

Modeling, Analysis, and Optimization of Process Parameters of Metal Spinning

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Abstract : Physically into various derived shapes and sizes under the effect of externally applied forces. The spinning process is an advanced plastic working technology and is frequently used for manufacturing axisymmetric shapes. Over the last few decades, Sheet metal spinning has developed significantly and spun products have widely used in various industries. Nowadays the process has been expanded to new horizons in industries, since tendency to use minimum tool and equipment costs and also using lower forces with the output of excellent surface quality and good mechanical properties. The automation of the process is of greater importance, due to its wider applications like decorative household goods, rocket nose cones, gas cylinders, etc. This paper aims to gain insight into the conventional spinning process by employing experimental and numerical methods. The present work proposes an approach for optimizing process parameters are mandrel speed (rpm), roller nose radius (mm), thickness of the sheet (mm). Forming force, surface roughness and strain are the responses.in spinning of Aluminum (2024-T3) using DOE-Response Surface Methodology (RSM) and Analysis of variance (ANOVA). The FEA software is used for modeling and analysis. The process parameters considered in the experimentation.

Keywords : FEA, RSM, process parameters, sheet metal spinning

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