14.31	446.0	280.4	3.74	229.3	3.88	230.3	1.076
42	0.81	1191.3	1.81	316.9	19.52	615.3	14.31	445.9	280.3	3.76	229.2	3.89	230.2	1.078
44	0.81	1177.9	1.76	317.2	19.11	615.3	14.31	446.4	281.2	3.75	230.0	3.89	231.5	1.053
45	0.81	1207.4	1.85	315.2	18.89	615.3	14.31	445.4	279.3	3.70	228.3	3.85	228.7	1.109
45	0.81	1224.7	1.85	306.1	18.43	615.3	14.31	444.9	278.3	3.69	227.4	3.83	227.2	1.141
49	0.81	1277.8	1.81	276.4	16.16	615.3	14.31	443.5	275.5	3.61	225.1	3.76	223.2	1.243
49	0.81	1300.3	1.81	267.3	15.60	615.3	14.31	443.0	274.5	3.59	224.2	3.74	221.7	1.288
49	0.81	1289.5	1.81	271.6	16.05	615.3	14.31	443.2	275.0	3.61	224.6	3.76	222.4	1.266
51	0.81	1140.4	1.81	349.4	21.27	615.3	14.31	447.8	284.1	3.83	232.4	3.96	235.8	0.982
51	0.81	1148.1	1.81	344.3	21.16	615.3	14.31	447.5	283.4	3.83	231.9	3.96	234.8	0.997
53	0.81	1224.6	1.80	298.0	17.87	615.3	14.31	444.9	278.3	3.68	227.5	3.83	227.2	1.141
53	0.81	1214.7	1.80	303.0	18.28	615.3	14.31	445.2	278.8	3.70	227.9	3.84	228.0	1.122
58	0.81	1273.8	1.81	278.1	16.33	615.3	14.31	443.6	275.7	3.61	225.3	3.77	223.5	1.236
58	0.81	1269.8	1.81	279.8	16.79	615.3	14.31	443.7	275.9	3.64	225.4	3.78	223.8	1.228
59	0.81	1280.0	1.79	272.4	16.02	615.3	14.31	443.5	275.4	3.61	225.0	3.76	223.1	1.248
59	0.81	1269.8	1.79	276.7	16.26	615.3	14.31	443.7	275.9	3.62	225.4	3.77	223.8	1.228
59	0.81	1266.8	1.79	277.9	16.34	615.3	14.31	443.8	276.0	3.62	225.6	3.77	224.0	1.222
61	0.81	1285.5	1.80	271.8	15.90	615.3	14.31	443.3	275.2	3.60	224.8	3.75	222.7	1.259
61	0.81	1308.7	1.80	262.6	15.27	615.3	14.31	442.8	274.2	3.58	223.9	3.73	221.2	1.304
61	0.81	1309.2	1.80	262.4	15.22	615.3	14.31	442.8	274.1	3.58	223.9	3.73	221.2	1.305
62	0.81	1317.7	1.82	261.8	15.17	615.3	14.31	442.6	273.8	3.57	223.6	3.73	220.7	1.322
63	0.81	1298.5	1.85	273.5	15.85	615.3	14.31	443.0	274.6	3.59	224.3	3.74	221.9	1.284
63	0.81	1310.1	1.85	268.9	15.74	615.3	14.31	442.8	274.1	3.58	223.9	3.74	221.1	1.307
64	0.81	1394.8	1.81	234.4	13.55	615.3	14.31	441.2	271.1	3.53	221.3	3.68	216.8	1.475
64	0.81	1372.6	1.81	241.4	13.98	615.3	14.31	441.6	271.8	3.54	221.9	3.69	217.8	1.430

********** STEADY STATE TEST C **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H F T**2
				BTU/H FT**2 F						
LEVEL F										
1	1.07	1325.6	1.82	257.8	15.42	267.4	17.7	572.2	231.9	1.705
3	1.07	1311.5	1.85	268.3	15.67	278.5	18.1	572.2	232.8	1.670
4	1.07	1321.1	1.83	262.1	15.23	272.0	17.6	572.2	232.2	1.693
7	1.07	1336.7	1.78	248.5	14.71	257.6	16.9	572.2	231.3	1.732
7	1.07	1326.2	1.78	252.2	14.76	261.6	17.0	572.2	231.9	1.706
10	1.07	1286.8	1.79	269.6	16.11	280.3	18.8	572.2	234.4	1.609
10	1.07	1290.5	1.79	268.1	16.09	278.7	18.7	572.2	234.2	1.618
10	1.07	1279.3	1.79	272.7	16.39	283.6	19.1	572.2	235.0	1.592
13	1.07	1306.9	1.84	268.0	15.69	278.3	18.2	572.2	233.1	1.659
13	1.07	1299.1	1.84	271.1	16.34	281.6	18.9	572.2	233.6	1.639
14	1.07	1260.8	1.79	280.1	16.47	291.6	19.4	572.2	236.3	1.548
15	1.07	1298.2	1.92	284.3	16.59	295.4	19.3	572.2	233.7	1.637
16	1.07	1314.4	1.79	258.2	15.14	268.0	17.5	572.2	232.6	1.677
17	1.07	1289.6	1.80	269.5	15.54	280.2	18.2	572.2	234.2	1.616
18	1.07	1181.8	1.81	322.3	19.29	337.5	23.6	572.2	243.4	1.360
20	1.07	1230.1	1.80	296.3	17.23	309.2	20.6	572.2	238.8	1.474
21	1.07	1248.9	1.81	288.0	18.15	300.1	21.3	572.2	237.2	1.519
28	1.07	1305.4	1.79	261.8	15.16	271.9	17.6	572.2	233.2	1.655
28	1.07	1288.3	1.79	268.5	15.62	279.1	18.2	572.2	234.3	1.613
28	1.07	1294.5	1.79	266.0	15.51	276.5	18.1	572.2	233.9	1.628
31	1.07	1285.6	1.82	274.1	16.14	285.0	18.8	572.2	234.5	1.606
31	1.07	1290.9	1.82	272.0	15.91	282.7	18.6	572.2	234.2	1.619
34	1.07	1293.9	1.84	273.3	16.21	284.1	18.8	572.2	233.9	1.627
37	1.07	1263.6	1.82	283.5	18.13	295.1	21.1	572.2	236.1	1.555
38	1.07	1302.8	1.82	267.1	15.76	277.4	18.3	572.2	233.4	1.648
42	1.07	1305.3	1.81	264.6	15.87	274.8	18.3	572.2	233.2	1.655
45	1.07	1289.9	1.85	276.8	16.10	287.7	18.8	572.2	234.2	1.617
45	1.07	1297.4	1.85	273.7	15.93	284.4	18.5	572.2	233.7	1.635
53	1.07	1321.9	1.86	265.4	15.64	275.4	18.0	572.2	232.2	1.695
59	1.07	1305.7	1.80	262.6	15.33	272.7	17.8	572.2	233.2	1.656
59	1.07	1300.9	1.80	264.4	15.35	274.7	17.8	572.2	233.5	1.644
59	1.07	1313.1	1.80	259.7	15.59	269.6	18.0	572.2	232.7	1.674
60	1.07	1342.2	1.81	251.5	14.93	260.7	17.1	572.2	231.0	1.745
64	1.07	1408.1	1.82	230.9	13.32	238.6	15.0	572.2	227.7	1.908
64	1.07	1416.4	1.82	228.5	13.16	236.0	14.8	572.2	227.3	1.929
64	1.07	1413.5	1.82	229.3	13.21	236.9	14.9	572.2	227.4	1.921
LEVEL G										
1	1.32	1327.2	1.82	257.6	15.29	330.8	26.9	383.8	242.8	1.578
14	1.32	1269.4	1.79	276.7	17.02	364.7	32.3	383.8	246.8	1.422
16	1.32	1374.9	1.79	237.0	14.08	299.0	23.5	383.8	240.0	1.708
16	1.32	1376.7	1.79	236.4	13.91	298.1	23.2	383.8	239.9	1.713
18	1.32	1337.3	1.80	251.8	14.61	322.1	25.5	383.8	242.1	1.605
18	1.32	1300.9	1.80	265.3	15.57	344.5	28.4	383.8	244.5	1.507
18	1.32	1332.4	1.80	253.5	14.72	325.0	25.8	383.8	242.4	1.591
20	1.32	1223.1	1.80	299.2	17.40	404.2	36.0	383.8	250.7	1.298
20	1.32	1302.2	1.80	264.4	15.79	343.2	28.7	383.8	244.4	1.509
20	1.32	1328.7	1.80	254.5	14.93	326.7	26.3	383.8	242.7	1.581
21	1.32	1301.6	1.81	265.6	15.31	344.8	27.9	383.8	244.4	1.508
34	1.32	1448.0	1.83	221.9	12.98	273.6	20.2	383.8	236.6	1.909
37	1.32	1308.6	1.82	265.1	15.53	343.2	28.0	383.8	244.0	1.527
38	1.32	1328.8	1.82	257.7	15.14	330.8	26.6	383.8	242.7	1.581
42	1.32	1433.1	1.81	222.5	14.93	275.6	23.5	383.8	237.2	1.867
42	1.32	1437.9	1.81	221.2	12.95	273.6	20.4	383.8	237.0	1.881
45	1.32	1327.4	1.85	261.6	15.55	335.9	27.4	383.8	242.7	1.578
45	1.32	1337.3	1.85	258.0	15.27	330.0	26.6	383.8	242.1	1.605
45	1.32	1335.5	1.85	258.6	15.30	331.1	26.7	383.8	242.2	1.600
47	1.32	1368.1	1.82	244.2	14.40	308.9	24.2	383.8	240.4	1.689
50	1.32	1424.8	1.78	222.1	12.86	275.8	20.5	383.8	237.6	1.844
58	1.32	1381.5	1.81	238.3	13.98	300.0	23.2	383.8	239.7	1.725
60	1.32	1379.6	1.81	238.6	14.34	300.6	23.8	383.8	239.8	1.721
64	1.32	1401.8	1.81	232.3	13.51	290.5	21.9	383.8	238.7	1.781
64	1.32	1397.1	1.81	233.7	13.61	292.7	22.2	383.8	238.9	1.768

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E1														
1	0.85	1370.0	1.81	242.0	14.32	636.6	14.54	455.5	276.3	3.42	226.4	3.60	219.7	1.499
38	0.85	1236.6	1.82	295.4	17.28	636.6	14.54	458.5	282.2	3.51	231.5	3.69	228.1	1.228
50	0.85	1208.0	1.78	304.2	18.29	636.6	14.54	459.4	283.8	3.57	232.9	3.74	230.5	1.172
LEVEL E2														
21	0.88	1238.5	1.81	292.8	16.98	651.8	14.76	469.4	284.8	3.48	234.1	3.73	229.3	1.286
60	0.88	1324.7	1.81	257.2	15.20	651.8	14.76	467.2	280.7	3.43	230.5	3.67	223.5	1.465
LEVEL E3														
14	0.92	1207.5	1.79	305.3	18.91	669.5	15.07	483.0	289.1	3.95	237.9	4.31	233.7	1.286
17	0.92	1270.0	1.80	277.1	16.69	669.5	15.07	481.1	285.6	3.84	234.9	4.22	228.6	1.419
34	0.92	1301.6	1.83	269.6	16.35	669.5	15.07	480.3	284.1	3.82	233.6	4.19	226.5	1.488
37	0.92	1287.3	1.82	273.0	15.93	669.5	15.07	480.7	284.8	3.80	234.2	4.18	227.4	1.457
38	0.92	1285.0	1.82	273.8	15.92	669.5	15.07	480.8	284.9	3.80	234.3	4.18	227.6	1.452
5C	0.92	1264.9	1.78	277.3	16.86	669.5	15.07	481.3	285.8	3.86	235.1	4.23	229.0	1.408
60	0.92	1356.0	1.81	246.3	14.46	669.5	15.07	479.2	281.9	3.76	231.7	4.14	223.4	1.606
LEVEL E6														
60	0.99	1285.8	1.81	272.5	15.97	706.5	19.60	507.6	283.0	11.13	231.0	12.72	231.0	1.618

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL E7										
1	1.01	1313.6	1.81	262.0	15.60	263.7	16.6	689.9	230.2	1.717
34	1.01	1244.9	1.84	294.4	17.71	296.6	19.1	689.9	235.0	1.554
37	1.01	1241.7	1.82	293.4	17.20	295.5	18.6	689.9	235.3	1.546
50	1.01	1227.0	1.79	295.0	17.48	297.2	18.9	689.9	236.5	1.511
LEVEL E8										
1	1.05	1325.1	1.81	257.9	15.32	264.0	17.0	612.6	231.0	1.718
14	1.05	1276.7	1.79	273.4	16.26	280.4	18.3	612.6	234.1	1.601
34	1.05	1278.5	1.84	279.5	16.68	286.6	18.8	612.6	234.0	1.605
37	1.05	1254.9	1.82	287.4	16.82	295.0	19.1	612.6	235.8	1.549
38	1.05	1280.2	1.82	276.3	16.07	283.3	18.1	612.6	233.9	1.609
LEVEL F1										
17	1.11	1316.3	1.80	259.0	14.92	276.8	18.2	510.7	234.3	1.655
21	1.11	1275.3	1.81	276.7	16.18	297.0	20.1	510.7	237.1	1.554
34	1.11	1330.3	1.84	259.1	15.36	276.5	18.5	510.7	233.5	1.689
37	1.11	1301.4	1.82	267.7	15.60	286.5	19.1	510.7	235.3	1.619
50	1.11	1306.7	1.79	260.7	15.13	279.0	18.5	510.7	235.0	1.632
LEVEL F2										
1	1.14	1340.8	1.82	252.5	14.74	275.0	18.5	475.6	234.3	1.699
14	1.14	1286.3	1.79	269.6	16.47	295.8	21.1	475.6	237.8	1.561
17	1.14	1321.6	1.80	257.2	14.80	280.9	18.8	475.6	235.4	1.650
34	1.14	1358.7	1.84	249.3	14.71	270.9	18.3	475.6	233.3	1.745
38	1.14	1345.2	1.82	251.6	14.56	273.9	18.2	475.6	234.0	1.710
50	1.14	1329.9	1.79	252.4	14.67	275.3	18.5	475.6	234.9	1.671
LEVEL F3										
14	1.17	1296.4	1.79	265.2	15.80	298.0	21.5	450.2	238.4	1.571
17	1.17	1313.0	1.80	260.1	14.99	291.4	20.2	450.2	237.3	1.613
21	1.17	1290.1	1.81	270.3	15.60	304.2	21.4	450.2	238.9	1.554
34	1.17	1389.3	1.83	239.0	14.07	264.6	18.1	450.2	233.1	1.808
60	1.17	1333.6	1.81	254.2	15.34	283.8	20.3	450.2	236.1	1.665
LEVEL F4										
60	1.20	1174.8	1.81	327.0	19.41	390.4	32.2	430.2	250.4	1.249
LEVEL F5										
21	1.22	1174.1	1.81	326.9	19.07	401.0	33.3	418.7	251.5	1.234
60	1.22	1262.6	1.81	282.2	16.55	335.6	25.8	418.7	243.2	1.459
LEVEL F6										
1	1.25	1266.9	1.81	281.0	17.35	342.4	28.0	407.0	243.8	1.457
17	1.25	1285.5	1.80	271.0	15.88	328.2	25.3	407.0	242.5	1.505
37	1.25	1258.1	1.82	285.8	16.80	349.3	27.6	407.0	244.5	1.435
38	1.25	1256.8	1.82	286.3	16.70	350.1	27.5	407.0	244.6	1.431
50	1.25	1339.4	1.79	249.2	14.57	297.1	22.0	407.0	239.0	1.646
60	1.25	1316.1	1.81	260.7	15.23	312.9	23.5	407.0	240.4	1.586
LEVEL F7										
14	1.27	1258.2	1.79	281.3	16.87	351.3	28.7	399.0	245.4	1.423
17	1.27	1315.0	1.80	259.4	15.03	317.6	24.0	399.0	241.4	1.572
21	1.27	1252.4	1.81	286.6	16.62	358.9	28.6	399.0	245.9	1.408
37	1.27	1284.2	1.82	274.6	16.12	339.7	26.6	399.0	243.5	1.490
38	1.27	1286.6	1.82	273.5	15.91	338.0	26.2	399.0	243.3	1.497
50	1.27	1371.3	1.79	238.2	13.91	286.8	21.1	399.0	238.1	1.722
60	1.27	1343.3	1.81	250.9	14.64	304.5	22.7	399.0	239.6	1.646

********** STEADY STATE TEST C **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F8										
1	1.30	1328.8	1.82	256.9	15.14	322.5	25.2	389.2	241.8	1.593
17	1.30	1336.0	1.80	252.2	14.55	315.7	24.0	389.2	241.4	1.612
21	1.30	1278.7	1.81	275.6	15.93	352.7	28.2	389.2	245.2	1.460
34	1.30	1420.6	1.84	230.1	13.54	280.5	20.6	389.2	237.0	1.841
37	1.30	1307.6	1.82	265.6	15.47	336.0	26.4	389.2	243.2	1.536
50	1.30	1405.7	1.79	228.1	13.26	279.3	20.5	389.2	237.7	1.800
60	1.30	1375.0	1.81	240.7	13.98	297.4	22.2	389.2	239.2	1.717

STEADY STATE TEST D

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST D **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.813E+05 LBM/SQFT H — 517.47 KG/SQM S
UNC. MASS FLUX 8.660E+03 LBM/SQFT H — 11.7514 KG/SQM S
PRESSURE 1847.3 PSI — 12.75 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.225	700.9	0.030	9.58	1253.8	679.1	50.83	28.240	624.5	329.5	0.443	0.2	.6436	.0301
F	2.219	698.9	0.037	11.60	1255.2	679.9	40.65	22.583	624.5	329.5	0.443	0.2	.8486	.0352
G	2.212	696.8	0.051	16.15	1205.5	652.3	33.96	18.864	642.9	339.7	15.689	8.7	1.0516	.0402
E1	2.209	695.8	0.026	8.28	1287.3	697.7	62.40	34.669	624.5	329.5	0.443	0.2	.6764	.0309
E2	2.175	685.1	0.065	20.58	1275.4	691.1	35.72	19.846	624.5	329.5	0.443	0.2	.6999	.0316
E3	2.215	697.7	0.022	7.08	1301.4	705.6	24.87	13.819	624.5	329.5	0.443	0.2	.7275	.0325
E6	2.159	680.1	0.082	25.89	1197.0	647.6	42.00	23.335	624.5	329.5	0.443	0.2	.7860	.0338
E7	2.218	698.5	0.026	8.11	1215.0	657.5	37.20	20.665	624.5	329.5	0.443	0.2	.8055	.0342
E8	2.225	700.9	0.015	4.65	1235.4	668.9	33.18	18.431	624.5	329.5	0.443	0.2	.8312	.0348
F1	2.193	690.9	0.050	15.70	1246.3	674.9	14.18	7.876	624.5	329.5	0.443	0.2	.8814	.0361
F2	2.213	697.2	0.022	7.05	1269.1	687.6	26.83	14.906	624.5	329.5	0.443	0.2	.9071	.0368
F3	2.193	690.9	0.048	15.17	1259.1	682.1	21.43	11.908	624.5	329.5	0.443	0.2	.9328	.0376
F4	2.158	679.7	0.082	25.88	1057.9	570.2	4.88	2.711	624.5	329.5	0.443	0.2	.9564	.0382
F5	2.175	685.1	0.065	20.58	1109.5	598.9	25.04	13.910	624.5	329.5	0.443	0.2	.9738	.0386
F6	2.195	691.4	0.046	14.40	1161.8	628.0	12.46	6.920	624.5	329.5	0.443	0.2	.9922	.0389
F7	2.195	691.4	0.042	13.25	1170.3	632.7	16.78	9.324	627.5	331.1	13.230	7.4	1.0096	.0393
F8	2.199	692.7	0.044	13.79	1197.9	648.0	25.87	14.373	636.6	336.2	13.876	7.7	1.0342	.0398

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test D

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST D **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	GGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E														
2	0.64	1277.6	2.21	338.7	20.42	767.4	17.88	547.4	344.3	5.35	300.4	6.01	296.5	1.551
3	0.64	1097.8	2.26	477.3	30.68	767.4	17.88	555.3	360.2	5.88	315.0	6.51	321.6	1.129
4	0.64	1204.0	2.24	386.7	23.19	767.4	17.88	549.9	349.3	5.45	305.0	6.11	304.4	1.377
7	0.64	1230.9	2.18	359.4	22.02	767.4	17.88	548.9	347.3	5.43	303.2	6.09	301.2	1.439
7	0.64	1228.3	2.18	360.9	21.98	767.4	17.88	549.0	347.5	5.43	303.4	6.09	301.5	1.433
10	0.64	1227.5	2.19	363.6	21.75	767.4	17.88	549.0	347.5	5.41	303.4	6.07	301.6	1.431
12	0.64	1246.0	2.26	363.8	22.03	767.4	17.88	548.4	346.3	5.39	302.2	6.05	299.6	1.476
13	0.64	1243.4	2.24	362.5	22.43	767.4	17.88	548.5	346.4	5.42	302.4	6.08	299.9	1.469
13	0.64	1248.1	2.24	359.8	21.87	767.4	17.88	548.3	346.1	5.39	302.1	6.05	299.4	1.481
15	0.64	1236.4	2.32	379.7	22.98	767.4	17.88	548.7	346.9	5.41	302.8	6.07	300.6	1.453
15	0.64	1245.1	2.32	374.4	22.47	767.4	17.88	548.4	346.3	5.38	302.3	6.05	299.7	1.473
16	0.64	1302.3	2.19	323.5	19.23	767.4	17.88	546.7	342.9	5.30	299.1	5.97	294.4	1.610
16	0.64	1290.3	2.19	329.3	19.57	767.4	17.88	547.0	343.5	5.32	299.7	5.98	295.4	1.581
20	0.64	1190.7	2.26	398.4	24.16	767.4	17.88	550.5	350.4	5.49	306.0	6.15	306.1	1.345
20	0.64	1209.0	2.26	385.9	23.63	767.4	17.88	549.7	348.9	5.47	304.7	6.13	303.7	1.388
24	0.64	1230.4	2.21	364.7	22.32	767.4	17.88	548.9	347.3	5.43	303.2	6.09	301.3	1.438
24	0.64	1194.4	2.21	387.7	27.31	767.4	17.88	550.3	350.1	5.73	305.7	6.33	305.6	1.354
26	0.64	1235.0	2.23	365.4	21.76	767.4	17.88	548.8	347.0	5.39	302.9	6.06	300.8	1.449
26	0.64	1235.5	2.23	365.1	21.66	767.4	17.88	548.8	347.0	5.38	302.9	6.05	300.7	1.450
26	0.64	1237.5	2.23	363.9	21.64	767.4	17.88	548.7	346.8	5.38	302.8	6.05	300.5	1.455
29	0.64	1234.9	2.21	361.6	21.33	767.4	17.88	548.8	347.0	5.38	302.9	6.05	300.8	1.449
29	0.64	1218.7	2.21	371.5	22.41	767.4	17.88	549.4	348.2	5.43	304.0	6.09	302.6	1.411
29	0.64	1225.8	2.21	367.1	21.84	767.4	17.88	549.1	347.7	5.40	303.5	6.07	301.8	1.427
30	0.64	1206.8	2.20	377.2	22.53	767.4	17.88	549.8	349.1	5.44	304.8	6.11	304.0	1.383
30	0.64	1214.8	2.20	372.1	22.33	767.4	17.88	549.5	348.5	5.43	304.3	6.10	303.1	1.402
31	0.64	1233.7	2.23	365.3	21.85	767.4	17.88	548.8	347.1	5.40	303.0	6.06	300.9	1.446
33	0.64	1281.3	2.23	340.0	20.33	767.4	17.88	547.3	344.1	5.33	300.2	5.99	296.2	1.559
33	0.64	1265.1	2.23	348.6	21.43	767.4	17.88	547.8	345.0	5.38	301.1	6.04	297.7	1.522
33	0.64	1255.8	2.23	353.7	21.41	767.4	17.88	548.1	345.6	5.38	301.6	6.04	298.6	1.499
35	0.64	1243.1	2.24	362.4	22.38	767.4	17.88	548.5	346.5	5.42	302.4	6.08	299.9	1.469
42	0.64	1227.1	2.21	366.4	23.21	767.4	17.88	549.1	347.6	5.48	303.4	6.13	301.6	1.430
44	0.64	1190.0	2.17	384.6	23.81	767.4	17.88	550.5	350.5	5.52	306.1	6.18	306.1	1.343
45	0.64	1190.4	2.26	400.1	24.76	767.4	17.88	550.5	350.4	5.52	306.0	6.18	306.1	1.344
45	0.64	1212.6	2.26	385.0	23.95	767.4	17.88	549.6	348.7	5.48	304.4	6.14	303.3	1.396
49	0.64	1286.3	2.22	335.4	19.91	767.4	17.88	547.1	343.8	5.32	299.9	5.98	295.7	1.571
49	0.64	1310.2	2.22	323.7	19.17	767.4	17.88	546.5	342.5	5.29	298.7	5.95	293.7	1.630
49	0.64	1297.5	2.22	329.8	19.88	767.4	17.88	546.8	343.1	5.32	299.4	5.98	294.8	1.599
51	0.64	1196.2	2.22	388.0	24.03	767.4	17.88	550.2	350.0	5.51	305.6	6.16	305.3	1.358
51	0.64	1197.3	2.22	387.2	24.28	767.4	17.88	550.2	349.9	5.52	305.5	6.18	305.2	1.361
53	0.64	1269.6	2.21	342.6	20.91	767.4	17.88	547.6	344.8	5.37	300.9	6.03	297.3	1.532
53	0.64	1260.1	2.21	347.7	21.44	767.4	17.88	547.9	345.3	5.39	301.4	6.05	298.2	1.510
58	0.64	1286.9	2.22	335.5	20.02	767.4	17.88	547.1	343.7	5.32	299.9	5.99	295.7	1.573
58	0.64	1278.1	2.22	340.0	20.97	767.4	17.88	547.4	344.2	5.37	300.4	6.02	296.5	1.552
59	0.64	1296.3	2.20	327.3	19.60	767.4	17.88	546.9	343.2	5.32	299.4	5.98	294.9	1.596
59	0.64	1282.7	2.20	334.0	19.97	767.4	17.88	547.2	344.0	5.33	300.1	5.99	296.1	1.563
59	0.64	1280.6	2.20	335.1	20.04	767.4	17.88	547.3	344.1	5.33	300.3	6.00	296.2	1.558
61	0.64	1300.0	2.21	327.4	19.42	767.4	17.88	546.8	343.0	5.30	299.2	5.97	294.5	1.605
61	0.64	1320.6	2.21	317.8	18.71	767.4	17.88	546.2	341.9	5.28	298.3	5.94	292.9	1.655
61	0.64	1325.9	2.21	315.4	18.49	767.4	17.88	546.1	341.6	5.27	298.0	5.93	292.5	1.668
62	0.64	1329.9	2.23	316.2	18.51	767.4	17.88	546.0	341.4	5.26	297.8	5.93	292.2	1.678
63	0.64	1299.6	2.27	336.2	19.73	767.4	17.88	546.8	343.0	5.30	299.3	5.96	294.6	1.604
63	0.64	1310.0	2.27	331.1	19.71	767.4	17.88	546.5	342.5	5.30	298.8	5.96	293.7	1.629
64	0.64	1395.7	2.22	288.1	16.83	767.4	17.88	544.5	338.5	5.21	295.2	5.87	287.7	1.839
64	0.64	1369.7	2.22	298.2	17.50	767.4	17.88	545.0	339.6	5.23	296.2	5.89	289.4	1.774
LEVEL F														
1	0.85	1275.7	2.22	341.1	21.16	925.4	19.20	658.7	384.0	4.61	344.7	5.31	314.0	2.032
3	0.85	1266.7	2.27	352.7	21.09	925.4	19.20	659.1	384.6	4.56	345.3	5.28	314.9	2.005
4	0.85	1285.3	2.25	339.9	20.11	925.4	19.20	658.4	383.4	4.53	344.1	5.24	313.0	2.062
7	0.85	1289.9	2.18	328.1	20.02	925.4	19.20	658.2	383.1	4.57	343.8	5.27	312.6	2.076
7	0.85	1272.9	2.18	336.7	20.22	925.4	19.20	658.8	384.2	4.56	344.9	5.27	314.2	2.024
10	0.85	1235.6	2.19	359.0	22.24	925.4	19.20	660.3	386.9	4.67	347.4	5.37	318.2	1.911
10	0.85	1232.5	2.19	360.8	22.54	925.4	19.20	660.4	387.2	4.69	347.6	5.38	318.6	1.902
10	0.85	1231.5	2.19	361.4	22.58	925.4	19.20	660.5	387.2	4.69	347.7	5.39	318.7	1.898
13	0.85	1252.4	2.25	357.8	21.48	925.4	19.20	659.6	385.7	4.59	346.2	5.30	316.3	1.962
13	0.85	1248.1	2.25	360.2	22.60	925.4	19.20	659.8	386.0	4.67	346.5	5.36	316.8	1.949
14	0.85	1192.8	2.20	387.1	23.54	925.4	19.20	662.3	390.5	4.71	350.8	5.42	323.6	1.785
15	0.85	1240.3	2.32	377.5	22.52	925.4	19.20	660.1	386.6	4.60	347.1	5.31	317.7	1.925
16	0.85	1261.1	2.19	344.4	20.74	925.4	19.20	659.3	385.0	4.58	345.6	5.29	315.4	1.988
17	0.85	1234.9	2.20	359.8	21.08	925.4	19.20	660.3	387.0	4.57	347.5	5.30	318.3	1.909
18	0.85	1147.5	2.21	421.9	26.17	925.4	19.20	664.8	395.2	4.87	355.2	5.57	330.6	1.651

********** STEADY STATE TEST D **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
20	0.85	1197.8	2.26	394.0	23.36	925.4	19.20	662.0	390.1	4.65	350.4	5.37	322.9	1.799
21	0.85	1213.0	2.21	375.5	25.06	925.4	19.20	661.3	388.8	4.87	349.1	5.53	320.9	1.845
28	0.85	1283.3	2.19	332.5	19.55	925.4	19.20	658.5	383.5	4.52	344.2	5.24	313.2	2.055
28	0.85	1260.3	2.19	344.6	20.40	925.4	19.20	659.3	385.1	4.56	345.7	5.27	315.5	1.986
28	0.85	1260.1	2.19	344.7	20.48	925.4	19.20	659.3	385.1	4.56	345.7	5.28	315.5	1.985
31	0.85	1243.7	2.23	359.8	21.78	925.4	19.20	660.0	386.3	4.62	346.8	5.32	317.3	1.935
31	0.85	1243.5	2.23	360.0	21.59	925.4	19.20	660.0	386.3	4.60	346.9	5.31	317.3	1.935
34	0.85	1225.0	2.24	373.2	22.93	925.4	19.20	660.7	387.8	4.67	348.2	5.37	319.4	1.880
37	0.85	1238.4	2.23	362.9	24.71	925.4	19.20	660.2	386.7	4.85	347.2	5.50	317.9	1.919
38	0.85	1270.3	2.23	345.6	20.94	925.4	19.20	658.9	384.4	4.58	345.0	5.29	314.5	2.016
42	0.85	1251.6	2.21	352.5	21.96	925.4	19.20	659.6	385.7	4.65	346.3	5.35	316.4	1.959
45	0.85	1248.3	2.27	363.3	21.56	925.4	19.20	659.8	386.0	4.58	346.5	5.29	316.8	1.949
45	0.85	1254.6	2.27	359.7	21.38	925.4	19.20	659.5	385.5	4.57	346.1	5.29	316.1	1.968
53	0.85	1263.7	2.27	354.9	21.54	925.4	19.20	659.2	384.8	4.59	345.5	5.30	315.2	1.996
59	0.85	1246.0	2.20	353.6	21.15	925.4	19.20	659.9	386.1	4.59	346.7	5.31	317.0	1.942
59	0.85	1251.5	2.20	350.5	20.73	925.4	19.20	659.6	385.7	4.57	346.3	5.28	316.4	1.959
59	0.85	1260.0	2.20	345.8	21.56	925.4	19.20	659.3	385.1	4.64	345.7	5.33	315.5	1.985
60	0.85	1282.3	2.22	337.7	20.76	925.4	19.20	658.5	383.6	4.59	344.3	5.29	313.3	2.052
64	0.85	1340.8	2.22	310.6	18.25	925.4	19.20	656.6	380.2	4.47	341.1	5.18	308.3	2.230
64	0.85	1364.2	2.22	300.8	17.59	925.4	19.20	656.0	379.0	4.44	339.9	5.15	306.6	2.302
64	0.85	1354.9	2.22	304.6	17.80	925.4	19.20	656.2	379.4	4.45	340.4	5.16	307.3	2.274

********** STEADY STATE TEST D **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.05	1219.5	2.22	373.2	23.16	385.0	26.3	867.1	336.7	2.277
14	1.05	1179.8	2.20	396.2	26.02	409.8	29.7	867.1	342.3	2.137
16	1.05	1213.4	2.19	371.8	23.21	383.8	26.3	867.1	337.5	2.255
16	1.05	1238.4	2.19	356.7	21.93	367.7	24.7	867.1	334.3	2.345
18	1.05	1191.4	2.20	388.6	23.37	401.6	26.9	867.1	340.5	2.178
18	1.05	1177.4	2.20	398.4	24.43	412.1	28.2	867.1	342.6	2.129
18	1.05	1182.7	2.20	394.7	23.79	408.1	27.4	867.1	341.8	2.147
20	1.05	1100.9	2.26	473.5	28.65	492.5	34.5	867.1	357.2	1.860
20	1.05	1193.1	2.26	396.7	25.21	409.9	28.8	867.1	340.3	2.185
20	1.05	1191.5	2.26	397.8	24.35	411.1	27.9	867.1	340.5	2.179
21	1.05	1168.4	2.11	388.5	22.92	402.1	26.7	867.1	344.1	2.097
34	1.05	1242.2	2.24	362.3	22.23	373.4	25.0	867.1	333.9	2.359
37	1.05	1192.2	2.23	392.5	23.87	405.6	27.4	867.1	340.4	2.181
38	1.05	1209.0	2.23	381.5	23.34	393.9	26.6	867.1	338.1	2.239
42	1.05	1213.4	2.21	374.9	29.17	387.0	32.4	867.1	337.5	2.255
42	1.05	1224.7	2.21	367.8	22.58	379.4	25.6	867.1	336.0	2.295
45	1.05	1202.3	2.26	392.0	24.72	404.9	28.1	867.1	339.0	2.217
45	1.05	1190.0	2.26	400.5	25.15	414.0	28.8	867.1	340.7	2.173
45	1.05	1200.6	2.26	393.2	24.47	406.1	27.9	867.1	339.2	2.211
47	1.05	1210.8	2.24	381.3	23.62	393.6	26.9	867.1	337.8	2.246
50	1.05	1221.4	2.18	365.1	21.94	376.7	24.9	867.1	336.4	2.284
58	1.05	1216.6	2.22	374.9	23.09	386.9	26.2	867.1	337.1	2.266
60	1.05	1227.9	2.22	367.6	23.31	379.2	26.3	867.1	335.6	2.307
64	1.05	1271.5	2.23	344.0	20.63	354.1	23.1	867.1	330.6	2.465
64	1.05	1275.1	2.23	342.1	20.54	352.1	23.0	867.1	330.3	2.478

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E1														
1	0.68	1358.5	2.22	302.2	18.32	793.2	18.15	562.1	347.5	5.17	304.8	5.83	292.7	1.817
38	0.68	1261.3	2.23	350.1	20.74	793.2	18.15	564.8	352.8	5.25	309.7	5.92	300.7	1.573
50	0.68	1242.1	2.18	352.9	21.65	793.2	18.15	565.4	354.0	5.32	310.9	5.98	302.7	1.526
LEVEL E2														
21	0.70	1251.2	2.21	352.6	20.65	811.6	18.41	578.5	358.6	5.19	316.1	5.87	303.8	1.599
60	0.70	1316.4	2.22	320.3	19.37	811.6	18.41	576.5	354.6	5.14	312.4	5.81	297.9	1.766
LEVEL E3														
17	0.73	1272.4	2.20	339.1	21.03	833.0	18.77	592.8	363.0	5.16	321.2	5.83	304.1	1.714
34	0.73	1324.1	2.24	320.0	19.93	833.0	18.77	591.2	360.0	5.10	318.5	5.76	299.6	1.851
37	0.73	1290.4	2.23	334.6	19.83	833.0	18.77	592.2	361.9	5.08	320.2	5.77	302.4	1.761
38	0.73	1298.6	2.23	330.8	19.48	833.0	18.77	592.0	361.4	5.07	319.8	5.75	301.7	1.782
50	0.73	1285.0	2.18	330.0	20.62	833.0	18.77	592.4	362.2	5.15	320.5	5.82	302.9	1.747
60	0.73	1338.0	2.22	310.6	18.65	833.0	18.77	590.9	359.2	5.05	317.8	5.72	298.5	1.888
LEVEL E6														
60	0.79	1226.7	2.22	368.2	22.17	877.9	18.98	627.0	377.4	4.89	336.8	5.57	314.0	1.727
LEVEL E7														
1	0.81	1262.1	2.22	348.2	21.48	892.8	19.01	635.4	378.2	4.77	338.1	5.44	311.6	1.873
34	0.81	1197.3	2.24	391.1	24.52	892.8	19.01	638.1	383.3	4.92	342.9	5.58	319.2	1.689
37	0.81	1224.5	2.23	371.6	22.22	892.8	19.01	636.9	381.0	4.78	340.8	5.46	315.8	1.766
50	0.81	1175.9	2.18	395.6	24.27	892.8	19.01	639.2	385.3	4.92	344.8	5.59	322.2	1.628
LEVEL E8														
1	0.83	1276.1	2.22	340.8	20.94	912.2	19.10	649.0	381.4	4.64	341.8	5.32	312.4	1.984
14	0.83	1190.3	2.20	389.2	24.15	912.2	19.10	652.6	388.1	4.81	348.2	5.48	322.4	1.732
34	0.83	1217.2	2.24	378.1	23.45	912.2	19.10	651.3	385.8	4.75	345.9	5.43	318.9	1.809
37	0.83	1238.9	2.23	363.0	21.66	912.2	19.10	650.4	384.1	4.65	344.3	5.34	316.3	1.873
38	0.83	1254.6	2.23	354.2	20.98	912.2	19.10	649.8	382.9	4.61	343.2	5.31	314.6	1.920
LEVEL F1														
17	0.88	1259.8	2.20	346.0	20.23	950.0	19.45	676.5	389.4	4.57	350.4	5.39	318.2	2.075
21	0.88	1229.9	2.21	365.3	21.86	950.0	19.45	677.8	391.7	4.65	352.5	5.46	321.6	1.983
34	0.88	1249.3	2.24	358.5	22.05	950.0	19.45	676.9	390.2	4.67	351.1	5.46	319.3	2.043
37	0.88	1265.0	2.23	348.1	20.68	950.0	19.45	676.3	389.1	4.59	350.0	5.40	317.7	2.091
50	0.88	1234.1	2.18	357.8	21.23	950.0	19.45	677.6	391.4	4.63	352.2	5.44	321.1	1.997
LEVEL F2														
1	0.91	1297.3	2.22	330.3	19.69	969.2	19.70	689.0	389.6	4.85	350.8	5.82	316.7	2.275
14	0.91	1233.6	2.20	361.6	23.17	969.2	19.70	691.5	394.1	5.05	355.0	6.00	323.3	2.070
17	0.91	1263.1	2.20	344.5	20.11	969.2	19.70	690.3	391.9	4.86	352.9	5.84	320.0	2.165
34	0.91	1271.7	2.24	346.3	21.17	969.2	19.70	689.9	391.3	4.91	352.4	5.87	319.1	2.192
38	0.91	1301.2	2.23	329.9	19.43	969.2	19.70	688.9	389.3	4.83	350.5	5.80	316.3	2.288
50	0.91	1247.4	2.18	350.4	20.87	969.2	19.70	690.9	393.0	4.91	354.0	5.88	321.7	2.114
LEVEL F3														
14	0.93	1235.8	2.20	359.8	22.24	988.2	20.01	704.7	395.8	5.99	356.6	7.26	325.1	2.154
17	0.93	1254.6	2.20	348.6	20.41	988.2	20.01	703.9	394.3	5.89	355.2	7.17	323.0	2.214
21	0.93	1243.5	2.21	357.0	20.90	988.2	20.01	704.4	395.2	5.90	356.0	7.19	324.2	2.179
34	0.93	1295.4	2.24	333.7	20.33	988.2	20.01	702.3	391.5	5.88	352.6	7.14	318.9	2.349
60	0.93	1254.2	2.22	351.9	22.24	988.2	20.01	703.9	394.3	5.98	355.2	7.24	323.0	2.213
LEVEL F4														
60	0.96	1061.3	2.22	507.3	31.97	1005.7	20.22	729.5	417.6	11.05	376.8	11.79	359.2	1.660
LEVEL F5														
21	0.97	1081.3	2.21	483.7	29.13	1018.5	22.82	737.1	413.1	14.65	371.8	22.09	355.4	1.775
60	0.97	1129.2	2.22	439.1	26.97	1018.5	22.82	733.2	406.1	14.40	365.2	21.65	344.7	1.933

