A Model for Microporosity Prediction During Casting Solidification Was Developed

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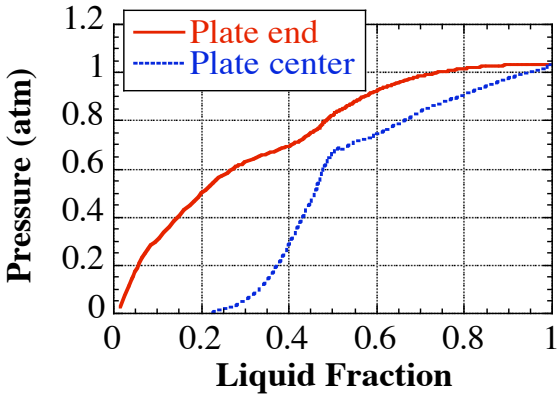
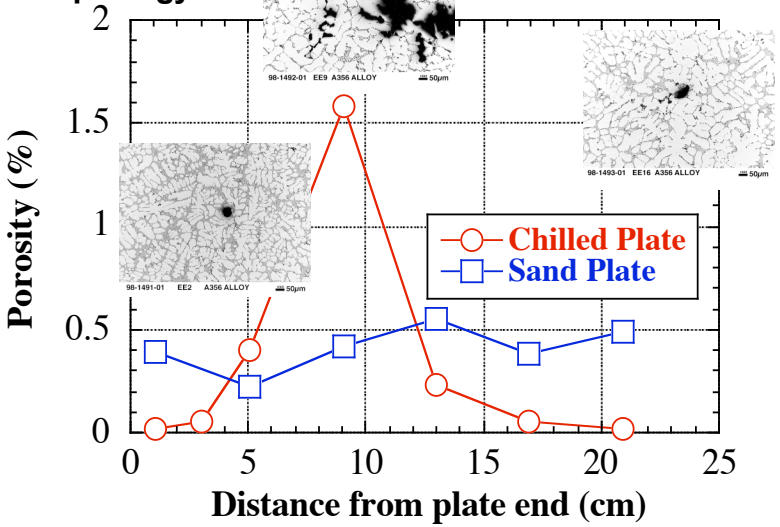
Test plates, with and without chills, were designed by Srinath Viswanathan.

The model was developed based on experimental evidence for pore morphology and thermodynamic considerations for pressure drop.

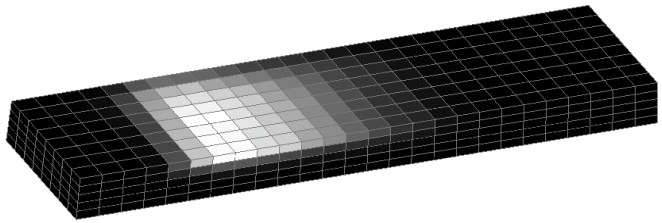


Proposed concept: When pressure drops abruptly to low levels (below the cavitation pressure), the shrinkage porosity starts to evolve.

Microporosity distribution and morphology.



Shrinkage porosity occurs near the plate center where severe pressure drops are computed.



Ratio of shrinkage/gas porosity.

Interdendritic, irregular pore morphology is predicted correctly in the center of the plate.

Pore morphology can be predicted (pore irregularity is considered to be proportional to ratio of shrinkage/gas porosity).