

Alfa Laval in Lund, Sweden is looking for

Master thesis – Friction modelling

We create better everyday conditions for people. We do this by contributing to a more sustainable future through many changes. We love what we do and we're good at it. But now we want to be even better! We're looking for Master thesis students in friction modelling for metal sheet forming simulations, Alfa Laval Lund.

Gustav de Laval invented the milk separator in 1878 and this invention laid the foundation for what Alfa Laval is today; a leading global supplier of innovative engineered solutions.

Background

Alfa Laval AB is a world leading manufacturer of heat exchangers, the manufacturing process involves stamping of blanks into channel plates. The heat exchangers are produced in many varieties of materials. When it comes to stamping exotic material types the process can suffer from galling effects i.e. blank material will gradually stick to the tools leading to reduced formability. This galling phenomena is connected to the tribological condition at the interaction surface between stamp/die and the blank. Alfa Laval has good experience of predicting the formability of pressed channel plates by the use of finite element (FE) forming simulations. In order to further increase the accuracy of these models, which could enable prediction of galling when pressing with exotic material types, a more advanced friction model has to be implemented.

About the Master thesis project

Investigate and implement advanced friction models in order to improve the accuracy of stamping simulations. When stamping with exotic blank material, it can be observed that blank material sticks on the tooling surface, called galling. This galling will gradually reduce the formability of the stamping process, leading to reduced productivity. This project consists of two parts. Part one is to evaluate and implement advanced friction models into the FE-software LS-DYNA and analyze the tribological effects. Part two is related to indicate galling areas on actual physical tools using scanning and microscope (SEM) equipment.

Objective

- Develop and implement advanced friction models in a FE-simulation software.
- Evaluate presence of galling on existing physical tools.

Deliverables

To be defined.

Contact persons and supervisors

- Forming Specialist: Mathias Agmell
- Senior Project Manager and Specialist: Per Gabrielson
- OD Manager Global: Anna Wenemark, anna.wenemark@alfalaval.com

Education

Masters student in engineering, mechanical design or material science

Number of students: 2

Start date: September 2020

Estimated time needed: 20 weeks

Please send your application no later than 30th June. Enclose CV, personal letter and university course transcript.