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
1	0.99	1178.9	2.22	400.1	26.40	1032.0	29.25	739.4	396.2	14.54	354.0	20.67	337.6	2.158
17	0.99	1161.7	2.20	408.9	24.94	1032.0	29.25	740.5	397.9	15.12	355.7	20.27	340.4	2.101
37	0.99	1148.1	2.23	425.4	26.07	1032.0	29.25	741.4	399.5	15.10	357.1	20.44	342.7	2.054
38	0.99	1147.3	2.23	426.4	25.74	1032.0	29.25	741.4	399.6	15.23	357.2	20.32	342.9	2.052
50	0.99	1165.1	2.18	403.1	24.75	1032.0	29.25	740.3	397.6	15.07	355.4	20.30	339.8	2.112
60	0.99	1175.8	2.22	401.9	24.45	1032.0	29.25	739.6	396.5	15.14	354.3	20.13	338.1	2.147

********** STEADY STATE TEST D **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL F7										
14	1.01	1151.3	2.20	417.6	26.45	419.9	28.7	1021.1	343.6	2.097
17	1.01	1176.9	2.20	397.6	23.79	399.7	25.8	1021.1	339.4	2.186
21	1.01	1142.7	2.21	426.5	25.47	428.9	27.9	1021.1	345.1	2.068
37	1.01	1165.3	2.23	412.3	25.19	414.6	27.3	1021.1	341.2	2.146
38	1.01	1178.9	2.23	402.2	24.10	404.3	26.1	1021.1	339.0	2.193
50	1.01	1184.9	2.18	388.9	23.82	390.9	25.7	1021.1	338.1	2.214
60	1.01	1192.5	2.22	390.2	23.73	392.2	25.6	1021.1	337.0	2.240
LEVEL F8										
1	1.03	1229.4	2.22	367.1	22.45	374.5	24.6	911.6	334.1	2.328
17	1.03	1182.1	2.20	394.1	23.40	402.8	26.1	911.6	340.6	2.160
21	1.03	1153.4	2.21	418.0	24.84	427.7	28.0	911.6	345.3	2.059
34	1.03	1219.0	2.24	376.7	23.38	384.5	25.7	911.6	335.5	2.291
37	1.03	1188.3	2.23	395.3	23.82	403.9	26.5	911.6	339.7	2.182
50	1.03	1208.6	2.18	373.3	22.63	381.1	25.0	911.6	336.8	2.254
60	1.03	1220.9	2.22	371.7	22.37	379.4	24.6	911.6	335.2	2.298

STEADY STATE TEST E

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST E **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 4.370E+05 LBM/SQFT H UNC. MASS FLUX 9.951E+03 LBM/SQFT H PRESSURE 1908.0 PSI UNC. PRESSURE 6.00 PSI
593.04 KG/SQM S 13.5033 KG/SQM S 13.16 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.287	720.4	0.034	10.75	1234.7	668.5	46.72	25.956	629.0	332.0	0.443	0.2	.5757	.0282
F	2.275	716.8	0.040	12.68	1220.4	660.5	39.99	22.218	629.0	332.0	0.443	0.2	.7637	.0329
G	2.260	712.0	0.052	16.34	1155.5	624.5	29.19	16.215	629.0	332.0	0.443	0.2	.9495	.0375
E1	2.260	712.0	0.022	7.04	1260.0	682.6	61.40	34.114	629.0	332.0	0.443	0.2	.6058	.0290
E2	2.221	699.6	0.069	21.84	1251.2	677.6	30.09	16.719	629.0	332.0	0.443	0.2	.6274	.0297
E3	2.264	713.0	0.021	6.54	1270.7	688.5	22.75	12.639	629.0	332.0	0.443	0.2	.6528	.0305
E6	2.201	693.2	0.085	26.67	1160.6	627.3	35.50	19.720	629.0	332.0	0.443	0.2	.7063	.0317
E7	2.269	714.7	0.025	8.01	1181.3	638.8	37.09	20.603	629.0	332.0	0.443	0.2	.7242	.0320
E8	2.278	717.5	0.012	3.78	1211.5	655.6	22.90	12.724	629.0	332.0	0.443	0.2	.7477	.0325
F1	2.241	706.0	0.054	16.89	1210.1	654.8	16.16	8.977	629.0	332.0	0.443	0.2	.7937	.0337
F2	2.264	713.1	0.022	6.80	1228.4	665.0	28.10	15.610	629.0	332.0	0.443	0.2	.8172	.0344
F3	2.243	706.4	0.053	16.67	1218.6	659.6	18.96	10.535	629.0	332.0	0.443	0.2	.8407	.0351
F5	2.220	699.2	0.069	21.82	1054.1	568.1	18.46	10.258	629.0	332.0	0.443	0.2	.8783	.0360
F6	2.242	706.2	0.047	14.88	1111.1	599.8	14.60	8.110	629.0	332.0	0.443	0.2	.8951	.0363
F7	2.242	706.2	0.043	13.51	1118.1	603.8	14.17	7.872	629.0	332.0	0.443	0.2	.9111	.0366
F8	2.247	707.9	0.047	14.83	1144.1	618.1	24.09	13.385	629.0	332.0	0.443	0.2	.9336	.0371

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test E

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST E **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E														
2	0.58	1256.0	2.29	365.8	22.28	829.8	19.65	584.1	369.7	6.12	326.3	6.98	325.0	1.594
3	0.58	1147.7	2.34	451.5	28.70	829.8	19.65	588.9	379.4	6.44	335.3	7.29	340.5	1.325
4	0.58	1216.3	2.33	396.1	23.81	829.8	19.65	585.6	372.7	6.17	329.1	7.05	329.8	1.496
7	0.58	1192.4	2.23	395.6	24.60	829.8	19.65	586.6	374.8	6.27	331.1	7.14	333.2	1.435
7	0.58	1192.8	2.23	395.4	24.40	829.8	19.65	586.6	374.8	6.26	331.0	7.13	333.1	1.436
10	0.58	1229.9	2.27	378.5	22.75	829.8	19.65	585.0	371.6	6.14	328.1	7.02	328.1	1.530
12	0.58	1220.0	2.31	390.9	23.89	829.8	19.65	585.4	372.4	6.18	328.9	7.05	329.4	1.505
13	0.58	1229.6	2.30	382.2	23.84	829.8	19.65	585.0	371.6	6.19	328.2	7.06	328.1	1.529
13	0.58	1234.4	2.30	379.1	23.21	829.8	19.65	584.9	371.3	6.16	327.8	7.03	327.5	1.540
15	0.58	1210.0	2.39	411.2	25.15	829.8	19.65	585.8	373.2	6.20	329.6	7.08	330.7	1.480
15	0.58	1220.6	2.39	403.8	24.46	829.8	19.65	585.4	372.4	6.17	328.8	7.04	329.3	1.506
16	0.58	1275.2	2.24	347.2	20.78	829.8	19.65	583.4	368.4	6.07	325.1	6.94	323.0	1.643
16	0.58	1263.5	2.24	353.6	21.16	829.8	19.65	583.8	369.2	6.08	325.9	6.96	324.2	1.613
20	0.58	1212.5	2.30	393.5	23.83	829.8	19.65	585.7	373.0	6.19	329.4	7.06	330.3	1.486
20	0.58	1228.3	2.30	383.1	23.44	829.8	19.65	585.1	371.7	6.17	328.3	7.04	328.3	1.526
24	0.58	1160.1	2.26	425.5	26.60	829.8	19.65	588.2	378.0	6.36	334.0	7.23	338.3	1.356
24	0.58	1124.3	2.26	456.2	34.23	829.8	19.65	590.3	382.2	6.99	337.9	7.73	345.0	1.269
26	0.58	1196.0	2.29	403.5	24.27	829.8	19.65	586.5	374.5	6.21	330.8	7.09	332.6	1.444
26	0.58	1210.2	2.29	393.6	23.54	829.8	19.65	585.8	373.2	6.17	329.6	7.05	330.7	1.480
26	0.58	1205.0	2.29	397.2	23.84	829.8	19.65	586.1	373.7	6.19	330.0	7.07	331.4	1.467
29	0.58	1175.3	2.26	413.5	24.72	829.8	19.65	587.4	376.4	6.24	332.6	7.13	335.8	1.393
29	0.58	1166.8	2.26	420.1	25.72	829.8	19.65	587.9	377.3	6.31	333.4	7.18	337.2	1.373
29	0.58	1171.9	2.26	416.1	25.07	829.8	19.65	587.6	376.8	6.26	332.9	7.15	336.3	1.386
30	0.58	1211.0	2.24	385.5	23.08	829.8	19.65	585.8	373.2	6.17	329.6	7.05	330.5	1.482
30	0.58	1223.0	2.24	377.7	22.72	829.8	19.65	585.3	372.2	6.16	328.6	7.03	329.0	1.512
31	0.58	1202.1	2.28	397.5	24.00	829.8	19.65	586.2	373.9	6.20	330.3	7.08	331.8	1.460
33	0.58	1282.5	2.29	350.0	20.98	829.8	19.65	583.2	367.9	6.06	324.7	6.93	322.2	1.662
33	0.58	1265.3	2.29	359.5	22.23	829.8	19.65	583.7	369.0	6.12	325.7	6.98	324.0	1.618
33	0.58	1255.9	2.29	364.9	22.18	829.8	19.65	584.1	369.7	6.11	326.3	6.98	325.0	1.594
35	0.58	1227.3	2.30	383.9	23.94	829.8	19.65	585.1	371.8	6.20	328.3	7.06	328.4	1.523
42	0.58	1203.9	2.27	394.0	25.31	829.8	19.65	586.1	373.8	6.30	330.1	7.15	331.5	1.464
44	0.58	1209.4	2.31	398.0	24.79	829.8	19.65	585.9	373.3	6.23	329.7	7.10	330.8	1.478
45	0.58	1174.3	2.31	422.8	26.43	829.8	19.65	587.5	376.5	6.32	332.7	7.19	335.9	1.391
45	0.58	1196.5	2.31	406.3	25.52	829.8	19.65	586.4	374.4	6.28	330.7	7.14	332.6	1.446
49	0.58	1260.6	2.27	359.8	21.52	829.8	19.65	583.9	369.4	6.09	326.0	6.96	324.5	1.606
49	0.58	1280.7	2.27	348.7	20.79	829.8	19.65	583.2	368.0	6.06	324.8	6.93	322.4	1.657
49	0.58	1269.2	2.27	355.0	21.62	829.8	19.65	583.6	368.8	6.10	325.5	6.96	323.6	1.628
51	0.58	1201.1	2.30	401.8	25.03	829.8	19.65	586.2	374.0	6.25	330.4	7.12	331.9	1.457
51	0.58	1200.8	2.30	402.0	25.41	829.8	19.65	586.2	374.0	6.28	330.4	7.13	332.0	1.457
53	0.58	1271.3	2.35	366.0	22.54	829.8	19.65	583.5	368.6	6.11	325.4	6.97	323.4	1.633
53	0.58	1261.1	2.35	371.9	23.18	829.8	19.65	583.9	369.3	6.14	326.0	6.99	324.5	1.607
58	0.58	1267.0	2.31	361.5	21.76	829.8	19.65	583.7	368.9	6.09	325.6	6.96	323.8	1.622
58	0.58	1258.7	2.31	366.2	22.85	829.8	19.65	584.0	369.5	6.14	326.2	7.00	324.7	1.601
59	0.58	1277.9	2.28	351.6	21.22	829.8	19.65	583.3	368.2	6.07	325.0	6.94	322.7	1.650
59	0.58	1264.9	2.28	358.7	21.63	829.8	19.65	583.7	369.1	6.09	325.8	6.96	324.0	1.617
59	0.58	1262.2	2.28	360.3	21.74	829.8	19.65	583.8	369.2	6.10	325.9	6.97	324.3	1.610
61	0.58	1273.6	2.26	349.9	20.89	829.8	19.65	583.5	368.5	6.07	325.2	6.94	323.1	1.639
61	0.58	1291.1	2.26	340.6	20.18	829.8	19.65	582.9	367.3	6.04	324.2	6.91	321.4	1.684
61	0.58	1296.1	2.26	338.1	19.93	829.8	19.65	582.7	367.0	6.03	323.9	6.90	320.9	1.697
62	0.58	1296.0	2.27	341.1	20.09	829.8	19.65	582.7	367.0	6.03	323.9	6.90	320.9	1.696
63	0.58	1274.9	2.32	358.6	21.16	829.8	19.65	583.4	368.4	6.05	325.1	6.93	323.0	1.642
63	0.58	1282.1	2.32	354.6	21.26	829.8	19.65	583.2	367.9	6.06	324.7	6.93	322.3	1.661
64	0.58	1359.1	2.27	310.8	18.27	829.8	19.65	581.0	363.6	5.96	320.7	6.82	315.5	1.857
64	0.58	1333.2	2.27	322.3	19.04	829.8	19.65	581.7	364.9	5.99	321.9	6.85	317.6	1.790
LEVEL F														
1	0.76	1236.9	2.28	374.3	23.55	999.2	20.99	701.8	418.4	5.50	381.8	6.39	346.3	1.969
3	0.76	1242.1	2.35	382.8	23.11	999.2	20.99	701.6	418.0	5.42	381.4	6.32	345.7	1.986
4	0.76	1258.7	2.33	369.9	22.07	999.2	20.99	700.8	416.6	5.37	380.1	6.27	343.7	2.036
7	0.76	1253.8	2.23	357.2	22.04	999.2	20.99	701.0	417.0	5.44	380.5	6.33	344.2	2.021
7	0.76	1235.3	2.23	368.1	22.36	999.2	20.99	701.9	418.6	5.44	382.0	6.34	346.5	1.964
10	0.76	1209.2	2.27	391.9	24.63	999.2	20.99	703.1	421.0	5.56	384.3	6.45	350.1	1.882
10	0.76	1205.3	2.27	394.5	25.03	999.2	20.99	703.3	421.3	5.60	384.6	6.47	350.6	1.870
10	0.76	1204.4	2.27	395.2	25.07	999.2	20.99	703.4	421.4	5.60	384.7	6.48	350.8	1.867
13	0.76	1216.6	2.29	390.6	23.71	999.2	20.99	702.8	420.3	5.48	383.6	6.37	349.0	1.906
13	0.76	1210.7	2.29	394.5	25.10	999.2	20.99	703.1	420.8	5.59	384.1	6.47	349.9	1.887
14	0.76	1110.1	2.25	468.5	29.34	999.2	20.99	709.5	433.1	5.88	395.9	6.77	368.4	1.581
15	0.76	1201.2	2.39	417.6	25.22	999.2	20.99	703.6	421.7	5.50	385.0	6.40	351.3	1.858
16	0.76	1227.2	2.24	374.9	22.82	999.2	20.99	702.3	419.3	5.46	382.7	6.36	347.6	1.939
17	0.76	1201.7	2.25	392.7	23.17	999.2	20.99	703.5	421.7	5.45	385.0	6.36	351.2	1.859
18	0.76	1122.8	2.26	457.9	28.82	959.2	20.99	708.5	431.2	5.85	394.0	6.73	365.5	1.618

********** STEADY STATE TEST E **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
20	0.76	1181.3	2.30	415.7	24.79	999.2	20.99	704.7	423.8	5.51	387.0	6.42	354.4	1.797
21	0.76	1184.9	2.26	406.6	27.58	999.2	20.99	704.4	423.4	5.83	386.6	6.67	353.8	1.808
28	0.76	1247.0	2.24	363.0	21.48	999.2	20.99	701.3	417.6	5.38	381.0	6.28	345.1	2.001
28	0.76	1226.7	2.24	375.3	22.41	999.2	20.99	702.3	419.3	5.42	382.7	6.33	347.7	1.937
28	0.76	1226.4	2.24	375.5	22.52	999.2	20.99	702.3	419.4	5.43	382.7	6.34	347.7	1.936
31	0.76	1210.6	2.28	391.7	24.01	999.2	20.99	703.1	420.8	5.51	384.1	6.40	349.9	1.887
31	0.76	1211.0	2.28	391.4	23.71	999.2	20.99	703.0	420.8	5.48	384.1	6.38	349.8	1.888
34	0.76	1188.5	2.30	410.4	25.59	999.2	20.99	704.2	423.1	5.60	386.3	6.49	353.2	1.819
37	0.76	1207.4	2.27	392.3	27.27	999.2	20.99	703.2	421.1	5.81	384.4	6.64	350.3	1.877
38	0.76	1229.4	2.27	378.2	23.16	999.2	20.99	702.1	419.1	5.47	382.5	6.36	347.3	1.946
42	0.76	1216.3	2.26	385.7	24.39	999.2	20.99	702.8	420.3	5.56	383.6	6.44	349.1	1.905
45	0.76	1214.8	2.31	393.8	23.58	999.2	20.99	702.9	420.4	5.45	383.7	6.36	349.3	1.900
45	0.76	1219.3	2.31	390.8	23.42	999.2	20.99	702.6	420.0	5.45	383.3	6.35	348.7	1.914
53	0.76	1237.0	2.35	386.6	23.70	999.2	20.99	701.8	418.4	5.46	381.8	6.35	346.3	1.970
59	0.76	1212.5	2.28	390.7	23.63	999.2	20.99	703.0	420.6	5.48	384.0	6.38	349.6	1.893
59	0.76	1221.2	2.28	384.9	22.97	999.2	20.99	702.5	419.8	5.43	383.2	6.34	348.4	1.920
59	0.76	1227.2	2.28	381.1	24.12	999.2	20.99	702.3	419.3	5.54	382.7	6.42	347.6	1.939
60	0.76	1240.0	2.26	370.3	23.05	999.2	20.99	701.7	418.2	5.48	381.6	6.36	345.9	1.979
64	0.76	1296.6	2.27	340.7	20.17	999.2	20.99	699.3	413.9	5.31	377.5	6.21	339.5	2.156
64	0.76	1320.6	2.27	328.9	19.36	999.2	20.99	698.5	412.3	5.27	376.0	6.17	337.2	2.232
64	0.76	1310.6	2.27	333.7	19.63	999.2	20.99	698.8	412.9	5.28	376.6	6.18	338.2	2.200
LEVEL G														
1	0.95	1177.6	2.27	414.6	26.20	1159.9	22.22	818.3	451.5	8.89	417.5	10.71	373.7	2.333
14	0.95	1141.0	2.25	440.2	29.66	1159.9	22.22	821.0	456.3	9.17	422.0	10.97	380.7	2.197
16	0.95	1152.0	2.24	428.2	27.33	1159.9	22.22	820.1	454.8	9.00	420.6	10.83	378.4	2.238
16	0.95	1180.5	2.24	406.1	25.46	1159.9	22.22	818.1	451.2	8.87	417.1	10.69	373.2	2.343
18	0.95	1143.3	2.26	439.2	26.82	1159.9	22.22	820.8	455.9	8.95	421.7	10.80	380.2	2.205
18	0.95	1137.2	2.26	444.5	27.77	1159.9	22.22	821.3	456.8	9.02	422.6	10.86	381.5	2.183
18	0.95	1133.7	2.26	447.6	27.42	1159.9	22.22	821.6	457.3	8.99	423.0	10.85	382.3	2.170
20	0.95	1066.6	2.29	524.4	32.22	1159.9	22.22	828.3	469.1	9.33	434.5	11.22	400.1	1.925
20	0.95	1162.0	2.29	430.5	27.87	1159.9	22.22	819.4	453.5	8.99	419.3	10.81	376.5	2.275
20	0.95	1151.8	2.29	438.9	27.22	1159.9	22.22	820.1	454.8	8.95	420.6	10.79	378.5	2.237
21	0.95	1122.1	2.16	438.3	26.12	1159.9	22.22	822.6	459.1	8.98	424.7	10.86	384.9	2.127
34	0.95	1173.8	2.29	421.1	26.44	1159.9	22.22	818.5	452.0	8.89	417.9	10.72	374.3	2.319
37	0.95	1149.6	2.27	435.8	26.91	1159.9	22.22	820.3	455.1	8.95	420.9	10.79	378.9	2.229
38	0.95	1160.8	2.27	426.7	26.53	1159.9	22.22	819.5	453.6	8.92	419.5	10.75	376.7	2.270
42	0.95	1152.4	2.26	432.5	35.55	1159.9	22.22	820.1	454.7	9.64	420.5	11.32	378.4	2.239
42	0.95	1159.2	2.26	427.0	26.78	1159.9	22.22	819.6	453.8	8.94	419.7	10.77	377.0	2.264
45	0.95	1160.3	2.31	434.0	28.00	1159.9	22.22	819.5	453.7	8.99	419.5	10.81	376.8	2.268
45	0.95	1145.2	2.31	446.7	28.68	1159.9	22.22	820.7	455.7	9.04	421.5	10.87	379.8	2.212
45	0.95	1158.7	2.31	435.3	27.57	1159.9	22.22	819.6	453.9	8.96	419.7	10.79	377.1	2.262
47	0.95	1151.0	2.28	435.9	27.58	1159.9	22.22	820.2	454.9	8.99	420.7	10.82	378.6	2.234
50	0.95	1149.0	2.23	429.5	26.35	1159.9	22.22	820.4	455.2	8.94	421.0	10.78	379.0	2.226
58	0.95	1164.2	2.30	430.1	27.10	1159.9	22.22	819.2	453.2	8.93	419.0	10.76	376.1	2.283
60	0.95	1172.3	2.26	415.9	26.95	1159.9	22.22	818.7	452.2	8.95	418.1	10.77	374.6	2.313
64	0.95	1217.6	2.27	385.6	23.45	1159.9	22.22	815.8	447.2	8.72	413.3	10.54	367.3	2.482
64	0.95	1224.3	2.27	381.2	23.17	1159.9	22.22	815.4	446.6	8.70	412.6	10.52	366.3	2.508

********** STEADY STATE TEST E **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E1														
1	0.61	1329.5	2.28	324.8	19.88	857.4	19.92	599.2	373.5	5.94	331.6	6.82	320.7	1.844
38	0.61	1237.6	2.27	373.1	22.23	857.4	19.92	602.3	379.5	6.04	337.2	6.94	330.0	1.603
5C	0.61	1213.0	2.23	382.6	23.75	857.4	19.92	603.3	381.5	6.15	339.1	7.03	333.2	1.541
LEVEL E2														
21	0.63	1238.0	2.26	371.3	21.83	877.2	20.19	616.4	385.4	5.98	343.9	6.90	332.3	1.651
60	0.63	1285.6	2.26	344.3	21.01	877.2	20.19	614.7	381.9	5.96	340.7	6.85	327.0	1.778
LEVEL E3														
17	0.65	1260.1	2.25	356.6	22.31	900.2	20.56	631.6	390.4	5.99	350.0	6.90	332.3	1.766
34	0.65	1290.0	2.30	347.3	21.94	900.2	20.56	630.5	388.3	5.96	348.0	6.85	329.1	1.850
37	0.65	1247.1	2.27	367.3	21.95	900.2	20.56	632.1	391.3	5.95	350.9	6.87	333.8	1.731
38	0.65	1270.5	2.27	354.0	20.97	900.2	20.56	631.2	389.6	5.91	349.3	6.83	331.2	1.795
50	0.65	1251.3	2.23	359.1	22.81	900.2	20.56	631.9	391.0	6.03	350.6	6.93	333.3	1.742
60	0.65	1304.9	2.26	334.5	20.26	900.2	20.56	630.0	387.3	5.89	347.1	6.79	327.7	1.891
LEVEL E6														
60	0.71	1185.7	2.26	406.1	24.75	948.3	20.77	669.2	410.2	5.85	371.5	6.76	347.8	1.678
LEVEL E7														
1	0.72	1225.0	2.28	381.8	23.86	964.2	20.80	678.0	410.7	5.71	372.7	6.60	343.9	1.833
34	0.72	1166.2	2.30	427.3	27.25	964.2	20.80	681.0	416.6	5.91	378.4	6.79	352.8	1.660
37	0.72	1195.1	2.27	401.0	24.21	964.2	20.80	679.4	413.5	5.70	375.4	6.62	348.1	1.745
50	0.72	1138.9	2.23	438.2	27.32	964.2	20.80	682.8	420.0	5.94	381.6	6.84	357.9	1.580
LEVEL E8														
1	0.75	1237.6	2.28	373.9	23.26	985.1	20.89	691.8	414.9	5.56	377.8	6.44	344.6	1.929
34	0.75	1182.3	2.30	414.9	26.14	985.1	20.89	694.6	420.2	5.71	382.9	6.60	352.5	1.761
37	0.75	1208.8	2.27	391.5	23.55	985.1	20.89	693.2	417.5	5.55	380.3	6.45	348.5	1.842
38	0.75	1217.2	2.27	386.0	23.05	985.1	20.89	692.7	416.7	5.52	379.5	6.43	347.3	1.867
LEVEL F1														
17	0.79	1225.5	2.25	377.1	22.18	1025.6	21.25	721.0	425.6	5.27	389.9	6.19	350.8	2.014
21	0.79	1199.6	2.26	396.1	23.91	1025.6	21.25	722.3	428.1	5.37	392.3	6.28	354.6	1.930
34	0.79	1210.1	2.29	394.9	24.65	1025.6	21.25	721.7	427.1	5.43	391.3	6.31	353.0	1.964
37	0.79	1233.2	2.27	375.6	22.51	1025.6	21.25	720.6	424.9	5.30	389.2	6.20	349.8	2.039
50	0.79	1192.2	2.23	396.6	23.80	1025.6	21.25	722.7	428.9	5.38	393.0	6.29	355.7	1.906
LEVEL F2														
1	0.82	1258.6	2.28	361.5	21.74	1046.1	21.51	734.2	427.3	5.18	392.3	6.09	349.0	2.189
14	0.82	1190.3	2.25	401.8	26.22	1046.1	21.51	737.7	433.6	5.52	398.4	6.39	358.4	1.966
17	0.82	1228.4	2.25	375.5	22.05	1046.1	21.51	735.6	429.9	5.18	394.8	6.11	352.9	2.090
34	0.82	1230.4	2.30	381.8	23.67	1046.1	21.51	735.5	429.7	5.29	394.6	6.19	352.6	2.096
38	0.82	1259.3	2.27	360.3	21.37	1046.1	21.51	734.2	427.2	5.16	392.2	6.07	349.0	2.191
50	0.82	1203.4	2.23	389.1	23.44	1046.1	21.51	736.9	432.3	5.28	397.1	6.20	356.4	2.009
LEVEL F3														
14	0.84	1191.9	2.25	400.4	25.13	1066.5	21.83	751.7	437.7	5.36	403.0	6.27	360.5	2.038
17	0.84	1220.3	2.25	380.3	22.43	1066.5	21.83	750.2	434.8	5.15	400.2	6.10	356.3	2.132
21	0.84	1209.3	2.26	389.5	22.95	1066.5	21.83	750.7	435.9	5.17	401.3	6.12	357.8	2.096
34	0.84	1247.9	2.29	370.7	22.94	1066.5	21.83	748.8	432.3	5.20	397.8	6.12	352.6	2.224
60	0.84	1213.4	2.26	386.6	24.80	1066.5	21.83	750.5	435.4	5.36	400.9	6.26	357.2	2.110
LEVEL F5														
21	0.88	1034.2	2.26	557.8	34.24	1099.0	22.02	789.3	469.8	5.97	435.0	7.01	404.0	1.615
60	0.88	1070.7	2.26	511.5	32.26	1099.0	22.02	784.9	461.6	5.89	427.0	6.89	391.4	1.740
LEVEL F6														
1	0.90	1139.8	2.27	445.2	30.12	1113.5	22.02	788.9	452.2	5.91	418.2	6.97	375.6	2.025
17	0.90	1115.2	2.25	462.6	28.69	1113.5	22.02	790.9	455.8	5.69	421.7	6.82	381.1	1.939
37	0.90	1104.7	2.27	477.0	29.76	1113.5	22.02	791.9	457.6	5.76	423.4	6.89	383.7	1.902
38	0.90	1105.1	2.27	476.7	29.21	1113.5	22.02	791.9	457.5	5.69	423.3	6.83	383.6	1.904

********** STEADY STATE TEST E **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
50	0.90	1099.3	2.23	474.9	29.93	1113.5	22.02	792.4	458.5	5.84	424.3	6.95	385.1	1.883
60	0.90	1116.2	2.26	463.8	28.80	1113.5	22.02	790.9	455.7	5.69	421.6	6.82	380.8	1.942
LEVEL F7														
14	0.91	1097.7	2.25	480.9	31.30	1127.1	22.05	801.7	460.6	6.26	426.5	7.50	387.0	1.922
17	0.91	1126.8	2.25	451.8	27.41	1127.1	22.05	799.1	455.8	5.85	421.9	7.15	379.9	2.025
21	0.91	1100.7	2.26	479.1	29.00	1127.1	22.05	801.4	460.1	5.94	426.0	7.25	386.3	1.932
37	0.91	1119.6	2.27	462.7	28.73	1127.1	22.05	799.7	456.9	5.96	422.9	7.24	381.6	1.999
38	0.91	1135.0	2.27	448.5	27.24	1127.1	22.05	798.4	454.6	5.83	420.7	7.13	378.1	2.054
50	0.91	1116.5	2.23	458.1	28.78	1127.1	22.05	800.0	457.4	6.02	423.4	7.29	382.3	1.988
60	0.91	1135.4	2.26	446.2	27.69	1127.1	22.05	798.4	454.6	5.90	420.6	7.18	378.0	2.055
LEVEL F8														
1	0.93	1188.4	2.27	406.6	25.26	1146.3	22.13	808.5	449.7	6.76	415.9	8.39	370.3	2.321
17	0.93	1129.1	2.25	449.7	27.09	1146.3	22.13	812.9	457.4	6.87	423.3	8.53	381.8	2.104
21	0.93	1110.0	2.26	469.9	28.28	1146.3	22.13	814.6	460.4	6.94	426.2	8.61	386.3	2.037
34	0.93	1151.7	2.29	438.9	27.93	1146.3	22.13	811.1	454.2	6.94	420.2	8.56	377.0	2.186
37	0.93	1142.5	2.27	441.9	26.99	1146.3	22.13	811.8	455.4	6.87	421.4	8.51	378.9	2.153
50	0.93	1137.8	2.23	438.9	27.18	1146.3	22.13	812.2	456.1	6.92	422.1	8.56	379.9	2.136
60	0.93	1163.8	2.26	422.5	25.83	1146.3	22.13	810.2	452.6	6.80	418.7	8.44	374.7	2.231

STEADY STATE TEST F

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST F **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX	1.881E+05	LBM/SQFT H	UNC. MASS FLUX	4.250E+03	LBM/SQFT H	PRESSURE	1829.6	PSI	UNC. PRESSURE 6.00 PSI
	255.26	KG/SQM S		5.7674	KG/SQM S		12.62	MPA	0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.223	385.2	0.026	8.17	1099.3	593.3	50.81	28.227	623.2	328.8	0.443	0.2	.9454	.0388
G	1.224	385.7	0.020	6.40	1172.8	634.1	41.10	22.836	697.7	370.2	21.885	12.2	1.1750	.0445
E6	1.218	383.7	0.000	0.00	1068.2	576.0	0.00	0.000	623.2	328.8	0.443	0.2	.8746	.0372
E7	1.228	386.9	0.000	0.00	1146.5	619.5	0.00	0.000	623.2	328.8	0.443	0.2	.8967	.0377
E8	1.237	389.7	0.012	3.77	1109.5	598.9	76.51	42.505	623.2	328.8	0.443	0.2	.9257	.0383
F1	1.212	381.7	0.031	9.86	1087.1	586.5	22.50	12.502	623.2	328.8	0.443	0.2	.9824	.0398
F2	1.223	385.2	0.014	4.30	1125.6	607.9	48.78	27.102	627.2	331.0	13.237	7.4	1.0114	.0406
F3	1.211	381.6	0.031	9.82	1129.9	610.3	37.58	20.879	637.5	336.7	15.754	8.8	1.0404	.0415
F4	1.220	384.4	0.000	0.00	1055.0	568.7	0.00	0.000	648.0	342.6	17.781	9.9	1.0671	.0423
F5	1.199	377.6	0.040	12.54	1059.4	571.1	36.36	20.199	656.6	347.3	19.060	10.6	1.0868	.0426
F6	1.211	381.3	0.026	8.21	1119.8	604.6	30.40	16.891	666.3	352.7	19.579	10.9	1.1077	.0430
F7	1.210	381.1	0.024	7.43	1123.9	606.9	25.00	13.890	676.0	358.1	20.181	11.2	1.1274	.0434
F8	1.215	382.7	0.027	8.57	1162.5	628.4	36.23	20.128	688.3	364.9	20.990	11.7	1.1553	.0440

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test F

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST F **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
1	0.95	1172.3	1.23	223.8	13.17	560.4	11.74	402.7	245.5	4.56	190.5	4.71	195.0	0.965
3	0.95	1114.5	1.25	254.3	14.85	560.4	11.74	404.9	249.7	4.65	193.9	4.80	201.1	0.867
4	0.95	1138.8	1.24	240.8	13.98	560.4	11.74	403.9	247.7	4.60	192.4	4.76	198.3	0.908
7	0.95	1144.1	1.19	229.0	13.44	560.4	11.74	403.7	247.4	4.60	192.0	4.75	197.8	0.917
7	0.95	1132.6	1.19	234.1	13.68	560.4	11.74	404.1	248.2	4.62	192.7	4.77	199.0	0.898
10	0.95	1077.0	1.21	266.8	15.89	560.4	11.74	406.7	253.1	4.76	196.7	4.90	206.1	0.805
10	0.95	1080.0	1.21	265.0	15.83	560.4	11.74	406.5	252.8	4.76	196.5	4.90	205.7	0.810
10	0.95	1074.0	1.21	268.6	16.05	560.4	11.74	406.8	253.4	4.77	197.0	4.91	206.6	0.800
13	0.95	1074.5	1.24	275.3	16.20	560.4	11.74	406.8	253.4	4.75	197.0	4.90	206.5	0.800
13	0.95	1063.7	1.24	282.0	16.93	560.4	11.74	407.4	254.6	4.81	197.9	4.94	208.2	0.782
15	0.95	1057.2	1.26	289.7	17.03	560.4	11.74	407.8	255.3	4.79	198.5	4.94	209.3	0.772
16	0.95	1126.4	1.21	239.5	14.01	560.4	11.74	404.4	248.7	4.63	193.1	4.78	199.7	0.887
17	0.95	1074.9	1.22	269.5	15.64	560.4	11.74	406.8	253.4	4.73	196.9	4.88	206.4	0.801
18	0.95	1031.9	1.22	298.9	17.84	560.4	11.74	409.3	258.4	4.90	201.1	5.03	213.9	0.730
28	0.95	1082.8	1.21	263.4	15.33	560.4	11.74	406.4	252.6	4.71	196.3	4.87	205.3	0.814
28	0.95	1069.4	1.21	271.3	15.89	560.4	11.74	407.1	253.9	4.75	197.4	4.90	207.3	0.792
28	0.95	1067.6	1.21	272.4	15.98	560.4	11.74	407.2	254.1	4.76	197.5	4.91	207.6	0.789
31	0.95	1060.7	1.23	281.2	16.68	560.4	11.74	407.6	254.9	4.80	198.2	4.94	208.7	0.777
31	0.95	1068.2	1.23	276.4	16.29	560.4	11.74	407.1	254.1	4.77	197.5	4.91	207.5	0.790
32	0.95	1167.9	1.27	233.7	13.53	560.4	11.74	402.9	245.7	4.56	190.7	4.71	195.4	0.957
34	0.95	1071.7	1.25	277.8	16.50	560.4	11.74	406.9	253.7	4.77	197.2	4.91	206.9	0.796
37	0.95	1043.2	1.22	291.1	18.37	560.4	11.74	408.6	257.0	4.97	199.9	5.07	211.7	0.749
38	0.95	1045.1	1.22	289.6	17.22	560.4	11.74	408.5	256.7	4.85	199.7	4.99	211.4	0.752
42	0.95	1086.8	1.23	264.5	15.79	560.4	11.74	406.2	252.2	4.74	195.9	4.88	204.7	0.821
45	0.95	1050.8	1.25	291.4	17.14	560.4	11.74	408.1	256.0	4.81	199.1	4.96	210.4	0.761
45	0.95	1055.3	1.25	288.4	16.96	560.4	11.74	407.9	255.5	4.80	198.7	4.94	209.6	0.768
53	0.95	1089.5	1.26	270.4	15.95	560.4	11.74	406.0	251.9	4.72	195.7	4.86	204.3	0.826
59	0.95	1104.8	1.22	252.7	14.76	560.4	11.74	405.3	250.5	4.67	194.6	4.82	202.3	0.851
59	0.95	1104.2	1.22	253.0	14.72	560.4	11.74	405.3	250.5	4.67	194.6	4.82	202.3	0.850
59	0.95	1117.1	1.22	246.4	14.61	560.4	11.74	404.8	249.4	4.66	193.7	4.81	200.8	0.871
60	0.95	1138.8	1.22	236.7	13.96	560.4	11.74	403.9	247.7	4.62	192.4	4.77	198.3	0.908
64	0.95	1207.0	1.22	209.0	12.06	560.4	11.74	401.6	243.4	4.50	188.8	4.66	192.2	1.023
64	0.95	1223.5	1.22	203.2	11.69	560.4	11.74	401.2	242.6	4.48	188.1	4.64	190.9	1.052
64	0.95	1216.7	1.22	205.6	11.81	560.4	11.74	401.4	242.9	4.49	188.4	4.65	191.4	1.040

********** STEADY STATE TEST F **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL G										
1	1.18	1201.8	1.23	212.4	12.42	243.7	18.0	366.0	200.1	1.016
14	1.18	1128.9	1.21	239.2	14.37	280.5	22.5	366.0	207.2	0.876
16	1.18	1200.6	1.21	208.7	12.20	239.6	17.7	366.0	200.2	1.014
16	1.18	1216.5	1.21	203.1	11.83	232.3	16.9	366.0	198.9	1.044
18	1.18	1162.2	1.22	226.6	13.13	263.0	19.8	366.0	203.6	0.940
18	1.18	1143.3	1.22	234.9	13.72	274.1	21.2	366.0	205.6	0.903
18	1.18	1154.7	1.22	229.8	13.33	267.3	20.3	366.0	204.4	0.926
20	1.18	1065.3	1.23	278.0	16.20	334.3	28.3	366.0	216.0	0.755
20	1.18	1142.5	1.23	236.7	14.03	276.3	21.6	366.0	205.6	0.902
20	1.18	1150.2	1.23	233.2	13.59	271.6	20.8	366.0	204.8	0.917
21	1.18	1126.1	1.22	243.2	14.03	285.5	22.2	366.0	207.5	0.871
32	1.18	1231.7	1.27	209.2	12.15	238.4	17.1	366.0	197.8	1.074
34	1.18	1203.2	1.25	214.8	12.53	246.4	18.1	366.0	200.0	1.019
37	1.18	1146.3	1.22	233.7	13.62	272.5	21.0	366.0	205.2	0.909
38	1.18	1153.6	1.22	230.4	13.45	268.0	20.5	366.0	204.5	0.924
42	1.18	1194.5	1.23	214.6	13.73	246.8	19.7	366.0	200.7	1.002
42	1.18	1201.7	1.23	211.9	12.34	243.2	17.9	366.0	200.1	1.016
45	1.18	1160.6	1.25	231.9	13.70	269.2	20.7	366.0	203.8	0.937
45	1.18	1154.2	1.25	234.7	13.82	272.9	21.0	366.0	204.4	0.925
45	1.18	1157.5	1.25	233.2	13.70	271.0	20.8	366.0	204.1	0.931
47	1.18	1156.3	1.23	230.2	13.50	267.5	20.5	366.0	204.2	0.929
50	1.18	1185.7	1.21	215.2	12.45	248.0	18.3	366.0	201.4	0.985
58	1.18	1190.0	1.23	217.2	12.68	250.1	18.6	366.0	201.1	0.993
60	1.18	1199.9	1.22	211.6	12.47	243.0	18.0	366.0	200.2	1.013
64	1.18	1248.0	1.22	195.3	11.27	221.7	15.7	366.0	196.7	1.105
64	1.18	1251.9	1.22	194.1	11.20	220.1	15.5	366.0	196.4	1.113

********** STEADY STATE TEST F **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E6														
60	0.87	1068.2	1.22	273.7	16.11	530.7	11.60	386.0	250.4	3.10	194.4	3.09	204.9	0.706
LEVEL E7														
1	0.90	1146.5	1.23	234.7	13.82	540.0	11.62	389.0	245.2	3.03	190.3	3.09	195.8	0.855
LEVEL E8														
1	0.93	1163.6	1.23	227.4	13.35	552.2	11.68	397.3	245.5	3.47	190.6	3.63	195.2	0.922
34	0.93	1055.4	1.25	288.2	17.25	552.2	11.68	402.1	255.0	3.71	198.3	3.84	208.9	0.745
LEVEL F1														
17	0.98	1112.7	1.22	248.7	14.36	575.8	13.55	416.1	248.4	9.42	192.0	11.30	202.6	0.917
21	0.98	1052.1	1.22	285.2	16.76	575.8	13.55	419.3	254.5	9.37	196.9	11.85	211.5	0.813
34	0.98	1110.6	1.25	255.6	15.11	575.8	13.55	416.2	248.6	9.24	192.2	11.46	202.9	0.914
37	0.98	1086.5	1.22	263.9	15.42	575.8	13.55	417.4	250.8	9.36	193.9	11.54	206.1	0.872
50	0.98	1082.1	1.21	263.7	15.38	575.8	13.55	417.6	251.2	9.38	194.3	11.56	206.7	0.864

