

# Multiphysics Analysis of Inductive Brazing Process

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## Abstract

The Objective is to analyze temperature rise and distribution in different parts of an Inductive Brazing process. This process includes three physics - Electromagnetic Excitation- Eddy Heating- Heat Transfer in Solids. AC Inductive heating physics coupled to heat transfer in solid including conduction, convection and radiation effects are modeled using COMSOL Multiphysics® software and produced accurate results. Forced water cooling is modeled inside coils with a high effective thermal conduction and metals are modeled with a temperature dependent electrical resistivity. Different brazing process parameters which affects brazing quality and characteristics could identify effectively and accurately with this analysis which helped design team to improve and optimize process parameters.

## Reference

1. AC/DC Module User's Guide, COMSOL Multiphysics.
2. COMSOL Multiphysics Reference Manual

## Figures used in the abstract

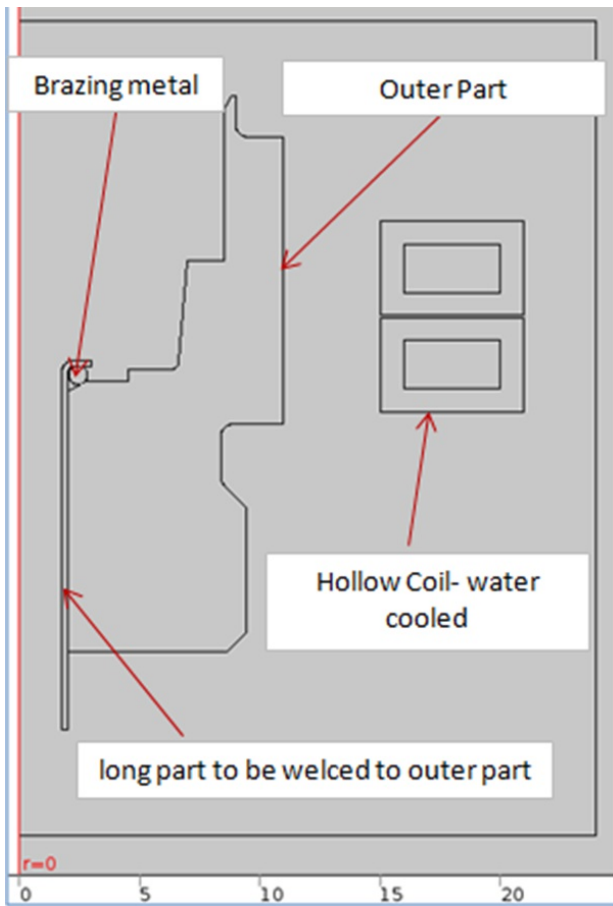


Figure 1: Brazing Assembly.

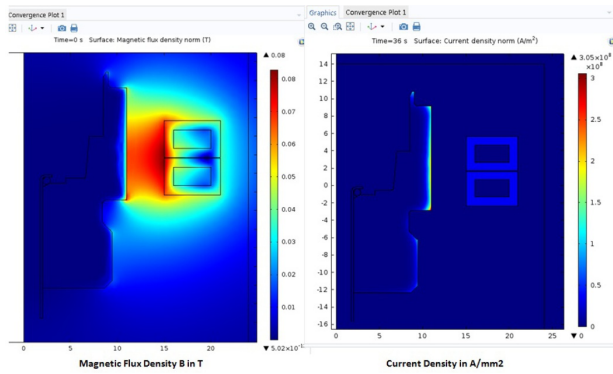


Figure 2: Flux and Current Density.

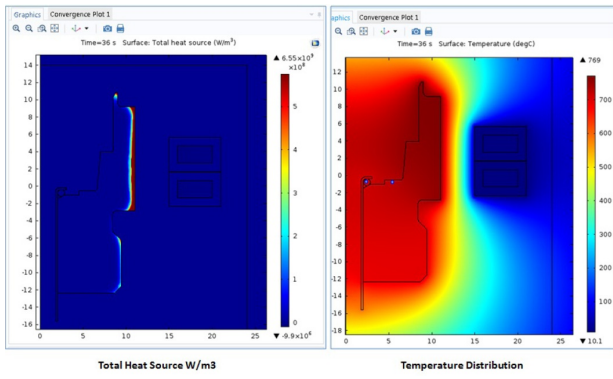


Figure 3: Heat Source and Temperature Distribution.

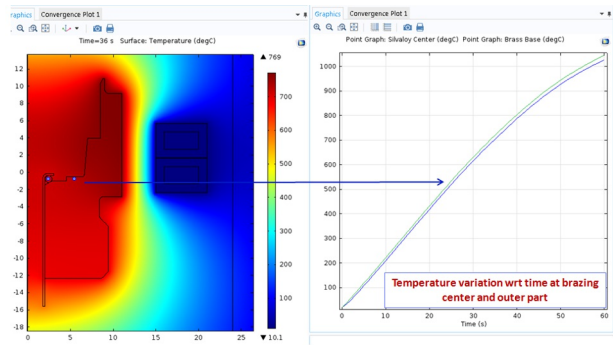


Figure 4: Temperature Distribution.