

## **Rapid coupling optimization method for tube hydroforming process**

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### **Abstract**

This paper deals with the optimization of tube hydroforming parameters in order to reduce defects that may occur at the end of the forming process such as necking and wrinkling. A specific methodology is proposed based on the coupling between an inverse finite element model for the rapid simulation of the tube hydroforming process, and a response surface method based on diffuse approximation. The response surfaces are built using moving least-squares approximations and constructed within a moving region of interest, which moves across a predefined discrete grid of authorized experimental designs. An application of hydroforming of a bulge from aluminium alloy 6061-T6 tubing has been utilized to validate the methodology. The final design is validated with ABAQUS Explicit Dynamic commercial code.

**Keywords :** tube hydroforming ; inverse method ; response surface ; process optimization.

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