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TMS2024
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HYATT REGENCY ORLANDO
ORLANDO, FLORIDA, USA
#TMSAnnualMeeting



SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2024 SYMPOSIUM:

MATERIALS SYNTHESIS AND PROCESSING

Defects and Properties of Cast Metals

This is the 5th International Symposium on Defects and Properties in Cast Metals sponsored by the Solidification Committee of the TMS MPMD. Defects generated during the solidification of liquid metals, whether during primary metal processing, shape casting or additive manufacturing, dramatically affect the subsequent mechanical and physical properties of the final product. These defects arise from a range of fundamental mechanisms such as surface oxidation, entrainment of exogenous materials, dissolved gasses, solidification shrinkage, unwanted micro-structural phases with detrimental morphologies and the development of stresses in the solidifying metal resulting in hot tearing and cracking. In many instances, defects arise from a combination of many physical processes.

This symposium seeks contributions from all alloys systems, including ferrous, non-ferrous, superalloys, and other materials; and from all metals processes, including ingot casting, DC casting, foundry/shape casting; including die casting, investment casting and sand casting, continuous casting, remelting processes and advanced solidification processes, such as additive manufacturing involving molten metal.

Topics include measurements and modeling of any phenomena related to casting defects and properties:

- liquid metal refining, inclusions and metal cleanliness
- re-oxidation
- slag / dross entrainment and fluid flow effects
- surface defects, shrinkage, gas, and porosity problems
- segregation (a-, v-, freckles, inverse, centerline, etc.)
- hot tearing and other cracks
- residual stresses, distortion, and shape problems
- microstructural, precipitate- and grain defects in the present of or without external fields, e.g., ultrasound, electromagnetic, shearing, etc.
- in-service properties, such as strength, ductility, toughness, fatigue, and wear
- advanced characterization methods for defect detection, both online and ex situ sampling methods and modeling.

The objective is to bring together researchers working in diverse fields that may share common fundamentals and goals, but may not usually collaborate, in order to stimulate interdisciplinary discussion.

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