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Processing and characterization of Intercritically Austempered Ductile Iron (IADI)

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Intercritically austempered ductile iron (IADI) has a microstructure of well-formed graphite nodules in a matrix of ferrite and ausferrite. This microstructure produces a material that has better strength and ductility compared to ferrite/pearlite microstructures and better ductility, improved resistance to environmentally assisted cracking, and better machinability compared to fully ausferritic microstructures (conventional austempered ductile iron). The austenite in the ausferrite particles can undergo transformation induced plasticity but this transformation is a function of particle morphology and chemistry. This microstructure is also a challenge to produce in thick section sizes since the ability to produce ausferrite is a function of cooling rate and chemistry. The production and characterization of IADI will be discussed in an effort to encourage the further development of this material.

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