********** STEADY STATE TEST F **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F2										
1	1.01	1209.2	1.23	209.7	12.12	211.1	13.1	572.1	194.2	1.124
14	1.01	1060.2	1.21	276.8	16.76	279.4	19.0	572.1	211.2	0.857
17	1.01	1127.2	1.22	241.5	13.93	243.4	15.5	572.1	201.9	0.977
34	1.01	1136.4	1.25	242.8	14.29	244.6	15.8	572.1	200.9	0.992
38	1.01	1115.5	1.22	248.8	14.45	250.9	16.1	572.1	203.3	0.956
50	1.01	1105.3	1.21	251.0	14.64	253.1	16.4	572.1	204.5	0.937
LEVEL F3										
14	1.04	1083.2	1.21	263.0	15.59	271.4	18.8	507.7	208.6	0.873
17	1.04	1130.6	1.22	239.9	13.84	246.8	16.3	507.7	202.5	0.959
21	1.04	1092.4	1.22	260.7	15.10	268.9	18.2	507.7	207.3	0.890
34	1.04	1165.6	1.25	229.7	13.48	235.9	15.6	507.7	198.9	1.022
60	1.04	1176.8	1.22	220.5	13.03	226.3	15.0	507.7	197.9	1.042
LEVEL F4										
60	1.07	1055.0	1.22	282.7	16.67	299.9	22.2	467.3	214.1	0.805
LEVEL F5										
21	1.09	1023.5	1.22	305.6	17.87	333.3	26.3	441.6	220.9	0.735
60	1.09	1096.2	1.22	258.0	15.09	277.6	20.4	441.6	208.4	0.867
LEVEL F6										
1	1.11	1172.4	1.23	223.8	13.35	242.8	17.4	417.6	200.5	0.994
17	1.11	1120.4	1.22	244.8	14.29	268.0	19.6	417.6	206.0	0.898
37	1.11	1092.4	1.22	260.6	15.27	286.9	21.6	417.6	209.7	0.846
38	1.11	1090.4	1.22	261.5	15.23	288.1	21.6	417.6	209.9	0.843
50	1.11	1114.3	1.21	246.4	14.44	270.1	19.9	417.6	206.8	0.886
60	1.11	1147.6	1.22	232.7	13.53	253.6	18.1	417.6	203.0	0.948
LEVEL F7										
14	1.13	1098.1	1.21	254.7	15.09	286.6	22.1	398.0	209.5	0.844
17	1.13	1138.9	1.22	236.0	13.67	262.9	19.2	398.0	204.5	0.920
21	1.13	1092.5	1.22	260.6	15.11	293.6	22.4	398.0	210.3	0.835
37	1.13	1117.0	1.22	247.6	14.46	277.2	20.8	398.0	207.1	0.880
38	1.13	1117.2	1.22	247.4	14.36	276.9	20.6	398.0	207.0	0.880
50	1.13	1136.6	1.21	235.7	13.77	262.7	19.4	398.0	204.8	0.915
60	1.13	1171.1	1.22	222.8	12.94	246.5	17.6	398.0	201.3	0.980
LEVEL F8										
1	1.16	1214.7	1.23	207.8	12.07	233.4	16.6	377.3	198.5	1.049
17	1.16	1151.0	1.22	230.6	13.31	263.0	19.5	377.3	204.2	0.926
21	1.16	1111.8	1.22	250.3	14.47	288.8	22.2	377.3	208.6	0.853
34	1.16	1191.0	1.25	219.4	12.84	247.8	18.0	377.3	200.4	1.003
37	1.16	1139.8	1.22	236.7	13.74	270.8	20.4	377.3	205.3	0.905
50	1.16	1165.8	1.21	223.0	12.97	253.4	18.7	377.3	202.7	0.955
60	1.16	1197.6	1.22	212.5	12.29	239.6	17.2	377.3	199.8	1.015

STEADY STATE TEST G

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST G **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.835E+05 LBM/SQFT H 248.97 KG/SQM S

UNC. MASS FLUX 4.149E+03 LBM/SQFT H 5.6307 KG/SQM S

PRESSURE 1817.6 PSI 12.54 MPA

UNC. PRESSURE 6.00 PSI 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.038	326.9	0.016	5.18	1077.5	581.2	27.47	15.262	622.3	328.3	0.443	0.2	.9953	.0387
F6	1.038	327.0	0.000	0.00	1047.2	564.3	0.00	0.000	622.3	328.3	0.443	0.2	.9371	.0374
F8	1.037	326.6	0.005	1.66	1067.9	575.8	39.74	22.077	622.3	328.3	0.443	0.2	.9782	.0383

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test G

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	2/6
F4	1/2
F5	2/3
F6	2/7
F7	2/8
F8	All dry

********** STEADY STATE TEST G **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL G														
1	1.00	1086.2	1.04	224.3	13.18	565.2	17.86	410.7	242.3	9.47	185.4	10.67	202.2	0.864
16	1.00	1055.8	1.02	235.7	13.89	565.2	17.86	412.3	245.4	9.50	187.9	10.89	206.9	0.813
16	1.00	1079.6	1.02	223.4	13.11	565.2	17.86	411.0	242.9	9.49	185.9	10.70	203.2	0.853
32	1.00	1083.6	1.07	232.8	13.67	565.2	17.86	410.8	242.5	9.48	185.6	10.68	202.6	0.860
58	1.00	1043.9	1.04	247.1	14.61	565.2	17.86	413.1	246.7	9.49	188.9	11.00	208.9	0.792
60	1.00	1045.3	1.03	244.3	14.54	565.2	17.86	413.0	246.6	9.44	188.8	11.03	209.7	0.795
64	1.00	1109.0	1.03	212.6	12.35	565.2	17.86	409.6	240.3	9.52	183.8	10.47	199.2	0.904
64	1.00	1116.7	1.03	209.3	12.15	565.2	17.86	409.3	239.7	9.52	183.5	10.43	198.3	0.917

********** STEADY STATE TEST G **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
1	0.94	1047.2	1.04	244.3	14.70	541.7	10.82	396.2	250.7	4.08	194.1	4.24	206.3	0.726
LEVEL F8														
1	0.98	1096.0	1.04	219.7	12.84	558.4	12.17	405.5	244.8	9.16	188.6	11.20	200.3	0.858
60	0.98	1039.8	1.03	247.5	14.49	558.4	12.17	408.6	250.7	9.25	193.4	11.63	209.1	0.764

STEADY STATE TEST H

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST H **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.887E+05 LBM/SQFT H — 256.06 KG/SQM S
UNC. MASS FLUX 4.216E+03 LBM/SQFT H — 5.7217 KG/SQM S
PRESSURE 1288.9 PSI — 8.89 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.342	422.6	0.027	8.56	1150.3	621.6	73.03	40.570	576.0	302.6	0.597	0.3	.8787	.0345
G	1.338	421.4	0.026	8.29	1300.7	705.1	48.67	27.038	629.8	332.4	25.473	14.2	1.0884	.0396
E6	1.312	413.3	0.000	0.00	1121.7	605.7	0.00	0.000	576.0	302.6	0.597	0.3	.8142	.0330
E7	1.353	426.1	0.019	6.05	1089.1	587.6	132.49	73.607	576.0	302.6	0.597	0.3	.8343	.0334
E8	1.362	429.1	0.013	4.20	1185.2	641.0	88.25	49.026	576.0	302.6	0.597	0.3	.8608	.0340
F1	1.323	416.7	0.040	12.55	1148.7	620.7	33.58	18.655	576.0	302.6	0.597	0.3	.9126	.0353
F2	1.340	422.1	0.020	6.44	1204.9	652.0	66.57	36.985	576.0	302.6	0.597	0.3	.9391	.0361
F3	1.322	416.5	0.043	13.66	1209.0	654.2	51.76	28.754	576.0	302.6	0.597	0.3	.9655	.0369
F4	1.278	402.6	0.049	15.37	1095.0	590.9	69.30	38.498	576.0	302.6	0.597	0.3	.9898	.0376
F5	1.298	408.9	0.049	15.40	1149.3	621.1	49.06	27.257	578.3	303.8	24.472	13.6	1.0079	.0379
F6	1.317	414.7	0.036	11.24	1225.0	663.1	46.61	25.895	590.6	310.7	21.888	12.2	1.0269	.0383
F7	1.315	414.1	0.031	9.90	1234.5	668.4	38.80	21.557	603.2	317.7	24.788	13.8	1.0450	.0386
F8	1.327	418.0	0.039	12.21	1285.1	696.5	46.54	25.853	618.8	326.3	25.132	14.0	1.0704	.0392

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test H

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	3/5
F	All dry

********** STEADY STATE TEST H **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
3	0.88	1209.3	1.39	219.3	12.67	397.3	8.38	309.5	197.7	2.38	157.9	2.56	176.6	0.867
4	0.88	1224.3	1.38	212.9	12.24	397.3	8.38	309.2	197.2	2.37	157.5	2.55	175.8	0.890
7	0.88	1213.6	1.31	205.6	11.96	397.3	8.38	309.4	197.5	2.38	157.8	2.56	176.3	0.874
7	0.88	1198.0	1.31	210.7	12.20	397.3	8.38	309.6	198.0	2.39	158.2	2.57	177.2	0.849
10	0.88	1162.5	1.35	229.6	13.48	397.3	8.38	310.3	199.3	2.42	159.3	2.59	179.3	0.795
10	0.88	1171.1	1.35	226.3	13.30	397.3	8.38	310.1	199.0	2.41	159.0	2.59	178.7	0.808
10	0.88	1159.6	1.35	230.7	13.58	397.3	8.38	310.3	199.4	2.42	159.4	2.60	179.4	0.790
13	0.88	1121.2	1.36	249.4	14.52	397.3	8.38	311.2	201.1	2.44	160.8	2.62	182.1	0.733
13	0.88	1111.9	1.36	253.7	15.04	397.3	8.38	311.4	201.5	2.47	161.2	2.64	182.8	0.719
15	0.88	1084.1	1.38	271.1	15.80	397.3	8.38	312.1	203.0	2.47	162.4	2.65	185.2	0.678
16	0.88	1211.1	1.32	208.2	12.04	397.3	8.38	309.4	197.6	2.38	157.9	2.56	176.5	0.870
17	0.88	1112.3	1.34	250.4	14.42	397.3	8.38	311.4	201.5	2.44	161.1	2.62	182.8	0.720
18	0.88	1122.9	1.34	245.3	14.41	397.3	8.38	311.1	201.0	2.45	160.7	2.62	182.0	0.735
18	0.88	1097.6	1.34	257.2	15.08	397.3	8.38	311.7	202.2	2.47	161.8	2.64	184.0	0.697
20	0.88	1056.4	1.35	281.9	16.39	397.3	8.38	312.9	204.6	2.50	163.8	2.68	187.9	0.638
21	0.88	1046.9	1.34	284.2	17.40	397.3	8.38	313.2	205.2	2.58	164.2	2.72	188.9	0.625
28	0.88	1103.7	1.34	253.0	14.64	397.3	8.38	311.6	201.9	2.45	161.5	2.63	183.5	0.706
28	0.88	1094.2	1.34	257.7	14.99	397.3	8.38	311.8	202.4	2.46	161.9	2.64	184.3	0.693
28	0.88	1092.5	1.34	258.5	15.05	397.3	8.38	311.9	202.5	2.47	162.0	2.64	184.4	0.690
31	0.88	1115.0	1.35	249.7	14.61	397.3	8.38	311.3	201.4	2.45	161.0	2.63	182.6	0.724
31	0.88	1122.9	1.35	246.1	14.33	397.3	8.38	311.1	201.0	2.44	160.7	2.62	182.0	0.735
32	0.88	1187.4	1.35	221.2	12.73	397.3	8.38	309.8	198.4	2.39	158.5	2.57	177.8	0.833
34	0.88	1145.3	1.37	241.0	14.11	397.3	8.38	310.6	200.0	2.43	159.9	2.60	180.4	0.770
38	0.88	1038.4	1.32	284.5	16.82	397.3	8.38	313.5	205.8	2.55	164.8	2.71	189.9	0.612
42	0.88	1153.5	1.35	233.7	13.77	397.3	8.38	310.5	199.7	2.43	159.6	2.60	179.8	0.782
45	0.88	1055.0	1.34	279.6	16.34	397.3	8.38	312.9	204.7	2.51	163.8	2.68	188.0	0.636
45	0.88	1057.6	1.34	278.1	16.26	397.3	8.38	312.8	204.5	2.51	163.7	2.68	187.8	0.640
53	0.88	1164.4	1.40	237.7	13.85	397.3	8.38	310.3	199.2	2.41	159.3	2.59	179.1	0.798
59	0.88	1223.3	1.35	208.9	12.04	397.3	8.38	309.2	197.2	2.37	157.5	2.55	175.9	0.889
59	0.88	1209.3	1.35	213.5	12.27	397.3	8.38	309.5	197.7	2.38	157.9	2.56	176.6	0.867
59	0.88	1235.7	1.35	205.0	11.99	397.3	8.38	309.1	196.8	2.38	157.2	2.55	175.3	0.908
60	0.88	1218.5	1.31	204.3	11.90	397.3	8.38	309.3	197.4	2.38	157.7	2.56	176.1	0.982
64	0.88	1275.2	1.32	188.5	10.80	397.3	8.38	308.5	195.7	2.35	156.3	2.53	173.5	0.970
64	0.88	1303.1	1.32	181.3	10.36	397.3	8.38	308.2	195.1	2.34	155.8	2.52	172.4	1.014
64	0.88	1285.9	1.32	185.7	10.61	397.3	8.38	308.4	195.5	2.34	156.1	2.52	173.1	0.986

********** STEADY STATE TEST H **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL G										
1	1.09	1332.1	1.36	179.3	10.36	193.0	13.2	345.3	178.1	1.236
3	1.09	1331.2	1.39	184.3	10.56	198.4	13.5	345.3	178.1	1.234
14	1.09	1231.4	1.32	202.1	11.93	220.1	16.1	345.3	182.3	1.048
16	1.09	1347.6	1.33	171.8	9.95	184.7	12.6	345.3	177.6	1.264
16	1.09	1362.0	1.33	168.7	9.71	181.1	12.2	345.3	177.1	1.291
18	1.09	1297.3	1.34	186.2	10.66	201.2	13.9	345.3	179.4	1.170
18	1.09	1274.9	1.34	192.1	11.07	208.1	14.6	345.3	180.3	1.128
18	1.09	1301.9	1.34	185.0	10.60	199.8	13.8	345.3	179.2	1.178
20	1.09	1183.1	1.36	223.3	12.82	245.0	18.1	345.3	184.9	0.960
20	1.09	1269.5	1.36	195.5	11.38	211.9	15.1	345.3	180.5	1.118
20	1.09	1279.7	1.36	192.6	11.10	208.6	14.6	345.3	180.1	1.138
21	1.09	1255.2	1.34	197.2	11.26	214.2	15.1	345.3	181.2	1.092
32	1.09	1328.4	1.35	179.9	10.35	193.7	13.3	345.3	178.2	1.229
34	1.09	1353.2	1.37	176.7	10.18	189.8	12.9	345.3	177.4	1.274
37	1.09	1241.1	1.31	197.7	11.39	215.1	15.4	345.3	181.8	1.067
38	1.09	1274.1	1.32	188.5	10.86	204.2	14.4	345.3	180.3	1.127
42	1.09	1338.0	1.35	177.3	11.08	190.8	13.9	345.3	177.9	1.246
42	1.09	1355.3	1.35	173.4	9.98	186.2	12.6	345.3	177.3	1.279
45	1.09	1263.8	1.34	194.8	11.33	211.4	15.0	345.3	180.8	1.107
45	1.09	1265.4	1.34	194.4	11.28	210.8	15.0	345.3	180.7	1.111
45	1.09	1265.0	1.34	194.5	11.27	211.0	15.0	345.3	180.7	1.110
47	1.09	1268.5	1.32	190.7	11.04	206.7	14.6	345.3	180.6	1.116
50	1.09	1338.0	1.33	175.1	10.03	188.4	12.8	345.3	177.9	1.246
58	1.09	1364.4	1.37	173.8	10.01	186.5	12.6	345.3	177.0	1.296
60	1.09	1327.7	1.31	174.9	10.19	188.4	13.0	345.3	178.2	1.227
64	1.09	1359.1	1.32	168.6	9.66	181.1	12.2	345.3	177.2	1.286
64	1.09	1362.7	1.32	167.9	9.62	180.2	12.1	345.3	177.1	1.293

********** STEADY STATE TEST H **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E6														
60	0.81	1121.7	1.31	240.4	13.98	375.6	8.29	294.5	197.0	2.35	157.0	2.41	179.8	0.658
LEVEL E7														
1	0.83	1238.9	1.35	204.1	11.89	382.4	8.30	297.5	194.2	2.26	154.8	2.35	173.6	0.851
34	0.83	1041.3	1.37	294.8	17.69	382.4	8.30	301.7	203.0	2.45	162.2	2.52	187.9	0.567
50	0.83	987.2	1.33	324.3	19.45	382.4	8.30	303.7	207.3	2.54	165.8	2.60	195.2	0.494
LEVEL E8														
1	0.86	1247.6	1.35	201.5	11.72	391.3	8.34	304.2	195.6	2.29	156.1	2.42	174.1	0.900
34	0.86	1122.8	1.37	250.9	14.78	391.3	8.34	306.4	200.1	2.37	159.9	2.50	181.4	0.712
LEVEL F1														
17	0.91	1178.8	1.34	222.8	12.77	408.5	8.50	318.9	199.9	2.83	159.8	3.14	179.4	0.869
21	0.91	1122.5	1.34	244.9	14.21	408.5	8.50	320.0	202.2	2.88	161.7	3.19	183.2	0.782
34	0.91	1197.7	1.37	220.7	12.88	408.5	8.50	318.5	199.2	2.83	159.2	3.13	178.3	0.899
37	0.91	1112.3	1.31	245.2	14.22	408.5	8.50	320.3	202.7	2.89	162.1	3.19	184.0	0.766
38	0.91	1132.1	1.32	236.6	13.66	408.5	8.50	319.8	201.8	2.87	161.3	3.17	182.5	0.797
50	0.91	1173.0	1.33	223.4	12.88	408.5	8.50	319.0	200.1	2.84	159.9	3.14	179.8	0.860
LEVEL F2														
1	0.94	1316.7	1.35	182.7	10.48	417.3	8.62	323.5	196.2	3.77	156.4	4.19	173.9	1.139
14	0.94	1114.9	1.32	245.7	14.65	417.3	8.62	327.0	202.9	3.93	162.0	4.36	184.7	0.810
17	0.94	1206.5	1.34	213.0	12.18	417.3	8.62	325.1	199.2	3.83	158.9	4.26	178.8	0.956
34	0.94	1221.1	1.37	212.7	12.38	417.3	8.62	324.9	198.7	3.82	158.5	4.25	178.0	0.979
38	0.94	1169.1	1.32	221.8	12.77	417.3	8.62	325.8	200.5	3.86	160.0	4.29	180.9	0.895
50	0.94	1201.2	1.33	213.3	12.29	417.3	8.62	325.2	199.4	3.83	159.1	4.27	179.0	0.947
LEVEL F3														
14	0.97	1141.2	1.32	234.3	13.74	426.0	8.78	333.4	200.8	9.49	159.7	8.43	183.7	0.895
17	0.97	1211.5	1.34	211.3	12.10	426.0	8.78	332.0	198.2	9.52	157.6	8.31	179.4	1.012
21	0.97	1178.4	1.34	222.1	12.73	426.0	8.78	332.6	199.3	9.55	158.5	8.36	181.2	0.956
34	0.97	1256.5	1.37	201.6	11.71	426.0	8.78	331.3	196.9	9.41	156.4	8.25	177.2	1.088
60	0.97	1280.2	1.31	186.4	10.89	426.0	8.78	330.9	196.2	9.37	155.9	8.22	176.2	1.128
LEVEL F4														
60	0.99	1144.0	1.31	231.1	13.39	434.0	11.58	339.5	197.4	9.75	155.7	10.83	184.3	0.942

********** STEADY STATE TEST H **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL F5										
21	1.01	1108.6	1.34	251.3	14.48	252.3	18.7	436.1	187.6	0.902
60	1.01	1203.8	1.31	209.1	12.06	209.9	14.7	436.1	181.2	1.067
LEVEL F6										
1	1.03	1288.1	1.35	190.0	11.19	194.0	13.0	408.6	177.9	1.203
17	1.03	1218.9	1.34	208.9	12.05	213.7	14.4	408.6	181.0	1.079
37	1.03	1172.1	1.31	220.6	12.76	226.1	15.6	408.6	183.7	0.997
38	1.03	1180.2	1.32	217.7	12.52	223.1	15.3	408.6	183.2	1.010
50	1.03	1253.9	1.33	196.7	11.34	201.0	13.4	408.6	179.3	1.140
60	1.03	1271.6	1.31	188.7	10.83	192.7	12.7	408.6	178.5	1.172
LEVEL F7										
14	1.04	1197.5	1.32	213.0	12.44	222.8	16.1	383.9	182.7	1.022
17	1.04	1247.6	1.34	200.0	11.46	208.4	14.4	383.9	180.2	1.111
21	1.04	1208.7	1.34	211.5	12.12	221.0	15.6	383.9	182.1	1.042
37	1.04	1204.0	1.31	208.2	12.01	217.6	15.5	383.9	182.4	1.034
38	1.04	1217.1	1.32	205.2	11.78	214.3	15.1	383.9	181.7	1.057
50	1.04	1283.2	1.33	188.7	10.87	196.2	13.4	383.9	178.6	1.176
60	1.04	1301.0	1.31	181.1	10.40	188.1	12.7	383.9	177.9	1.209
LEVEL F8										
1	1.07	1335.0	1.36	178.6	10.29	189.3	12.8	357.9	177.5	1.252
17	1.07	1262.8	1.34	195.6	11.19	208.6	14.5	357.9	180.3	1.117
21	1.07	1240.6	1.34	201.4	11.51	215.3	15.1	357.9	181.3	1.077
34	1.07	1329.5	1.37	182.1	10.53	193.1	13.1	357.9	177.7	1.241
37	1.07	1230.0	1.32	201.1	11.55	215.2	15.3	357.9	181.8	1.057
50	1.07	1319.8	1.33	179.3	10.30	190.3	12.9	357.9	178.0	1.223
60	1.07	1325.8	1.31	175.2	10.03	185.7	12.6	357.9	177.8	1.234

STEADY STATE TEST I

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST I **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.674E+05 LBM/SQFT H — 362.83 KG/SQM S
UNC. MASS FLUX 6.019E+03 LBM/SQFT H — 8.1678 KG/SQM S
PRESSURE 1331.5 PSI — 9.19 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.785	562.2	0.037	11.78	1153.5	623.4	75.73	42.070	580.3	304.9	0.597	0.3	.8885	.0333
G	1.772	558.1	0.045	14.31	1272.2	689.3	47.47	26.372	633.4	334.4	24.747	13.7	1.0874	.0382
E6	1.743	549.1	0.000	0.00	1136.8	614.1	0.00	0.000	580.3	304.9	0.597	0.3	.8272	.0320
E7	1.791	564.2	0.037	11.52	1099.6	593.4	8.63	4.793	580.3	304.9	0.597	0.3	.8463	.0324
E8	1.784	561.9	0.047	14.72	1078.2	581.5	97.65	54.251	580.3	304.9	0.597	0.3	.8714	.0329
F1	1.756	553.3	0.051	15.92	1152.2	622.6	37.24	20.687	580.3	304.9	0.597	0.3	.9206	.0342
F2	1.775	559.1	0.024	7.47	1196.0	647.0	38.23	21.238	580.3	304.9	0.597	0.3	.9458	.0349
F3	1.755	552.9	0.055	17.42	1209.6	654.6	49.83	27.682	580.3	304.9	0.597	0.3	.9709	.0357
F4	1.699	535.2	0.063	19.74	1082.6	584.0	66.82	37.123	580.3	304.9	0.597	0.3	.9940	.0363
F5	1.725	543.4	0.063	19.97	1128.3	609.4	49.51	27.505	584.3	307.1	20.798	11.6	1.0111	.0366
F6	1.750	551.2	0.047	14.86	1195.2	646.6	38.82	21.565	594.9	313.1	21.457	11.9	1.0291	.0370
F7	1.748	550.5	0.040	12.62	1209.3	654.4	39.90	22.166	605.8	319.1	24.173	13.4	1.0462	.0373
F8	1.762	555.1	0.050	15.83	1254.5	679.5	45.22	25.125	622.6	328.4	24.543	13.6	1.0703	.0378

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test I

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	6/7
E6	1/2
E7	2/4
E8	3/5
F	All dry

********** STEADY STATE TEST I **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
3	0.89	1115.1	1.85	345.5	20.60	541.0	10.78	422.2	260.5	3.28	223.8	3.79	239.6	1.083
4	0.89	1129.2	1.84	334.5	19.75	541.0	10.78	421.8	259.6	3.25	223.0	3.76	238.1	1.114
7	0.89	1101.0	1.75	335.9	20.34	541.0	10.78	422.7	261.4	3.32	224.7	3.82	241.1	1.055
7	0.89	1086.1	1.75	345.7	20.79	541.0	10.78	423.3	262.5	3.33	225.6	3.84	242.9	1.024
10	0.89	1172.1	1.79	303.1	18.26	541.0	10.78	420.6	257.3	3.23	220.9	3.73	234.3	1.203
10	0.89	1176.1	1.79	301.0	18.21	541.0	10.78	420.5	257.1	3.23	220.8	3.73	234.0	1.212
10	0.89	1168.9	1.79	304.7	18.45	541.0	10.78	420.7	257.4	3.24	221.1	3.74	234.6	1.197
13	0.89	1154.4	1.80	314.1	18.59	541.0	10.78	421.0	258.2	3.23	221.8	3.74	235.8	1.165
13	0.89	1139.9	1.80	322.3	19.65	541.0	10.78	421.5	259.0	3.28	222.5	3.78	237.1	1.135
15	0.89	1116.9	1.87	347.8	20.59	541.0	10.78	422.2	260.4	3.27	223.7	3.78	239.4	1.087
16	0.89	1214.3	1.76	277.0	16.30	541.0	10.78	419.6	255.3	3.17	219.2	3.68	231.1	1.293
18	0.89	1125.2	1.78	326.9	19.71	541.0	10.78	421.9	259.9	3.28	223.3	3.79	238.5	1.105
18	0.89	1090.3	1.78	349.3	21.06	541.0	10.78	423.1	262.2	3.33	225.3	3.83	242.3	1.033
20	0.89	985.8	1.80	443.6	26.66	541.0	10.78	428.2	272.2	3.55	234.4	4.05	259.2	0.820
20	0.89	1087.1	1.80	354.9	20.87	541.0	10.78	423.2	262.4	3.30	225.6	3.81	242.7	1.026
28	0.89	1076.7	1.77	356.6	21.04	541.0	10.78	423.6	263.2	3.32	226.3	3.83	244.0	1.004
28	0.89	1072.9	1.77	359.3	21.37	541.0	10.78	423.8	263.5	3.33	226.5	3.85	244.5	0.996
28	0.89	1063.4	1.77	366.4	21.87	541.0	10.78	424.2	264.2	3.36	227.2	3.87	245.8	0.976
31	0.89	1141.7	1.79	318.0	18.97	541.0	10.78	421.4	258.9	3.25	222.4	3.76	236.9	1.139
31	0.89	1151.5	1.79	312.5	18.47	541.0	10.78	421.1	258.3	3.23	221.9	3.74	236.0	1.159
32	0.89	1207.4	1.80	286.9	16.71	541.0	10.78	419.7	255.6	3.17	219.5	3.68	231.6	1.278
34	0.89	1160.6	1.82	313.1	18.75	541.0	10.78	420.9	257.9	3.23	221.5	3.74	235.3	1.179
38	0.89	1109.3	1.75	330.9	19.83	541.0	10.78	422.4	260.9	3.29	224.2	3.80	240.2	1.071
42	0.89	1173.5	1.79	301.9	18.26	541.0	10.78	420.5	257.2	3.23	220.9	3.73	234.2	1.206
45	0.89	1089.9	1.78	349.5	20.70	541.0	10.78	423.1	262.2	3.30	225.4	3.82	242.4	1.032
45	0.89	1094.6	1.78	346.3	20.54	541.0	10.78	422.9	261.9	3.30	225.1	3.81	241.8	1.041
53	0.89	1190.0	1.86	304.4	18.08	541.0	10.78	420.1	256.4	3.20	220.2	3.71	232.9	1.242
59	0.89	1240.8	1.80	272.0	15.89	541.0	10.78	419.0	254.3	3.15	218.2	3.66	229.4	1.351
59	0.89	1233.0	1.80	275.2	15.99	541.0	10.78	419.2	254.6	3.15	218.5	3.66	229.9	1.334
59	0.89	1253.4	1.80	266.9	15.99	541.0	10.78	418.8	253.8	3.16	217.8	3.66	228.6	1.378
60	0.89	1234.4	1.74	266.6	15.86	541.0	10.78	419.1	254.5	3.17	218.5	3.67	229.8	1.337
64	0.89	1292.7	1.76	246.6	14.27	541.0	10.78	418.1	252.4	3.12	216.6	3.62	226.5	1.464
64	0.89	1326.4	1.76	235.5	13.57	541.0	10.78	417.5	251.4	3.10	215.7	3.61	224.8	1.538
64	0.89	1307.3	1.76	241.6	13.93	541.0	10.78	417.8	252.0	3.11	216.2	3.62	225.7	1.496

********** STEADY STATE TEST I **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP BTU/H FT**2 F	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
LEVEL G										
1	1.09	1281.9	1.81	257.5	15.25	278.6	19.8	461.3	237.0	1.644
3	1.09	1278.9	1.85	264.9	15.43	286.7	20.1	461.3	237.2	1.636
14	1.09	1208.6	1.76	279.7	17.13	305.5	23.2	461.3	241.7	1.461
16	1.09	1317.6	1.76	238.8	14.14	257.4	18.0	461.3	235.1	1.737
16	1.09	1330.2	1.76	234.8	13.78	252.7	17.5	461.3	234.5	1.769
18	1.09	1262.7	1.78	261.0	15.17	283.1	20.0	461.3	238.1	1.596
18	1.09	1241.0	1.78	269.6	15.83	293.2	21.1	461.3	239.5	1.541
18	1.09	1267.4	1.78	259.3	15.05	281.0	19.8	461.3	237.8	1.608
20	1.09	1157.9	1.80	311.4	18.14	343.0	25.9	461.3	245.8	1.335
20	1.09	1239.9	1.80	272.7	16.33	296.6	21.7	461.3	239.5	1.538
20	1.09	1247.8	1.80	269.5	15.82	292.8	21.0	461.3	239.0	1.559
21	1.09	1220.3	1.69	264.4	15.23	288.4	20.7	461.3	240.9	1.488
32	1.09	1299.7	1.80	250.1	14.63	270.0	18.8	461.3	236.0	1.690
34	1.09	1322.1	1.82	244.9	14.39	263.8	18.3	461.3	234.9	1.748
37	1.09	1217.6	1.75	274.2	16.08	299.1	21.8	461.3	241.1	1.483
38	1.09	1249.7	1.75	261.6	15.35	284.1	20.4	461.3	238.9	1.564
42	1.09	1304.5	1.79	247.3	16.70	266.9	21.0	461.3	235.8	1.703
42	1.09	1325.1	1.79	240.4	14.10	258.9	17.9	461.3	234.8	1.755
45	1.09	1242.1	1.78	269.3	16.06	292.8	21.3	461.3	239.4	1.544
45	1.09	1244.0	1.78	268.6	15.94	291.9	21.2	461.3	239.3	1.549
45	1.09	1245.5	1.78	268.0	15.87	291.2	21.1	461.3	239.2	1.553
47	1.09	1249.7	1.76	262.2	15.51	284.8	20.5	461.3	238.9	1.564
50	1.09	1323.7	1.77	237.4	13.77	255.7	17.5	461.3	234.8	1.752
58	1.09	1332.6	1.82	241.5	14.16	259.9	17.9	461.3	234.4	1.774
60	1.09	1300.7	1.75	242.4	14.49	261.7	18.6	461.3	236.0	1.693
64	1.09	1338.6	1.76	231.9	13.46	249.4	17.0	461.3	234.1	1.790
64	1.09	1346.2	1.76	229.6	13.34	246.7	16.8	461.3	233.8	1.810

********** STEADY STATE TEST I **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	GGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E6														
60	0.83	1136.8	1.74	313.2	18.52	513.4	10.65	400.4	254.5	3.01	218.0	3.34	234.1	1.018
LEVEL E7														
34	0.85	1105.7	1.82	345.8	21.15	522.0	10.67	407.7	258.1	3.09	221.5	3.45	238.2	0.988
50	0.85	1093.5	1.77	343.9	20.69	522.0	10.67	408.1	258.9	3.09	222.2	3.45	239.6	0.965
LEVEL E8														
34	0.87	1147.2	1.82	320.5	19.34	533.4	10.72	415.3	257.5	3.11	221.1	3.54	235.5	1.118
38	0.87	1009.1	1.75	408.3	24.50	533.4	10.72	420.7	268.3	3.33	230.8	3.76	253.5	0.839
LEVEL F1														
17	0.92	1140.5	1.78	318.2	18.51	555.4	10.93	432.6	260.2	3.90	223.5	4.63	238.8	1.202
21	0.92	1103.3	1.78	339.9	20.14	555.4	10.93	433.9	262.6	3.96	225.6	4.70	242.6	1.122
34	0.92	1205.0	1.82	290.8	17.35	555.4	10.93	430.9	257.0	3.86	220.6	4.58	233.5	1.344
37	0.92	1120.5	1.75	323.5	19.08	555.4	10.93	433.3	261.4	3.94	224.6	4.67	240.8	1.160
38	0.92	1152.2	1.75	306.1	17.90	555.4	10.93	432.3	259.6	3.89	222.9	4.62	237.7	1.228
50	0.92	1196.6	1.77	286.4	16.69	555.4	10.93	431.1	257.4	3.85	220.9	4.58	234.1	1.325
LEVEL F2														
1	0.95	1228.2	1.78	274.3	16.06	566.6	11.08	439.1	256.1	5.35	219.4	6.32	233.2	1.456
14	0.95	1128.9	1.76	320.3	19.79	566.6	11.08	441.7	261.0	5.50	223.8	6.47	241.3	1.230
17	0.95	1186.9	1.78	293.8	17.00	566.6	11.08	440.0	257.9	5.38	221.0	6.36	236.1	1.361
34	0.95	1230.1	1.82	279.6	16.62	566.6	11.08	439.0	256.0	5.35	219.3	6.32	233.1	1.461
38	0.95	1185.7	1.75	289.2	16.85	566.6	11.08	440.1	258.0	5.39	221.1	6.36	236.2	1.358
50	0.95	1216.4	1.76	277.5	16.19	566.6	11.08	439.3	256.6	5.36	219.9	6.33	234.0	1.429
LEVEL F3														
14	0.97	1153.5	1.76	306.5	18.41	577.7	11.72	449.6	258.2	12.07	220.5	13.94	240.3	1.344
17	0.97	1198.2	1.78	288.5	16.69	577.7	11.72	448.4	256.0	12.21	218.5	13.81	236.6	1.448
21	0.97	1165.7	1.78	303.6	17.60	577.7	11.72	449.2	257.6	12.24	219.9	13.90	239.2	1.373
34	0.97	1263.0	1.82	266.1	15.77	577.7	11.72	446.9	253.4	12.02	216.2	13.66	232.3	1.603
60	0.97	1275.2	1.74	250.9	15.04	577.7	11.72	446.7	253.0	11.96	215.8	13.64	231.6	1.632
LEVEL F4														
60	0.99	1129.9	1.74	317.2	18.75	587.8	17.29	458.3	254.3	12.39	215.0	15.07	243.7	1.343

********** STEADY STATE TEST I **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F5										
21	1.01	1080.8	1.78	355.1	20.80	358.0	25.8	584.1	250.3	1.248
60	1.01	1179.6	1.74	290.9	17.07	292.8	20.0	584.1	240.2	1.486
LEVEL F6										
1	1.03	1216.1	1.80	283.7	17.45	290.4	20.6	546.6	238.3	1.552
17	1.03	1180.2	1.78	297.2	17.50	304.6	21.2	546.6	241.1	1.462
37	1.03	1149.2	1.75	307.2	18.12	315.3	22.3	546.6	243.7	1.388
38	1.03	1159.5	1.75	302.3	17.67	310.1	21.7	546.6	242.8	1.413
50	1.03	1240.5	1.77	267.4	15.69	273.5	18.5	546.6	236.7	1.613
60	1.03	1245.6	1.74	262.0	15.28	267.9	18.0	546.6	236.4	1.625
LEVEL F7										
14	1.05	1174.5	1.76	295.7	17.75	309.0	22.9	516.9	242.3	1.426
17	1.05	1211.5	1.78	282.4	16.43	294.3	20.9	516.9	239.5	1.518
21	1.05	1175.2	1.78	298.8	17.35	312.2	22.6	516.9	242.3	1.428
37	1.05	1177.5	1.75	292.6	17.21	305.7	22.3	516.9	242.1	1.434
38	1.05	1196.8	1.75	284.0	16.52	296.2	21.2	516.9	240.6	1.482
50	1.05	1267.4	1.77	257.1	15.06	267.0	18.5	516.9	235.9	1.658
60	1.05	1273.3	1.74	251.6	14.66	261.2	18.0	516.9	235.5	1.673
LEVEL F8										
1	1.07	1281.7	1.81	257.5	15.15	274.1	19.2	480.2	236.3	1.664
17	1.07	1226.9	1.78	275.8	15.96	295.1	21.0	480.2	239.7	1.526
21	1.07	1205.2	1.78	284.5	16.45	305.2	22.0	480.2	241.2	1.471
34	1.07	1299.8	1.82	252.6	14.92	268.4	18.7	480.2	235.3	1.711
37	1.07	1206.2	1.75	279.3	16.30	299.5	21.7	480.2	241.1	1.474
50	1.07	1302.9	1.77	244.4	14.24	259.6	17.9	480.2	235.1	1.719
60	1.07	1299.5	1.74	242.5	14.07	257.6	17.7	480.2	235.3	1.710

STEADY STATE TEST J

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST J **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.393E+05 LBM/SQFT H UNC. MASS FLUX 1.229E+04 LBM/SQFT H PRESSURE 1937.3 PSI UNC. PRESSURE 6.00 PSI
731.82 KG/SQM S 16.6829 KG/SQM S 13.37 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
E	2.457	774.0	0.036	11.22	1200.0	649.2	49.80	27.667	631.2	333.2	0.443	0.2	.4889	.0256
F	2.451	771.9	0.046	14.44	1191.7	644.6	40.73	22.625	631.2	333.2	0.443	0.2	.6547	.0297
G	2.435	766.9	0.054	17.13	1117.0	603.1	29.78	16.542	631.2	333.2	0.443	0.2	.8188	.0337
E1	2.439	768.3	0.023	7.33	1230.6	666.2	52.74	29.303	631.2	333.2	0.443	0.2	.5154	.0263
E2	2.391	753.2	0.075	23.65	1230.9	666.4	29.15	16.193	631.2	333.2	0.443	0.2	.5344	.0268
E3	2.439	768.4	0.024	7.50	1246.6	675.1	28.70	15.944	631.2	333.2	0.443	0.2	.5568	.0275
E6	2.367	745.7	0.089	28.05	1137.3	614.4	35.21	19.563	631.2	333.2	0.443	0.2	.6041	.0286
E7	2.448	771.1	0.028	8.67	1138.2	614.9	45.59	25.326	631.2	333.2	0.443	0.2	.6198	.0289
E8	2.457	774.0	0.015	4.73	1175.3	635.5	28.47	15.817	631.2	333.2	0.443	0.2	.6406	.0294
F1	2.416	761.2	0.060	18.75	1173.6	634.5	27.23	15.129	631.2	333.2	0.443	0.2	.6812	.0304
F2	2.442	769.2	0.025	7.88	1197.5	647.8	26.28	14.603	631.2	333.2	0.443	0.2	.7019	.0310
F3	2.417	761.2	0.059	18.48	1189.1	643.2	16.97	9.425	631.2	333.2	0.443	0.2	.7227	.0316
F5	2.430	765.6	0.000	0.00	1035.9	558.1	0.00	0.000	631.2	333.2	0.443	0.2	.7558	.0324
F6	2.412	759.8	0.055	17.39	1068.3	576.0	29.63	16.459	631.2	333.2	0.443	0.2	.7707	.0326
F7	2.416	761.0	0.047	14.71	1071.9	578.1	18.75	10.417	631.2	333.2	0.443	0.2	.7848	.0329
F8	2.423	763.3	0.052	16.46	1103.7	595.7	27.94	15.520	631.2	333.2	0.443	0.2	.8047	.0334

