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## Effects of Size on Characteristics of Electroslag Remelted (ESR) HAYNES®282® alloy ingots

*Monday, 23 September 2024 10:30 (20 minutes)*

ESR ingots of varying sizes – 4”, 6” and 8” diameter laboratory scale ingots and commercial scale 20” diameter and 10”x42” slab ingots were produced using stabilized processes. Process control steps needed to stabilize the ESR process used to produce the laboratory 6” and 8” diameter ingots will be discussed, with attention to how the process was modified based on outcomes of employed trials. Variations in ingot microstructure characteristics (primary / secondary dendrite arm spacings) across the spatial extents of the ingots of the aforementioned sizes were obtained by metallographic analysis. These results will be compared with predictions from simulations of the ESR process using the commercial software package MeltFlow-ESR. Results for other simulation predicted ingot characteristics, such as local solidification time and the likelihood for freckle formation based on the Suzuki-Yang criterion will also be presented. It was found that the ESR simulations, reasonably accurately, captured the variation in dendrite arm spacings across the ingots of the discussed sizes. The observed changes in ingot characteristics as the ingot sizes are increased will be presented and their implication for down-stream ingot processing and for ingot soundness will be discussed.

### Speaker Country

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