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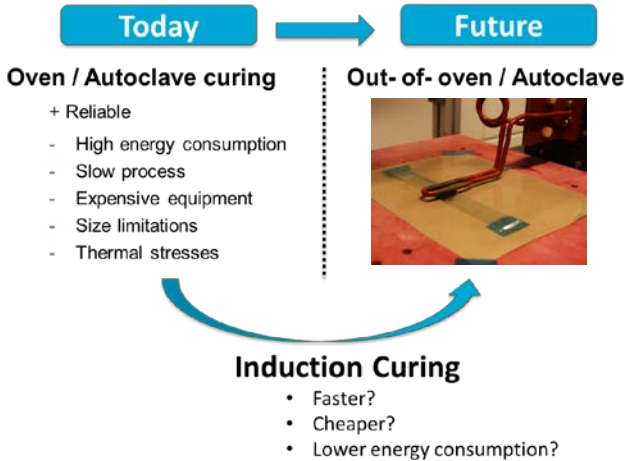
# On the Assessment of Susceptor- Assisted Induction Curing of Adhesively Bonded Joints

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## Background

Towards green & affordable manufacturing processes for composite bonded aircraft structures.



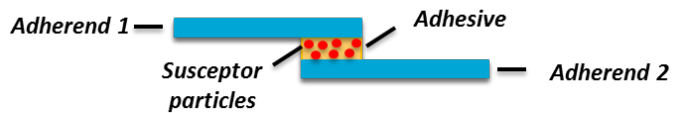
## The Working Principle

By mixing ferromagnetic nanoparticles into the bond layer, heat can be generated locally within the adhesive by applying an external electromagnetic field.

### Oven / Autoclave

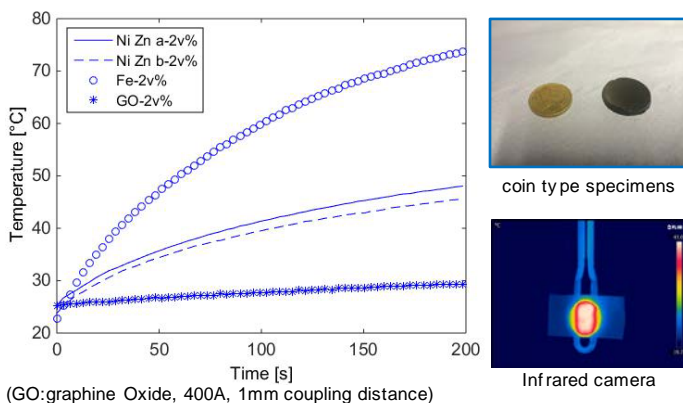


### Susceptor- Assisted Induction



## Susceptor Analysis

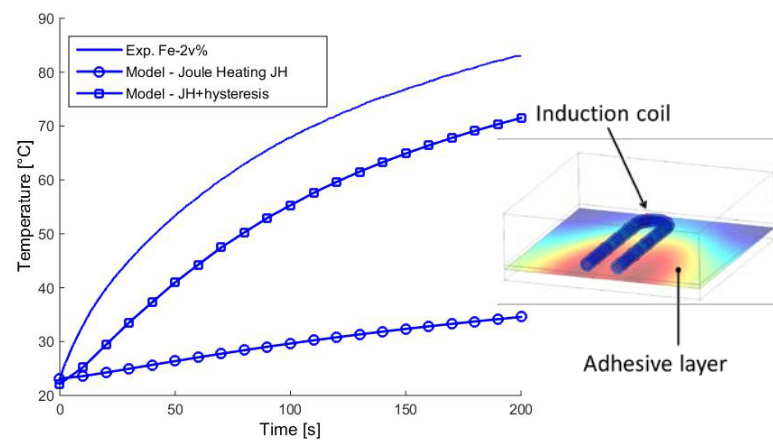
Heat-generating properties of different susceptor particles



## Induction Heating model

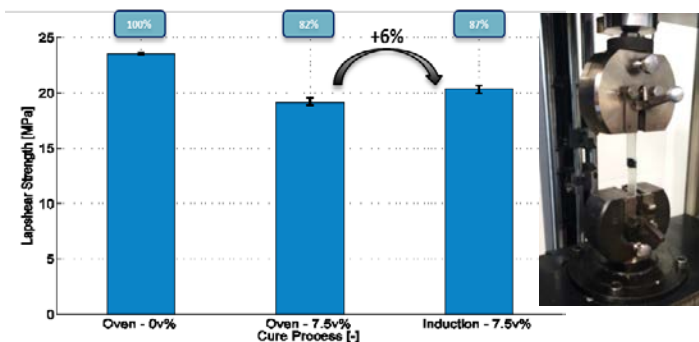
COMSOL model:

- Joule Heating vs. Hysteresis heating



## Mechanical Testing

Single lap- shear strength (LSS) comparison



## Main findings:

- Susceptor-assisted induction curing using Fe particles is mainly driven by hysteresis heating.
- Adding Fe particles results in a reduction of the LSS of 15% (from 0.5v% up to 7.5v%).
- Curing the adhesive layer using susceptor-assisted induction heating results in a slight increase in LSS (6%) when compared to oven-cured samples.
- Induction curing only becomes energy & cost efficient for large assemblies(>1m<sup>3</sup>) with small bonded areas.