

# EUROMAT 2019 / Area B (Structural Materials)

## SYMPOSIUM: B9

Title: Advanced Cast Irons		
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Abstract		
<p>Advanced cast irons can be produced with excellent mechanical and service properties that can challenge several quenched and tempered steels for structural components, with the benefit of tremendous money saving because of near shape casting and low alloying element contents. Advanced cast irons consist of several classes of new modern materials, e.g.: high-Si irons where silicon promotes fully ferritic structures with significant solid-solution strengthening effect; austempered ductile irons where opportune heat treatments trigger a microstructure made of tough bainite and metastable carbon rich austenite which confers remarkable strength and ductility; ductile irons with pearlitic structure that has the same strength as conventional fully pearlitic ductile irons but higher ductility; high Ni grey and ductile irons with austenitic metallic matrix with corrosion resistance, tightness and creep resistance, and which can be applied in extremely low temperature; compacted graphite irons which are fast developing at the expense of grey and ductile irons.</p> <p>The combination in advanced cast irons of excellent mechanical and utility properties - at significantly lower cost and relatively lower density than steels - makes the use of these materials very attractive for components in heavy transportations like trucks, mining machinery and train systems, and in power generation as in wind turbines.</p> <p>In this symposium on modern cast and ductile irons for structural applications, contributions from experimental investigations and simulations are invited, covering topics like melt control, modification and inoculation, pouring process, solidification and heat treatments, mechanical properties. Control and prediction of process-microstructure-properties relationships are key issues.</p> <p>Topics to be covered:</p> <ul style="list-style-type: none"><li>• Mould filling</li><li>• Solidification and solid-state transformations</li><li>• Modification and inoculation</li><li>• Microstructure and mechanical properties</li><li>• Residual stresses</li><li>• Tribology and machinability</li><li>• High-Alloy Iron Castings</li><li>• Mathematical modeling and applications</li></ul>		