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test J

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	All dry

********** STEADY STATE TEST J **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E														
2	0.49	1238.7	2.47	405.9	25.09	904.3	21.98	632.2	402.8	7.17	363.5	8.41	369.7	1.717
4	0.49	1184.8	2.50	451.8	27.63	904.3	21.98	634.7	407.8	7.28	368.2	8.53	378.0	1.573
7	0.49	1189.6	2.40	429.8	27.13	904.3	21.98	634.4	407.3	7.32	367.8	8.56	377.2	1.586
7	0.49	1193.5	2.40	426.8	26.69	904.3	21.98	634.2	406.9	7.29	367.4	8.54	376.5	1.595
10	0.49	1211.7	2.45	421.7	25.71	904.3	21.98	633.3	405.2	7.20	365.7	8.46	373.6	1.644
12	0.49	1194.4	2.49	441.6	27.50	904.3	21.98	634.2	406.8	7.28	367.3	8.53	376.4	1.598
13	0.49	1213.9	2.47	424.4	27.03	904.3	21.98	633.2	405.0	7.27	365.5	8.50	373.3	1.650
13	0.49	1214.4	2.47	424.0	26.42	904.3	21.98	633.2	404.9	7.23	365.5	8.48	373.2	1.652
15	0.49	1205.5	2.59	450.8	27.97	904.3	21.98	633.6	405.7	7.25	366.3	8.49	374.6	1.628
15	0.49	1216.8	2.59	442.1	27.10	904.3	21.98	633.1	404.7	7.20	365.3	8.45	372.8	1.658
16	0.49	1195.1	2.42	429.1	26.41	904.3	21.98	634.1	406.8	7.26	367.2	8.51	376.3	1.600
16	0.49	1188.1	2.42	434.5	26.70	904.3	21.98	634.5	407.5	7.28	367.9	8.53	377.5	1.582
18	0.49	1065.7	2.43	559.8	37.67	904.3	21.98	643.0	424.9	8.09	384.4	9.30	406.9	1.260
20	0.49	1179.3	2.47	449.9	27.77	904.3	21.98	635.0	408.4	7.31	368.8	8.56	379.0	1.559
20	0.49	1194.2	2.47	437.9	27.41	904.3	21.98	634.2	406.9	7.29	367.3	8.54	376.4	1.597
26	0.49	1155.2	2.46	470.3	28.85	904.3	21.98	636.3	411.2	7.37	371.4	8.63	383.6	1.495
26	0.49	1185.6	2.46	444.5	26.94	904.3	21.98	634.6	407.7	7.26	368.2	8.52	377.9	1.575
26	0.49	1176.0	2.46	452.3	27.60	904.3	21.98	635.1	408.8	7.30	369.1	8.56	379.6	1.550
28	0.49	1087.5	2.41	528.7	33.01	904.3	21.98	641.1	420.9	7.69	380.7	8.96	400.1	1.317
28	0.49	1088.3	2.41	527.8	34.47	904.3	21.98	641.0	420.8	7.83	380.5	9.06	399.9	1.319
29	0.49	1115.8	2.43	502.0	30.75	904.3	21.98	638.9	416.4	7.50	376.4	8.78	392.4	1.392
29	0.49	1114.7	2.43	503.1	31.67	904.3	21.98	639.0	416.6	7.58	376.5	8.84	392.7	1.389
29	0.49	1116.6	2.43	501.1	30.96	904.3	21.98	638.8	416.3	7.52	376.3	8.79	392.2	1.393
30	0.49	1194.1	2.42	429.1	26.01	904.3	21.98	634.2	406.9	7.24	367.3	8.50	376.4	1.597
30	0.49	1204.9	2.42	421.0	25.65	904.3	21.98	633.7	405.8	7.22	366.3	8.48	374.7	1.626
31	0.49	1186.2	2.45	441.6	27.06	904.3	21.98	634.6	407.7	7.28	368.1	8.53	377.8	1.577
33	0.49	1254.8	2.46	394.5	24.01	904.3	21.98	631.5	401.5	7.11	362.2	8.36	367.6	1.761
33	0.49	1237.0	2.46	406.1	25.63	904.3	21.98	632.2	402.9	7.20	363.6	8.43	369.9	1.713
33	0.49	1226.4	2.46	413.3	25.59	904.3	21.98	632.7	403.8	7.19	364.5	8.44	371.4	1.684
35	0.49	1207.1	2.47	429.4	27.38	904.3	21.98	633.6	405.6	7.29	366.1	8.52	374.3	1.632
42	0.49	1171.5	2.44	451.5	29.92	904.3	21.98	635.4	409.3	7.47	369.6	8.69	380.4	1.538
44	0.49	1204.8	2.43	423.9	26.70	904.3	21.98	633.7	405.8	7.27	366.3	8.52	374.7	1.626
45	0.49	1172.9	2.48	457.5	29.04	904.3	21.98	635.3	409.1	7.38	369.5	8.62	380.2	1.542
45	0.49	1200.4	2.48	435.4	27.73	904.3	21.98	633.9	406.2	7.30	366.7	8.54	375.4	1.614
49	0.49	1205.4	2.45	426.6	26.05	904.3	21.98	633.6	405.8	7.22	366.3	8.48	374.6	1.627
49	0.49	1237.1	2.45	404.3	24.53	904.3	21.98	632.2	402.9	7.14	363.6	8.39	369.9	1.713
49	0.49	1214.1	2.45	420.3	26.29	904.3	21.98	633.2	404.9	7.24	365.5	8.48	373.3	1.651
51	0.49	1169.6	2.48	459.7	29.34	904.3	21.98	635.5	409.5	7.40	369.8	8.64	380.8	1.533
51	0.49	1170.1	2.48	459.3	29.83	904.3	21.98	635.5	409.4	7.43	369.8	8.67	380.7	1.535
53	0.49	1219.9	2.47	420.1	26.49	904.3	21.98	633.0	404.4	7.24	365.0	8.48	372.4	1.666
53	0.49	1206.3	2.47	430.1	27.51	904.3	21.98	633.6	405.7	7.29	366.2	8.53	374.5	1.630
58	0.49	1234.9	2.48	411.2	25.15	904.3	21.98	632.3	403.1	7.16	363.8	8.41	370.2	1.707
58	0.49	1231.0	2.48	413.8	26.45	904.3	21.98	632.5	403.4	7.23	364.1	8.46	370.8	1.697
59	0.49	1254.7	2.46	393.8	24.12	904.3	21.98	631.5	401.5	7.12	362.3	8.37	367.6	1.761
59	0.49	1241.7	2.46	402.2	24.61	904.3	21.98	632.0	402.5	7.15	363.2	8.39	369.3	1.726
59	0.49	1235.2	2.46	406.5	24.92	904.3	21.98	632.3	403.1	7.16	363.8	8.41	370.2	1.708
61	0.49	1186.5	2.43	438.3	26.92	904.3	21.98	634.6	407.6	7.28	368.1	8.54	377.7	1.578
61	0.49	1191.8	2.43	434.2	26.40	904.3	21.98	634.3	407.1	7.25	367.6	8.51	376.8	1.592
61	0.49	1195.5	2.43	431.3	26.05	904.3	21.98	634.1	406.7	7.23	367.2	8.49	376.2	1.601
62	0.49	1265.9	2.45	385.9	22.98	904.3	21.98	631.1	400.6	7.07	361.4	8.32	366.2	1.791
63	0.49	1253.1	2.49	400.3	23.88	904.3	21.98	631.6	401.6	7.09	362.4	8.35	367.8	1.757
63	0.49	1255.2	2.49	399.0	24.25	904.3	21.98	631.5	401.4	7.11	362.2	8.36	367.5	1.762
64	0.49	1339.6	2.44	344.3	20.41	904.3	21.98	628.7	395.8	6.96	356.9	8.20	358.3	1.995
64	0.49	1308.9	2.44	359.9	21.49	904.3	21.98	629.6	397.6	7.01	358.6	8.25	361.3	1.909
LEVEL F														
3	0.65	1213.7	2.53	433.7	26.64	1088.2	23.34	760.1	460.9	6.68	431.7	8.03	395.5	2.041
4	0.65	1235.6	2.50	414.4	25.04	1088.2	23.34	759.0	458.7	6.60	429.5	7.95	392.1	2.114
7	0.65	1231.5	2.40	400.1	25.15	1088.2	23.34	759.2	459.1	6.68	429.9	8.02	392.7	2.100
7	0.65	1214.3	2.40	411.9	25.41	1088.2	23.34	760.1	460.9	6.69	431.6	8.04	395.4	2.045
10	0.65	1173.7	2.45	451.0	29.15	1088.2	23.34	762.5	465.5	6.93	436.2	8.26	402.6	1.911
10	0.65	1171.3	2.45	453.0	29.58	1088.2	23.34	762.7	465.8	6.96	436.5	8.29	403.0	1.903
10	0.65	1172.0	2.45	452.4	29.53	1088.2	23.34	762.6	465.7	6.96	436.4	8.29	402.9	1.905
13	0.65	1185.7	2.47	446.0	27.57	1088.2	23.34	761.7	464.1	6.77	434.8	8.12	400.3	1.949
13	0.65	1174.9	2.47	454.8	29.78	1088.2	23.34	762.4	465.4	6.96	436.1	8.28	402.3	1.914
15	0.65	1172.7	2.59	478.0	29.42	1088.2	23.34	762.6	465.6	6.80	436.3	8.16	402.8	1.908
16	0.65	1206.2	2.42	421.2	26.06	1088.2	23.34	760.5	461.7	6.71	432.5	8.06	396.7	2.016
17	0.65	1170.3	2.42	448.9	26.82	1088.2	23.34	762.7	466.0	6.73	436.6	8.11	403.2	1.900
18	0.65	1106.7	2.43	511.9	32.97	1088.2	23.34	767.7	475.5	7.23	446.0	8.57	418.2	1.693
20	0.65	1156.1	2.47	469.7	28.37	1088.2	23.34	763.7	467.8	6.80	438.5	8.17	406.2	1.853
21	0.65	1085.8	2.44	536.3	39.00	1088.2	23.34	769.7	479.4	7.96	449.9	9.19	424.4	1.625

********** STEADY STATE TEST J **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
28	0.65	1225.7	2.41	406.1	24.29	1088.2	23.34	759.5	459.7	6.60	430.5	7.96	393.6	2.081
28	0.65	1203.6	2.41	421.7	25.53	1088.2	23.34	760.7	462.0	6.67	432.8	8.03	397.1	2.007
28	0.65	1204.6	2.41	421.0	25.59	1088.2	23.34	760.6	461.9	6.68	432.7	8.04	397.0	2.011
31	0.65	1175.2	2.45	450.7	28.27	1088.2	23.34	762.4	465.3	6.84	436.0	8.19	402.3	1.915
31	0.65	1177.2	2.45	449.1	27.74	1088.2	23.34	762.3	465.1	6.79	435.8	8.15	401.9	1.921
34	0.65	1151.9	2.48	476.1	30.50	1088.2	23.34	764.0	468.4	6.99	439.0	8.33	407.1	1.839
37	0.65	1182.1	2.44	443.8	32.13	1088.2	23.34	762.0	464.5	7.23	435.2	8.49	401.0	1.937
38	0.65	1185.7	2.45	441.7	27.70	1088.2	23.34	761.7	464.1	6.80	434.8	8.15	400.3	1.949
42	0.65	1180.6	2.44	444.0	28.85	1088.2	23.34	762.1	464.7	6.91	435.4	8.24	401.3	1.932
45	0.65	1178.2	2.48	453.0	27.62	1088.2	23.34	762.2	465.0	6.76	435.7	8.12	401.7	1.924
45	0.65	1186.8	2.48	445.9	27.19	1088.2	23.34	761.7	463.9	6.73	434.6	8.09	400.1	1.953
53	0.65	1202.8	2.54	443.6	27.79	1088.2	23.34	760.7	462.1	6.75	432.8	8.10	397.3	2.005
59	0.65	1181.9	2.45	445.4	27.43	1088.2	23.34	762.0	464.5	6.77	435.2	8.13	401.0	1.937
59	0.65	1187.5	2.45	440.9	26.75	1088.2	23.34	761.6	463.8	6.72	434.6	8.08	400.0	1.955
59	0.65	1198.3	2.45	432.5	28.08	1088.2	23.34	761.0	462.6	6.85	433.3	8.18	398.1	1.990
60	0.65	1214.6	2.43	417.0	26.55	1088.2	23.34	760.1	460.8	6.75	431.6	8.09	395.3	2.044
64	0.65	1265.8	2.44	385.2	23.10	1088.2	23.34	757.5	456.0	6.53	426.8	7.88	387.9	2.214
64	0.65	1293.7	2.44	369.0	21.94	1088.2	23.34	756.3	453.7	6.47	424.6	7.82	384.5	2.307
64	0.65	1281.3	2.44	376.0	22.33	1088.2	23.34	756.8	454.7	6.49	425.6	7.84	385.9	2.265
LEVEL G														
14	0.82	1108.3	2.43	508.9	35.76	1262.8	24.60	889.7	519.6	7.07	499.0	8.31	440.0	2.126
16	0.82	1119.1	2.42	495.8	32.62	1262.8	24.60	888.6	517.6	6.63	497.0	7.93	437.0	2.167
16	0.82	1152.2	2.42	464.3	29.92	1262.8	24.60	885.6	512.2	6.35	491.5	7.66	428.7	2.297
18	0.82	1113.9	2.43	503.9	31.44	1262.8	24.60	889.1	518.6	6.40	498.0	7.74	438.4	2.147
18	0.82	1111.2	2.43	506.8	32.46	1262.8	24.60	889.4	519.1	6.54	498.5	7.86	439.2	2.136
18	0.82	1098.0	2.43	521.1	32.74	1262.8	24.60	890.8	521.7	6.52	501.1	7.86	443.1	2.087
20	0.82	1033.2	2.47	613.3	38.66	1262.8	24.60	899.3	537.6	7.04	517.1	8.38	467.6	1.835
20	0.82	1128.1	2.47	496.2	33.36	1262.8	24.60	887.7	516.1	6.68	495.4	7.96	434.6	2.202
20	0.82	1119.4	2.47	505.0	32.12	1262.8	24.60	888.6	517.6	6.46	497.0	7.78	436.9	2.168
21	0.82	1086.9	2.36	518.2	31.48	1262.8	24.60	892.1	524.0	6.41	503.4	7.78	446.6	2.044
34	0.82	1119.6	2.48	507.5	33.05	1262.8	24.60	888.6	517.6	6.57	496.9	7.88	436.8	2.169
37	0.82	1109.6	2.44	511.1	32.45	1262.8	24.60	889.6	519.4	6.51	498.8	7.84	439.6	2.131
38	0.82	1120.0	2.45	501.0	32.10	1262.8	24.60	888.5	517.5	6.49	496.9	7.81	436.7	2.171
42	0.82	1103.4	2.44	516.6	46.20	1262.8	24.60	890.2	520.6	8.78	500.0	9.80	441.5	2.107
42	0.82	1105.2	2.44	514.6	33.45	1262.8	24.60	890.0	520.2	6.66	499.6	7.97	440.9	2.114
45	0.82	1126.0	2.48	500.7	33.54	1262.8	24.60	887.9	516.4	6.67	495.8	7.95	435.1	2.194
45	0.82	1107.6	2.48	520.1	34.64	1262.8	24.60	889.8	519.8	6.77	499.2	8.06	440.2	2.123
45	0.82	1125.5	2.48	501.2	32.76	1262.8	24.60	888.0	516.5	6.55	495.9	7.86	435.3	2.192
47	0.82	1113.5	2.45	508.7	33.24	1262.8	24.60	889.2	518.7	6.63	498.1	7.93	438.5	2.145
50	0.82	1093.2	2.41	522.1	33.15	1262.8	24.60	891.3	522.7	6.61	502.1	7.94	444.6	2.069
58	0.82	1120.2	2.48	506.6	33.04	1262.8	24.60	888.5	517.4	6.58	496.8	7.88	436.7	2.171
60	0.82	1131.0	2.43	486.2	32.63	1262.8	24.60	887.5	515.6	6.65	494.9	7.93	433.8	2.214
64	0.82	1182.6	2.44	442.4	27.45	1262.8	24.60	883.2	507.8	6.09	487.2	7.43	422.2	2.417
64	0.82	1192.0	2.44	435.0	26.94	1262.8	24.60	882.6	506.6	6.05	485.9	7.39	420.4	2.454

********** STEADY STATE TEST J **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	GGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E1														
1	0.52	1277.5	2.46	379.9	23.79	934.3	22.26	649.6	409.4	7.06	371.8	8.32	368.0	1.882
38	0.52	1240.8	2.45	401.7	24.14	934.3	22.26	651.1	412.3	7.07	374.6	8.36	372.7	1.778
50	0.52	1173.5	2.41	444.8	28.39	934.3	22.26	654.4	418.8	7.34	380.9	8.61	383.4	1.593
LEVEL E2														
21	0.53	1229.0	2.44	407.8	24.16	955.7	22.53	666.6	420.1	7.05	383.5	8.37	377.0	1.789
60	0.53	1261.0	2.43	385.9	23.99	955.7	22.53	665.2	417.3	7.06	380.9	8.35	372.6	1.882
LEVEL E3														
17	0.56	1248.2	2.42	392.3	25.03	980.7	22.92	682.9	426.1	7.12	391.0	8.43	377.3	1.898
34	0.56	1242.5	2.48	405.4	26.50	980.7	22.92	683.2	426.6	7.17	391.5	8.47	378.0	1.881
37	0.56	1214.5	2.44	419.2	25.44	980.7	22.92	684.5	429.2	7.11	394.0	8.45	382.1	1.798
38	0.56	1269.0	2.45	383.9	22.91	980.7	22.92	682.1	424.4	6.98	389.4	8.31	374.6	1.960
50	0.56	1217.4	2.41	411.5	26.96	980.7	22.92	684.4	428.9	7.24	393.7	8.55	381.7	1.807
60	0.56	1288.0	2.43	370.0	22.75	980.7	22.92	681.3	423.0	6.99	388.0	8.31	372.3	2.016
LEVEL E6														
60	0.60	1162.2	2.43	457.7	28.38	1032.9	23.13	724.8	450.9	7.09	418.5	8.45	398.0	1.754
LEVEL E7														
1	0.62	1201.1	2.46	430.9	27.55	1050.2	23.15	734.0	451.4	6.95	420.1	8.29	392.9	1.910
34	0.62	1116.9	2.48	510.3	33.85	1050.2	23.15	739.8	462.6	7.42	431.0	8.74	410.5	1.647
37	0.62	1139.2	2.44	481.3	29.77	1050.2	23.15	738.0	459.2	7.08	427.7	8.44	405.1	1.717
50	0.62	1095.5	2.41	519.6	33.50	1050.2	23.15	741.6	466.3	7.43	434.6	8.78	416.4	1.581
LEVEL E8														
1	0.64	1211.9	2.46	422.9	26.88	1072.9	23.24	748.8	456.8	6.81	426.7	8.15	393.8	1.996
34	0.64	1142.9	2.48	484.4	31.51	1072.9	23.24	753.2	465.3	7.13	435.1	8.46	407.0	1.773
37	0.64	1177.3	2.44	447.7	27.41	1072.9	23.24	750.8	460.7	6.83	430.6	8.19	399.9	1.884
38	0.64	1169.1	2.45	455.2	27.70	1072.9	23.24	751.3	461.7	6.84	431.6	8.20	401.4	1.858
LEVEL F1														
17	0.68	1194.0	2.42	430.0	25.58	1116.9	23.61	781.0	471.0	6.56	443.3	7.94	402.3	2.046
21	0.68	1131.1	2.44	487.7	30.26	1116.9	23.61	785.5	479.5	6.88	451.7	8.25	415.4	1.835
34	0.68	1173.5	2.48	457.0	29.33	1116.9	23.61	782.3	473.5	6.82	445.8	8.16	406.1	1.976
37	0.68	1209.8	2.44	422.6	25.65	1116.9	23.61	780.1	469.2	6.57	441.5	7.93	399.6	2.100
50	0.68	1160.4	2.41	455.8	27.81	1116.9	23.61	783.2	475.2	6.72	447.5	8.09	408.8	1.932
LEVEL F2														
1	0.70	1235.0	2.46	407.0	24.84	1139.2	23.88	794.5	472.5	6.46	446.1	7.82	398.3	2.247
14	0.70	1168.5	2.43	452.0	30.38	1139.2	23.88	798.6	480.2	6.93	453.6	8.24	409.9	2.014
17	0.70	1196.0	2.42	428.7	25.47	1139.2	23.88	796.7	476.7	6.49	450.2	7.87	404.7	2.110
34	0.70	1192.3	2.48	441.9	28.13	1139.2	23.88	797.0	477.2	6.68	450.6	8.02	405.4	2.097
38	0.70	1220.8	2.45	415.5	25.02	1139.2	23.88	795.3	474.0	6.47	447.5	7.83	400.5	2.197
50	0.70	1172.3	2.41	446.0	27.35	1139.2	23.88	798.3	479.7	6.64	453.1	8.00	409.2	2.027
LEVEL F3														
14	0.72	1180.6	2.43	441.9	28.27	1161.4	24.21	812.8	484.4	6.68	459.0	8.02	410.2	2.114
17	0.72	1188.6	2.42	434.2	25.92	1161.4	24.21	812.3	483.4	6.47	458.0	7.85	408.7	2.142
21	0.72	1163.0	2.44	458.5	27.44	1161.4	24.21	814.0	486.7	6.54	461.3	7.93	413.7	2.051
34	0.72	1212.9	2.48	426.1	27.00	1161.4	24.21	810.7	480.5	6.55	455.2	7.90	404.4	2.227
60	0.72	1189.5	2.43	435.3	28.66	1161.4	24.21	812.2	483.3	6.73	457.9	8.06	408.5	2.146
LEVEL F5														
60	0.76	1035.9	2.43	600.5	39.20	1196.6	24.41	852.9	521.0	7.56	497.3	8.87	457.6	1.689
LEVEL F6														
1	0.77	1114.0	2.46	508.6	35.84	1212.4	24.40	854.9	507.2	7.21	484.3	8.46	432.2	2.013
17	0.77	1085.7	2.42	532.5	33.88	1212.4	24.40	857.9	512.7	6.89	489.9	8.22	440.7	1.908
38	0.77	1038.5	2.45	601.2	38.28	1212.4	24.40	863.9	524.2	7.27	501.4	8.60	458.6	1.735
50	0.77	1044.0	2.41	584.4	38.54	1212.4	24.40	863.1	522.7	7.47	499.9	8.76	456.2	1.756
60	0.77	1079.2	2.43	542.5	34.69	1212.4	24.40	858.6	514.1	6.96	491.3	8.29	442.9	1.884

********** STEADY STATE TEST J **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F7														
14	0.78	1040.0	2.43	593.9	40.68	1227.2	24.43	874.3	527.4	7.74	505.3	8.98	459.9	1.776
17	0.78	1094.4	2.42	522.5	32.37	1227.2	24.43	867.4	514.4	6.62	492.3	7.96	439.8	1.978
21	0.78	1062.6	2.44	565.2	34.99	1227.2	24.43	871.1	521.5	6.81	499.4	8.17	450.8	1.861
37	0.78	1065.4	2.45	563.2	36.23	1227.2	24.43	870.8	520.8	7.03	498.7	8.34	449.7	1.872
38	0.78	1084.5	2.45	540.2	33.72	1227.2	24.43	868.5	516.5	6.71	494.4	8.06	443.0	1.941
50	0.78	1061.8	2.41	560.2	36.65	1227.2	24.43	871.2	521.7	7.17	499.6	8.47	451.1	1.858
60	0.78	1095.3	2.43	523.7	33.48	1227.2	24.43	867.3	514.2	6.78	492.1	8.09	439.6	1.982
LEVEL F8														
1	0.80	1164.3	2.46	460.6	29.26	1248.1	24.51	875.8	507.2	6.29	486.0	7.61	424.4	2.305
17	0.80	1094.1	2.42	522.8	32.10	1248.1	24.51	882.3	519.3	6.48	498.0	7.83	442.7	2.035
21	0.80	1075.5	2.44	548.8	33.68	1248.1	24.51	884.5	523.3	6.58	502.1	7.94	448.9	1.964
34	0.80	1096.3	2.48	532.9	35.44	1248.1	24.51	882.1	518.8	6.90	497.6	8.18	442.0	2.043
37	0.80	1098.3	2.44	523.4	32.83	1248.1	24.51	881.9	518.4	6.56	497.2	7.90	441.4	2.051
50	0.80	1082.9	2.41	534.0	34.32	1248.1	24.51	883.6	521.6	6.80	500.4	8.11	446.3	1.992
60	0.80	1121.8	2.43	495.4	31.08	1248.1	24.51	879.5	514.0	6.44	492.7	7.77	434.6	2.142

STEADY STATE TEST K

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST K **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.663E+05 LBM/SQFT H UNC. MASS FLUX 3.686E+03 LBM/SQFT H PRESSURE 634.8 PSI UNC. PRESSURE 6.00 PSI
225.73 KG/SQM S 5.0023 KG/SQM S 4.38 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.432	451.0	0.029	9.07	1198.3	648.3	108.90	60.500	492.3	256.0	1.042	0.6	.8918	.0335
G	1.422	447.9	0.037	11.73	1402.2	761.6	37.65	20.918	597.6	314.6	43.002	23.9	1.1010	.0386
E7	1.441	453.9	0.029	9.20	1132.1	611.5	28.57	15.871	492.3	256.0	1.042	0.6	.8475	.0325
E8	1.462	460.4	0.000	0.00	1230.1	665.9	0.00	0.000	492.3	256.0	1.042	0.6	.8739	.0331
F1	1.411	444.4	0.042	13.36	1227.9	664.7	64.25	35.693	492.3	256.0	1.042	0.6	.9256	.0344
F2	1.419	447.0	0.020	6.38	1273.1	689.8	46.28	25.710	492.3	256.0	1.042	0.6	.9520	.0351
F3	1.411	444.3	0.046	14.55	1307.9	709.2	46.85	26.029	492.3	256.0	1.042	0.6	.9784	.0360
F4	1.364	429.8	0.054	17.11	1157.1	625.4	67.46	37.477	494.2	257.1	36.769	20.4	1.0027	.0366
F5	1.385	436.3	0.053	16.55	1236.9	669.7	43.41	24.119	512.5	267.3	33.027	18.3	1.0207	.0369
F6	1.409	443.7	0.042	13.09	1320.1	716.0	40.46	22.479	532.2	278.2	39.110	21.7	1.0397	.0373
F7	1.404	442.2	0.034	10.66	1347.3	731.1	42.91	23.839	550.7	288.5	39.933	22.2	1.0577	.0376
F8	1.420	447.4	0.043	13.44	1397.5	759.0	49.47	27.485	579.0	304.2	41.339	23.0	1.0831	.0382

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test K

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	2/4
E8	4/5
F	All dry

********** STEADY STATE TEST K **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
3	0.89	1117.2	1.49	238.2	13.78	257.9	5.51	217.9	147.7	2.59	121.2	3.03	151.0	0.620
4	0.89	1029.0	1.48	276.1	16.05	257.9	5.51	219.0	150.0	2.64	123.2	3.08	155.2	0.512
7	0.89	994.0	1.40	279.6	16.52	257.9	5.51	219.5	151.1	2.67	124.1	3.11	157.3	0.471
7	0.89	950.8	1.40	305.9	18.11	257.9	5.51	220.3	152.8	2.70	125.6	3.15	160.5	0.421
10	0.89	1270.1	1.45	185.9	10.75	257.9	5.51	216.7	145.2	2.54	119.0	2.97	146.4	0.818
10	0.89	1272.3	1.45	185.4	10.74	257.9	5.51	216.7	145.2	2.54	119.0	2.97	146.3	0.821
10	0.89	1263.5	1.45	187.5	10.88	257.9	5.51	216.8	145.3	2.54	119.1	2.97	146.5	0.809
13	0.89	1218.5	1.45	199.5	11.46	257.9	5.51	217.1	145.9	2.55	119.7	2.98	147.7	0.750
13	0.89	1208.8	1.45	202.2	11.78	257.9	5.51	217.1	146.1	2.56	119.8	2.99	148.0	0.737
15	0.89	1177.1	1.41	205.8	11.79	257.9	5.51	217.4	146.6	2.57	120.2	3.00	148.9	0.696
16	0.89	1241.4	1.41	188.7	10.84	257.9	5.51	216.9	145.6	2.55	119.4	2.98	147.1	0.780
18	0.89	1213.4	1.43	198.6	11.47	257.9	5.51	217.1	146.0	2.56	119.7	2.99	147.8	0.744
18	0.89	1203.9	1.43	201.2	11.60	257.9	5.51	217.2	146.1	2.56	119.8	2.99	148.1	0.731
20	0.89	1080.7	1.45	245.8	14.12	257.9	5.51	218.3	148.6	2.61	122.0	3.04	152.6	0.575
20	0.89	1175.7	1.45	211.6	12.09	257.9	5.51	217.4	146.6	2.57	120.3	3.00	149.0	0.695
21	0.89	1156.3	1.43	214.8	12.77	257.9	5.51	217.6	147.0	2.58	120.6	3.01	149.6	0.670
28	0.89	1157.3	1.42	214.2	12.26	257.9	5.51	217.6	146.9	2.57	120.5	3.01	149.6	0.671
28	0.89	1153.8	1.42	215.3	12.36	257.9	5.51	217.6	147.0	2.58	120.6	3.01	149.7	0.667
28	0.89	1148.8	1.42	216.9	12.48	257.9	5.51	217.6	147.1	2.58	120.7	3.01	149.9	0.660
31	0.89	1199.6	1.44	202.9	11.70	257.9	5.51	217.2	146.2	2.56	119.9	2.99	148.2	0.725
31	0.89	1206.7	1.44	200.9	11.54	257.9	5.51	217.2	146.1	2.56	119.8	2.99	148.0	0.735
32	0.89	1092.9	1.44	240.2	13.85	257.9	5.51	218.2	148.3	2.60	121.7	3.04	152.0	0.591
34	0.89	1252.9	1.46	192.2	11.08	257.9	5.51	216.8	145.4	2.55	119.2	2.97	146.8	0.795
37	0.89	1026.8	1.40	262.8	16.15	257.9	5.51	219.0	150.1	2.66	123.2	3.09	155.3	0.509
38	0.89	1101.4	1.40	230.5	13.39	257.9	5.51	218.1	148.1	2.60	121.5	3.03	151.7	0.601
42	0.89	1251.6	1.44	189.6	11.00	257.9	5.51	216.8	145.4	2.55	119.2	2.97	146.8	0.794
45	0.89	1144.6	1.43	219.1	12.58	257.9	5.51	217.7	147.2	2.58	120.7	3.01	150.0	0.655
45	0.89	1147.9	1.43	218.0	12.52	257.9	5.51	217.6	147.1	2.58	120.7	3.01	149.9	0.659
53	0.89	1269.8	1.49	191.9	11.04	257.9	5.51	216.7	145.2	2.54	119.0	2.97	146.4	0.818
59	0.89	1349.5	1.45	168.8	9.64	257.9	5.51	216.3	144.3	2.52	118.3	2.95	144.8	0.926
59	0.89	1333.1	1.45	172.1	9.80	257.9	5.51	216.4	144.5	2.53	118.4	2.95	145.1	0.904
59	0.89	1351.8	1.45	168.3	9.74	257.9	5.51	216.3	144.3	2.52	118.3	2.95	144.8	0.928
60	0.89	1303.0	1.40	173.2	9.98	257.9	5.51	216.5	144.8	2.53	118.7	2.96	145.7	0.862
64	0.89	1366.4	1.41	161.8	9.21	257.9	5.51	216.2	144.1	2.52	118.1	2.94	144.5	0.949
64	0.89	1396.6	1.41	156.4	8.89	257.9	5.51	216.1	143.9	2.51	117.9	2.94	144.1	0.991
64	0.89	1382.4	1.41	158.9	9.03	257.9	5.51	216.2	144.0	2.52	118.0	2.94	144.3	0.971

********** STEADY STATE TEST K **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL G										
1	1.10	1390.8	1.46	162.0	9.31	183.5	14.6	233.6	149.7	1.099
3	1.10	1424.8	1.49	159.6	9.09	180.0	14.0	233.6	149.2	1.154
14	1.10	1346.2	1.42	165.8	9.65	189.1	15.6	233.6	150.4	1.028
16	1.10	1442.7	1.41	148.7	8.56	167.2	13.0	233.6	149.0	1.184
16	1.10	1452.5	1.41	147.2	8.42	165.3	12.7	233.6	148.9	1.200
18	1.10	1414.4	1.43	155.3	8.83	175.3	13.7	233.6	149.3	1.138
18	1.10	1390.1	1.43	159.5	9.10	180.7	14.3	233.6	149.7	1.098
18	1.10	1426.7	1.43	153.2	8.71	172.7	13.4	233.6	149.2	1.157
20	1.10	1302.8	1.45	178.4	10.15	205.1	17.3	233.6	151.3	0.959
20	1.10	1389.7	1.45	161.2	9.26	182.6	14.6	233.6	149.7	1.097
20	1.10	1409.2	1.45	157.7	9.01	178.2	14.0	233.6	149.4	1.129
21	1.10	1379.8	1.43	160.7	9.11	182.4	14.5	233.6	149.9	1.081
32	1.10	1421.6	1.44	155.2	8.86	175.1	13.6	233.6	149.2	1.149
37	1.10	1364.0	1.41	161.3	9.21	183.5	14.8	233.6	150.1	1.056
38	1.10	1396.1	1.41	155.9	8.90	176.4	14.0	233.6	149.6	1.108
45	1.10	1392.1	1.43	158.8	9.11	179.9	14.3	233.6	149.7	1.102
45	1.10	1390.3	1.43	159.1	9.12	180.3	14.4	233.6	149.7	1.099
45	1.10	1386.0	1.43	159.9	9.17	181.3	14.5	233.6	149.8	1.091
47	1.10	1399.5	1.41	155.4	8.90	175.8	13.9	233.6	149.6	1.114
60	1.10	1445.0	1.40	147.2	8.51	165.5	12.8	233.6	149.0	1.188
64	1.10	1458.6	1.41	145.9	8.31	163.8	12.5	233.6	148.8	1.210
64	1.10	1459.0	1.41	145.9	8.31	163.7	12.5	233.6	148.8	1.211

********** STEADY STATE TEST K **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E7														
34	0.85	1152.3	1.46	221.4	12.91	247.9	5.45	209.2	146.8	1.99	120.8	2.29	148.5	0.608
50	0.85	1111.9	1.42	229.2	13.29	247.9	5.45	209.6	147.6	2.01	121.5	2.30	150.0	0.560
LEVEL E8														
34	0.87	1230.1	1.46	198.1	11.47	253.9	5.48	213.6	145.8	2.26	119.7	2.63	146.9	0.739
LEVEL F1														
17	0.93	1118.6	1.43	229.1	13.11	265.5	5.59	224.2	147.0	3.58	120.0	4.16	151.9	0.666
21	0.93	1221.4	1.43	195.6	11.20	265.5	5.59	223.3	145.1	3.53	118.5	4.11	148.5	0.804
34	0.93	1310.0	1.46	178.7	10.30	265.5	5.59	222.7	144.0	3.50	117.5	4.07	149.4	0.928
37	0.93	1205.6	1.40	196.7	11.26	265.5	5.59	223.4	145.4	3.54	118.7	4.12	149.0	0.783
38	0.93	1216.7	1.40	193.8	11.07	265.5	5.59	223.3	145.2	3.53	118.5	4.11	148.7	0.798
50	0.93	1301.2	1.42	175.6	10.00	265.5	5.59	222.8	144.1	3.50	117.6	4.08	146.6	0.915
LEVEL F2														
1	0.95	1237.0	1.41	189.0	10.83	271.3	5.67	228.2	143.5	5.40	116.4	6.14	148.9	0.871
14	0.95	1232.9	1.41	190.6	11.15	271.3	5.67	228.3	143.5	5.40	116.4	6.14	149.0	0.865
17	0.95	1245.0	1.43	189.8	10.80	271.3	5.67	228.2	143.3	5.40	116.3	6.13	148.7	0.882
34	0.95	1335.4	1.45	172.6	9.92	271.3	5.67	227.7	142.3	5.36	115.4	6.09	146.7	1.013
38	0.95	1260.5	1.40	182.0	10.38	271.3	5.67	228.1	143.1	5.39	116.1	6.13	148.3	0.904
50	0.95	1327.5	1.41	169.3	9.65	271.3	5.67	227.7	142.4	5.36	115.4	6.09	146.8	1.001
LEVEL F3														
14	0.98	1265.2	1.41	182.6	10.54	277.2	5.80	232.9	140.0	10.48	112.3	11.66	148.9	0.958
17	0.98	1273.4	1.43	183.7	10.45	277.2	5.80	232.8	139.9	10.51	112.3	11.63	148.7	0.970
21	0.98	1280.0	1.43	181.1	10.29	277.2	5.80	232.8	139.8	10.51	112.2	11.62	148.5	0.980
34	0.98	1374.2	1.46	165.7	9.52	277.2	5.80	232.3	138.9	10.43	111.4	11.54	146.7	1.123
60	0.98	1359.2	1.40	161.8	9.37	277.2	5.80	232.4	139.0	10.43	111.5	11.56	147.0	1.100

********** STEADY STATE TEST K **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F4										
60	1.00	1204.8	1.40	196.9	11.29	197.4	15.3	281.9	151.3	0.918
LEVEL F5										
21	1.02	1199.1	1.43	201.8	11.50	207.8	15.6	269.2	151.8	0.891
60	1.02	1284.3	1.40	177.1	10.12	181.8	13.0	269.2	149.6	1.021
LEVEL F6										
1	1.04	1323.4	1.46	175.4	10.26	184.2	14.2	256.6	149.3	1.059
17	1.04	1295.6	1.44	179.0	10.24	188.4	14.5	256.6	149.9	1.016
37	1.04	1283.7	1.40	177.4	10.14	186.8	14.5	256.6	150.1	0.998
38	1.04	1288.4	1.41	176.6	10.07	185.9	14.4	256.6	150.0	1.005
50	1.04	1385.5	1.42	159.4	9.11	166.9	12.3	256.6	148.2	1.157
60	1.04	1366.2	1.40	160.7	9.16	168.4	12.5	256.6	148.5	1.127
LEVEL F7										
14	1.06	1309.3	1.41	172.8	9.96	186.1	14.6	248.2	150.1	1.018
17	1.06	1330.6	1.44	171.4	9.76	184.3	14.2	248.2	149.6	1.051
21	1.06	1325.7	1.43	171.2	9.72	184.0	14.2	248.2	149.7	1.043
37	1.06	1319.8	1.40	169.5	9.69	182.4	14.2	248.2	149.8	1.035
38	1.06	1330.0	1.40	167.6	9.54	180.2	13.9	248.2	149.6	1.050
50	1.06	1424.7	1.42	152.3	8.69	162.5	11.9	248.2	148.1	1.202
60	1.06	1405.9	1.40	153.5	8.75	164.0	12.1	248.2	148.4	1.171
LEVEL F8										
1	1.08	1389.8	1.46	162.7	9.32	180.1	13.9	238.2	149.3	1.115
17	1.08	1352.8	1.44	167.2	9.50	185.9	14.6	238.2	149.9	1.056
21	1.08	1366.0	1.43	163.7	9.28	181.7	14.1	238.2	149.7	1.077
34	1.08	1459.2	1.47	151.6	8.69	166.5	12.4	238.2	148.4	1.228
37	1.08	1351.0	1.41	163.8	9.33	182.2	14.3	238.2	149.9	1.053
50	1.08	1464.9	1.42	146.4	8.34	160.7	11.9	238.2	148.3	1.238
60	1.08	1440.5	1.41	148.3	8.43	163.3	12.2	238.2	148.6	1.198

