

## Induction heating modelling for tempering of low alloy steels

*Thursday, 8 September 2022 09:00 (25 minutes)*

Induction thermal processing is found in modern production lines as it brings benefits in time and energy savings and allows increased reproducibility and integration in a manufacturing chain. Simulation and experimental studies addressing induction hardening have been widely performed in opposition to induction tempering, which has not been extensively studied. However, applying an optimum tempering treatment is often necessary because of the final mechanical properties it grants to the components before it is in service use. This research aims to develop a fully coupled induction tempering FE simulation model, and a time-efficient induction heating simulation procedure is presented, comparing different approaches in the general-purpose ANSYS software. In addition to thermal results, microstructural evolution calculation models have been implemented in the simulation procedure regarding austenite formation and microstructural grain size. The simulation models have also been employed to analyze the effect of critical material properties, such as the dependence of the electrical resistivity with the microstructure change during the heating phenomena. The numerical results have been experimentally validated in 42CrMo4 low alloy steel cylindrical samples.

### Speaker Country

Spain

### Register for the Tom Bell Young Author Award (TBYAA)?

Yes

**Primary authors:** QUEREJETA IRIZAR, Xabier (Ikerlan); AREITIOAURTENA, Maialen (Ikerlan); Dr SEGU-RAJAUREGI, Unai (Ikerlan); Dr CABELLO, Mario J. (Ikerlan); Dr UKAR, Eneko (UPV-EHU)

**Presenter:** QUEREJETA IRIZAR, Xabier (Ikerlan)

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