

DEVELOPMENT OF SATELLITE COMPONENT THROUGH FLOW FORMING PROCESS

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Abstract

Metal forming of metals involves deforming of metal plastically into various derived shapes and sizes under the effect of externally applied forces. Flow forming is an advanced, near net shape, chipless metal forming process, which employs an incremental rotary point deformation technique for manufacturing seamless, dimensionally precise tubular and other rotationally symmetrical products. Compression is given to the outside diameter of a cylindrical preform, attached to a rotating mandrel by a combination of axial and radial forces using a set of rollers that are simultaneously moved along the length of the rotating preform. In the present project work flow forming (Shear spinning) process is carried out for development of truncated parabolic nozzle which is used for a critical space application. The experimentation is carried out Lathe forming machine. The material identified for making the nozzle is columbium alloy. Since this material being very costly, rare and strategic in nature, it is decided to develop the parabolic nozzle in prototype in MDN347 steel grade and then in columbium alloy. After the successful completion of development of prototype in columbium alloy, the development in actual size is done. Numbers of experimentation trials are conducted to achieve the required quality and dimensional accuracy.

Keywords: Metal Forming, Flow Forming, MDN347, columbium alloy, Lathe forming machine, Shear Spinning.