STEADY STATE TEST L

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST L **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.882E+05 LBM/SQFT H — 526.73 KG/SQM S
UNC. MASS FLUX 8.711E+03 LBM/SQFT H — 11.8214 KG/SQM S
PRESSURE 1202.5 PSI — 8.30 MPA
UNC. PRESSURE 6.00 PSI — C.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.487	783.3	0.047	14.95	1229.7	665.7	92.74	51.523	567.4	297.8	0.621	0.3	.8214	.0308
G	2.473	779.1	0.061	19.11	1313.1	712.1	44.80	24.889	570.5	299.5	19.280	10.7	1.0054	.0353
E3	2.464	776.1	0.049	15.38	1132.4	611.7	30.17	16.761	567.4	297.8	0.621	0.3	.7122	.0284
E6	2.435	767.0	0.000	0.00	1213.0	656.4	0.00	0.000	567.4	297.8	0.621	0.3	.7647	.0296
E7	2.492	785.0	0.051	16.15	1202.6	650.7	13.93	7.739	567.4	297.8	0.621	0.3	.7824	.0299
E8	2.476	779.8	0.046	14.44	1180.4	638.4	67.45	37.472	567.4	297.8	0.621	0.3	.8056	.0304
F1	2.451	772.2	0.068	21.49	1251.2	677.7	36.51	20.284	567.4	297.8	0.621	0.3	.8512	.0316
F2	2.473	778.9	0.029	9.24	1270.6	688.5	47.08	26.155	567.4	297.8	0.621	0.3	.8744	.0323
F3	2.449	771.6	0.075	23.62	1292.3	700.5	53.83	29.904	567.4	297.8	0.621	0.3	.8977	.0330
F4	2.373	747.4	0.088	27.73	1115.4	602.2	67.03	37.241	567.4	297.8	0.621	0.3	.9191	.0336
F5	2.409	758.8	0.088	27.84	1164.9	629.7	49.20	27.334	567.4	297.8	0.621	0.3	.9348	.0338
F6	2.446	770.5	0.067	20.98	1234.4	668.3	38.19	21.219	567.4	297.8	0.621	0.3	.9516	.0341
F7	2.442	769.1	0.055	17.45	1251.1	677.6	37.52	20.846	567.4	297.8	0.621	0.3	.9674	.0345
F8	2.462	775.5	0.068	21.55	1294.4	701.7	44.50	24.725	567.4	297.8	0.621	0.3	.9896	.0350

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test L

T/C Level	(# wet T/C)/(Total # T/C)
E1	All wet
E2	1/3
E3	4/7
E6	1/2
E7	2/4
E8	2/5
F	All dry

********** STEADY STATE TEST L **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
3	0.82	1170.0	2.59	429.4	26.25	642.4	12.92	508.0	311.5	3.63	291.2	4.40	299.2	1.565
4	0.82	1194.2	2.57	410.3	24.69	642.4	12.92	507.3	310.2	3.58	289.9	4.36	297.0	1.631
7	0.82	1116.1	2.45	446.9	28.36	642.4	12.92	509.7	314.9	3.75	294.5	4.52	305.1	1.417
7	0.82	1102.5	2.45	458.2	28.64	642.4	12.92	510.2	315.9	3.75	295.5	4.53	306.8	1.381
10	0.82	1261.8	2.51	361.4	22.40	642.4	12.92	505.7	307.2	3.55	286.9	4.32	291.7	1.822
10	0.82	1269.4	2.51	357.4	22.34	642.4	12.92	505.5	306.9	3.55	286.6	4.32	291.2	1.842
10	0.82	1257.0	2.51	363.9	22.78	642.4	12.92	505.8	307.4	3.57	287.1	4.33	292.0	1.808
13	0.82	1259.7	2.51	363.3	21.81	642.4	12.92	505.7	307.2	3.53	287.0	4.30	291.8	1.816
13	0.82	1247.2	2.51	370.0	23.28	642.4	12.92	506.0	307.8	3.58	287.5	4.34	292.7	1.781
15	0.82	1234.3	2.45	367.4	21.83	642.4	12.92	506.3	308.3	3.54	288.0	4.32	293.7	1.744
16	0.82	1303.0	2.45	333.7	20.00	642.4	12.92	504.9	305.6	3.50	285.4	4.27	289.1	1.939
17	0.82	1071.4	2.49	493.2	29.71	642.4	12.92	511.5	318.4	3.74	297.9	4.53	311.2	1.297
18	0.82	1191.7	2.49	398.4	24.67	642.4	12.92	507.4	310.4	3.62	290.0	4.39	297.2	1.626
18	0.82	1138.7	2.49	435.4	27.07	642.4	12.92	508.9	313.4	3.69	293.0	4.46	302.4	1.480
20	0.82	1058.4	2.51	512.2	31.18	642.4	12.92	512.1	319.6	3.79	299.1	4.58	313.2	1.263
20	0.82	1176.1	2.51	413.1	24.54	642.4	12.92	507.8	311.2	3.59	290.8	4.37	298.6	1.582
21	0.82	996.5	2.48	578.1	41.95	642.4	12.92	515.5	326.4	4.51	305.7	5.20	325.2	1.099
28	0.82	1180.1	2.47	402.7	24.00	642.4	12.92	507.7	311.0	3.59	290.6	4.37	298.2	1.593
28	0.82	1186.2	2.47	398.8	23.90	642.4	12.92	507.5	310.6	3.59	290.3	4.37	297.7	1.610
28	0.82	1167.8	2.47	411.0	24.81	642.4	12.92	508.0	311.6	3.61	291.3	4.39	299.4	1.558
31	0.82	1245.2	2.49	367.8	22.29	642.4	12.92	506.1	307.8	3.55	287.6	4.32	292.9	1.775
31	0.82	1252.4	2.49	364.0	21.80	642.4	12.92	505.9	307.5	3.53	287.3	4.31	292.4	1.796
32	0.82	1316.9	2.51	334.8	19.67	642.4	12.92	504.6	305.1	3.48	284.9	4.25	288.3	1.980
34	0.82	1256.2	2.53	367.9	22.52	642.4	12.92	505.8	307.4	3.55	287.1	4.32	292.1	1.805
37	0.82	1171.1	2.45	405.3	28.24	642.4	12.92	507.9	311.5	3.79	291.1	4.53	299.1	1.568
38	0.82	1227.7	2.46	371.9	22.68	642.4	12.92	506.5	308.6	3.57	288.3	4.34	294.2	1.725
42	0.82	1278.6	2.49	350.4	21.82	642.4	12.92	505.4	306.5	3.54	286.3	4.31	290.6	1.869
45	0.82	1187.9	2.48	400.3	23.96	642.4	12.92	507.5	310.6	3.58	290.2	4.36	297.5	1.615
45	0.82	1194.4	2.48	396.1	23.74	642.4	12.92	507.3	310.2	3.58	289.9	4.36	296.9	1.632
53	0.82	1300.0	2.59	353.5	21.42	642.4	12.92	504.9	305.7	3.51	285.5	4.28	289.3	1.931
59	0.82	1324.8	2.51	331.2	19.68	642.4	12.92	504.5	304.9	3.48	284.7	4.25	287.8	2.003
59	0.82	1318.8	2.51	333.8	19.62	642.4	12.92	504.6	305.1	3.48	284.9	4.25	288.2	1.986
59	0.82	1339.2	2.51	325.0	20.19	642.4	12.92	504.3	304.4	3.50	284.2	4.26	287.1	2.044
60	0.82	1327.4	2.43	320.4	19.54	642.4	12.92	504.5	304.8	3.50	284.6	4.26	287.7	2.009
64	0.82	1370.0	2.45	305.2	17.87	642.4	12.92	503.8	303.5	3.45	283.3	4.22	285.5	2.133
64	0.82	1413.9	2.45	289.3	16.85	642.4	12.92	503.2	302.4	3.43	282.2	4.20	283.6	2.264
64	0.82	1402.2	2.45	293.4	17.08	642.4	12.92	503.4	302.7	3.44	282.5	4.21	284.1	2.229

********** STEADY STATE TEST L **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP BTU/H FT**2	UHEXP F	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
LEVEL G										
1	1.01	1330.4	2.52	330.4	20.17	331.7	22.0	719.9	302.7	2.688
3	1.01	1316.9	2.59	345.0	20.51	346.4	22.5	719.9	303.5	2.640
14	1.01	1259.1	2.46	356.1	22.92	357.6	25.2	719.9	307.3	2.436
16	1.01	1348.5	2.45	314.3	19.30	315.5	20.9	719.9	301.7	2.752
16	1.01	1372.0	2.45	305.1	18.40	306.2	19.9	719.9	300.5	2.837
18	1.01	1285.9	2.48	345.5	20.48	346.9	22.6	719.9	305.5	2.530
18	1.01	1270.6	2.48	353.0	21.25	354.5	23.5	719.9	306.5	2.476
18	1.01	1296.1	2.48	340.6	20.18	342.1	22.2	719.9	304.8	2.566
20	1.01	1212.0	2.51	390.1	23.04	392.0	26.0	719.9	311.1	2.273
20	1.01	1299.9	2.51	343.3	21.19	344.7	23.2	719.9	304.6	2.579
20	1.01	1302.7	2.51	342.0	20.57	343.4	22.6	719.9	304.4	2.589
21	1.01	1263.8	2.39	343.4	20.00	344.9	22.3	719.9	307.0	2.452
32	1.01	1348.4	2.51	321.3	19.21	322.5	20.9	719.9	301.7	2.752
34	1.01	1358.5	2.53	319.6	19.31	320.8	20.9	719.9	301.2	2.788
37	1.01	1261.2	2.45	353.0	21.16	354.5	23.5	719.9	307.2	2.443
38	1.01	1283.3	2.46	343.5	20.70	345.0	22.8	719.9	305.6	2.521
42	1.01	1339.5	2.49	322.8	24.36	324.0	25.8	719.9	302.2	2.720
42	1.01	1364.4	2.49	312.7	18.85	313.9	20.4	719.9	300.9	2.809
45	1.01	1288.3	2.48	344.5	21.19	346.0	23.3	719.9	305.3	2.538
45	1.01	1285.1	2.48	346.1	21.18	347.5	23.3	719.9	305.5	2.527
45	1.01	1290.0	2.48	343.7	20.95	345.2	23.0	719.9	305.2	2.544
47	1.01	1289.4	2.46	340.1	20.74	341.6	22.8	719.9	305.2	2.542
50	1.01	1362.6	2.46	308.8	18.25	310.0	19.8	719.9	301.0	2.803
58	1.01	1366.0	2.54	317.5	19.14	318.7	20.7	719.9	300.8	2.815
60	1.01	1340.8	2.43	314.8	19.62	316.1	21.3	719.9	302.2	2.725
64	1.01	1377.6	2.45	302.3	17.89	303.4	19.4	719.9	300.3	2.857
64	1.01	1387.4	2.45	298.7	17.71	299.8	19.2	719.9	299.8	2.892

********** STEADY STATE TEST L **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	GGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E3														
34	0.71	1106.0	2.52	467.7	31.52	578.3	12.63	459.6	300.1	4.10	277.4	4.77	296.9	1.162
50	0.71	1126.0	2.45	438.0	29.10	578.3	12.63	458.9	298.7	4.04	276.1	4.72	294.5	1.209
60	0.71	1165.3	2.43	405.8	25.22	578.3	12.63	457.8	296.4	3.90	273.9	4.59	290.4	1.303
LEVEL E6														
60	0.76	1213.0	2.43	377.2	22.71	609.4	12.77	481.0	302.1	3.65	280.9	4.36	290.7	1.538
LEVEL E7														
34	0.78	1212.5	2.53	391.9	24.55	619.7	12.79	488.9	304.5	3.64	283.6	4.35	292.1	1.580
50	0.78	1192.8	2.46	392.7	23.99	619.7	12.79	489.3	305.5	3.63	284.6	4.35	293.8	1.528
LEVEL E8														
34	0.81	1248.0	2.53	371.5	22.98	633.2	12.85	498.7	305.9	3.56	285.4	4.30	291.3	1.738
37	0.81	1113.1	2.44	447.9	27.29	633.2	12.85	502.4	313.3	3.69	292.6	4.44	304.0	1.371
38	0.81	1180.2	2.45	400.6	23.94	633.2	12.85	500.3	309.1	3.59	288.6	4.34	296.9	1.552
LEVEL F1														
17	0.85	1226.8	2.49	376.9	22.10	659.6	13.10	519.7	311.7	3.62	291.7	4.49	296.7	1.805
21	0.85	1192.1	2.48	397.2	23.92	659.6	13.10	520.6	313.4	3.67	293.3	4.54	299.6	1.706
34	0.85	1289.0	2.53	350.4	21.48	659.6	13.10	518.4	309.1	3.61	289.1	4.47	292.3	1.989
37	0.85	1234.1	2.44	366.6	21.86	659.6	13.10	519.6	311.3	3.62	291.3	4.50	296.1	1.826
38	0.85	1260.7	2.45	354.1	20.92	659.6	13.10	519.0	310.2	3.60	290.2	4.47	294.2	1.905
50	0.85	1296.2	2.46	337.0	19.85	659.6	13.10	518.2	308.8	3.57	288.9	4.44	291.8	2.010
LEVEL F2														
1	0.87	1248.5	2.46	360.7	21.64	672.9	13.28	530.1	312.6	3.80	292.7	4.80	297.0	1.944
14	0.87	1189.9	2.46	394.9	25.62	672.9	13.28	531.6	315.4	3.93	295.4	4.91	301.7	1.768
17	0.87	1268.6	2.48	354.4	20.68	672.9	13.28	529.7	311.8	3.77	291.9	4.76	295.6	2.004
34	0.87	1315.1	2.53	338.1	20.59	672.9	13.28	528.7	310.1	3.77	290.2	4.75	292.7	2.148
38	0.87	1289.3	2.45	340.0	20.03	672.9	13.28	529.2	311.0	3.76	291.1	4.75	294.2	2.068
50	0.87	1312.4	2.46	329.6	19.49	672.9	13.28	528.8	310.2	3.75	290.3	4.74	292.8	2.139
LEVEL F3														
14	0.90	1230.0	2.46	370.7	22.97	686.2	13.50	541.0	314.8	4.22	294.8	5.40	300.3	1.961
17	0.90	1274.0	2.49	351.8	20.57	686.2	13.50	539.9	313.0	4.14	293.0	5.33	297.1	2.099
21	0.90	1243.4	2.48	367.1	21.49	686.2	13.50	540.6	314.2	4.17	294.2	5.36	299.2	2.003
34	0.90	1357.2	2.53	320.1	19.41	686.2	13.50	538.4	310.1	4.11	290.2	5.29	292.2	2.361
60	0.90	1352.7	2.43	310.1	19.32	686.2	13.50	538.4	310.2	4.13	290.3	5.30	292.5	2.347
LEVEL F4														
60	0.92	1162.8	2.43	409.0	24.80	698.4	13.65	552.3	319.1	4.96	298.8	6.44	308.0	1.821
LEVEL F5														
21	0.93	1115.9	2.48	452.4	26.95	707.3	13.63	561.2	322.2	5.94	301.5	7.75	314.7	1.732
60	0.93	1214.3	2.43	376.4	22.62	707.3	13.63	558.0	316.4	5.82	295.8	7.60	304.5	2.037
LEVEL F6														
1	0.95	1249.4	2.52	370.0	24.10	716.7	13.63	564.7	314.3	7.76	293.2	9.95	303.1	2.211
17	0.95	1216.1	2.49	383.7	23.18	716.7	13.63	565.5	315.8	7.77	294.7	9.99	305.7	2.103
37	0.95	1197.3	2.45	388.2	23.46	716.7	13.63	566.1	316.7	7.80	295.6	10.02	307.4	2.042
38	0.95	1191.6	2.46	393.7	23.50	716.7	13.63	566.2	317.0	7.80	295.9	10.02	307.9	2.024
50	0.95	1285.6	2.46	342.7	20.57	716.7	13.63	563.8	312.8	7.69	291.8	9.88	300.6	2.331
60	0.95	1280.8	2.44	341.7	20.36	716.7	13.63	563.9	313.0	7.69	292.0	9.88	300.9	2.315
LEVEL F7														
14	0.97	1221.3	2.46	375.9	23.40	725.6	13.68	572.1	314.2	15.66	292.3	15.66	306.5	2.178
17	0.97	1249.1	2.49	365.0	21.61	725.6	13.68	571.4	312.9	15.86	291.1	15.59	304.3	2.270
21	0.97	1218.2	2.48	381.5	22.47	725.6	13.68	572.2	314.3	15.93	292.5	15.66	306.8	2.168
37	0.97	1222.3	2.44	373.3	22.48	725.6	13.68	572.1	314.1	15.81	292.3	15.65	306.4	2.182
38	0.97	1234.8	2.46	368.0	21.82	725.6	13.68	571.7	313.6	15.87	291.7	15.62	305.4	2.223
50	0.97	1312.5	2.46	329.8	19.78	725.6	13.68	569.9	310.5	15.74	288.8	15.46	300.1	2.480
60	0.97	1305.7	2.44	330.0	19.66	725.6	13.68	570.1	310.7	15.77	289.0	15.47	300.5	2.457

********** STEADY STATE TEST L **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F8														
1	0.99	1330.8	2.52	330.8	19.97	738.1	17.74	579.8	304.7	15.85	281.0	20.58	300.8	2.644
17	0.99	1256.3	2.49	361.4	21.27	738.1	17.74	581.4	307.4	16.03	283.6	20.72	305.6	2.386
21	0.99	1246.5	2.49	366.1	21.45	738.1	17.74	581.6	307.8	16.06	284.0	20.74	306.4	2.354
34	0.99	1329.6	2.53	332.3	20.28	738.1	17.74	579.8	304.8	15.81	281.0	20.62	300.9	2.640
37	0.99	1251.2	2.45	358.1	21.30	738.1	17.74	581.5	307.6	15.98	283.8	20.79	306.0	2.370
50	0.99	1344.9	2.46	316.4	18.83	738.1	17.74	579.5	304.3	15.89	280.6	20.48	300.1	2.693
60	0.99	1337.4	2.44	316.8	18.72	738.1	17.74	579.6	304.5	15.93	280.8	20.47	300.5	2.667

STEADY STATE TEST M

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB	- CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT	TSAT	- SATURATION TEMPERATURE
HDB	- DITTUS-BOELTER HEAT TRANSFER COEFFICIENT	TSRF(TSURF)	- SURFACE TEMPERATURE
HDR	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT	TF	- EQUILIBRIUM FLUID TEMPERATURE
HDRPW	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER	UHDR	- UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HEXP	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)	UHEXP	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HEXPS	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)	UHEXPS	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HG57	- GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT	UHG57	- UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59	- GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT	UHG59	- UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q	- HEAT FLUX	UNC	- UNCERTAINTY
QGD	- GROENEVELD-DELORME HEAT FLUX	UTF	- UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
SDTSRF	- CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE	UX	- UNCERTAINTY, QUALITY
SDQ	- CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX	X	- QUALITY
TBULK	- BULK VAPOR TEMPERATURE		

********** STEADY STATE TEST M **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 4.838E+05 LBM/SQFT H 656.51 KG/SQM S

UNC. MASS FLUX 1.090E+04 LBM/SQFT H 14.7924 KG/SQM S

PRESSURE 1242.1 PSI 8.57 MPA

UNC. PRESSURE 6.00 PSI C.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.811	885.3	0.053	16.84	1272.0	689.2	66.76	37.087	571.4	300.0	0.597	0.3	.7677	.0287
G	2.791	879.1	0.068	21.48	1282.3	695.0	40.26	22.367	571.4	300.0	0.597	0.3	.9364	.0328
E2	2.730	860.0	0.000	0.00	1143.8	618.0	0.00	0.000	571.4	300.0	0.597	0.3	.6449	.0258
E3	2.788	878.2	0.055	17.40	1203.5	651.2	6.33	3.518	571.4	300.0	0.597	0.3	.6673	.0265
E6	2.677	843.3	0.098	30.96	1181.7	639.1	33.23	18.463	571.4	300.0	0.597	0.3	.7156	.0275
E7	2.794	880.1	0.051	15.94	1179.0	637.6	58.56	32.532	571.4	300.0	0.597	0.3	.7318	.0279
E8	2.796	880.7	0.050	15.79	1230.2	666.0	26.39	14.661	571.4	300.0	0.597	0.3	.7531	.0283
F1	2.768	872.0	0.077	24.13	1283.4	695.6	36.78	20.433	571.4	300.0	0.597	0.3	.7950	.0294
F2	2.796	880.9	0.031	9.71	1295.4	702.2	48.29	26.829	571.4	300.0	0.597	0.3	.8163	.0300
F3	2.764	870.8	0.084	26.55	1301.1	705.4	49.01	27.229	571.4	300.0	0.597	0.3	.8376	.0307
F4	2.677	843.3	0.098	30.96	1092.1	589.3	46.74	25.967	571.4	300.0	0.597	0.3	.8572	.0312
F5	2.718	856.1	0.095	31.07	1137.8	614.7	44.28	24.599	571.4	300.0	0.597	0.3	.8717	.0315
F6	2.760	869.5	0.075	23.52	1205.4	652.2	37.20	20.667	571.4	300.0	0.597	0.3	.8870	.0318
F7	2.759	869.2	0.062	19.65	1221.0	660.9	30.78	17.099	571.4	300.0	0.597	0.3	.9015	.0320
F8	2.777	874.9	0.077	24.15	1264.3	684.9	39.69	22.049	571.4	300.0	0.597	0.3	.9219	.0325

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test M

T/C Level	(# wet T/C)/(Total # T/C)
D	All wet
E	53/60
E1	1/4
E2	2/3
E3	3/7
E6	0.2
E7	1/4
E8	2/5
F	All dry

********** STEADY STATE TEST M **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	GGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
3	0.77	1242.9	2.93	435.7	26.71	744.9	14.75	583.6	355.2	4.19	345.2	5.24	341.6	2.047
4	0.77	1241.8	2.91	433.5	26.29	744.9	14.75	583.6	355.3	4.18	345.2	5.23	341.7	2.043
7	0.77	1249.1	2.78	409.6	25.85	744.9	14.75	583.4	354.9	4.21	344.9	5.26	341.1	2.068
7	0.77	1246.6	2.78	411.2	25.31	744.9	14.75	583.5	355.1	4.19	345.0	5.24	341.3	2.059
10	0.77	1262.6	2.84	410.5	26.10	744.9	14.75	583.1	354.3	4.21	344.2	5.25	340.0	2.113
10	0.77	1276.2	2.84	402.6	25.79	744.9	14.75	582.8	353.6	4.20	343.6	5.24	338.9	2.156
10	0.77	1262.9	2.84	410.3	26.38	744.9	14.75	583.1	354.3	4.22	344.2	5.26	339.9	2.114
13	0.77	1303.1	2.84	388.1	23.52	744.9	14.75	582.2	352.5	4.13	342.4	5.17	336.9	2.245
13	0.77	1288.6	2.84	395.9	25.42	744.9	14.75	582.5	353.1	4.19	343.0	5.23	337.9	2.196
15	0.77	1251.5	2.77	406.9	24.44	744.9	14.75	583.4	354.8	4.16	344.7	5.21	340.9	2.076
16	0.77	1314.9	2.77	373.2	22.68	744.9	14.75	581.9	352.0	4.12	341.9	5.17	336.1	2.285
17	0.77	1259.3	2.81	408.5	24.10	744.9	14.75	583.2	354.4	4.14	344.4	5.19	340.2	2.102
18	0.77	1197.1	2.81	449.2	28.46	744.9	14.75	584.9	357.8	4.28	347.8	5.33	346.0	1.899
18	0.77	1135.8	2.81	498.0	31.79	744.9	14.75	587.1	361.9	4.39	352.0	5.44	353.2	1.704
20	0.77	1083.7	2.84	554.8	34.18	744.9	14.75	589.4	366.4	4.43	356.6	5.50	361.1	1.544
20	0.77	1199.3	2.84	452.7	27.15	744.9	14.75	584.8	357.6	4.21	347.6	5.27	345.8	1.906
21	0.77	1144.1	2.80	488.6	34.89	744.9	14.75	586.7	361.3	4.58	351.3	5.59	352.1	1.730
28	0.77	1282.7	2.79	392.7	23.39	744.9	14.75	582.6	353.4	4.13	343.3	5.18	338.4	2.177
28	0.77	1262.3	2.79	404.3	24.27	744.9	14.75	583.1	354.3	4.15	344.2	5.20	340.0	2.112
28	0.77	1258.7	2.79	406.4	24.55	744.9	14.75	583.2	354.5	4.16	344.4	5.21	340.3	2.100
31	0.77	1251.3	2.81	414.0	25.53	744.9	14.75	583.4	354.8	4.19	344.8	5.24	340.9	2.075
31	0.77	1260.5	2.81	408.5	24.83	744.9	14.75	583.2	354.4	4.16	344.3	5.21	340.1	2.106
32	0.77	1335.7	2.83	370.3	21.95	744.9	14.75	581.5	351.2	4.09	341.1	5.14	334.7	2.355
34	0.77	1262.1	2.86	414.2	25.89	744.9	14.75	583.1	354.3	4.19	344.2	5.23	340.0	2.111
37	0.77	1228.3	2.76	420.4	30.08	744.9	14.75	584.0	356.0	4.39	346.0	5.41	342.9	1.999
38	0.77	1277.3	2.78	393.5	24.27	744.9	14.75	582.7	353.6	4.16	343.5	5.21	338.8	2.160
42	0.77	1281.3	2.82	396.6	25.34	744.9	14.75	582.7	353.4	4.19	343.3	5.23	338.5	2.172
45	0.77	1265.1	2.81	404.7	24.24	744.9	14.75	583.0	354.2	4.15	344.1	5.20	339.8	2.121
45	0.77	1277.3	2.81	397.7	23.83	744.9	14.75	582.7	353.6	4.14	343.5	5.19	338.8	2.160
53	0.77	1327.6	2.93	387.1	23.84	744.9	14.75	581.7	351.5	4.12	341.4	5.16	335.2	2.328
59	0.77	1321.8	2.84	378.0	22.80	744.9	14.75	581.8	351.7	4.11	341.6	5.16	335.6	2.308
59	0.77	1312.3	2.84	382.8	22.77	744.9	14.75	582.0	352.1	4.11	342.0	5.15	336.3	2.276
59	0.77	1335.3	2.84	371.3	23.68	744.9	14.75	581.5	351.2	4.14	341.1	5.18	334.7	2.354
60	0.77	1339.7	2.75	358.1	22.26	744.9	14.75	581.4	351.1	4.12	340.9	5.16	334.5	2.369
64	0.77	1383.8	2.77	340.5	20.12	744.9	14.75	580.6	349.6	4.06	339.4	5.10	331.9	2.517
64	0.77	1414.2	2.77	328.3	19.30	744.9	14.75	580.2	348.7	4.04	338.5	5.08	330.4	2.621
64	0.77	1417.1	2.77	327.1	19.19	744.9	14.75	580.1	348.6	4.04	338.4	5.08	330.3	2.631
LEVEL G														
1	0.94	1318.9	2.84	380.3	23.77	862.9	15.70	673.9	368.6	6.74	360.1	9.16	353.2	2.999
3	0.94	1295.3	2.92	403.0	24.40	862.9	15.70	674.5	369.6	6.75	361.1	9.18	355.0	2.904
14	0.94	1252.5	2.78	408.6	27.27	862.9	15.70	675.7	371.6	6.85	363.2	9.29	358.5	2.733
16	0.94	1304.0	2.77	378.2	23.91	862.9	15.70	674.3	369.2	6.76	360.7	9.19	354.3	2.939
16	0.94	1338.0	2.77	361.4	22.31	862.9	15.70	673.5	367.8	6.71	359.3	9.14	351.9	3.076
18	0.94	1255.7	2.80	409.4	24.70	862.9	15.70	675.6	371.4	6.79	363.0	9.24	358.2	2.745
18	0.94	1249.7	2.80	413.0	25.43	862.9	15.70	675.8	371.7	6.80	363.3	9.25	358.7	2.722
18	0.94	1264.1	2.80	404.4	24.38	862.9	15.70	675.4	371.0	6.78	362.6	9.22	357.5	2.779
20	0.94	1183.5	2.84	463.6	27.88	862.9	15.70	678.0	375.6	6.88	367.3	9.36	365.5	2.462
20	0.94	1279.2	2.84	401.0	25.47	862.9	15.70	674.9	370.3	6.79	361.9	9.22	356.2	2.839
20	0.94	1271.0	2.84	405.7	24.96	862.9	15.70	675.2	370.7	6.78	362.3	9.22	356.9	2.806
21	0.94	1230.6	2.70	409.6	24.18	862.9	15.70	676.4	372.8	6.80	364.4	9.26	360.5	2.646
32	0.94	1325.7	2.83	374.6	22.86	862.9	15.70	673.8	368.3	6.72	359.8	9.15	352.8	3.026
34	0.94	1316.0	2.85	383.0	23.75	862.9	15.70	674.0	368.7	6.74	360.2	9.17	353.5	2.987
37	0.94	1236.1	2.76	415.8	25.48	862.9	15.70	676.2	372.5	6.82	364.1	9.27	360.0	2.668
38	0.94	1253.5	2.78	407.0	25.11	862.9	15.70	675.7	371.5	6.80	363.1	9.25	358.4	2.737
42	0.94	1295.2	2.81	388.3	31.68	862.9	15.70	674.5	369.6	6.95	361.1	9.33	355.0	2.903
42	0.94	1315.5	2.81	377.7	23.36	862.9	15.70	674.0	368.7	6.74	360.2	9.17	353.5	2.985
45	0.94	1267.5	2.80	402.7	25.45	862.9	15.70	675.3	370.8	6.80	362.4	9.24	357.2	2.792
45	0.94	1259.7	2.80	407.2	25.61	862.9	15.70	675.5	371.2	6.81	362.8	9.25	357.9	2.761
45	0.94	1266.0	2.80	403.5	25.25	862.9	15.70	675.3	370.9	6.80	362.5	9.24	357.3	2.786
47	0.94	1254.5	2.77	405.4	25.40	862.9	15.70	675.6	371.5	6.81	363.1	9.25	358.3	2.741
50	0.94	1302.3	2.77	379.0	22.88	862.9	15.70	674.3	369.2	6.74	360.8	9.17	354.4	2.932
58	0.94	1319.9	2.86	382.6	23.68	862.9	15.70	673.9	368.5	6.73	360.0	9.16	353.2	3.003
60	0.94	1303.9	2.75	375.0	24.13	862.9	15.70	674.3	369.2	6.77	360.7	9.19	354.3	2.938
64	0.94	1346.4	2.76	356.4	21.45	862.9	15.70	673.3	367.5	6.70	359.0	9.12	351.4	3.110
64	0.94	1359.8	2.76	350.4	21.12	862.9	15.70	673.0	367.0	6.69	358.5	9.11	350.6	3.165

********** STEADY STATE TEST M **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E2														
60	0.64	1143.8	2.73	476.9	30.80	656.1	14.15	517.5	336.7	4.74	321.7	5.78	338.5	1.433
LEVEL E3														
34	0.67	1210.8	2.85	445.8	29.76	672.6	14.42	528.2	337.6	4.65	323.7	5.68	333.7	1.670
50	0.67	1200.2	2.77	440.3	29.31	672.6	14.42	528.5	338.2	4.66	324.2	5.69	334.7	1.640
60	0.67	1199.5	2.75	437.0	27.57	672.6	14.42	528.5	338.3	4.60	324.3	5.65	334.8	1.638
LEVEL E6														
60	0.72	1205.2	2.75	433.4	26.58	707.6	14.58	555.9	347.9	4.39	335.9	5.43	339.6	1.780
LEVEL E7														
34	0.73	1216.2	2.85	442.3	28.44	719.3	14.60	564.6	350.3	4.37	339.0	5.39	340.3	1.857
37	0.73	1111.5	2.76	510.9	31.79	719.3	14.60	568.2	357.4	4.48	346.2	5.54	352.7	1.537
50	0.73	1209.3	2.77	434.3	26.96	719.3	14.60	564.8	350.7	4.33	339.4	5.37	340.9	1.836
LEVEL E8														
34	0.75	1254.3	2.85	417.8	26.41	734.6	14.68	575.5	352.2	4.24	341.7	5.27	339.1	2.040
37	0.75	1202.0	2.76	437.8	26.65	734.6	14.68	576.9	355.0	4.26	344.5	5.30	343.9	1.872
38	0.75	1234.3	2.77	418.4	25.15	734.6	14.68	576.0	353.2	4.21	342.7	5.26	340.9	1.977
LEVEL F1														
17	0.79	1295.9	2.81	387.5	22.77	764.3	14.95	597.4	357.1	4.08	347.8	5.16	340.3	2.314
21	0.79	1207.3	2.80	440.3	26.91	764.3	14.95	599.7	361.5	4.19	352.3	5.28	347.9	2.013
34	0.79	1282.0	2.85	401.6	25.19	764.3	14.95	597.7	357.7	4.14	348.4	5.22	341.3	2.266
37	0.79	1273.1	2.76	393.5	23.66	764.3	14.95	597.9	358.1	4.11	348.8	5.20	342.0	2.235
38	0.79	1299.2	2.77	381.1	22.71	764.3	14.95	597.3	356.9	4.09	347.7	5.17	340.0	2.326
50	0.79	1317.7	2.77	371.4	22.09	764.3	14.95	596.9	356.2	4.07	346.9	5.15	338.7	2.390
LEVEL F2														
1	0.82	1315.0	2.80	376.4	22.76	779.4	15.16	609.1	359.3	4.10	350.6	5.22	341.2	2.462
14	0.82	1198.6	2.78	443.1	29.72	779.4	15.16	612.2	365.1	4.34	356.5	5.45	351.1	2.059
17	0.82	1306.8	2.81	381.5	22.37	779.4	15.16	609.3	359.7	4.08	350.9	5.21	341.8	2.433
34	0.82	1305.1	2.85	388.7	24.22	779.4	15.16	609.4	359.7	4.13	351.0	5.25	341.9	2.427
38	0.82	1315.6	2.77	372.5	22.13	779.4	15.16	609.1	359.3	4.08	350.5	5.21	341.2	2.465
50	0.82	1331.1	2.77	364.6	21.78	779.4	15.16	608.8	358.7	4.08	349.9	5.20	340.2	2.519
LEVEL F3														
14	0.84	1239.7	2.78	415.3	26.32	794.4	15.40	622.6	365.5	4.27	357.3	5.45	349.4	2.274
17	0.84	1298.0	2.81	386.1	22.74	794.4	15.40	621.1	362.8	4.14	354.5	5.34	344.6	2.482
21	0.84	1244.6	2.80	415.7	24.56	794.4	15.40	622.5	365.3	4.19	357.0	5.39	348.9	2.292
34	0.84	1350.5	2.85	366.1	22.65	794.4	15.40	620.0	360.7	4.14	352.3	5.33	341.1	2.671
60	0.84	1341.8	2.75	356.5	22.83	794.4	15.40	620.1	361.0	4.18	352.7	5.35	341.7	2.640
LEVEL F4														
60	0.86	1125.1	2.75	496.1	31.00	808.1	15.57	637.7	375.4	4.52	367.6	5.82	364.6	1.949
LEVEL F5														
21	0.87	1088.7	2.80	541.0	32.92	818.2	15.55	647.8	380.1	4.67	372.6	6.09	372.1	1.875
60	0.87	1174.7	2.75	455.3	28.05	818.2	15.55	644.0	373.1	4.54	365.4	5.94	359.8	2.180
LEVEL F6														
1	0.89	1238.3	2.85	426.6	28.88	828.8	15.55	650.1	370.5	4.78	362.8	6.29	354.8	2.469
17	0.89	1207.5	2.81	441.7	27.23	828.8	15.55	651.0	372.3	4.72	364.6	6.25	357.8	2.354
37	0.89	1158.6	2.76	470.0	29.18	828.8	15.55	652.8	375.5	4.79	367.9	6.34	363.4	2.176
38	0.89	1153.2	2.77	476.9	29.13	828.8	15.55	653.1	375.9	4.78	368.3	6.33	364.1	2.159
50	0.89	1238.0	2.77	416.2	25.65	828.8	15.55	650.1	370.5	4.68	362.8	6.21	354.8	2.468
60	0.89	1240.4	2.75	410.9	25.03	828.8	15.55	650.0	370.4	4.67	362.6	6.20	354.6	2.477
LEVEL F7														
14	0.90	1190.9	2.78	448.8	28.93	838.8	15.57	659.3	374.2	5.12	366.5	6.83	361.0	2.349
17	0.90	1236.9	2.81	422.2	25.36	838.8	15.57	657.7	371.5	4.99	363.7	6.70	356.4	2.523

********** STEADY STATE TEST M **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F7														
21	0.90	1198.5	2.80	447.0	26.74	838.8	15.57	659.0	373.8	5.03	366.0	6.75	360.2	2.378
37	0.90	1187.2	2.76	448.8	27.70	838.8	15.57	659.4	374.5	5.07	366.8	6.79	361.5	2.335
38	0.90	1204.6	2.78	438.6	26.51	838.8	15.57	658.8	373.4	5.03	365.6	6.75	359.6	2.401
50	0.90	1259.5	2.78	403.6	24.86	838.8	15.57	657.1	370.4	4.99	362.5	6.69	354.4	2.609
60	0.90	1266.4	2.75	395.9	24.10	838.8	15.57	656.9	370.0	4.97	362.2	6.68	353.8	2.635
LEVEL F8														
1	0.92	1323.8	2.85	378.4	23.29	852.9	15.63	666.8	368.3	5.72	360.1	7.78	351.6	2.955
17	0.92	1239.2	2.81	420.8	25.11	852.9	15.63	669.1	372.2	5.78	364.2	7.86	358.4	2.621
21	0.92	1219.8	2.80	432.3	25.70	852.9	15.63	669.7	373.3	5.80	365.3	7.89	360.2	2.546
34	0.92	1286.1	2.86	399.7	25.12	852.9	15.63	667.7	369.9	5.77	361.8	7.83	354.4	2.805
37	0.92	1223.0	2.76	424.2	25.74	852.9	15.63	669.6	373.1	5.82	365.1	7.90	359.9	2.559
50	0.92	1287.8	2.77	387.3	23.60	852.9	15.63	667.7	369.8	5.75	361.7	7.81	354.2	2.812
60	0.92	1299.8	2.75	377.7	22.73	852.9	15.63	667.4	369.3	5.73	361.2	7.79	353.3	2.860

STEADY STATE TEST N

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST N **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 5.941E+05 LBM/SQFT H UNC. MASS FLUX 1.339E+04 LBM/SQFT H PRESSURE 1234.2 PSI UNC. PRESSURE 6.00 PSI
806.19 KG/SQM S 18.1759 KG/SQM S 8.52 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	3.016	949.9	0.057	18.05	1203.8	651.3	57.05	31.695	570.6	299.6	0.597	0.3	.6681	.0254
G	3.000	944.9	0.075	23.67	1235.3	668.8	45.44	25.243	570.6	299.6	0.597	0.3	.8152	.0290
E2	2.990	941.9	0.054	17.04	1165.2	629.9	15.77	8.761	570.6	299.6	0.597	0.3	.5808	.0235
E7	3.018	950.7	0.058	18.35	1121.1	605.4	49.21	27.341	570.6	299.6	0.597	0.3	.6369	.0247
E8	3.016	949.9	0.062	19.47	1193.0	645.4	47.02	26.124	570.6	299.6	0.597	0.3	.6555	.0251
F1	2.964	933.7	0.085	26.67	1243.6	673.5	18.48	10.266	570.6	299.6	0.597	0.3	.6919	.0261
F2	2.945	927.6	0.039	12.25	1267.1	686.5	11.06	6.143	570.6	299.6	0.597	0.3	.7105	.0266
F3	2.970	935.6	0.087	27.34	1223.8	662.5	110.80	61.557	570.6	299.6	0.597	0.3	.7291	.0272
F5	2.957	931.5	0.000	0.00	983.9	529.2	0.00	0.000	570.6	299.6	0.597	0.3	.7588	.0278
F6	2.960	932.5	0.093	29.23	1130.8	610.8	33.55	18.640	570.6	299.6	0.597	0.3	.7721	.0281
F7	2.960	932.5	0.064	20.25	1136.4	613.9	55.99	31.106	570.6	299.6	0.597	0.3	.7848	.0283
F8	2.980	938.8	0.079	24.87	1206.1	652.6	38.95	21.638	570.6	299.6	0.597	0.3	.8026	.0287

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

T/C Level	Test N (# wet T/C)/(Total # T/C)
E2	All wet
E3	4/7
E6	1/2
E7	2/4
E8	3/5
F	All dry

