

Cavitation behavior in superplastic 5083 Al alloy during multiaxial gas
blow forming with lubrication

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Abstract

Despite its importance for industrial applications, the effect of lubrication on the cavitation behavior of superplastic materials has been given little attention. In this paper, a series of experiments were performed regarding bulging superplastic 5083 Al alloy sheet into dies with a cylindrical (cup) and rectangular (pan) die cavity for forming with and without lubrication, the formed parts were then evaluated to determine the effect of lubrication on the cavitation level evolution, thickness distribution, and void distribution. For forming with lubrication, it was found that void shrinkage took place in the overlaid region. The maximum void volume fraction could be effectively reduced for forming with lubrication; however, reductions in the maximum void volume fractions for cup forming were less significant than those of pan forming.

Keyword : Superplastic forming

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