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## **Study of Sheet Metal Properties to Improve Drawability of Hydroformed Parts**

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### **ABSTRACT**

The increase demand for lighter, stronger, deeper and complex shape of sheet metal hysroforming parts require better understanding of the material properties. The tensile test us the "classic" test for measuring the material properties. The tensile results are use in selecting material for engineering applications and often measured during development of new materials and processes. Tensile test procedure is relatively simple and provides the engineers large selection of tensile properties (tensile strength, ultimate strength, elongation, reduction of area, strain hardening and normal anisotropy). However, during sheet metal forming and hydroforming large stress in circumferential direction are develop and reach a critical level of the material and its thickness, this cause undulation, buckling and wrinkles. The large strain measurement technique to characterize the Forming Limit Diagram (FLD) is tested to give the material limits.

The aim of this work is to examine material properties and their effect on the forming capability of the Hydromecanical process in production of hemisphere parts made of materials commonly used in the aviation and aerospace industries. Experimental procedures were carried out to assess their ductility through FLD and the Forming Limit Carve (FLC). It will shown that the material limits is not constant and can be variable depend on the deformation process as well.