********** STEADY STATE TEST N **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
3	0.67	1195.8	3.14	502.7	31.55	789.9	15.78	620.9	389.0	4.98	389.9	6.40	388.8	2.017
4	0.67	1198.8	3.12	496.3	30.66	789.9	15.78	620.8	388.8	4.95	389.7	6.37	388.5	2.027
7	0.67	1107.9	2.98	553.8	37.05	789.9	15.78	624.4	395.9	5.27	397.1	6.69	401.2	1.719
7	0.67	1105.8	2.98	555.9	36.23	789.9	15.78	624.5	396.1	5.22	397.3	6.64	401.6	1.712
10	0.67	1224.0	3.04	465.3	30.37	789.9	15.78	620.1	387.3	4.99	388.1	6.39	385.7	2.116
10	0.67	1254.2	3.04	444.8	29.16	789.9	15.78	619.2	385.6	4.95	386.3	6.35	382.7	2.219
10	0.67	1219.7	3.04	468.4	30.97	789.9	15.78	620.2	387.5	5.01	388.3	6.41	386.2	2.100
13	0.67	1235.7	3.05	457.9	28.41	789.9	15.78	619.7	386.6	4.91	387.4	6.33	384.5	2.157
13	0.67	1221.7	3.05	467.7	31.02	789.9	15.78	620.1	387.4	5.01	388.2	6.41	386.0	2.107
15	0.67	1216.1	2.97	460.5	28.10	789.9	15.78	620.3	387.7	4.92	388.6	6.34	386.6	2.088
16	0.67	1208.9	2.98	467.2	29.40	789.9	15.78	620.5	388.2	4.96	389.0	6.38	387.4	2.062
17	0.67	1212.0	3.01	468.8	28.04	789.9	15.78	620.4	388.0	4.90	388.8	6.32	387.0	2.073
18	0.67	1157.0	3.01	513.5	33.50	789.9	15.78	622.3	391.7	5.10	392.8	6.52	393.7	1.885
18	0.67	1101.4	3.01	567.3	37.34	789.9	15.78	624.7	396.5	5.25	397.8	6.68	402.4	1.697
20	0.67	1025.1	3.05	671.0	42.76	789.9	15.78	629.1	405.4	5.43	407.2	6.89	418.8	1.452
20	0.67	1167.9	3.05	510.6	31.08	789.9	15.78	621.9	390.9	4.98	391.9	6.41	392.3	1.923
28	0.67	1166.1	2.99	501.7	30.70	789.9	15.78	622.0	391.1	4.99	392.1	6.42	392.5	1.916
28	0.67	1177.0	2.99	492.7	30.40	789.9	15.78	621.6	390.3	4.98	391.2	6.41	391.1	1.954
28	0.67	1178.5	2.99	491.5	30.48	789.9	15.78	621.5	390.2	4.99	391.1	6.41	390.9	1.960
31	0.67	1190.0	3.02	487.6	30.97	789.9	15.78	621.1	389.4	5.00	390.3	6.42	389.5	1.998
31	0.67	1195.9	3.02	483.0	30.14	789.9	15.78	620.9	389.0	4.97	389.9	6.39	388.8	2.017
32	0.67	1226.5	3.04	463.4	28.20	789.9	15.78	620.0	387.1	4.90	387.9	6.32	385.5	2.124
34	0.67	1246.3	3.07	454.1	28.87	789.9	15.78	619.4	386.0	4.93	386.8	6.33	383.5	2.193
37	0.67	1142.4	2.96	518.1	39.68	789.9	15.78	622.9	392.9	5.45	394.0	6.83	395.8	1.834
38	0.67	1215.8	2.97	461.0	29.14	789.9	15.78	620.3	387.8	4.96	388.6	6.37	386.6	2.087
42	0.67	1236.0	3.02	453.3	29.76	789.9	15.78	619.7	386.6	4.98	387.4	6.38	384.5	2.158
45	0.67	1200.6	3.01	477.7	29.24	789.9	15.78	620.8	388.7	4.94	389.6	6.36	388.3	2.033
45	0.67	1210.7	3.01	470.2	28.79	789.9	15.78	620.5	388.1	4.93	388.9	6.35	387.2	2.069
53	0.67	1269.0	3.14	450.0	28.37	789.9	15.78	618.8	384.8	4.89	385.5	6.30	381.4	2.272
59	0.67	1247.4	3.05	450.0	27.77	789.9	15.78	619.4	386.0	4.89	386.7	6.31	383.4	2.196
59	0.67	1214.3	3.05	473.2	28.89	789.9	15.78	620.4	387.9	4.92	388.7	6.34	386.8	2.081
59	0.67	1264.1	3.05	439.2	28.88	789.9	15.78	618.9	385.1	4.94	385.8	6.34	381.8	2.254
60	0.67	1250.3	2.97	436.3	28.05	789.9	15.78	619.3	385.8	4.93	386.5	6.34	383.1	2.205
64	0.67	1290.8	2.98	413.6	24.95	789.9	15.78	618.3	383.8	4.83	384.4	6.24	379.5	2.349
64	0.67	1314.6	2.98	400.4	23.96	789.9	15.78	617.7	382.7	4.81	383.3	6.21	377.6	2.433
64	0.67	1272.5	2.98	424.4	25.47	789.9	15.78	618.7	384.7	4.84	385.3	6.25	381.1	2.284
LEVEL G														
1	0.82	1296.5	3.05	420.3	26.77	913.7	16.74	714.8	413.5	4.64	421.7	6.18	398.6	2.951
3	0.82	1223.0	3.15	482.4	29.98	913.7	16.74	717.0	417.6	4.70	426.0	6.25	405.7	2.648
14	0.82	1213.0	2.99	465.3	32.15	913.7	16.74	717.4	418.2	4.88	426.7	6.41	406.9	2.607
16	0.82	1255.7	2.98	435.3	28.22	913.7	16.74	715.9	415.6	4.71	424.0	6.25	402.2	2.780
16	0.82	1311.5	2.98	402.5	25.31	913.7	16.74	714.4	412.8	4.61	420.9	6.15	397.4	3.014
18	0.82	1221.5	3.00	461.6	28.33	913.7	16.74	717.1	417.7	4.68	426.1	6.24	405.9	2.642
18	0.82	1219.1	3.00	463.3	29.09	913.7	16.74	717.2	417.8	4.72	426.3	6.27	406.2	2.632
18	0.82	1227.5	3.00	457.4	28.06	913.7	16.74	716.9	417.3	4.68	425.7	6.23	405.3	2.667
20	0.82	1146.0	3.05	530.0	32.43	913.7	16.74	720.1	423.3	4.79	432.1	6.36	415.7	2.337
20	0.82	1239.0	3.05	456.2	29.88	913.7	16.74	716.5	416.6	4.75	425.0	6.29	404.0	2.715
20	0.82	1228.2	3.05	463.7	29.13	913.7	16.74	716.8	417.3	4.71	425.7	6.26	405.2	2.670
21	0.82	1184.6	2.90	471.9	28.22	913.7	16.74	718.4	420.2	4.69	428.8	6.26	410.3	2.491
32	0.82	1316.6	3.04	407.4	25.19	913.7	16.74	714.2	412.5	4.59	420.6	6.13	397.0	3.036
34	0.82	1241.9	3.06	455.7	29.12	913.7	16.74	716.4	416.4	4.71	424.8	6.26	403.7	2.727
37	0.82	1190.5	2.97	478.3	29.97	913.7	16.74	718.2	419.8	4.76	428.4	6.32	409.6	2.515
38	0.82	1207.6	2.97	466.9	29.50	913.7	16.74	717.6	418.6	4.74	427.1	6.30	407.5	2.585
42	0.82	1221.7	3.02	463.3	40.72	913.7	16.74	717.1	417.7	5.35	426.1	6.82	405.9	2.643
42	0.82	1238.7	3.02	451.5	28.75	913.7	16.74	716.5	416.6	4.71	425.0	6.26	404.1	2.713
45	0.82	1215.6	3.02	467.6	30.63	913.7	16.74	717.3	418.1	4.79	426.6	6.33	406.6	2.618
45	0.82	1202.4	3.02	477.4	31.09	913.7	16.74	717.8	418.9	4.80	427.5	6.35	408.1	2.564
45	0.82	1207.8	3.02	473.3	30.56	913.7	16.74	717.6	418.6	4.78	427.1	6.32	407.5	2.586
47	0.82	1217.1	2.98	461.6	29.66	913.7	16.74	717.2	418.0	4.76	426.5	6.30	406.4	2.624
50	0.82	1204.1	2.98	469.9	29.21	913.7	16.74	717.7	418.8	4.72	427.4	6.28	407.9	2.571
58	0.82	1247.9	3.08	454.6	29.02	913.7	16.74	716.2	416.1	4.70	424.4	6.25	403.1	2.749
60	0.82	1253.9	2.96	433.9	28.75	913.7	16.74	716.0	415.7	4.74	424.1	6.28	402.5	2.772
64	0.82	1315.1	2.98	400.1	24.45	913.7	16.74	714.3	412.6	4.58	420.7	6.12	397.1	3.029
64	0.82	1346.3	2.98	384.0	23.45	913.7	16.74	713.5	411.2	4.56	419.3	6.09	394.7	3.162

********** STEADY STATE TEST N **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E3														
34	0.58	1179.5	3.05	501.2	34.66	714.0	15.45	562.5	366.5	5.46	361.2	6.87	378.6	1.725
50	0.58	1167.9	2.97	497.1	34.32	714.0	15.45	562.9	367.2	5.48	362.0	6.90	380.0	1.691
60	0.58	1148.3	2.95	510.6	33.30	714.0	15.45	563.5	368.6	5.44	363.5	6.87	382.6	1.632
LEVEL E7														
34	0.64	1155.9	3.06	522.7	34.94	763.0	15.63	601.2	383.8	5.24	382.7	6.66	389.5	1.796
50	0.64	1086.3	2.98	577.3	38.07	763.0	15.63	604.2	389.8	5.40	389.0	6.83	400.6	1.571
LEVEL E8														
34	0.66	1226.3	3.06	466.6	30.16	779.1	15.70	611.9	384.0	5.01	383.9	6.42	383.8	2.085
38	0.66	1159.8	2.97	504.4	31.06	779.1	15.70	614.1	388.3	5.04	388.5	6.48	391.7	1.861
LEVEL F1														
17	0.69	1266.7	3.01	431.9	25.64	810.2	15.98	635.0	390.6	4.78	392.8	6.20	384.9	2.345
34	0.69	1253.6	3.06	447.9	28.69	810.2	15.98	635.4	391.3	4.87	393.6	6.28	386.1	2.299
37	0.69	1216.5	2.96	458.7	28.10	810.2	15.98	636.5	393.5	4.86	395.8	6.29	389.8	2.164
38	0.69	1251.9	2.97	436.2	26.36	810.2	15.98	635.4	391.4	4.81	393.6	6.23	386.2	2.293
50	0.69	1245.8	2.98	440.9	26.74	810.2	15.98	635.6	391.8	4.82	394.0	6.24	386.8	2.271
LEVEL F2														
1	0.71	1259.5	2.98	432.4	26.60	826.0	16.19	647.9	395.3	4.79	398.6	6.21	388.1	2.386
17	0.71	1279.5	2.94	414.6	24.48	826.0	16.19	647.4	394.2	4.73	397.5	6.15	386.3	2.462
34	0.71	1263.6	2.99	431.5	27.37	826.0	16.19	647.8	395.0	4.82	398.4	6.23	387.7	2.402
38	0.71	1278.0	2.91	410.7	24.64	826.0	16.19	647.4	394.3	4.75	397.6	6.17	386.4	2.456
50	0.71	1255.0	2.91	425.2	25.85	826.0	16.19	648.1	395.5	4.78	398.8	6.21	388.5	2.370
LEVEL F3														
14	0.73	1012.1	2.98	675.8	47.69	841.7	16.44	671.7	422.2	5.80	427.9	7.24	431.5	1.563
17	0.73	1284.2	3.01	421.4	25.02	841.7	16.44	659.3	398.1	4.71	402.4	6.14	388.3	2.545
21	0.73	1192.3	3.01	483.6	29.02	841.7	16.44	662.1	403.4	4.82	408.0	6.26	397.7	2.200
34	0.73	1300.3	3.06	419.3	26.56	841.7	16.44	658.9	397.3	4.76	401.5	6.18	387.0	2.607
60	0.73	1291.3	2.96	410.3	27.00	841.7	16.44	659.1	397.7	4.81	402.0	6.22	387.7	2.573
LEVEL F5														
60	0.76	983.9	2.96	715.5	48.74	866.7	16.59	694.4	433.5	5.80	441.2	7.27	445.0	1.545
LEVEL F6														
1	0.77	1133.6	3.05	541.9	39.14	877.9	16.59	693.7	416.7	5.18	423.9	6.62	411.9	2.134
17	0.77	1152.1	3.01	517.5	32.72	877.9	16.59	692.8	415.2	4.85	422.2	6.32	409.1	2.205
50	0.77	1133.4	2.98	529.0	34.02	877.9	16.59	693.7	416.8	4.92	423.9	6.39	412.0	2.133
60	0.77	1160.4	2.96	501.4	31.48	877.9	16.59	692.5	414.5	4.82	421.5	6.29	408.0	2.237
LEVEL F7														
14	0.78	1021.5	2.98	661.9	46.80	888.5	16.61	708.5	432.3	5.66	440.9	7.13	437.2	1.756
17	0.78	1192.8	3.01	483.6	29.56	888.5	16.61	699.1	414.4	4.71	421.8	6.19	405.3	2.408
21	0.78	1145.3	3.01	523.4	31.92	888.5	16.61	701.1	418.1	4.77	425.7	6.27	411.8	2.222
37	0.78	1105.4	2.96	554.0	35.48	888.5	16.61	703.0	421.8	4.96	429.7	6.46	418.3	2.071
38	0.78	1133.0	2.97	528.6	32.80	888.5	16.61	701.6	419.2	4.83	426.9	6.33	413.7	2.176
50	0.78	1161.0	2.98	504.5	32.28	888.5	16.61	700.4	416.8	4.83	424.4	6.32	409.5	2.283
60	0.78	1198.8	2.96	470.9	29.46	888.5	16.61	698.9	414.0	4.73	421.4	6.21	404.6	2.432
LEVEL F8														
1	0.80	1283.4	3.05	428.3	26.91	903.3	16.67	708.0	412.1	4.63	419.9	6.13	398.3	2.847
17	0.80	1198.0	3.01	479.6	29.03	903.3	16.67	710.7	417.2	4.68	425.3	6.20	407.2	2.499
21	0.80	1181.1	3.01	492.9	29.71	903.3	16.67	711.4	418.4	4.69	426.6	6.23	409.3	2.433
34	0.80	1207.2	3.06	480.9	31.33	903.3	16.67	710.4	416.6	4.78	424.6	6.28	406.1	2.536
37	0.80	1167.4	2.96	496.7	30.81	903.3	16.67	711.9	419.4	4.76	427.7	6.29	411.1	2.378
50	0.80	1188.6	2.98	482.0	30.33	903.3	16.67	711.1	417.8	4.75	426.0	6.27	408.3	2.463
60	0.80	1243.7	2.96	439.6	26.99	903.3	16.67	709.1	414.3	4.64	422.2	6.16	402.1	2.683

STEADY STATE TEST 0

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST 0 **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.261E+05 LBM/SQFT H UNC. MASS FLUX 5.042E+03 LBM/SQFT H PRESSURE 866.7 PSI UNC. PRESSURE 6.00 PSI
306.80 KG/SQM S 6.8414 KG/SQM S 5.98 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.709	538.5	0.033	10.49	1236.0	669.3	72.41	40.227	527.4	275.5	0.824	0.5	.8907	.0321
G	1.700	535.6	0.042	13.35	1379.6	749.0	44.33	24.629	604.4	318.3	34.045	18.9	1.0875	.0369
E6	1.674	527.4	0.000	0.00	1206.8	653.0	0.00	0.000	527.4	275.5	0.824	0.5	.8300	.0308
E7	1.719	541.5	0.034	10.73	1189.1	643.2	11.17	6.207	527.4	275.5	0.824	0.5	.8489	.0311
E8	1.700	535.5	0.037	11.78	1182.7	639.6	51.63	28.684	527.4	275.5	0.824	0.5	.8738	.0317
F1	1.685	530.7	0.049	15.49	1259.6	682.3	28.18	15.657	527.4	275.5	0.824	0.5	.9225	.0329
F2	1.700	535.5	0.023	7.33	1278.2	692.7	45.35	25.195	527.4	275.5	0.824	0.5	.9474	.0337
F3	1.683	530.1	0.054	16.91	1315.0	713.1	45.99	25.551	527.4	275.5	0.824	0.5	.9722	.0344
F4	1.630	513.4	0.063	19.86	1160.2	627.1	58.05	32.252	527.4	275.5	0.824	0.5	.9951	.0351
F5	1.653	520.8	0.061	19.07	1233.3	667.7	45.30	25.168	535.7	280.2	29.017	16.1	1.0120	.0353
F6	1.682	529.9	0.049	15.35	1298.8	704.1	33.49	18.608	551.3	288.9	29.231	16.2	1.0299	.0357
F7	1.677	528.1	0.039	12.33	1318.2	714.9	38.00	21.111	567.4	297.8	32.602	18.1	1.0468	.0360
F8	1.694	533.7	0.050	15.65	1363.9	740.3	43.83	24.349	588.5	309.5	33.619	18.7	1.0706	.0365

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test 0

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST 0 **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
3	0.89	1179.2	1.78	272.7	15.91	373.0	7.46	306.1	195.2	2.85	167.1	3.41	193.5	0.980
4	0.89	1154.1	1.77	282.3	16.43	373.0	7.46	306.5	195.9	2.86	167.8	3.42	194.7	0.937
7	0.89	1143.9	1.68	272.1	16.09	373.0	7.46	306.6	196.3	2.88	168.0	3.43	195.3	0.919
7	0.89	1119.1	1.68	283.5	16.67	373.0	7.46	307.0	197.1	2.89	168.8	3.45	196.7	0.877
10	0.89	1260.2	1.73	235.4	13.83	373.0	7.46	305.2	193.3	2.82	165.4	3.37	190.0	1.125
10	0.89	1254.7	1.73	237.2	14.00	373.0	7.46	305.2	193.4	2.82	165.5	3.38	190.2	1.116
10	0.89	1253.1	1.73	237.7	14.03	373.0	7.46	305.2	193.4	2.82	165.5	3.38	190.3	1.113
13	0.89	1242.4	1.73	241.6	14.00	373.0	7.46	305.4	193.7	2.82	165.7	3.38	190.7	1.093
13	0.89	1235.9	1.73	243.8	14.43	373.0	7.46	305.4	193.8	2.83	165.8	3.38	191.0	1.081
15	0.89	1223.8	1.68	241.2	13.91	373.0	7.46	305.6	194.1	2.83	166.1	3.39	191.5	1.059
16	0.89	1274.9	1.69	226.2	13.11	373.0	7.46	305.0	193.0	2.81	165.1	3.36	189.5	1.151
17	0.89	1056.6	1.71	323.6	18.83	373.0	7.46	308.2	199.5	2.93	170.9	3.50	201.1	0.771
18	0.89	1207.2	1.71	251.6	14.76	373.0	7.46	305.8	194.5	2.84	166.5	3.40	192.2	1.031
18	0.89	1173.5	1.71	264.7	15.52	373.0	7.46	306.2	195.4	2.86	167.2	3.41	193.7	0.971
20	0.89	1095.7	1.73	303.7	17.63	373.0	7.46	307.5	197.9	2.90	169.5	3.46	198.2	0.837
20	0.89	1205.4	1.73	254.6	14.65	373.0	7.46	305.8	194.5	2.84	166.5	3.39	192.2	1.028
21	0.89	1191.3	1.70	256.2	15.64	373.0	7.46	306.0	194.9	2.86	166.8	3.41	192.9	1.002
28	0.89	1255.2	1.70	233.5	13.42	373.0	7.46	305.2	193.4	2.82	165.5	3.37	190.2	1.116
28	0.89	1237.3	1.70	239.4	13.80	373.0	7.46	305.4	193.8	2.82	165.8	3.38	190.9	1.084
28	0.89	1243.7	1.70	237.2	13.70	373.0	7.46	305.3	193.6	2.82	165.7	3.38	190.7	1.095
31	0.89	1240.0	1.71	240.1	13.97	373.0	7.46	305.4	193.7	2.83	165.8	3.38	190.8	1.089
31	0.89	1247.5	1.71	237.6	13.75	373.0	7.46	305.3	193.6	2.82	165.6	3.38	190.5	1.102
32	0.89	1215.5	1.73	251.0	14.49	373.0	7.46	305.7	194.3	2.83	166.3	3.39	191.8	1.045
34	0.89	1255.7	1.74	239.5	14.00	373.0	7.46	305.2	193.4	2.82	165.5	3.37	190.2	1.117
37	0.89	1183.7	1.68	255.8	15.87	373.0	7.46	306.1	195.1	2.87	167.0	3.42	193.2	0.988
38	0.89	1217.5	1.68	243.5	14.21	373.0	7.46	305.6	194.2	2.83	166.2	3.39	191.7	1.049
42	0.89	1262.3	1.72	233.8	13.78	373.0	7.46	305.1	193.3	2.82	165.3	3.37	190.0	1.128
45	0.89	1206.0	1.71	251.4	14.52	373.0	7.46	305.8	194.5	2.84	166.5	3.39	192.2	1.029
45	0.89	1213.6	1.71	248.6	14.37	373.0	7.46	305.7	194.3	2.83	166.3	3.39	191.9	1.041
53	0.89	1298.8	1.78	230.8	13.42	373.0	7.46	304.8	192.6	2.80	164.7	3.36	188.7	1.196
59	0.89	1323.9	1.73	216.9	12.50	373.0	7.46	304.6	192.1	2.80	164.3	3.35	188.0	1.242
59	0.89	1308.7	1.73	221.2	12.69	373.0	7.46	304.7	192.4	2.80	164.5	3.35	188.4	1.215
59	0.89	1335.3	1.73	213.9	12.57	373.0	7.46	304.5	191.9	2.80	164.1	3.35	187.6	1.263
60	0.89	1315.6	1.68	212.9	12.43	373.0	7.46	304.6	192.3	2.80	164.4	3.35	188.2	1.226
64	0.89	1357.5	1.69	203.2	11.64	373.0	7.46	304.3	191.6	2.79	163.8	3.34	187.0	1.305
64	0.89	1395.2	1.69	194.4	11.11	373.0	7.46	304.0	191.1	2.78	163.4	3.33	186.1	1.375
64	0.89	1374.0	1.69	199.3	11.39	373.0	7.46	304.2	191.4	2.78	163.6	3.33	186.6	1.336

********** STEADY STATE TEST 0 **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.09	1363.2	1.74	208.0	12.11	229.1	17.0	333.7	194.7	1.507
3	1.09	1383.4	1.78	207.6	11.93	228.1	16.6	333.7	194.2	1.552
14	1.09	1309.8	1.69	215.7	12.84	239.2	18.6	333.7	196.2	1.391
16	1.09	1396.7	1.69	194.1	11.33	212.9	15.6	333.7	193.9	1.580
16	1.09	1415.6	1.69	190.0	11.00	208.0	15.0	333.7	193.4	1.622
18	1.09	1371.5	1.71	202.5	11.61	222.8	16.3	333.7	194.5	1.525
18	1.09	1342.8	1.71	209.6	12.10	231.4	17.2	333.7	195.2	1.461
18	1.09	1372.8	1.71	202.2	11.59	222.4	16.2	333.7	194.4	1.528
20	1.09	1275.1	1.73	230.7	13.22	257.2	19.8	333.7	197.4	1.317
20	1.09	1360.2	1.73	207.2	12.08	228.3	17.0	333.7	194.8	1.500
20	1.09	1380.1	1.73	202.3	11.68	222.4	16.2	333.7	194.3	1.544
21	1.09	1331.2	1.64	204.2	11.64	225.8	16.8	333.7	195.6	1.437
32	1.09	1384.9	1.73	201.3	11.61	221.2	16.1	333.7	194.1	1.554
34	1.09	1450.8	1.74	188.8	10.91	205.9	14.6	333.7	192.7	1.700
37	1.09	1338.4	1.68	207.3	11.94	229.0	17.1	333.7	195.4	1.453
38	1.09	1355.7	1.68	203.4	11.74	224.2	16.6	333.7	194.9	1.490
42	1.09	1440.3	1.72	188.1	12.07	205.5	15.9	333.7	192.9	1.678
42	1.09	1451.4	1.72	185.9	10.74	202.8	14.4	333.7	192.7	1.701
45	1.09	1364.6	1.71	203.7	11.84	224.3	16.6	333.7	194.7	1.510
45	1.09	1359.9	1.71	204.8	11.90	225.7	16.7	333.7	194.8	1.499
45	1.09	1361.4	1.71	204.4	11.87	225.2	16.7	333.7	194.7	1.503
47	1.09	1351.8	1.68	204.1	11.85	225.1	16.8	333.7	195.0	1.481
50	1.09	1434.8	1.69	186.8	10.71	204.1	14.5	333.7	193.0	1.665
58	1.09	1433.3	1.74	192.4	11.12	210.3	15.0	333.7	193.1	1.662
60	1.09	1408.5	1.67	190.0	11.15	208.2	15.2	333.7	193.6	1.606
64	1.09	1423.4	1.69	188.2	10.80	205.9	14.7	333.7	193.3	1.639
64	1.09	1431.8	1.69	186.5	10.72	203.8	14.5	333.7	193.1	1.658

********** STEADY STATE TEST 0 **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E6														
60	0.83	1206.8	1.67	246.4	14.30	353.4	7.36	290.1	192.5	2.28	164.8	2.63	189.7	0.926
LEVEL E7														
34	0.85	1197.0	1.74	260.3	15.40	359.5	7.38	295.0	193.6	2.39	165.8	2.78	190.9	0.940
50	0.85	1181.2	1.69	259.2	15.15	359.5	7.38	295.2	194.0	2.39	166.2	2.78	191.6	0.912
LEVEL E8														
34	0.87	1239.8	1.74	244.7	14.37	367.5	7.42	300.9	193.4	2.59	165.6	3.06	190.1	1.055
37	0.87	1139.3	1.68	274.0	15.94	367.5	7.42	302.2	196.1	2.63	168.0	3.11	194.8	0.882
38	0.87	1169.0	1.68	261.9	15.15	367.5	7.42	301.8	195.2	2.61	167.2	3.09	193.2	0.933
LEVEL F1														
17	0.92	1234.5	1.71	242.1	13.87	383.1	7.57	313.6	193.8	3.67	165.5	4.43	192.3	1.142
21	0.92	1235.1	1.70	240.3	13.90	383.1	7.57	313.6	193.8	3.68	165.4	4.44	192.3	1.143
34	0.92	1309.1	1.74	223.0	13.02	383.1	7.57	312.8	192.4	3.65	164.1	4.40	189.7	1.282
37	0.92	1240.8	1.68	235.0	13.56	383.1	7.57	313.5	193.7	3.67	165.3	4.43	192.1	1.154
38	0.92	1251.3	1.68	232.1	13.35	383.1	7.57	313.4	193.5	3.67	165.1	4.43	191.7	1.173
50	0.92	1285.3	1.69	223.6	12.85	383.1	7.57	313.1	192.8	3.65	164.5	4.41	190.4	1.237
LEVEL F2														
1	0.95	1212.1	1.69	246.8	14.33	391.0	7.68	320.7	193.5	5.26	164.6	6.28	194.3	1.156
14	0.95	1246.0	1.68	234.3	13.98	391.0	7.68	320.2	192.7	5.25	163.9	6.25	192.9	1.221
17	0.95	1278.9	1.71	227.7	13.01	391.0	7.68	319.9	192.1	5.22	163.3	6.22	191.7	1.284
34	0.95	1339.5	1.74	214.5	12.48	391.0	7.68	319.3	191.0	5.19	162.3	6.19	189.9	1.403
38	0.95	1281.4	1.68	222.7	12.79	391.0	7.68	319.9	192.0	5.22	163.2	6.22	191.7	1.289
50	0.95	1311.5	1.69	216.0	12.43	391.0	7.68	319.6	191.5	5.21	162.8	6.20	190.7	1.348
LEVEL F3														
14	0.97	1265.6	1.68	228.0	13.35	398.8	8.01	326.3	190.0	11.89	160.5	13.72	193.2	1.314
17	0.97	1290.0	1.71	224.5	12.84	398.8	8.01	326.0	189.6	11.94	160.1	13.68	192.3	1.364
21	0.97	1281.0	1.70	225.7	12.90	398.8	8.01	326.1	189.7	11.95	160.2	13.70	192.6	1.346
34	0.97	1382.1	1.74	203.9	11.85	398.8	8.01	325.2	188.1	11.84	158.8	13.57	189.7	1.552
60	0.97	1358.0	1.67	201.6	11.86	398.8	8.01	325.4	188.5	11.82	159.1	13.60	190.3	1.502
LEVEL F4														
60	1.00	1201.2	1.67	248.5	14.41	406.0	12.34	333.0	185.3	11.71	154.2	13.68	196.8	1.241

********** STEADY STATE TEST 0 **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F5										
21	1.01	1187.7	1.70	257.6	14.80	260.8	19.0	401.4	198.1	1.232
60	1.01	1278.3	1.67	223.0	12.86	225.5	15.7	401.4	194.4	1.419
LEVEL F6										
1	1.03	1295.1	1.74	226.7	13.57	234.0	16.8	379.3	194.5	1.431
17	1.03	1280.4	1.72	227.8	13.17	235.3	16.6	379.3	195.0	1.400
37	1.03	1274.6	1.68	224.6	12.97	232.0	16.4	379.3	195.2	1.387
38	1.03	1264.7	1.68	228.2	13.12	235.8	16.7	379.3	195.6	1.366
50	1.03	1342.5	1.70	208.4	12.03	214.7	14.8	379.3	193.1	1.531
60	1.03	1349.1	1.68	204.0	11.73	210.1	14.4	379.3	192.9	1.545
LEVEL F7										
14	1.05	1278.4	1.68	224.2	13.14	236.8	17.7	362.1	195.8	1.374
17	1.05	1313.4	1.71	218.1	12.52	229.8	16.6	362.1	194.6	1.448
21	1.05	1288.7	1.70	223.5	12.79	235.9	17.3	362.1	195.4	1.395
37	1.05	1303.9	1.68	215.9	12.46	227.6	16.6	362.1	194.9	1.428
38	1.05	1296.9	1.68	218.4	12.53	230.4	16.8	362.1	195.1	1.412
50	1.05	1374.9	1.70	200.1	11.54	210.0	14.8	362.1	192.9	1.579
60	1.05	1379.0	1.67	196.7	11.31	206.4	14.5	362.1	192.8	1.588
LEVEL F8										
1	1.07	1369.3	1.74	207.0	11.99	223.1	16.2	343.4	193.9	1.537
17	1.07	1324.3	1.72	215.3	12.32	233.2	17.2	343.4	195.2	1.440
21	1.07	1318.5	1.70	215.5	12.31	233.5	17.2	343.4	195.3	1.427
34	1.07	1418.4	1.75	196.1	11.38	210.5	15.0	343.4	192.8	1.644
37	1.07	1330.8	1.68	209.1	12.01	226.3	16.6	343.4	195.0	1.453
50	1.07	1416.0	1.70	191.2	10.99	205.3	14.5	343.4	192.8	1.639
60	1.07	1405.7	1.68	191.1	10.95	205.3	14.6	343.4	193.0	1.616

STEADY STATE TEST P

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELCRME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST P **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 3.834E+05 LBM/SQFT H — 520.23 KG/SQM S
UNC. MASS FLUX 8.583E+03 LBM/SQFT H — 11.6476 KG/SQM S
PRESSURE 874.3 PSI — 6.03 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.612	822.7	0.051	16.07	1288.1	698.2	66.96	37.198	528.4	276.1	0.824	0.5	.8405	.0294
E	2.580	812.8	0.061	19.16	1362.7	739.6	44.58	24.769	541.3	283.3	26.746	14.9	1.0175	.0338
E3	2.585	814.3	0.048	15.25	1133.7	612.4	146.71	81.506	528.4	276.1	0.824	0.5	.7351	.0271
E6	2.489	784.1	0.097	30.45	1222.6	661.7	48.86	27.145	528.4	276.1	0.824	0.5	.7858	.0282
E7	2.595	817.3	0.047	14.87	1236.1	669.3	33.25	18.473	528.4	276.1	0.824	0.5	.8028	.0285
E8	2.594	817.2	0.047	14.94	1272.8	689.7	25.54	14.191	528.4	276.1	0.824	0.5	.8253	.0290
F1	2.570	809.5	0.072	22.64	1316.8	714.1	29.66	16.480	528.4	276.1	0.824	0.5	.8692	.0302
F2	2.605	820.6	0.037	11.64	1329.7	721.3	47.79	26.552	528.4	276.1	0.824	0.5	.8916	.0308
F3	2.569	809.2	0.079	24.84	1364.8	740.8	46.59	25.883	528.4	276.1	0.824	0.5	.9141	.0315
F4	2.489	784.1	0.097	30.45	1162.8	628.6	51.34	28.520	528.4	276.1	0.824	0.5	.9347	.0321
F5	2.526	795.8	0.094	29.55	1219.3	660.0	50.96	28.309	528.4	276.1	0.824	0.5	.9498	.0323
F6	2.568	809.0	0.072	22.55	1293.1	700.9	36.63	20.350	528.4	276.1	0.824	0.5	.9658	.0326
F7	2.566	808.4	0.059	18.54	1311.8	711.3	41.73	23.185	528.4	276.1	0.824	0.5	.9810	.0329
F8	2.570	809.6	0.073	22.86	1357.8	736.9	49.09	27.273	529.0	276.5	28.043	15.6	1.0024	.0334

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test P

T/C Level	(# wet T/C)/(Total # T/C)
E	All wet
E1	3/4
E2	3/3
E3	4/7
E6	0/2
E7	1/4
E8	2/5
F	All dry

********** STEADY STATE TEST P **********

PRIMARY LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
					BTU/H SQFT F					BTU/H SQFT F				
LEVEL F														
3	0.84	1232.6	2.72	386.4	23.27	546.5	10.53	448.0	277.3	3.36	265.5	4.35	281.1	1.736
4	0.84	1252.4	2.71	374.1	22.27	546.5	10.53	447.7	276.6	3.34	264.9	4.33	279.9	1.791
7	0.84	1200.2	2.58	383.5	23.78	546.5	10.53	448.6	278.4	3.40	266.6	4.38	283.1	1.645
7	0.84	1196.4	2.58	385.7	23.46	546.5	10.53	448.7	278.5	3.39	266.7	4.38	283.4	1.636
10	0.84	1312.7	2.64	336.4	20.66	546.5	10.53	446.8	275.0	3.33	263.2	4.31	276.9	1.962
10	0.84	1324.9	2.64	331.2	20.50	546.5	10.53	446.7	274.7	3.32	262.9	4.30	276.4	1.995
10	0.84	1312.9	2.64	336.3	20.84	546.5	10.53	446.8	275.0	3.33	263.2	4.31	276.9	1.962
13	0.84	1307.8	2.63	338.0	20.13	546.5	10.53	446.9	275.1	3.32	263.3	4.30	277.1	1.948
13	0.84	1299.8	2.63	341.5	21.28	546.5	10.53	447.0	275.3	3.34	263.5	4.32	277.5	1.925
15	0.84	1303.6	2.56	330.6	19.44	546.5	10.53	447.0	275.2	3.31	263.4	4.30	277.3	1.935
16	0.84	1321.5	2.58	325.4	19.43	546.5	10.53	446.7	274.8	3.31	263.0	4.29	276.5	1.986
17	0.84	1192.8	2.61	393.0	23.08	546.5	10.53	448.7	278.7	3.37	266.9	4.36	283.6	1.626
18	0.84	1225.0	2.61	374.1	22.90	546.5	10.53	448.1	277.5	3.37	265.7	4.36	281.5	1.715
18	0.84	1170.1	2.61	406.1	24.94	546.5	10.53	449.2	279.5	3.41	267.8	4.40	285.2	1.564
20	0.84	1093.7	2.64	467.2	28.05	546.5	10.53	451.0	283.1	3.46	271.4	4.47	291.8	1.359
20	0.84	1222.2	2.64	380.6	22.42	546.5	10.53	448.2	277.6	3.35	265.8	4.34	281.7	1.707
21	0.84	1230.2	2.60	370.8	24.70	546.5	10.53	448.1	277.3	3.42	265.6	4.40	281.2	1.729
28	0.84	1335.6	2.59	320.7	18.76	546.5	10.53	446.6	274.4	3.30	262.6	4.28	275.9	2.025
28	0.84	1301.9	2.59	334.7	19.70	546.5	10.53	447.0	275.2	3.31	263.5	4.30	277.4	1.931
28	0.84	1308.5	2.59	331.9	19.60	546.5	10.53	446.9	275.1	3.31	263.3	4.30	277.1	1.950
31	0.84	1309.0	2.61	333.9	19.99	546.5	10.53	446.9	275.1	3.32	263.3	4.30	277.1	1.951
31	0.84	1315.0	2.61	331.4	19.64	546.5	10.53	446.8	274.9	3.31	263.1	4.29	276.8	1.968
32	0.84	1229.7	2.64	376.1	22.31	546.5	10.53	448.1	277.4	3.35	265.6	4.34	281.2	1.728
34	0.84	1310.6	2.65	338.8	20.54	546.5	10.53	446.9	275.0	3.32	263.2	4.30	277.0	1.956
37	0.84	1268.2	2.57	347.4	23.44	546.5	10.53	447.4	276.2	3.40	264.4	4.37	279.1	1.834
38	0.84	1302.8	2.58	333.0	20.05	546.5	10.53	447.0	275.2	3.32	263.4	4.31	277.4	1.933
42	0.84	1345.6	2.61	319.6	19.67	546.5	10.53	446.4	274.2	3.31	262.4	4.29	275.5	2.054
45	0.84	1290.9	2.60	341.2	20.07	546.5	10.53	447.1	275.5	3.32	263.8	4.30	277.9	1.899
45	0.84	1307.6	2.60	333.9	19.64	546.5	10.53	446.9	275.1	3.31	263.3	4.30	277.1	1.947
53	0.84	1372.4	2.71	321.7	19.33	546.5	10.53	446.1	273.6	3.29	261.8	4.27	274.5	2.132
59	0.84	1365.0	2.64	315.0	18.64	546.5	10.53	446.2	273.8	3.29	262.0	4.27	274.8	2.111
59	0.84	1362.0	2.64	316.1	18.49	546.5	10.53	446.3	273.8	3.29	262.1	4.27	274.9	2.102
59	0.84	1381.1	2.64	309.0	19.11	546.5	10.53	446.1	273.5	3.30	261.7	4.27	274.2	2.158
60	0.84	1357.4	2.56	308.7	18.74	546.5	10.53	446.3	273.9	3.30	262.2	4.28	275.1	2.088
64	0.84	1411.5	2.58	292.0	17.02	546.5	10.53	445.8	272.9	3.27	261.1	4.25	273.2	2.246

********** STEADY STATE TEST P **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.02	1369.7	2.64	313.2	19.00	318.1	21.9	601.0	288.1	2.773
3	1.02	1378.4	2.70	317.6	18.73	322.5	21.7	601.0	287.7	2.804
14	1.02	1311.6	2.56	327.0	20.76	332.5	24.2	601.0	290.5	2.568
16	1.02	1393.7	2.56	296.4	18.12	300.9	20.7	601.0	287.2	2.858
16	1.02	1414.9	2.56	289.3	17.35	293.6	19.8	601.0	286.5	2.934
18	1.02	1349.6	2.59	315.4	18.54	320.4	21.7	601.0	288.9	2.702
18	1.02	1327.3	2.59	324.2	19.32	329.5	22.7	601.0	289.8	2.623
18	1.02	1352.4	2.59	314.3	18.48	319.3	21.6	601.0	288.7	2.711
20	1.02	1253.2	2.62	362.1	21.24	368.7	25.8	601.0	293.6	2.366
20	1.02	1343.2	2.62	322.1	19.66	327.3	22.8	601.0	289.1	2.679
20	1.02	1353.1	2.62	318.2	19.01	323.3	22.1	601.0	288.7	2.714
21	1.02	1309.9	2.53	323.4	18.75	328.8	22.3	601.0	290.6	2.562
32	1.02	1388.0	2.62	305.0	18.12	309.6	20.9	601.0	287.4	2.838
34	1.02	1443.7	2.63	287.8	17.21	291.9	19.5	601.0	285.6	3.038
37	1.02	1323.0	2.55	320.5	19.03	325.8	22.4	601.0	290.0	2.608
38	1.02	1353.8	2.56	310.0	18.49	314.9	21.5	601.0	288.7	2.716
42	1.02	1434.0	2.60	286.6	21.11	290.7	23.3	601.0	285.9	3.003
45	1.02	1359.4	2.59	311.2	18.82	316.1	21.8	601.0	288.5	2.736
45	1.02	1351.9	2.59	314.0	18.96	319.0	22.0	601.0	288.8	2.710
45	1.02	1363.0	2.59	309.8	18.66	314.7	21.6	601.0	288.3	2.749
47	1.02	1355.2	2.56	309.2	18.66	314.1	21.7	601.0	288.6	2.721
50	1.02	1441.0	2.56	280.5	16.44	284.5	18.7	601.0	285.7	3.028
60	1.02	1399.6	2.54	291.9	18.07	296.3	20.6	601.0	287.0	2.879

