

Predicting thermomechanical damage to tooling used in hot forming

SITCOM project

IRT
JULES
VERNE

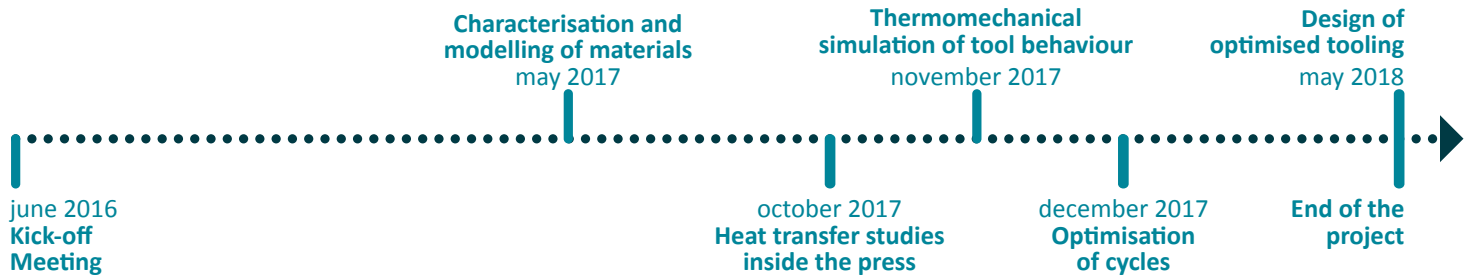
This project concerns the development of simulation software to predict thermomechanical damage to the tooling used in hot forming processes. The software will enable more accurate prediction of the durability of tooling and optimisation of heating and cooling ramps.

Technical and economic impacts

- ▶ Productivity: optimisation of cycles (heating and cooling)
- ▶ Reduction of investment: improved life cycle of tools
- ▶ Improvement of the finished product: tolerance of moulds/dilation management

Keywords

Digital simulation // Innovative HF/SPF tooling // Thermal instrumentation
Durability of tooling



INDUSTRIAL CONTEXT.....

Hot forming processes for metals are of great interest in the domain of air transport applications (due to the possibility of forming parts with complex shapes using hard metal alloys), but the tooling involved is expensive to manufacture and use. Given the extremely demanding operating conditions in terms of temperature and mechanical loads, the lifetime of such tooling is limited.

INNOVATIVES FEATURES.....

- ▶ Development of methods to characterise the heating/cooling cycle of tooling in order to minimise deterioration.
- ▶ Identification of new tooling designs consistent with faster heating/cooling cycles and improved duration.
- ▶ Establishment of a complete thermomechanical model for tooling in its operating environment.
- ▶ Thermal instrumentation of the press to measure conditions at the thermal limits.

INDUSTRIAL APPLICATIONS

The achievement of control and understanding of the thermomechanical behaviour of the tooling used in hot forming processes under actual operating conditions should help reduce the production costs of parts and improve control of the quality of the formed parts. The project will provide software associated with a process capable of supporting technological advances in tomorrow's aerospace industry.



Partners

- ▶ IRT JULES VERNE
- ▶ ACB
- ▶ AIRBUS

Equipment

- ▶ Hot-Forming press

Budget

- ▶ 1 150 k€

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