

# Elastoplastic Behaviour of AA2124 Alloy Used to Make Hemispherical Cups

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## **ABSTRACT**

The objective of the current work was to estimate plastic behaviour of AA2124 alloy to manufacture hemispherical cups. The design procedure for the finite element analysis was carried out as per Taguchi's techniques using ABAQUS software code. The tool radius of incremental deep drawing was the critical process parameter influencing the effective stress induced during the formation of hemispherical cups. von Mises stresses induced in the cups are within the limit of ultimate strength of AA2124. The sheet thickness and step depth had influenced the reduction of sheet thickness during the cup formation.

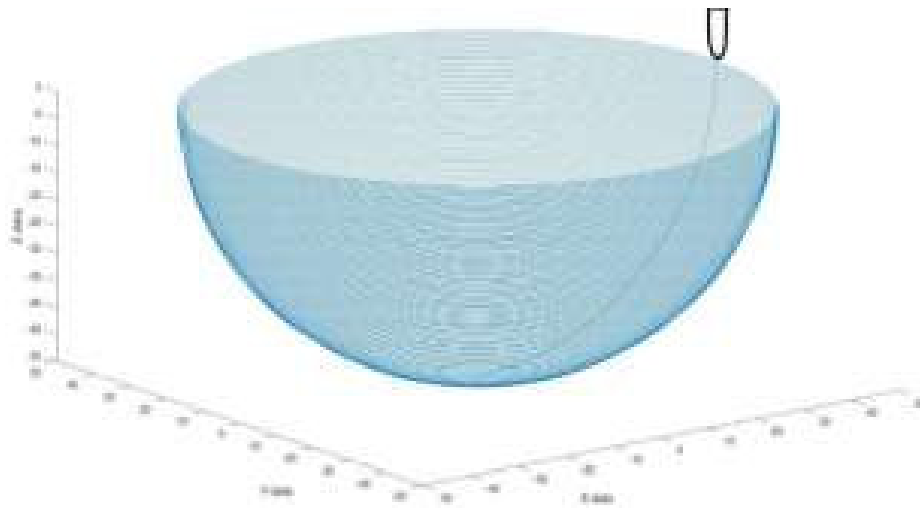


Figure 1: Tool path generation.