********** STEADY STATE TEST P **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E3														
34	0.74	1200.8	2.64	392.7	25.35	493.7	10.27	405.6	268.1	3.24	255.1	3.97	274.6	1.378
5C	0.74	1234.8	2.57	363.2	23.06	493.7	10.27	405.1	267.0	3.21	254.0	3.94	272.5	1.461
60	0.74	965.4	2.55	583.5	39.20	493.7	10.27	412.1	281.8	3.68	268.8	4.41	300.3	0.841
LEVEL E6														
60	0.79	1257.1	2.56	351.0	20.94	519.3	10.39	425.9	272.0	3.13	259.8	3.94	275.4	1.648
LEVEL E7														
34	0.80	1262.7	2.65	360.7	22.30	527.8	10.41	432.4	273.4	3.18	261.4	4.02	276.4	1.710
37	0.80	1198.8	2.56	382.1	22.83	527.8	10.41	433.5	275.5	3.19	263.5	4.04	280.2	1.540
50	0.80	1246.7	2.57	358.4	21.61	527.8	10.41	432.6	273.9	3.17	261.9	4.02	277.3	1.666
LEVEL E8														
34	0.83	1300.0	2.65	343.3	21.00	539.0	10.47	440.9	274.2	3.23	262.4	4.15	276.3	1.877
37	0.83	1249.3	2.56	355.3	21.09	539.0	10.47	441.6	275.7	3.24	263.8	4.17	278.9	1.736
38	0.83	1269.2	2.57	347.3	20.47	539.0	10.47	441.3	275.1	3.23	263.2	4.15	277.8	1.790
LEVEL F1														
17	0.87	1285.2	2.61	344.8	20.08	560.7	10.68	459.0	277.2	3.63	265.4	4.79	280.5	1.977
21	0.87	1269.9	2.60	350.7	20.85	560.7	10.68	459.2	277.7	3.64	265.8	4.81	281.3	1.933
34	0.87	1348.3	2.65	323.1	19.61	560.7	10.68	458.1	275.7	3.62	263.8	4.77	277.7	2.164
37	0.87	1316.0	2.56	325.2	19.17	560.7	10.68	458.5	276.4	3.62	264.6	4.78	279.0	2.069
38	0.87	1320.0	2.57	325.0	19.07	560.7	10.68	458.5	276.3	3.62	264.5	4.78	278.9	2.081
50	0.87	1345.8	2.57	314.9	18.44	560.7	10.68	458.2	275.7	3.61	263.9	4.76	277.8	2.157
LEVEL F2														
1	0.89	1252.9	2.65	365.8	21.96	571.7	10.83	468.7	278.9	4.09	266.8	5.45	284.0	1.961
14	0.89	1301.2	2.58	333.3	21.16	571.7	10.83	468.0	277.5	4.08	265.5	5.43	281.5	2.105
17	0.89	1331.6	2.61	324.9	18.83	571.7	10.83	467.6	276.8	4.04	264.7	5.40	280.2	2.198
34	0.89	1385.7	2.65	309.0	18.63	571.7	10.83	467.0	275.6	4.03	263.6	5.38	278.1	2.365
38	0.89	1338.7	2.57	317.5	18.60	571.7	10.83	467.5	276.6	4.04	264.5	5.39	279.9	2.220
5C	0.89	1368.3	2.57	306.5	18.01	571.7	10.83	467.2	276.0	4.03	263.9	5.38	278.7	2.312
LEVEL F3														
14	0.91	1325.4	2.58	323.2	19.73	582.7	11.01	476.5	277.1	4.78	264.6	6.42	282.1	2.264
17	0.91	1338.7	2.61	322.0	18.71	582.7	11.01	476.3	276.7	4.76	264.3	6.40	281.6	2.304
21	0.91	1313.1	2.60	331.4	19.25	582.7	11.01	476.7	277.4	4.77	264.9	6.42	282.7	2.225
34	0.91	1431.4	2.65	293.3	17.62	582.7	11.01	475.3	274.9	4.73	262.5	6.36	278.3	2.601
60	0.91	1400.7	2.56	293.2	18.18	582.7	11.01	475.6	275.5	4.75	263.0	6.38	279.2	2.501
LEVEL F4														
60	0.93	1199.1	2.56	381.4	22.91	592.7	11.14	487.0	280.3	6.06	267.2	8.13	290.7	1.950
LEVEL F5														
21	0.95	1164.6	2.60	408.8	24.10	600.0	11.13	493.7	280.6	7.74	266.9	10.27	294.4	1.898
60	0.95	1265.4	2.56	347.1	20.65	600.0	11.13	491.7	277.1	7.64	263.4	10.13	287.8	2.214
LEVEL F6														
1	0.97	1286.9	2.65	350.0	22.57	607.8	11.13	497.7	274.6	12.46	259.9	14.91	287.9	2.351
17	0.97	1276.8	2.61	349.3	20.87	607.8	11.13	497.9	274.9	12.47	260.2	14.92	288.5	2.318
37	0.97	1259.5	2.57	351.2	20.98	607.8	11.13	498.2	275.4	12.50	260.7	14.95	289.4	2.261
38	0.97	1254.3	2.58	355.1	20.96	607.8	11.13	498.3	275.5	12.50	260.8	14.96	289.7	2.244
50	0.97	1348.4	2.58	314.4	18.70	607.8	11.13	496.9	273.1	12.39	258.4	14.82	285.1	2.552
60	0.97	1338.1	2.56	316.4	18.70	607.8	11.13	497.0	273.3	12.40	258.7	14.83	285.6	2.518
LEVEL F7														
14	0.98	1275.8	2.58	345.6	21.30	615.0	11.92	503.8	271.7	16.85	255.6	22.50	289.7	2.375
17	0.98	1307.7	2.62	335.9	19.74	615.0	11.92	503.3	270.8	16.97	254.8	22.25	288.1	2.483
21	0.98	1268.7	2.61	352.3	20.60	615.0	11.92	504.0	271.9	17.03	255.8	22.35	290.0	2.351
37	0.98	1284.1	2.57	339.8	20.26	615.0	11.92	503.7	271.4	16.94	255.4	22.37	289.2	2.403
38	0.98	1295.8	2.58	336.2	19.78	615.0	11.92	503.5	271.1	16.98	255.1	22.29	288.6	2.442
50	0.98	1381.6	2.58	302.5	17.99	615.0	11.92	502.4	269.2	16.88	253.2	22.10	285.0	2.735

********** STEADY STATE TEST P **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F7														
60	0.98	1367.7	2.56	305.6	18.08	615.0	11.92	502.5	269.5	16.90	253.5	22.12	285.5	2.687

********** STEADY STATE TEST P **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSUPF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDP	HCB BTU/H FT**2 F	QCD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F8										
1	1.00	1378.3	2.64	310.9	18.65	311.1	21.3	611.3	286.9	2.789
17	1.00	1320.7	2.60	328.4	19.18	328.6	22.5	611.3	299.3	2.589
21	1.00	1292.7	2.59	339.3	19.76	339.5	23.4	611.3	290.6	2.494
34	1.00	1408.8	2.64	300.0	18.10	300.2	20.5	611.3	285.9	2.807
37	1.00	1316.8	2.55	323.9	19.09	324.2	22.4	611.3	299.5	2.575
50	1.00	1421.4	2.57	297.4	16.96	287.6	19.2	611.3	295.4	2.942
60	1.00	1396.9	2.55	293.6	17.24	293.8	19.7	611.3	286.2	2.855

STEADY STATE TEST Q

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST Q **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.396E+05 LBM/SQFT H — 325.15 KG/SQM S
UNC. MASS FLUX 5.353E+03 LBM/SQFT H — 7.2644 KG/SQM S
PRESSURE 946.7 PSI — 6.53 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.811	570.6	0.030	9.34	1251.9	678.1	71.98	39.988	537.9	281.4	0.757	0.4	.9164	.0329
G	1.804	568.2	0.036	11.49	1383.8	751.3	46.04	25.579	637.2	336.5	35.118	19.5	1.1176	.0379
E3	1.783	561.5	0.000	0.00	1138.3	614.9	0.00	0.000	537.9	281.4	0.757	0.4	.7970	.0303
E6	1.745	549.8	0.066	20.75	1163.2	628.8	110.10	61.165	537.9	281.4	0.757	0.4	.8544	.0316
E7	1.801	567.5	0.026	8.09	1150.6	621.8	55.43	30.794	537.9	281.4	0.757	0.4	.8737	.0320
E8	1.805	568.7	0.016	5.10	1191.0	644.2	27.28	15.156	537.9	281.4	0.757	0.4	.8991	.0325
F1	1.786	562.5	0.046	14.45	1253.2	678.8	43.81	24.341	537.9	281.4	0.757	0.4	.9490	.0338
F2	1.796	565.8	0.020	6.25	1258.8	681.9	70.39	39.104	537.9	281.4	0.757	0.4	.9744	.0345
F3	1.787	563.0	0.046	14.37	1315.2	713.2	51.48	28.601	537.9	281.4	0.757	0.4	.9998	.0353
F4	1.745	549.8	0.066	20.75	1184.2	640.4	58.76	32.645	555.7	291.3	25.203	14.0	1.0232	.0360
F5	1.768	556.9	0.061	19.17	1245.8	674.7	54.03	30.016	569.7	299.1	29.816	16.6	1.0405	.0363
F6	1.788	563.1	0.041	13.00	1301.5	705.6	41.90	23.276	584.1	307.1	30.922	17.2	1.0587	.0366
F7	1.785	562.2	0.036	11.29	1325.8	719.1	41.77	23.208	598.8	315.2	32.458	18.0	1.0760	.0370
F8	1.797	566.2	0.041	13.05	1363.1	739.9	44.81	24.895	621.1	327.6	33.937	18.9	1.1004	.0375

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test Q

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	6/7
E6	0/2
E7	3/4
E8	1/5
F	All dry

********** STEADY STATE TEST Q **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL F														
3	0.92	1120.9	1.87	320.7	18.95	416.1	8.26	339.3	210.9	3.60	181.4	4.34	208.9	0.987
4	0.92	1159.2	1.86	299.3	17.49	416.1	8.26	338.6	209.5	3.57	180.2	4.31	206.5	1.060
7	0.92	1211.0	1.79	265.6	15.71	416.1	8.26	337.8	208.0	3.54	178.7	4.27	203.7	1.160
7	0.92	1193.4	1.79	272.8	16.00	416.1	8.26	338.0	208.5	3.55	179.2	4.28	204.6	1.126
10	0.92	1248.7	1.82	255.5	15.12	416.1	8.26	337.3	207.0	3.52	177.9	4.25	202.0	1.233
10	0.92	1245.3	1.82	256.8	15.28	416.1	8.26	337.3	207.1	3.52	177.9	4.26	202.2	1.228
10	0.92	1243.3	1.82	257.5	15.32	416.1	8.26	337.3	207.1	3.52	178.0	4.26	202.3	1.224
13	0.92	1252.7	1.84	257.5	14.99	416.1	8.26	337.2	206.9	3.51	177.8	4.25	201.9	1.241
13	0.92	1247.6	1.84	259.4	15.46	416.1	8.26	337.3	207.0	3.52	177.9	4.25	202.1	1.231
15	0.92	1250.1	1.79	251.5	14.54	416.1	8.26	337.2	207.0	3.51	177.8	4.25	202.0	1.236
16	0.92	1310.5	1.79	232.1	13.48	416.1	8.26	336.6	205.6	3.49	176.6	4.22	199.7	1.357
18	0.92	1201.8	1.80	270.7	15.97	416.1	8.26	337.9	208.2	3.54	179.0	4.28	204.2	1.142
18	0.92	1163.7	1.80	287.2	16.95	416.1	8.26	338.5	209.4	3.57	180.0	4.31	206.2	1.069
20	0.92	1094.6	1.82	326.4	19.05	416.1	8.26	339.8	212.0	3.61	182.4	4.37	210.8	0.937
20	0.92	1196.8	1.82	275.8	15.93	416.1	8.26	338.0	208.4	3.54	179.1	4.28	204.4	1.132
21	0.92	1197.6	1.81	274.8	16.99	416.1	8.26	338.0	208.3	3.56	179.1	4.29	204.4	1.133
28	0.92	1235.6	1.78	255.6	14.75	416.1	8.26	337.4	207.3	3.52	178.2	4.26	202.6	1.208
28	0.92	1216.1	1.78	263.0	15.24	416.1	8.26	337.7	207.8	3.53	178.6	4.27	203.5	1.170
28	0.92	1220.9	1.78	261.1	15.16	416.1	8.26	337.6	207.7	3.53	178.5	4.27	203.3	1.180
31	0.92	1253.2	1.82	254.9	14.89	416.1	8.26	337.2	206.9	3.51	177.8	4.25	201.8	1.242
31	0.92	1262.4	1.82	251.7	14.61	416.1	8.26	337.1	206.7	3.51	177.6	4.24	201.5	1.261
32	0.92	1297.0	1.85	243.7	14.04	416.1	8.26	336.7	205.9	3.49	176.9	4.22	200.1	1.330
34	0.92	1241.8	1.83	260.1	15.30	416.1	8.26	337.3	207.2	3.52	178.0	4.26	202.3	1.221
37	0.92	1205.6	1.80	269.9	16.94	416.1	8.26	337.8	208.1	3.56	178.9	4.29	204.0	1.149
38	0.92	1235.1	1.80	258.5	15.16	416.1	8.26	337.4	207.3	3.52	178.2	4.26	202.6	1.207
42	0.92	1261.8	1.80	248.9	14.77	416.1	8.26	337.1	206.7	3.51	177.6	4.25	201.5	1.260
45	0.92	1232.0	1.83	263.5	15.26	416.1	8.26	337.5	207.4	3.52	178.2	4.26	202.8	1.202
45	0.92	1239.2	1.83	260.8	15.10	416.1	8.26	337.4	207.2	3.52	178.1	4.25	202.4	1.215
53	0.92	1299.6	1.87	245.6	14.34	416.1	8.26	336.7	205.9	3.49	176.8	4.22	200.0	1.336
59	0.92	1326.5	1.81	229.7	13.28	416.1	8.26	336.4	205.3	3.48	176.4	4.21	199.1	1.390
59	0.92	1316.8	1.81	232.6	13.38	416.1	8.26	336.5	205.5	3.48	176.5	4.21	199.5	1.370
59	0.92	1332.1	1.81	228.1	13.49	416.1	8.26	336.3	205.2	3.48	176.3	4.21	199.0	1.401
60	0.92	1337.3	1.79	224.3	13.15	416.1	8.26	336.3	205.1	3.48	176.2	4.21	198.8	1.412
64	0.92	1394.4	1.81	210.8	12.09	416.1	8.26	335.8	204.2	3.46	175.4	4.18	197.2	1.528
64	0.92	1424.6	1.81	203.6	11.65	416.1	8.26	335.6	203.8	3.45	175.0	4.17	196.5	1.592
64	0.92	1416.3	1.81	205.5	11.76	416.1	8.26	335.7	203.9	3.45	175.1	4.18	196.7	1.574

********** STEADY STATE TEST Q **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB	QGD X 1E-5
				BTU/H FT**2 F					BTU/H FT**2 F	BTU/H FT**2
LEVEL G										
1	1.12	1323.6	1.83	232.3	13.63	265.9	21.0	344.3	207.8	1.483
3	1.12	1373.3	1.87	223.6	12.89	253.8	19.2	344.3	206.2	1.599
14	1.12	1318.9	1.79	229.4	13.75	262.8	21.1	344.3	207.9	1.472
16	1.12	1420.2	1.79	202.9	11.90	228.7	17.1	344.3	205.0	1.709
16	1.12	1436.0	1.79	199.4	11.57	224.1	16.5	344.3	204.6	1.747
18	1.12	1356.9	1.79	219.1	12.60	249.3	19.0	344.3	206.7	1.560
18	1.12	1329.8	1.79	226.6	13.13	259.1	20.2	344.3	207.6	1.498
18	1.12	1359.9	1.79	218.3	12.56	248.3	18.9	344.3	206.6	1.567
20	1.12	1268.7	1.81	248.3	14.28	287.4	23.2	344.3	209.8	1.358
20	1.12	1351.9	1.81	223.0	13.07	253.9	19.7	344.3	206.9	1.549
20	1.12	1374.4	1.81	217.0	12.57	246.2	18.6	344.3	206.2	1.601
21	1.12	1339.7	1.81	225.9	12.92	257.9	19.7	344.3	207.2	1.521
32	1.12	1409.6	1.85	211.9	12.26	239.1	17.8	344.3	205.3	1.683
34	1.12	1430.1	1.83	204.8	11.89	230.5	17.0	344.3	204.8	1.733
37	1.12	1353.2	1.80	220.2	12.73	250.8	19.2	344.3	206.8	1.552
38	1.12	1372.4	1.80	215.7	12.50	244.8	18.6	344.3	206.3	1.597
42	1.12	1427.1	1.80	202.4	13.20	227.8	18.5	344.3	204.8	1.726
42	1.12	1450.5	1.80	197.2	11.43	221.2	16.1	344.3	204.3	1.781
45	1.12	1383.5	1.83	216.0	12.60	244.7	18.5	344.3	205.9	1.623
45	1.12	1375.8	1.83	218.0	12.71	247.3	18.8	344.3	206.2	1.605
45	1.12	1374.9	1.83	218.2	12.72	247.6	18.8	344.3	206.2	1.603
47	1.12	1374.4	1.80	215.6	12.57	244.6	18.6	344.3	206.2	1.601
50	1.12	1444.5	1.78	196.0	11.26	220.1	16.0	344.3	204.5	1.768
58	1.12	1433.7	1.83	204.3	11.85	229.8	16.9	344.3	204.7	1.742
60	1.12	1417.1	1.79	203.6	12.04	229.6	17.3	344.3	205.1	1.702
64	1.12	1438.4	1.80	200.2	11.53	225.0	16.4	344.3	204.6	1.753
64	1.12	1443.9	1.80	199.0	11.47	223.5	16.3	344.3	204.5	1.767

********** STEADY STATE TEST Q **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E3														
60	0.80	1138.3	1.78	296.9	17.67	374.3	8.05	305.1	205.3	2.43	176.4	2.72	202.2	0.821
LEVEL E6														
60	0.85	1241.1	1.79	254.8	14.82	394.5	8.15	320.0	205.7	2.52	177.1	2.93	199.6	1.095
LEVEL E7														
34	0.87	1185.7	1.83	282.3	16.83	401.3	8.16	326.2	208.0	2.71	179.1	3.20	203.1	1.030
37	0.87	1086.7	1.80	327.4	19.28	401.3	8.16	328.0	211.6	2.77	182.4	3.27	209.5	0.851
50	0.87	1179.4	1.78	277.2	16.30	401.3	8.16	326.3	208.2	2.71	179.3	3.20	203.4	1.018
LEVEL E8														
14	0.90	1162.0	1.79	287.3	17.07	410.1	8.21	333.7	209.3	3.11	180.2	3.73	205.6	1.032
34	0.90	1225.5	1.83	266.0	15.73	410.1	8.21	332.8	207.5	3.07	178.5	3.69	202.3	1.152
37	0.90	1178.6	1.80	280.5	16.35	410.1	8.21	333.4	208.8	3.09	179.7	3.72	204.6	1.063
38	0.90	1197.9	1.80	273.0	15.83	410.1	8.21	333.1	208.2	3.08	179.2	3.70	203.6	1.101
LEVEL F1														
17	0.95	1172.7	1.80	283.2	16.34	427.3	8.38	347.4	208.3	5.56	178.3	6.64	207.2	1.152
21	0.95	1237.1	1.81	259.3	15.06	427.3	8.38	346.4	206.4	5.51	176.7	6.58	204.0	1.283
34	0.95	1283.5	1.83	245.3	14.42	427.3	8.38	345.8	205.4	5.48	175.7	6.54	202.1	1.379
37	0.95	1258.5	1.80	249.4	14.44	427.3	8.38	346.1	205.9	5.49	176.2	6.56	203.0	1.327
50	0.95	1288.8	1.78	236.8	13.65	427.3	8.38	345.8	205.2	5.47	175.6	6.54	201.9	1.389
LEVEL F2														
1	0.97	1126.4	1.77	301.4	17.70	436.0	8.96	355.5	207.4	12.25	176.5	15.39	211.2	1.117
14	0.97	1257.8	1.80	249.4	15.01	436.0	8.96	353.4	203.6	12.03	173.0	15.06	204.4	1.388
17	0.97	1247.3	1.80	253.5	14.55	436.0	8.96	353.5	203.8	12.10	173.2	14.95	204.7	1.367
34	0.97	1314.7	1.83	235.4	13.79	436.0	8.96	352.7	202.4	12.06	172.0	14.87	202.1	1.511
38	0.97	1299.9	1.80	236.7	13.63	436.0	8.96	352.9	202.6	12.12	172.2	14.85	202.6	1.479
50	0.97	1306.7	1.78	231.3	13.35	436.0	8.96	352.8	202.5	12.11	172.1	14.84	202.3	1.493
LEVEL F3														
14	1.00	1271.3	1.79	244.5	14.41	444.7	16.40	360.2	191.7	10.91	158.8	13.89	204.8	1.482
17	1.00	1260.4	1.80	248.9	14.29	444.7	16.40	360.3	192.0	11.00	159.0	13.84	205.2	1.458
21	1.00	1282.1	1.81	243.6	13.96	444.7	16.40	360.0	191.5	10.99	158.6	13.79	204.3	1.506
34	1.00	1353.3	1.83	224.3	13.11	444.7	16.40	359.3	190.2	10.90	157.5	13.72	201.9	1.665
60	1.00	1388.4	1.79	210.7	12.48	444.7	16.40	359.0	189.7	10.86	157.1	13.69	200.9	1.744

********** STEADY STATE TEST Q **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F4										
60	1.02	1225.7	1.79	260.5	15.15	267.5	18.6	422.2	207.7	1.379
LEVEL F5										
21	1.04	1188.7	1.81	278.6	16.05	292.9	22.1	399.9	210.4	1.275
60	1.04	1296.1	1.79	236.3	13.68	246.7	17.6	399.9	205.6	1.512
LEVEL F6										
1	1.06	1261.7	1.83	252.8	15.31	270.0	20.7	383.4	207.7	1.413
17	1.06	1257.9	1.80	250.1	14.54	267.3	19.9	383.4	207.9	1.404
37	1.06	1293.4	1.80	238.3	13.81	253.9	18.5	383.4	206.4	1.484
38	1.06	1273.2	1.80	245.4	14.15	261.9	19.2	383.4	207.2	1.439
50	1.06	1349.1	1.78	219.8	12.73	233.1	16.5	383.4	204.6	1.611
60	1.06	1363.2	1.79	217.5	12.54	230.4	16.2	383.4	204.1	1.643
LEVEL F7										
14	1.08	1286.6	1.79	239.6	14.13	260.8	19.9	370.0	207.4	1.448
17	1.08	1288.5	1.80	239.7	13.80	260.8	19.5	370.0	207.4	1.452
21	1.08	1291.9	1.81	240.6	13.80	261.7	19.5	370.0	207.2	1.460
37	1.08	1319.2	1.80	230.0	13.32	249.5	18.4	370.0	206.2	1.521
38	1.08	1309.3	1.80	233.6	13.45	253.7	18.8	370.0	206.6	1.499
50	1.08	1383.4	1.78	210.4	12.17	226.7	16.2	370.0	204.3	1.668
60	1.08	1392.3	1.79	209.8	12.10	225.9	16.1	370.0	204.0	1.689
LEVEL F8										
1	1.10	1334.8	1.83	229.9	13.40	256.7	19.5	353.4	206.7	1.527
17	1.10	1309.9	1.80	233.6	13.41	261.9	20.0	353.4	207.6	1.468
21	1.10	1319.5	1.82	232.7	13.33	260.5	19.7	353.4	207.2	1.491
34	1.10	1402.5	1.83	212.2	12.38	234.8	17.2	353.4	204.8	1.684
37	1.10	1345.4	1.80	223.3	12.86	248.9	18.6	353.4	206.4	1.551
50	1.10	1422.9	1.78	201.6	11.62	222.5	16.0	353.4	204.3	1.732
60	1.10	1417.6	1.80	204.3	11.75	225.7	16.3	353.4	204.4	1.719

STEADY STATE TEST R

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST R **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.676E+05 LBM/SQFT H UNC. MASS FLUX 5.976E+03 LBM/SQFT H PRESSURE 952.4 PSI UNC. PRESSURE 6.00 PSI
363.11 KG/SQM S 8.1097 KG/SQM S 6.57 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	2.050	645.7	0.034	10.72	1305.5	707.9	60.91	33.837	538.6	281.8	0.757	0.4	.9254	.0334
G	2.039	642.1	0.047	14.73	1389.2	754.3	35.46	19.701	648.1	342.6	35.683	19.8	1.1296	.0384
E2	2.000	630.0	0.000	0.00	1110.6	599.6	0.00	0.000	538.6	281.8	0.757	0.4	.7771	.0298
E3	2.030	639.3	0.031	9.62	1118.7	604.1	111.06	61.702	538.6	281.8	0.757	0.4	.8042	.0307
E6	1.972	621.2	0.076	23.96	1241.3	672.2	69.86	38.812	538.6	281.8	0.757	0.4	.8625	.0320
E7	2.036	641.3	0.030	9.47	1232.7	667.4	18.21	10.119	538.6	281.8	0.757	0.4	.8821	.0324
E8	2.041	643.0	0.019	6.05	1266.9	686.4	14.65	8.141	538.6	281.8	0.757	0.4	.9079	.0330
F1	2.019	636.0	0.052	16.50	1322.2	717.1	23.44	13.023	538.6	281.8	0.757	0.4	.9585	.0343
F2	2.032	640.1	0.021	6.59	1336.9	725.3	35.33	19.629	538.6	281.8	0.757	0.4	.9843	.0350
F3	2.019	636.1	0.052	16.41	1371.9	744.7	51.99	28.884	545.2	285.4	26.838	14.9	1.0101	.0358
F4	1.972	621.2	0.076	23.96	1224.5	662.8	43.42	24.120	565.4	296.7	27.916	15.5	1.0338	.0364
F5	1.997	628.9	0.069	21.59	1284.4	696.1	56.96	31.645	578.9	304.1	30.544	17.0	1.0513	.0367
F6	2.017	635.4	0.047	14.80	1341.2	727.7	42.96	23.865	593.9	312.5	31.721	17.6	1.0698	.0371
F7	2.019	636.0	0.041	12.85	1362.8	739.6	44.79	24.881	609.2	321.0	33.182	18.4	1.0873	.0374
F8	2.027	638.5	0.051	16.02	1393.2	756.6	41.17	22.870	632.5	333.9	34.743	19.3	1.1121	.0380

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test R

T/C Level	(# wet T/C)/(Total # T/C)
E1	All wet
E2	2/3
E3	4/7
E6	0/2
E7	1/4
E8	1/5
F	All day

********** STEADY STATE TEST R **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
3	0.93	1259.6	2.12	293.9	17.24	459.2	9.14	372.5	223.4	4.16	196.3	5.15	219.9	1.438
4	0.93	1279.7	2.11	284.4	16.56	459.2	9.14	372.2	222.9	4.15	195.8	5.14	219.0	1.482
7	0.93	1298.8	2.03	266.5	15.82	459.2	9.14	372.0	222.5	4.14	195.4	5.13	218.2	1.526
7	0.93	1281.9	2.03	272.6	16.00	459.2	9.14	372.2	222.9	4.15	195.8	5.14	218.9	1.487
10	0.93	1302.9	2.06	269.0	16.03	459.2	9.14	371.9	222.4	4.14	195.3	5.13	218.1	1.536
10	0.93	1299.2	2.06	270.3	16.21	459.2	9.14	372.0	222.5	4.14	195.4	5.13	218.2	1.527
10	0.93	1296.4	2.06	271.3	16.28	459.2	9.14	372.0	222.5	4.14	195.5	5.13	218.3	1.521
13	0.93	1307.3	2.08	270.9	15.83	459.2	9.14	371.9	222.3	4.13	195.2	5.12	217.9	1.546
13	0.93	1303.7	2.08	272.2	16.37	459.2	9.14	371.9	222.4	4.14	195.3	5.13	218.0	1.537
15	0.93	1312.4	2.02	261.3	15.13	459.2	9.14	371.8	222.2	4.13	195.1	5.12	217.7	1.557
16	0.93	1367.8	2.03	244.5	14.26	459.2	9.14	371.3	221.1	4.11	194.2	5.09	215.8	1.683
17	0.93	1182.3	2.04	316.9	18.37	459.2	9.14	373.7	225.6	4.20	198.3	5.20	223.8	1.268
18	0.93	1243.5	2.04	288.8	17.13	459.2	9.14	372.7	223.8	4.17	196.7	5.16	220.6	1.403
18	0.93	1198.8	2.04	308.4	18.31	459.2	9.14	373.4	225.1	4.20	197.8	5.20	222.9	1.304
20	0.93	1127.8	2.06	349.2	20.43	459.2	9.14	374.7	227.6	4.25	200.2	5.26	227.4	1.152
20	0.93	1244.0	2.06	291.6	16.88	459.2	9.14	372.7	223.8	4.16	196.6	5.16	220.6	1.404
21	0.93	1274.3	2.05	278.3	17.46	459.2	9.14	372.3	223.0	4.17	195.9	5.15	219.2	1.470
28	0.93	1323.5	2.02	257.6	14.87	459.2	9.14	371.7	221.9	4.12	194.9	5.11	217.3	1.583
28	0.93	1294.0	2.02	267.6	15.52	459.2	9.14	372.0	222.6	4.14	195.5	5.13	218.4	1.515
28	0.93	1302.7	2.02	264.6	15.37	459.2	9.14	371.9	222.4	4.13	195.3	5.12	218.1	1.535
31	0.93	1328.8	2.06	260.7	15.26	459.2	9.14	371.6	221.8	4.13	194.8	5.11	217.1	1.595
31	0.93	1335.0	2.06	258.6	15.04	459.2	9.14	371.6	221.7	4.12	194.7	5.10	216.9	1.608
32	0.93	1388.2	2.09	245.9	14.16	459.2	9.14	371.1	220.8	4.10	193.9	5.08	215.2	1.731
34	0.93	1299.0	2.07	272.7	16.12	459.2	9.14	372.0	222.5	4.14	195.4	5.13	218.2	1.527
37	0.93	1268.2	2.03	278.9	17.76	459.2	9.14	372.4	223.2	4.17	196.1	5.16	219.5	1.457
38	0.93	1302.5	2.04	267.0	15.71	459.2	9.14	371.9	222.4	4.14	195.3	5.12	218.1	1.535
42	0.93	1333.2	2.04	256.7	15.32	459.2	9.14	371.6	221.8	4.13	194.8	5.11	217.0	1.604
45	0.93	1298.4	2.07	272.1	15.77	459.2	9.14	372.0	222.5	4.14	195.4	5.12	218.2	1.525
45	0.93	1313.7	2.07	266.8	15.46	459.2	9.14	371.8	222.1	4.13	195.1	5.12	217.6	1.560
53	0.93	1365.1	2.12	256.3	15.04	459.2	9.14	371.3	221.2	4.11	194.2	5.09	215.9	1.677
59	0.93	1375.0	2.05	245.1	14.23	459.2	9.14	371.2	221.0	4.11	194.1	5.09	215.6	1.700
59	0.93	1372.0	2.05	246.0	14.18	459.2	9.14	371.2	221.0	4.11	194.1	5.09	215.7	1.693
59	0.93	1385.3	2.05	242.2	14.47	459.2	9.14	371.1	220.8	4.11	193.9	5.08	215.3	1.724
60	0.93	1387.7	2.03	239.1	14.11	459.2	9.14	371.1	220.8	4.10	193.9	5.08	215.2	1.730
64	0.93	1442.2	2.04	225.7	12.98	459.2	9.14	370.7	220.0	4.08	193.1	5.06	213.9	1.856

********** STEADY STATE TEST R **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.13	1363.1	2.07	250.7	14.82	289.1	22.7	369.6	225.9	1.751
3	1.13	1414.4	2.11	241.4	13.97	275.9	20.7	369.6	224.4	1.886
14	1.13	1337.5	2.03	253.5	15.42	293.8	23.9	369.6	226.7	1.686
18	1.13	1393.0	2.03	237.6	13.72	272.5	20.6	369.6	225.0	1.831
18	1.13	1358.9	2.03	247.5	14.42	285.6	22.2	369.6	226.0	1.741
18	1.13	1391.4	2.03	238.0	13.75	273.1	20.7	369.6	225.0	1.827
20	1.13	1294.7	2.05	271.5	15.66	317.5	25.6	369.6	228.4	1.576
20	1.13	1377.7	2.05	244.7	14.46	281.4	21.9	369.6	225.4	1.790
20	1.13	1403.1	2.05	237.5	13.85	271.9	20.6	369.6	224.7	1.857
21	1.13	1370.0	2.05	246.0	14.10	283.4	21.6	369.6	225.7	1.769
37	1.13	1386.3	2.03	239.5	13.91	275.1	21.0	369.6	225.2	1.813
38	1.13	1407.8	2.04	234.3	13.65	268.1	20.3	369.6	224.5	1.869
45	1.13	1418.3	2.06	234.6	13.77	267.9	20.3	369.6	224.3	1.896
45	1.13	1413.7	2.06	235.8	13.84	269.5	20.5	369.6	224.4	1.884
45	1.13	1410.3	2.06	236.7	13.89	270.7	20.6	369.6	224.5	1.874
47	1.13	1418.5	2.04	231.4	13.59	264.3	20.0	369.6	224.3	1.897
60	1.13	1449.6	2.03	222.4	13.30	252.8	19.1	369.6	223.5	1.981

********** STEADY STATE TEST R **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL E2														
60	0.78	1110.6	2.00	349.6	21.29	402.4	8.74	328.8	221.3	2.67	194.4	3.02	220.7	0.849
LEVEL E3														
34	0.80	1006.7	2.06	440.8	29.11	412.9	8.92	340.1	229.2	2.91	202.0	3.27	232.4	0.705
50	0.80	1120.7	2.00	344.3	21.60	412.9	8.92	337.2	223.1	2.69	196.4	3.07	221.5	0.909
60	0.80	1228.8	2.02	292.8	17.42	412.9	8.92	335.5	219.5	2.59	193.0	2.98	215.0	1.110
LEVEL E6														
60	0.86	1290.7	2.03	269.3	15.72	435.3	9.03	353.2	221.5	2.76	195.1	3.31	215.4	1.358
LEVEL E7														
34	0.88	1245.8	2.07	292.4	17.53	442.8	9.04	359.4	223.3	3.00	196.7	3.65	218.3	1.305
37	0.88	1211.9	2.03	301.6	17.66	442.8	9.04	359.9	224.3	3.01	197.6	3.66	219.9	1.235
50	0.88	1240.4	2.01	286.2	16.86	442.8	9.04	359.4	223.5	3.00	196.8	3.65	218.5	1.293
LEVEL E8														
14	0.91	1263.7	2.03	279.5	16.62	452.6	9.09	367.2	223.4	3.52	196.5	4.34	218.8	1.405
34	0.91	1284.5	2.07	277.4	16.50	452.6	9.09	366.9	222.9	3.51	196.0	4.35	217.9	1.450
37	0.91	1249.2	2.03	285.9	16.69	452.6	9.09	367.4	223.7	3.52	196.9	4.34	219.5	1.373
38	0.91	1270.2	2.04	278.5	16.17	452.6	9.09	367.1	223.2	3.51	196.4	4.33	218.5	1.420
LEVEL F1														
17	0.96	1285.5	2.03	272.4	15.68	471.7	9.28	382.2	221.3	7.53	193.4	8.94	220.4	1.586
21	0.96	1306.1	2.05	266.7	15.53	471.7	9.28	382.0	220.8	7.51	193.0	8.92	219.6	1.633
34	0.96	1337.4	2.07	259.1	15.33	471.7	9.28	381.6	220.2	7.49	192.4	8.89	218.5	1.707
37	0.96	1317.8	2.03	260.8	15.14	471.7	9.28	381.9	220.6	7.50	192.7	8.91	219.2	1.660
50	0.96	1342.8	2.01	250.0	14.44	471.7	9.28	381.6	220.1	7.49	192.3	8.89	218.3	1.720
LEVEL F2														
1	0.98	1286.6	2.01	269.3	15.73	481.3	10.35	390.2	217.4	12.96	188.3	15.64	221.7	1.663
14	0.98	1307.0	2.03	264.4	16.10	481.3	10.35	389.9	217.0	12.83	187.9	15.70	220.9	1.712
17	0.98	1328.0	2.03	257.6	14.78	481.3	10.35	389.7	216.5	12.99	187.5	15.51	220.1	1.764
34	0.98	1373.9	2.07	247.6	14.57	481.3	10.35	389.2	215.7	12.88	186.7	15.49	218.6	1.877
38	0.98	1360.5	2.04	247.8	14.30	481.3	10.35	389.3	215.9	12.94	186.9	15.47	219.0	1.844
50	0.98	1365.4	2.01	242.9	14.05	481.3	10.35	389.3	215.8	12.93	186.8	15.46	218.8	1.856

********** STEADY STATE TEST R **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F3										
14	1.01	1312.3	2.03	261.8	15.55	264.0	18.2	480.9	221.9	1.781
17	1.01	1325.1	2.03	258.5	14.86	260.7	17.5	480.9	221.4	1.813
21	1.01	1340.8	2.05	255.0	14.64	257.1	17.1	480.9	220.9	1.853
34	1.01	1416.0	2.07	235.7	13.85	237.5	15.8	480.9	218.6	2.042
60	1.01	1434.5	2.03	226.1	13.53	227.8	15.3	480.9	218.2	2.089
LEVEL F4										
60	1.03	1255.2	2.03	282.7	16.53	293.7	21.0	443.9	225.5	1.601
LEVEL F5										
21	1.05	1221.7	2.05	299.5	17.31	318.2	24.0	424.3	228.0	1.495
60	1.05	1333.0	2.03	255.0	14.81	268.6	19.1	424.3	223.2	1.773
LEVEL F6										
1	1.07	1296.8	2.07	272.6	16.74	294.1	22.7	407.8	225.5	1.658
17	1.07	1303.7	2.03	265.7	15.52	286.5	21.2	407.8	225.2	1.675
37	1.07	1328.4	2.03	257.1	14.97	276.5	20.2	407.8	224.3	1.738
38	1.07	1309.4	2.04	264.2	15.30	284.6	20.9	407.8	225.0	1.690
50	1.07	1394.9	2.01	234.6	13.64	250.8	17.7	407.8	222.1	1.908
60	1.07	1399.8	2.03	235.2	13.62	251.4	17.7	407.8	222.0	1.920
LEVEL F7										
14	1.09	1311.7	2.03	262.4	15.63	288.8	22.2	394.4	225.7	1.673
17	1.09	1335.5	2.04	255.6	14.77	280.5	20.8	394.4	224.9	1.732
21	1.09	1323.3	2.05	261.1	15.03	287.0	21.4	394.4	225.3	1.701
37	1.09	1352.9	2.03	249.8	14.54	273.5	20.2	394.4	224.3	1.777
38	1.09	1347.2	2.04	252.3	14.58	276.4	20.4	394.4	224.4	1.762
50	1.09	1430.0	2.01	225.7	13.12	245.2	17.5	394.4	222.0	1.977
60	1.09	1427.1	2.03	228.4	13.24	248.1	17.7	394.4	222.1	1.969
LEVEL F8										
1	1.11	1377.6	2.07	246.4	14.45	277.4	21.0	378.0	224.7	1.809
17	1.11	1359.6	2.03	247.7	14.25	279.6	21.1	378.0	225.2	1.762
21	1.11	1348.7	2.05	252.5	14.50	285.6	21.6	378.0	225.6	1.735
34	1.11	1449.4	2.07	227.1	13.33	253.2	18.5	378.0	222.7	1.998
37	1.11	1377.6	2.03	242.0	14.00	272.5	20.4	378.0	224.7	1.809
60	1.11	1451.4	2.03	221.9	12.80	247.4	17.8	378.0	222.7	2.004

STEADY STATE TEST T

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST T **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX	1.766E+05	LBM/SQFT H	UNC. MASS FLUX	4.001E+03	LBM/SQFT H	PRESSURE	1723.0	PSI	UNC. PRESSURE 6.00 PSI
	239.60	KG/SQM S		5.4292	KG/SQM S		11.89	MPA	0.041 MPA

LEVEL	Q		SCQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.029	324.1	0.014	4.35	1068.3	576.1	39.17	21.759	624.0	329.2	15.766	8.8	1.0251	.0385
F6	1.030	324.4	0.000	0.00	1060.3	571.6	0.00	0.000	614.8	324.1	0.484	0.3	.9672	.0373
F7	1.014	319.5	0.000	0.00	1024.1	551.5	0.00	0.000	614.8	324.1	0.484	0.3	.9842	.0376
F8	1.027	323.4	0.006	1.75	1080.6	582.9	40.16	22.313	616.9	325.3	15.735	8.7	1.0081	.0381

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SCQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test T

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	1/3
F6	0/7
F7	1/8
F8	All dry

********** STEADY STATE TEST T **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.03	1098.0	1.03	213.3	12.48	217.4	14.7	488.1	193.0	0.844
16	1.03	1069.0	1.01	223.0	13.10	227.6	15.7	488.1	196.7	0.795
16	1.03	1094.3	1.01	211.3	12.36	215.4	14.6	488.1	193.4	0.837
18	1.03	1015.7	1.03	255.9	14.99	261.9	18.7	488.1	205.5	0.707
32	1.03	1096.4	1.06	220.9	12.92	225.2	15.2	488.1	193.2	0.841
34	1.03	1023.7	1.04	255.5	15.11	261.3	18.6	488.1	204.0	0.721
42	1.03	1028.0	1.03	248.5	16.13	254.1	19.4	488.1	203.2	0.727
42	1.03	1029.6	1.03	247.5	14.58	253.1	17.9	488.1	202.9	0.730
58	1.03	1058.9	1.03	232.4	13.67	237.3	16.4	488.1	198.2	0.778
60	1.03	1056.5	1.02	231.6	13.71	236.5	16.5	488.1	198.5	0.774
64	1.03	1120.6	1.02	202.5	11.73	206.3	13.7	488.1	190.5	0.880
64	1.03	1129.0	1.02	199.2	11.53	202.8	13.4	488.1	189.6	0.895

