Metal forming and the finite-element method

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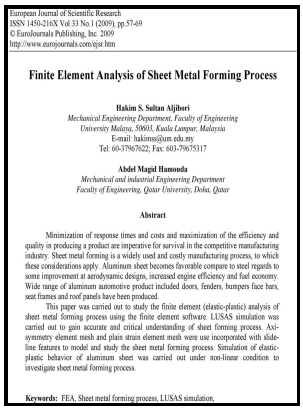

European Journal of Scientific Research
ISSN 1450-216X Vol.33 No.1 (2009), pp.57-69
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http://www.eurojournals.com/ejsr.htm

Finite Element Analysis of Sheet Metal Forming Process

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Abstract

Minimization of response times and costs and maximization of the efficiency and quality in producing a product are imperative for survival in the competitive manufacturing industry. Sheet metal forming is a widely used and costly manufacturing process, to which these considerations apply. Aluminum sheet becomes favorable compare to steel regards to some improvement at aerodynamic designs, increased engine efficiency and fuel economy. Wide range of aluminum automotive product included doors, fenders, bumpers face bars, seat frames and roof panels have been produced.

This paper was carried out to study the finite element (elastic-plastic) analysis of sheet metal forming process using the finite element software. LUSAS simulation was carried out to gain accurate and critical understanding of sheet forming process. Axi-symmetry element mesh and plain strain element mesh were use incorporated with slide-line features to model and study the sheet metal forming process. Simulation of elastic-plastic behavior of aluminum sheet was carried out under non-linear condition to investigate sheet metal forming process.

Keywords: FEA, Sheet metal forming process, LUSAS simulation,

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