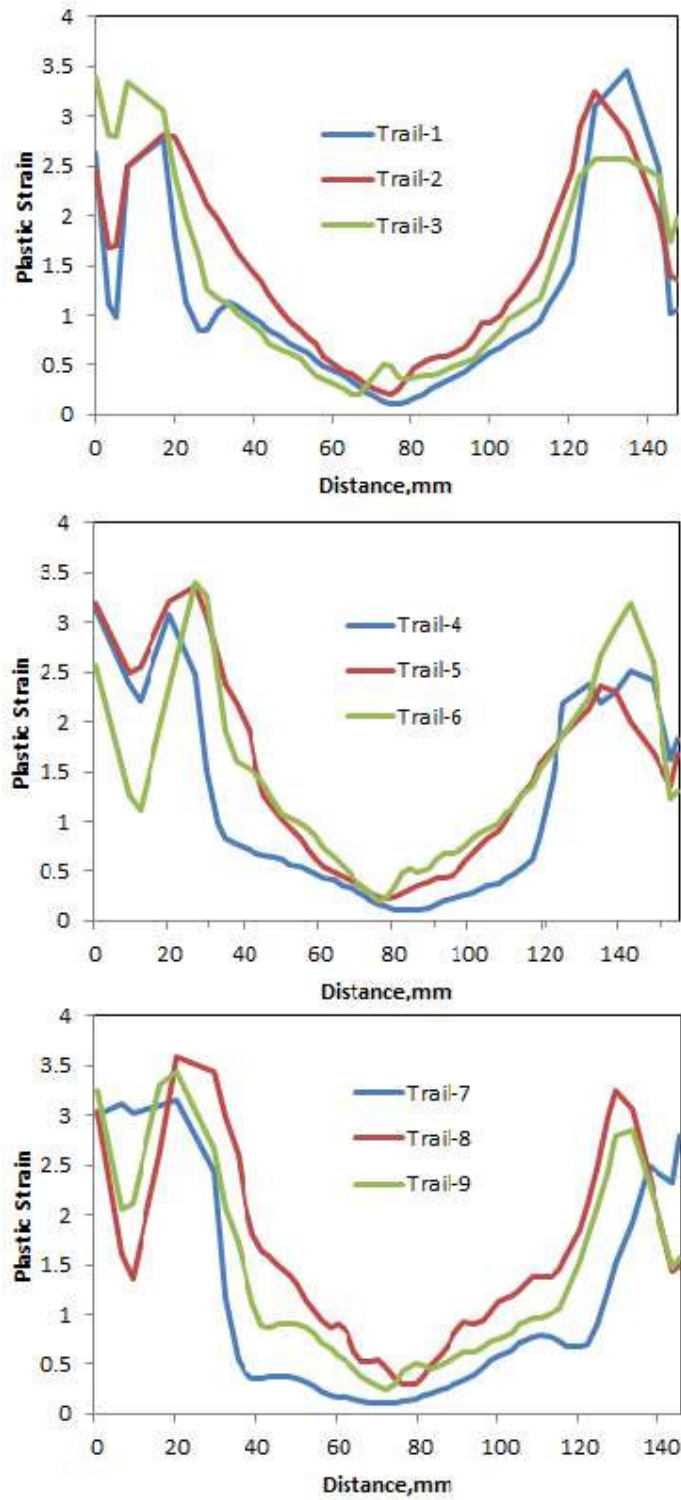


Figure 2: Plastic strain induced along the walls of cup.

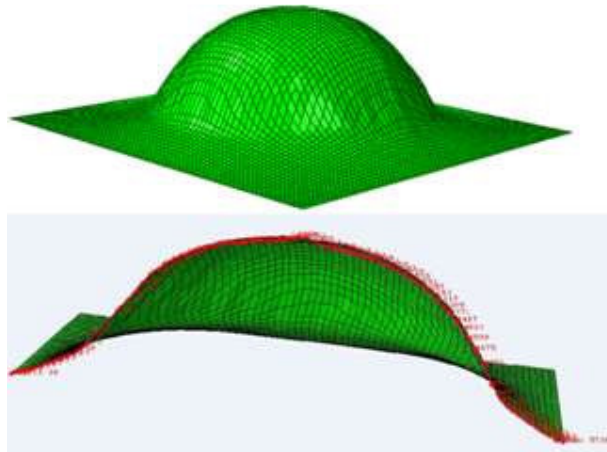


Figure 3: Formation of hemispherical cup.

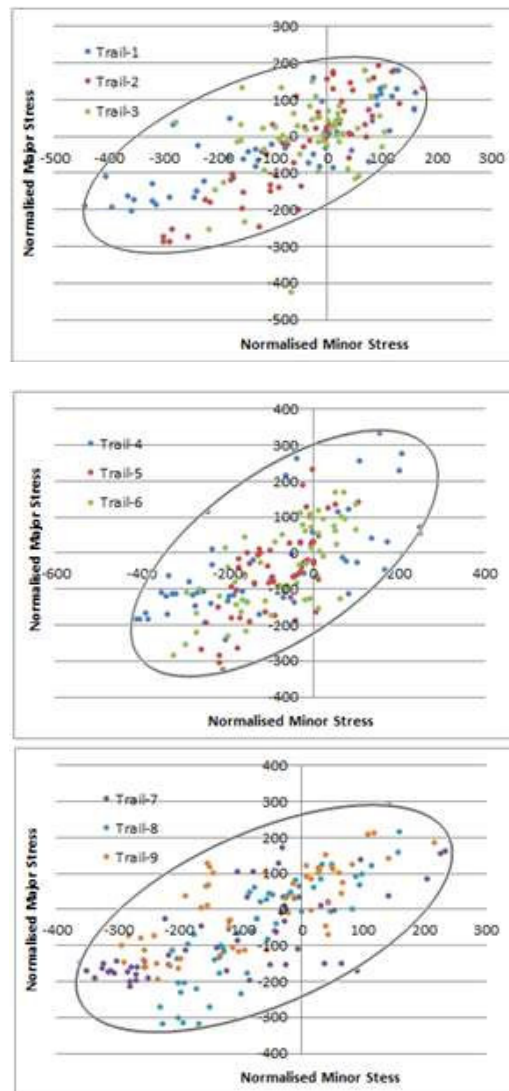


Figure 4: Formability of hemispherical cups.

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