

CODE COMPLIANCE CONSIDERATIONS IN THE DEVELOPMENT OF THE BUILDING ENVELOPE REQUIREMENTS FOR ASHRAE/IESNA STANDARD 90.1-1989R

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ABSTRACT

Following the direction of the ASHRAE Board of Directors and in response to the 1992 National Energy Policy Act (EPA) that references it, the next version of ASHRAE/IESNA Standard 90.1 has been developed as a code and is written in code language. To achieve successful implementation as a code, the requirements have been developed based on typical building practices. For the opaque envelope, calculation methodologies have been specified in much greater detail and precalculated tables of assembly U-factors are provided and required to be used, where appropriate, so that the intent is clear and compliance can be more easily verified. For fenestration, compliance is generally based on ratings for the overall product, including the frame, as determined in accordance with National Fenestration Rating Council (NFRC) standards.

There will be a range of compliance options from simple with limited flexibility to more complex with more flexibility. The simplest will be a true prescriptive compliance option that

will not require calculations and will specify minimum R-values for insulation for the opaque envelope and maximum U-factors and solar heat gain coefficients (SHGC) for windows, skylights, and doors. Another option allows compliance with maximum overall assembly U-factors instead of insulation R-values. A third option is an expanded version of the ENVSTD program, which now allows tradeoffs among all elements of the building envelope. The fourth option is an annual energy analysis of the entire building and all of its systems.

This presentation summarizes the assumptions used in developing the criteria for ASHRAE/IESNA Standard 90.1-1989R and the proposed procedures for demonstrating compliance. The roofs, walls, and floors evaluated for concrete/masonry, wood-frame, and metal building construction will be described. Assembly constructions, framing factors, and calculation methodologies will be cited. Example U-factor calculations will be shown, as will excerpts from the U-factor tables in the standard (which contain more than 2,500 roof, wall, and floor insulation options).

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