

High-speed blow forming of aluminium sheets

Record number : OPR-620

Overview

RESEARCH DIRECTION

Jocelyn Veilleux, Professeur - Department of Chemical and Biotechnological Engineering

INFORMATION

jocelyn.veilleux@usherbrooke.ca

ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie chimique et de génie biotechnologique
Département de génie mécanique

LEVEL(S)

2e cycle
3e cycle

LOCATION(S)

Campus de Sherbrooke

Project Description

Context and project description

The proposed project aims to improve a patented process for forming aluminum sheets by high-speed blow forming (HSBF). This process, which exploits the superplasticity of an alloy specific to Verbom, the industrial partner of the project, consists of spraying a solid lubricant on the sheet, preheating the sheet and shaping it against a mold using the pressure of a hot gas at a high rate, compatible with the needs of the automotive industry. The process encounters a few problems on which the research team will focus its activities.

PhD project:

We will seek to understand and to counter undesirable interfaces phenomena occurring between the mold and the aluminum sheet. After characterizing the nature of the interface, various surface treatments or coatings will be applied to the mold to minimize the adhesion of the aluminum sheets. Hot tribology tests will be performed to determine the coefficient of friction in an environment similar to that of the HSBF process. Ultimately, the surface treatment or coating should have a positive effect on the aesthetics of formed parts, on productivity and on the environment by reducing the consumption of solid lubricant.

MScA project:

We will seek to improve the cleaning process of formed parts in order to improve the adhesion of glues, paints and welds carried out by the partner's customers. In particular, the effect of various cleaning solutions on the microstructural and chemical characteristics of the surface of the formed parts will be studied. Ideally, the solutions proposed should allow the recovery and reconditioning of the solid lubricant, as well as the reuse of the hot rinsing water.

Discipline(s) by sector

Sciences naturelles et génie

Génie chimique, Génie mécanique

Funding offered

Yes

Partner(s)

Verbom

The last update was on 16 July 2024. The University reserves the right to modify its projects without notice.