********** STEADY STATE TEST T **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
1	0.97	1060.3	1.03	231.2	13.82	509.3	10.13	378.5	233.5	8.65	179.7	8.27	196.1	0.744
LEVEL F7														
60	0.98	1024.1	1.01	247.8	14.54	515.6	11.65	385.0	235.9	9.23	181.0	11.50	202.6	0.708

********** STEADY STATE TEST T **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F8										
1	1.01	1109.0	1.03	208.6	12.14	209.4	13.9	267.5	191.2	0.048
60	1.01	1052.2	1.02	233.9	13.64	235.0	16.2	267.5	198.7	0.018

STEADY STATE TEST U

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST U **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.778E+05 LBM/SQFT H UNC. MASS FLUX 4.028E+03 LBM/SQFT H PRESSURE 1694.4 PSI UNC. PRESSURE 6.00 PSI

241.22 KG/SQM S 5.4663 KG/SQM S 11.69 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.030	324.3	0.014	4.33	1069.9	576.9	37.12	20.624	616.9	325.3	16.060	8.9	1.0132	.0379
F6	1.030	324.5	0.000	0.00	1054.7	568.5	0.00	0.000	612.5	322.8	0.484	0.3	.9563	.0367
F7	1.014	319.3	0.000	0.00	1021.5	550.1	0.00	0.000	612.5	322.8	0.484	0.3	.9730	.0370
F8	1.027	323.5	0.006	1.83	1077.2	581.0	38.11	21.174	612.5	322.8	0.484	0.3	.9965	.0375

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test U

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	2/3
F6	1/7
F7	1/8
F8	All dry

********** STEADY STATE TEST U **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**? F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.01	1093.1	1.03	214.5	12.56	216.5	14.7	509.7	193.3	0.849
16	1.01	1064.3	1.01	224.3	13.18	226.5	15.6	509.7	197.0	0.801
16	1.01	1089.9	1.01	212.3	12.42	214.3	14.5	509.7	193.7	0.843
32	1.01	1091.2	1.06	221.7	12.96	223.8	15.1	509.7	193.5	0.846
34	1.01	1020.5	1.05	256.4	15.17	259.1	18.5	509.7	204.1	0.729
42	1.01	1025.3	1.03	248.9	16.16	251.6	19.2	509.7	203.2	0.737
42	1.01	1027.1	1.03	247.8	14.60	250.5	17.8	509.7	202.9	0.740
58	1.01	1056.3	1.03	232.6	13.68	234.9	16.3	509.7	198.2	0.788
60	1.01	1055.1	1.02	231.1	13.68	233.4	16.3	509.7	198.3	0.786
64	1.01	1119.1	1.03	202.4	11.73	204.2	13.5	509.7	190.4	0.891
64	1.01	1127.1	1.03	199.3	11.53	201.0	13.3	509.7	189.6	0.905

********** STEADY STATE TEST U **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
1	0.96	1054.7	1.03	232.9	13.94	499.8	9.66	373.5	232.7	5.84	179.9	5.71	196.6	0.722
LEVEL F7														
6C	0.97	1021.5	1.01	247.9	14.55	506.0	10.57	379.8	235.6	9.10	181.8	11.43	202.6	0.690
LEVEL F8														
1	1.00	1104.1	1.03	209.7	12.21	514.8	16.72	382.2	223.4	9.39	170.4	10.32	191.5	0.856
60	1.00	1050.2	1.02	233.7	13.63	514.8	16.72	384.6	227.9	9.48	174.0	10.63	198.6	0.768

STEADY STATE TEST V

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB	- CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT	TSAT	- SATURATION TEMPERATURE
HDB	- DITTUS-BOELTER HEAT TRANSFER COEFFICIENT	TSRF(TSURF)	- SURFACE TEMPERATURE
HDR	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT	TF	- EQUILIBRIUM FLUID TEMPERATURE
HDRPW	- DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER	UHDR	- UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HEXP	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)	UHEXP	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HEXPS	- EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)	UHEXPS	- UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
HG57	- GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT	UHG57	- UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59	- GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT	UHG59	- UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q	- HEAT FLUX	UNC	- UNCERTAINTY
QGD	- GROENEVELD-DELORME HEAT FLUX	UTF	- UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
SDTSRF	- CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE	UX	- UNCERTAINTY, QUALITY
SDQ	- CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX	X	- QUALITY
TBULK	- BULK VAPOR TEMPERATURE		

********** STEADY STATE TEST V **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.835E+05 LBM/SQFT H UNC. MASS FLUX 4.151E+03 LBM/SQFT H PRESSURE 1744.6 PSI UNC. PRESSURE 6.00 PSI
249.03 KG/SQM S 5.6330 KG/SQM S 12.04 MPA C.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
G	1.039	327.2	0.016	5.05	1069.6	576.8	29.29	16.274	616.6	325.1	0.484	0.3	.9856	.0378
F6	1.033	325.5	0.000	0.00	1038.5	559.5	0.00	0.000	616.6	325.1	0.484	0.3	.9289	.0365
F8	1.035	326.1	0.009	2.75	1060.3	571.6	39.46	21.920	616.6	325.1	0.484	0.3	.9690	.0374

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test V

T/C Level	(# wet T/C)/(Total # T/C)
F1	All wet
F2	5/6
F3	5/6
F4	1/2
F5	2/3
F6	4/7
F7	4/8
F8	All dry

********** STEADY STATE TEST V **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL G														
1	0.99	1078.3	1.04	225.6	13.26	538.8	12.47	397.1	238.5	9.33	184.0	11.48	200.7	0.829
16	0.99	1043.6	1.02	239.5	14.14	538.8	12.47	398.9	242.0	9.36	186.9	11.77	206.0	0.771
16	0.99	1070.7	1.02	225.2	13.23	538.8	12.47	397.5	239.2	9.35	184.6	11.53	201.7	0.817
32	0.99	1072.9	1.07	235.3	13.81	538.8	12.47	397.4	239.0	9.35	184.4	11.51	201.4	0.820
58	0.99	1036.6	1.04	248.4	14.69	538.8	12.47	399.4	242.8	9.36	187.5	11.84	207.2	0.760
60	0.99	1037.3	1.03	245.6	14.62	538.8	12.47	399.3	242.7	9.30	187.4	11.88	207.1	0.761
64	0.99	1105.0	1.04	212.2	12.32	538.8	12.47	395.9	236.2	9.38	182.2	11.24	197.3	0.874
64	0.99	1112.7	1.04	208.9	12.12	538.8	12.47	395.6	235.6	9.38	181.7	11.19	196.4	0.888

********** STEADY STATE TEST V **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F6														
1	0.93	1038.5	1.03	244.9	14.73	516.6	10.16	383.4	244.3	3.67	189.9	3.83	204.9	0.693
LEVEL F8														
1	0.97	1088.2	1.04	220.8	12.91	532.3	10.64	392.3	239.2	9.00	185.3	9.28	198.8	0.824
60	0.97	1032.4	1.03	247.5	14.50	532.3	10.64	395.2	244.9	9.08	189.9	9.53	207.4	0.733

STEADY STATE TEST W

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST W **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 1.885E+05 LBM/SQFT H UNC. MASS FLUX 4.260E+03 LBM/SQFT H PRESSURE 1819.5 PSI UNC. PRESSURE 6.00 PSI
255.85 KG/SQM S 5.7812 KG/SQM S 12.55 MPA 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.223	385.4	0.026	8.34	1091.1	588.7	53.23	29.574	622.5	328.4	0.443	0.2	.9418	.0386
G	1.221	384.6	0.024	7.65	1164.9	629.7	41.20	22.887	695.1	368.7	21.851	12.1	1.1700	.0442
E6	1.218	383.6	0.000	0.00	1060.9	571.9	0.00	0.000	622.5	328.4	0.443	0.2	.8715	.0370
E7	1.228	387.0	0.000	0.00	1139.3	615.5	0.00	0.000	622.5	328.4	0.443	0.2	.8934	.0375
E8	1.238	389.9	0.012	3.74	1100.4	593.9	81.53	45.294	622.5	328.4	0.443	0.2	.9222	.0381
F1	1.212	381.9	0.032	9.93	1076.0	580.3	22.76	12.646	622.5	328.4	0.443	0.2	.9787	.0396
F2	1.223	385.1	0.014	4.33	1115.1	602.0	53.70	29.832	625.1	329.8	13.507	7.5	1.0075	.0404
F3	1.212	381.7	0.031	9.87	1120.2	604.9	38.65	21.472	635.3	335.5	15.235	8.5	1.0363	.0413
F4	1.221	384.5	0.000	0.00	1050.1	565.9	0.00	0.000	645.8	341.3	17.746	9.9	1.0628	.0420
F5	1.187	373.8	0.048	15.12	1073.0	578.7	26.30	14.614	654.3	346.0	18.947	10.5	1.0824	.0424
F6	1.211	381.5	0.026	8.28	1112.7	600.7	31.00	17.221	664.0	351.4	19.474	10.8	1.1032	.0427
F7	1.210	381.1	0.024	7.48	1116.3	602.7	24.97	13.873	673.5	356.7	20.075	11.2	1.1228	.0432
F8	1.216	382.9	0.027	8.63	1153.8	623.5	36.39	20.217	685.8	363.5	20.895	11.6	1.1504	.0438

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test W

T/C Level	(# wet T/C)/(Total # T/C)
E3	All wet
E6	1/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST W **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	QGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F										
LEVEL F														
1	0.94	1167.2	1.23	225.7	13.30	556.3	11.65	401.1	245.1	4.26	190.5	4.44	195.5	0.952
3	0.94	1094.8	1.25	265.0	15.54	556.3	11.65	403.9	250.7	4.38	195.0	4.56	203.5	0.831
4	0.94	1122.6	1.24	248.3	14.44	556.3	11.65	402.7	248.3	4.32	193.1	4.50	200.0	0.877
7	0.94	1141.2	1.19	229.9	13.49	556.3	11.65	402.0	246.9	4.29	191.9	4.48	198.0	0.908
7	0.94	1127.8	1.19	236.0	13.80	556.3	11.65	402.5	247.9	4.31	192.7	4.50	199.4	0.886
10	0.94	1065.3	1.21	273.9	16.36	556.3	11.65	405.4	253.6	4.48	197.4	4.65	207.8	0.782
10	0.94	1068.6	1.21	271.9	16.27	556.3	11.65	405.3	253.3	4.47	197.1	4.64	207.3	0.787
10	0.94	1062.5	1.21	275.6	16.52	556.3	11.65	405.6	254.0	4.49	197.7	4.66	208.3	0.778
13	0.94	1058.9	1.24	284.6	16.80	556.3	11.65	405.8	254.4	4.47	198.0	4.65	208.9	0.772
13	0.94	1047.6	1.24	292.1	17.60	556.3	11.65	406.5	255.7	4.54	199.1	4.71	210.8	0.752
15	0.94	1045.3	1.26	298.9	17.62	556.3	11.65	406.6	256.0	4.51	199.3	4.69	211.2	0.749
16	0.94	1121.8	1.20	241.2	14.12	556.3	11.65	402.7	248.4	4.32	193.1	4.51	200.1	0.875
17	0.94	1054.7	1.22	281.8	16.39	556.3	11.65	406.0	254.8	4.46	198.4	4.65	209.6	0.764
28	0.94	1072.6	1.21	269.0	15.66	556.3	11.65	405.0	252.9	4.42	196.8	4.60	206.7	0.793
28	0.94	1058.8	1.21	277.5	16.28	556.3	11.65	405.8	254.4	4.46	198.0	4.64	208.9	0.771
28	0.94	1056.2	1.21	279.1	16.39	556.3	11.65	406.0	254.7	4.47	198.2	4.65	209.3	0.767
31	0.94	1049.0	1.23	288.3	17.16	556.3	11.65	406.4	255.5	4.52	198.9	4.69	210.5	0.755
31	0.94	1056.9	1.23	283.1	16.70	556.3	11.65	405.9	254.6	4.48	198.2	4.66	209.2	0.768
32	0.94	1162.3	1.27	234.7	13.58	556.3	11.65	401.2	245.4	4.25	190.7	4.44	195.9	0.944
34	0.94	1060.3	1.25	284.6	16.93	556.3	11.65	405.7	254.2	4.48	197.9	4.66	208.6	0.774
37	0.94	1030.6	1.22	299.9	19.02	556.3	11.65	407.6	257.8	4.72	200.8	4.83	214.0	0.724
38	0.94	1026.9	1.22	302.0	18.02	556.3	11.65	407.8	258.3	4.59	201.2	4.76	214.7	0.718
42	0.94	1076.8	1.23	270.1	16.16	556.3	11.65	404.8	252.4	4.45	196.4	4.62	206.0	0.800
45	0.94	1038.2	1.25	299.7	17.68	556.3	11.65	407.1	256.8	4.53	200.0	4.71	212.5	0.737
45	0.94	1042.9	1.25	296.4	17.48	556.3	11.65	406.8	256.2	4.52	199.5	4.69	211.6	0.744
53	0.94	1078.8	1.26	276.5	16.33	556.3	11.65	404.7	252.2	4.42	196.3	4.60	205.7	0.804
59	0.94	1099.6	1.22	255.2	14.92	556.3	11.65	403.7	250.3	4.36	194.6	4.55	202.9	0.839
59	0.94	1101.9	1.22	253.9	14.77	556.3	11.65	403.6	250.0	4.35	194.5	4.54	202.6	0.843
59	0.94	1112.4	1.22	248.5	14.75	556.3	11.65	403.1	249.1	4.36	193.7	4.54	201.2	0.860
60	0.94	1131.4	1.22	239.9	14.16	556.3	11.65	402.4	247.6	4.32	192.5	4.50	199.0	0.892
64	0.94	1201.3	1.22	210.8	12.16	556.3	11.65	400.0	243.1	4.20	188.8	4.39	192.6	1.010
64	0.94	1219.6	1.22	204.3	11.75	556.3	11.65	399.5	242.1	4.18	188.0	4.37	191.2	1.041
64	0.94	1210.9	1.22	207.3	11.92	556.3	11.65	399.7	242.6	4.19	188.4	4.38	191.8	1.027

********** STEADY STATE TEST W **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.17	1197.8	1.23	213.7	12.49	244.6	18.0	368.1	200.3	1.012
14	1.17	1120.2	1.21	243.0	14.61	284.6	22.9	368.1	208.1	0.863
16	1.17	1192.2	1.20	211.4	12.38	242.3	18.0	368.1	200.8	1.001
16	1.17	1210.2	1.20	204.9	11.94	233.8	17.0	368.1	199.3	1.036
18	1.17	1153.9	1.22	230.1	13.34	266.5	20.2	368.1	204.4	0.927
18	1.17	1135.7	1.22	238.3	13.94	277.5	21.6	368.1	206.3	0.892
18	1.17	1145.9	1.22	233.6	13.56	271.3	20.8	368.1	205.2	0.912
20	1.17	1058.1	1.22	280.3	16.35	336.4	28.6	368.1	217.1	0.745
20	1.17	1136.0	1.22	237.7	14.12	276.9	21.8	368.1	206.3	0.893
20	1.17	1143.4	1.22	234.4	13.66	272.3	21.0	368.1	205.5	0.907
21	1.17	1116.6	1.18	238.3	13.74	279.4	21.9	368.1	208.5	0.856
32	1.17	1225.5	1.27	210.1	12.20	238.8	17.2	368.1	198.2	1.066
34	1.17	1189.3	1.25	219.9	12.84	252.2	18.7	368.1	201.1	0.995
37	1.17	1138.2	1.22	237.3	13.83	276.2	21.4	368.1	206.0	0.897
38	1.17	1146.9	1.22	232.9	13.61	270.4	20.8	368.1	205.1	0.914
42	1.17	1184.6	1.23	218.3	14.00	250.7	20.2	368.1	201.5	0.986
42	1.17	1190.1	1.23	216.2	12.60	247.9	18.3	368.1	201.0	0.997
45	1.17	1152.3	1.25	235.2	13.91	272.6	21.0	368.1	204.5	0.925
45	1.17	1146.6	1.25	237.7	14.02	276.0	21.4	368.1	205.1	0.914
45	1.17	1149.0	1.25	236.7	13.91	274.5	21.1	368.1	204.9	0.918
47	1.17	1148.6	1.23	233.2	13.69	270.6	20.8	368.1	204.9	0.918
50	1.17	1174.1	1.21	219.5	12.72	252.7	18.8	368.1	202.4	0.967
58	1.17	1187.7	1.23	217.9	12.72	250.0	18.5	368.1	201.2	0.992
60	1.17	1190.9	1.22	214.8	12.66	246.2	18.4	368.1	200.9	0.998
64	1.17	1241.0	1.22	197.2	11.38	223.5	15.8	368.1	197.1	1.096
64	1.17	1245.2	1.22	195.9	11.31	221.8	15.7	368.1	196.8	1.103

********** STEADY STATE TEST W **********

INTERMEDIATE LEVELS

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E6														
60	0.87	1060.9	1.22	277.8	16.37	526.9	11.51	384.5	250.3	3.11	194.5	3.09	205.9	0.691
LEVEL E7														
1	0.89	1139.3	1.23	237.7	14.01	536.1	11.53	387.5	244.9	3.01	190.3	3.07	196.5	0.839
LEVEL E8														
1	0.92	1158.0	1.23	229.6	13.48	548.2	11.58	395.3	245.1	3.38	190.6	3.53	195.6	0.908
34	0.92	1042.7	1.25	296.6	17.82	548.2	11.58	400.7	255.6	3.65	199.1	3.77	210.9	0.720
LEVEL F1														
17	0.98	1100.4	1.22	254.8	14.74	571.6	12.93	414.6	249.2	9.37	193.1	11.34	204.0	0.891
21	0.98	1038.6	1.22	293.9	17.31	571.6	12.93	418.0	255.8	9.32	198.4	11.93	213.8	0.785
34	0.98	1099.1	1.25	261.5	15.50	571.6	12.93	414.6	249.4	9.17	193.2	11.51	204.2	0.889
37	0.98	1077.0	1.22	269.3	15.76	571.6	12.93	415.7	251.5	9.30	194.9	11.58	207.3	0.850
50	0.98	1070.9	1.21	270.0	15.78	571.6	12.93	416.1	252.1	9.32	195.4	11.61	208.2	0.840

********** STEADY STATE TEST W **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F2										
1	1.01	1206.0	1.23	210.7	12.18	211.6	13.2	580.3	194.4	1.125
14	1.01	1040.6	1.21	289.3	17.61	291.1	20.1	580.3	214.5	0.828
17	1.01	1119.1	1.22	245.2	14.15	246.5	15.8	580.3	202.7	0.967
34	1.01	1124.1	1.25	248.4	14.66	249.7	16.2	580.3	202.2	0.977
38	1.01	1106.0	1.22	252.6	14.69	254.0	16.4	580.3	204.3	0.945
50	1.01	1094.5	1.21	256.5	14.97	257.9	16.8	580.3	205.9	0.924
LEVEL F3										
14	1.04	1068.5	1.21	271.2	16.12	279.2	19.4	513.8	210.7	0.851
17	1.04	1123.5	1.22	243.1	14.04	249.5	16.4	513.8	203.2	0.950
21	1.04	1084.3	1.22	264.8	15.34	272.4	18.3	513.8	208.3	0.880
34	1.04	1153.2	1.25	234.8	13.80	240.6	15.9	513.8	200.0	1.004
60	1.04	1169.2	1.22	223.3	13.20	228.6	15.1	513.8	198.5	1.033
LEVEL F4										
60	1.06	1050.1	1.22	285.5	16.85	301.9	22.4	471.7	214.8	0.800
LEVEL F5										
60	1.08	1091.6	1.22	260.2	15.23	279.1	20.5	445.3	208.9	0.861
LEVEL F6										
1	1.10	1167.1	1.23	225.7	13.49	244.4	17.6	421.0	200.9	0.986
17	1.10	1113.6	1.22	248.0	14.47	270.9	19.8	421.0	206.7	0.888
37	1.10	1084.8	1.22	264.7	15.52	290.9	21.9	421.0	210.6	0.835
38	1.10	1083.6	1.22	264.9	15.45	291.1	21.9	421.0	210.8	0.833
50	1.10	1102.7	1.21	252.1	14.79	275.9	20.5	421.0	208.1	0.868
60	1.10	1141.0	1.22	235.4	13.70	255.9	18.3	421.0	203.6	0.938
LEVEL F7										
14	1.12	1089.8	1.21	258.8	15.36	290.5	22.5	400.9	210.5	0.832
17	1.12	1132.5	1.22	238.8	13.83	265.3	19.4	400.9	205.1	0.910
21	1.12	1085.0	1.22	264.4	15.35	297.2	22.7	400.9	211.2	0.823
37	1.12	1108.6	1.22	251.8	14.71	281.3	21.1	400.9	208.0	0.866
38	1.12	1111.0	1.22	250.0	14.53	279.2	20.9	400.9	207.7	0.871
50	1.12	1125.4	1.21	240.7	14.09	267.9	19.9	400.9	205.9	0.897
60	1.12	1163.7	1.22	225.5	13.11	249.0	17.8	400.9	201.9	0.968
LEVEL F8										
1	1.15	1210.7	1.23	209.0	12.15	234.2	16.6	379.8	198.7	1.044
17	1.15	1144.1	1.22	233.5	13.47	265.7	19.7	379.8	204.8	0.916
21	1.15	1102.3	1.22	254.9	14.75	293.6	22.7	379.8	209.8	0.838
34	1.15	1176.5	1.25	224.9	13.19	254.0	18.6	379.8	201.6	0.978
37	1.15	1130.9	1.22	240.7	13.98	275.0	20.7	379.8	206.2	0.892
50	1.15	1153.9	1.21	227.8	13.26	258.6	19.2	379.8	203.8	0.936
60	1.15	1189.3	1.22	215.4	12.47	242.4	17.4	379.8	200.5	1.003

STEADY STATE TEST X

FLUID CONDITIONS

CORRELATION COMPARISONS

ENGLISH UNITS

NOMENCLATURE

HCB - CONDIE-BENGSTON HEAT TRANSFER COEFFICIENT
HDB - DITTUS-BOELTER HEAT TRANSFER COEFFICIENT
HDR - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
HDRPW - DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT, WALL PRANDTL NUMBER
HEXP - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TBULK)
HEXPS - EXPERIMENTAL HEAT TRANSFER COEFFICIENT Q/(TSURF-TSAT)
HG57 - GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
HG59 - GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
Q - HEAT FLUX
QGD - GROENEVELD-DELORME HEAT FLUX
SDTSRF - CROSS-SECTIONAL STANDARD DEVIATION OF THE SURFACE TEMPERATURE
SDQ - CROSS-SECTIONAL STANDARD DEVIATION OF THE HEAT FLUX
TBULK - BULK VAPOR TEMPERATURE
TSAT - SATURATION TEMPERATURE
TSRF(TSURF) - SURFACE TEMPERATURE
TF - EQUILIBRIUM FLUID TEMPERATURE
UHDR - UNCERTAINTY, DOUGALL-ROHSENOW HEAT TRANSFER COEFFICIENT
UHEXP - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHEXPS - UNCERTAINTY, EXPERIMENTAL HEAT TRANSFER COEFFICIENT
UHG57 - UNCERTAINTY, GROENEVELD 5.7 HEAT TRANSFER COEFFICIENT
UHG59 - UNCERTAINTY, GROENEVELD 5.9 HEAT TRANSFER COEFFICIENT
UNC - UNCERTAINTY
UTF - UNCERTAINTY, EQUILIBRIUM FLUID TEMPERATURE
UX - UNCERTAINTY, QUALITY
X - QUALITY

********** STEADY STATE TEST X **********

LEVEL AVERAGE FLUID AND SURFACE CONDITIONS

MASS FLUX 2.537E+05 LBM/SQFT H — 344.32 KG/SQM S
UNC. MASS FLUX 5.683E+03 LBM/SQFT H — 7.7115 KG/SQM S
PRESSURE 871.5 PSI — 6.01 MPA
UNC. PRESSURE 6.00 PSI — 0.041 MPA

LEVEL	Q		SDQ		TSRF		SDTSRF		TF		UTF		X	UX
	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI	ENG	SI		
F	1.906	600.4	0.037	11.67	1272.9	689.7	63.76	35.421	528.0	275.9	0.824	0.5	.9309	.0322
G	1.868	588.5	0.046	14.36	1371.1	744.3	35.16	19.534	640.1	338.2	35.295	19.6	1.1255	.0370
E2	1.903	599.5	0.038	11.84	1076.5	580.6	37.05	20.585	528.0	275.9	0.824	0.5	.8147	.0296
E6	1.817	572.3	0.071	22.33	1183.6	640.1	61.31	34.059	528.0	275.9	0.824	0.5	.8706	.0308
E7	1.897	597.4	0.037	11.74	1199.5	648.9	35.40	19.668	528.0	275.9	0.824	0.5	.8894	.0312
E8	1.889	595.0	0.033	10.44	1220.9	660.8	29.00	16.110	528.0	275.9	0.824	0.5	.9141	.0318
F1	1.876	591.0	0.054	16.92	1284.0	695.9	26.82	14.900	528.0	275.9	0.824	0.5	.9626	.0330
F2	1.894	596.7	0.024	7.55	1299.7	704.6	45.11	25.063	528.0	275.9	0.824	0.5	.9873	.0337
F3	1.875	590.6	0.059	18.49	1333.8	723.5	49.64	27.578	536.4	280.6	27.746	15.4	1.0121	.0345
F4	1.817	572.3	0.071	22.33	1180.7	638.5	50.84	28.245	556.2	291.5	30.288	16.8	1.0347	.0351
F5	1.843	580.5	0.068	21.28	1244.6	674.0	48.51	26.952	572.0	300.3	32.139	17.9	1.0513	.0354
F6	1.875	590.7	0.054	17.06	1309.5	710.0	40.76	22.642	587.4	308.9	32.903	18.3	1.0689	.0357
F7	1.870	588.9	0.043	13.62	1333.0	723.1	43.63	24.241	602.7	317.4	33.132	18.4	1.0855	.0361
F8	1.889	595.0	0.055	17.27	1377.7	748.0	52.56	29.197	624.4	329.4	34.813	19.3	1.1089	.0366

NOMENCLATURE

	ENG	SI
Q	BTU/H FT**2 X 1E5	KW/M**2
SDQ	BTU/H FT**2 X 1E5	KW/M**2
TSRF	DEG F	DEG C
SDTSRF	DEG F	DEG C
TF	DEG F	DEG C
UTF	DEG F	DEG C

Test X

T/C Level	(# wet T/C)/(Total # T/C)
E2	All wet
E3	4/7
E6	0/2
E7	1/4
E8	1/5
F	All dry

********** STEADY STATE TEST X **********

PRIMARY LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F					BTU/H SQFT F					
LEVEL F														
3	0.93	1219.7	1.98	286.8	16.78	424.1	8.10	347.9	210.4	4.35	183.8	5.35	211.2	1.287
4	0.93	1227.9	1.97	282.1	16.42	424.1	8.10	347.8	210.2	4.34	183.6	5.34	210.8	1.304
7	0.93	1221.2	1.87	270.5	16.02	424.1	8.10	347.9	210.3	4.35	183.8	5.35	211.1	1.290
7	0.93	1203.0	1.87	277.7	16.31	424.1	8.10	348.2	210.8	4.36	184.2	5.36	212.0	1.252
10	0.93	1281.5	1.93	255.6	15.14	424.1	8.10	347.2	208.9	4.32	182.5	5.31	208.6	1.417
10	0.93	1274.8	1.93	257.9	15.37	424.1	8.10	347.2	209.1	4.32	182.6	5.32	208.9	1.403
10	0.93	1271.5	1.93	259.0	15.43	424.1	8.10	347.3	209.1	4.32	182.7	5.32	209.0	1.395
13	0.93	1267.5	1.93	260.5	15.17	424.1	8.10	347.3	209.2	4.32	182.7	5.32	209.2	1.388
13	0.93	1264.0	1.93	261.7	15.63	424.1	8.10	347.4	209.3	4.33	182.8	5.32	209.3	1.380
15	0.93	1259.6	1.87	256.3	14.82	424.1	8.10	347.4	209.4	4.32	182.9	5.32	209.5	1.371
16	0.93	1305.6	1.88	242.0	14.09	424.1	8.10	346.9	208.4	4.30	182.0	5.30	207.8	1.470
17	0.93	1181.1	1.91	292.2	16.87	424.1	8.10	348.5	211.4	4.37	184.8	5.38	213.1	1.207
18	0.93	1223.3	1.91	274.3	16.19	424.1	8.10	347.9	210.3	4.35	183.7	5.35	211.0	1.294
18	0.93	1190.2	1.91	288.0	16.99	424.1	8.10	348.3	211.2	4.37	184.5	5.37	212.7	1.226
20	0.93	1108.0	1.93	332.2	19.38	424.1	8.10	349.8	213.9	4.43	187.0	5.45	217.6	1.057
20	0.93	1224.1	1.93	276.8	15.98	424.1	8.10	347.9	210.3	4.34	183.7	5.35	211.0	1.296
21	0.93	1221.8	1.90	273.2	16.92	424.1	8.10	347.9	210.3	4.36	183.7	5.36	211.1	1.291
28	0.93	1291.1	1.89	248.1	14.29	424.1	8.10	347.1	208.7	4.31	182.3	5.30	208.3	1.438
28	0.93	1268.3	1.89	255.8	14.79	424.1	8.10	347.3	209.2	4.32	182.7	5.32	209.1	1.390
28	0.93	1275.6	1.89	253.3	14.67	424.1	8.10	347.2	209.1	4.31	182.6	5.31	208.8	1.404
31	0.93	1281.8	1.91	253.0	14.77	424.1	8.10	347.2	208.9	4.31	182.5	5.31	208.6	1.418
31	0.93	1285.5	1.91	251.7	14.62	424.1	8.10	347.1	208.9	4.31	182.4	5.31	208.5	1.426
32	0.93	1248.7	1.92	267.1	15.45	424.1	8.10	347.5	209.7	4.33	183.1	5.33	209.9	1.349
34	0.93	1278.0	1.94	258.9	15.23	424.1	8.10	347.2	209.0	4.32	182.5	5.31	208.8	1.409
37	0.93	1225.2	1.87	268.4	16.87	424.1	8.10	347.9	210.2	4.36	183.7	5.36	211.0	1.298
38	0.93	1252.1	1.87	258.9	15.19	424.1	8.10	347.5	209.6	4.33	183.1	5.33	209.8	1.356
42	0.93	1308.3	1.91	244.9	14.53	424.1	8.10	346.9	208.4	4.30	182.0	5.30	207.7	1.475
45	0.93	1253.1	1.90	262.1	15.16	424.1	8.10	347.5	209.6	4.33	183.0	5.33	209.7	1.358
45	0.93	1265.5	1.90	257.7	14.91	424.1	8.10	347.3	209.3	4.32	182.8	5.32	209.2	1.384
53	0.93	1338.9	1.98	244.7	14.30	424.1	8.10	346.6	207.8	4.29	181.5	5.28	206.7	1.541
59	0.93	1345.2	1.93	235.6	13.64	424.1	8.10	346.5	207.7	4.29	181.4	5.28	206.5	1.554
59	0.93	1337.7	1.93	237.8	13.68	424.1	8.10	346.6	207.9	4.29	181.5	5.28	206.7	1.539
59	0.93	1355.7	1.93	232.6	13.80	424.1	8.10	346.4	207.6	4.28	181.2	5.27	206.2	1.577
60	0.93	1334.6	1.87	231.7	13.61	424.1	8.10	346.6	207.9	4.29	181.5	5.28	206.8	1.532
64	0.93	1388.7	1.88	218.6	12.55	424.1	8.10	346.2	207.1	4.27	180.8	5.26	205.3	1.651
64	0.93	1427.0	1.88	209.3	12.00	424.1	8.10	345.9	206.6	4.26	180.3	5.24	204.4	1.735
64	0.93	1411.0	1.88	213.1	12.21	424.1	8.10	346.0	206.8	4.26	180.5	5.25	204.7	1.701

********** STEADY STATE TEST X **********

PRIMARY LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL G										
1	1.13	1353.3	1.91	231.9	13.62	268.4	20.9	346.1	215.1	1.623
3	1.13	1392.8	1.96	226.3	13.05	259.9	19.5	346.1	214.0	1.720
14	1.13	1312.2	1.85	236.3	14.21	275.7	22.4	346.1	216.4	1.524
16	1.13	1418.3	1.86	208.5	12.26	238.6	17.9	346.1	213.3	1.785
16	1.13	1431.7	1.86	205.4	11.95	234.5	17.4	346.1	213.0	1.817
18	1.13	1380.5	1.88	220.5	12.69	253.8	19.1	346.1	214.3	1.690
18	1.13	1350.2	1.88	228.6	13.25	264.7	20.4	346.1	215.2	1.616
18	1.13	1384.3	1.88	219.5	12.63	252.5	19.0	346.1	214.2	1.700
20	1.13	1277.2	1.90	253.7	14.59	298.3	24.1	346.1	217.7	1.440
20	1.13	1362.6	1.90	227.7	13.37	263.0	20.4	346.1	214.8	1.647
20	1.13	1383.3	1.90	222.2	12.89	255.7	19.4	346.1	214.2	1.697
21	1.13	1341.5	1.83	225.3	12.88	261.3	20.1	346.1	215.4	1.595
32	1.13	1394.8	1.90	219.0	12.69	251.6	18.9	346.1	213.9	1.725
37	1.13	1347.2	1.84	225.0	13.02	260.7	20.1	346.1	215.3	1.608
38	1.13	1373.3	1.85	219.0	12.70	252.4	19.2	346.1	214.5	1.674
45	1.13	1381.6	1.87	219.7	12.83	252.9	19.3	346.1	214.3	1.693
45	1.13	1380.9	1.87	219.8	12.83	253.1	19.3	346.1	214.3	1.691
45	1.13	1383.0	1.87	219.3	12.78	252.4	19.2	346.1	214.2	1.697
47	1.13	1367.2	1.85	220.7	12.89	254.7	19.6	346.1	214.7	1.658
60	1.13	1418.8	1.84	206.9	12.25	236.7	17.9	346.1	213.3	1.786

********** STEADY STATE TEST X **********

INTERMEDIATE LEVELS

ROD NO	X	TSURF DEG F	Q X 1E-5 BTU/H SQFT	HEXP	UHEXP	HDR	UHDR	HDRPW	HG57	UHG57	HG59	UHG59	HCB	CGD X 1E-5 BTU/H SQFT
				BTU/H SQFT F						BTU/H SQFT F				
LEVEL E3														
34	0.81	1050.3	1.93	369.5	23.42	383.1	7.90	317.7	213.4	2.62	187.4	3.02	216.4	0.750
50	0.81	1102.7	1.88	326.6	20.28	383.1	7.90	316.6	211.1	2.56	185.2	2.96	212.3	0.840
LEVEL E6														
60	0.87	1226.9	1.87	267.1	15.58	403.0	8.00	330.8	209.9	2.79	184.1	3.36	208.0	1.169
LEVEL E7														
34	0.89	1226.8	1.94	277.4	16.53	409.6	8.01	336.0	210.4	3.06	184.4	3.73	208.9	1.207
37	0.89	1159.5	1.87	295.6	17.28	409.6	8.01	337.0	212.3	3.08	186.2	3.76	212.3	1.076
50	0.89	1212.2	1.88	275.5	16.17	409.6	8.01	336.2	210.7	3.06	184.8	3.73	209.6	1.179
LEVEL E8														
14	0.91	1197.9	1.88	280.2	16.61	418.2	8.06	343.6	211.3	3.66	184.9	4.51	211.5	1.205
34	0.91	1262.3	1.94	264.0	15.61	418.2	8.06	342.8	209.7	3.63	183.5	4.47	208.6	1.338
37	0.91	1204.3	1.87	276.0	16.06	418.2	8.06	343.5	211.1	3.65	184.8	4.50	211.2	1.219
38	0.91	1218.9	1.87	271.3	15.72	418.2	8.06	343.3	210.7	3.64	184.4	4.49	210.5	1.248
LEVEL F1														
17	0.96	1257.5	1.91	261.4	15.02	435.1	8.22	356.6	207.5	8.24	180.1	9.45	211.1	1.448
21	0.96	1254.4	1.90	260.9	15.15	435.1	8.22	356.6	207.6	8.24	180.2	9.46	211.2	1.441
34	0.96	1323.4	1.94	243.7	14.33	435.1	8.22	355.9	206.2	8.18	178.9	9.39	208.7	1.595
37	0.96	1273.6	1.87	250.4	14.49	435.1	8.22	356.4	207.1	8.22	179.8	9.44	210.4	1.484
38	0.96	1272.5	1.87	251.8	14.54	435.1	8.22	356.4	207.2	8.22	179.8	9.44	210.5	1.482
50	0.96	1313.2	1.88	240.1	13.83	435.1	8.22	356.0	206.4	8.19	179.1	9.40	209.0	1.571
LEVEL F2														
1	0.99	1235.4	1.88	266.3	15.53	443.7	9.89	363.7	203.5	12.80	174.8	15.37	213.2	1.463
14	0.99	1269.7	1.88	253.4	15.29	443.7	9.89	363.3	202.8	12.68	174.1	15.38	211.7	1.542
17	0.99	1297.1	1.91	247.9	14.20	443.7	9.89	362.9	202.2	12.80	173.6	15.19	210.7	1.603
34	0.99	1359.9	1.94	232.9	13.64	443.7	9.89	362.3	201.1	12.70	172.7	15.14	208.7	1.750
38	0.99	1297.3	1.87	243.6	14.04	443.7	9.89	362.9	202.2	12.78	173.6	15.21	210.7	1.603
50	0.99	1338.5	1.88	232.5	13.42	443.7	9.89	362.5	201.5	12.75	173.0	15.14	209.3	1.699

********** STEADY STATE TEST X **********

INTERMEDIATE LEVELS

EQUILIBRIUM QUALITY GREATER THAN ONE

RCD NO	X	TSURF DEG F	Q X 1E-5 BTU/H FT**2	HEXPS	UHEXPS	HEXP	UHEXP	HDB	HCB BTU/H FT**2 F	QGD X 1E-5 BTU/H FT**2
				BTU/H FT**2 F						
LEVEL F3										
14	1.01	1281.3	1.88	249.1	14.70	251.9	17.6	439.2	212.4	1.608
17	1.01	1303.7	1.91	245.8	14.10	248.5	16.9	439.2	211.6	1.659
21	1.01	1290.4	1.90	248.6	14.25	251.4	17.2	439.2	212.1	1.629
34	1.01	1402.7	1.94	221.6	12.95	223.7	14.9	439.2	208.7	1.897
60	1.01	1376.6	1.87	220.0	13.07	222.2	15.1	439.2	209.3	1.835
LEVEL F4										
60	1.03	1216.6	1.87	271.1	15.81	282.7	21.1	409.3	216.3	1.424
LEVEL F5										
21	1.05	1192.1	1.90	285.4	16.46	305.6	23.9	391.1	218.3	1.342
60	1.05	1287.8	1.87	245.7	14.24	260.8	19.2	391.1	214.0	1.565
LEVEL F6										
1	1.07	1271.6	1.94	261.1	15.90	283.7	22.3	376.7	215.4	1.500
17	1.07	1286.9	1.91	252.0	14.66	273.3	20.6	376.7	214.8	1.535
37	1.07	1285.4	1.87	246.9	14.33	267.9	20.2	376.7	214.9	1.532
38	1.07	1280.0	1.88	249.7	14.41	271.0	20.4	376.7	215.1	1.520
50	1.07	1373.9	1.89	223.2	12.93	240.0	17.3	376.7	212.0	1.743
60	1.07	1358.7	1.87	225.1	13.00	242.4	17.5	376.7	212.4	1.706
LEVEL F7										
14	1.09	1285.2	1.88	248.2	14.67	275.3	21.3	365.8	215.6	1.509
17	1.09	1324.3	1.91	240.0	13.82	264.8	19.6	365.8	214.2	1.602
21	1.09	1295.0	1.90	247.4	14.21	274.1	20.6	365.8	215.3	1.533
37	1.09	1313.5	1.87	237.8	13.79	262.7	19.7	365.8	214.6	1.575
38	1.09	1315.5	1.88	238.3	13.72	263.3	19.6	365.8	214.5	1.580
50	1.09	1409.3	1.89	214.1	12.40	234.0	16.7	365.8	211.8	1.811
60	1.09	1387.9	1.87	217.4	12.55	238.0	17.1	365.8	212.4	1.757
LEVEL F8										
1	1.11	1359.6	1.94	233.8	13.65	264.5	20.1	352.8	214.2	1.659
17	1.11	1334.5	1.91	237.2	13.61	269.3	20.5	352.8	215.0	1.598
21	1.11	1324.0	1.90	238.9	13.69	271.8	20.8	352.8	215.3	1.573
34	1.11	1447.7	1.94	211.4	12.34	236.2	17.2	352.8	212.0	1.877
37	1.11	1340.7	1.87	230.4	13.28	261.4	19.9	352.8	214.8	1.613
50	1.11	1451.7	1.89	204.7	11.81	228.6	16.4	352.8	211.9	1.886
60	1.11	1417.0	1.87	210.7	12.12	236.3	17.2	352.8	212.7	1.801

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