

**Dissertation Release**

**Dissertation 05.02.2021**

# Ductile iron optimisation

<b>Title of the dissertation</b>	Ductile iron modelling and optimisation for mechanically and thermally loaded components
<b>Contents of the dissertation</b>	<p>The mechanical properties and thermal conductivity of spheroidal graphite cast irons depend on the microstructure and alloy contents. Higher perlite proportions and alloy concentrations typically increase mechanical properties and decrease thermal conductivity.</p> <p>The effects of perlite fraction and silicon content on thermal conductivity and strength properties at elevated temperatures were measured and modelled. The models were used for fatigue analysis of a thermally and mechanically loaded component with different perlite proportions and silicon concentrations. According to the results, the choice of the spheroidal graphite cast iron type is of great importance for the component's life.</p>
<b>Field of the dissertation</b>	Mechanical engineering
<b>Doctoral candidate</b>	Jarkko Laine, M.Sc. (Tech.), born in 1968 in Pälkäne, Finland
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<b>Place of the defence</b>	Remote dissertation: <a href="https://aalto.zoom.us/j/69243981991">https://aalto.zoom.us/j/69243981991</a>
<b>Opponent</b>	Professor Alberto Molinari, University of Trento, Italy
<b>Supervisor</b>	Professor Juhani Orkas, Aalto University, School of Engineering, Department of Mechanical Engineering
<b>Electronic dissertation</b>	<a href="https://aaltodoc.aalto.fi/handle/123456789/101758">https://aaltodoc.aalto.fi/handle/123456789/101758</a>
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