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DETERMINE OPTIMIZED PROCESS PARAMETERS THROUGH DEPLOYMENT OF STATISTICAL TOOLS FOR FORMING OPERATION IN SHEET-METAL INDUSTRY: A REVIEW

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ABSTRACT

The sheet metal industry is posed with numerous challenges pertaining to the productivity and/or the quality of the parts produced. The magnitude of the defect as also the number of defects at a location would determine if the part can be considered as 'acceptable' to the given function. A good technique for process control can go a long way in reducing the occurrence of defects. This work aims to undertake research over the processing parameters of importance and the effect of change in its value or level on the overall quality of the part in terms of wrinkles, tearing, thinning or spring-back. The process parameters like blank-holding pressure as also the type of material and its thickness shall be evaluated for checking performance at alternative levels of setting. The data collected during these phases of study shall be offered a suitable statistical treatment using ANOVA and Taguchi methods for conducting Design of Experiments and for arriving at a feasible optimized solution. Altair Hyper works shall be deployed for evaluating the performance using hyper form over the Numerical Phase of problem solving. This methodology shall be validated through physical experimentation with any one variant applicable to any one setting for the die. Then solution shall be in the form of recommended values of the significant parameters that is likely to render a defect free part over the production line.

KEYWORDS: Forming analysis, DOE, form die design, Taguchi, Regression equation.