A Developed Friction Test for Sheet Metal Forming

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Abstract:

Punch friction test is considered to be the best simulator of sheet metal stretching over the punch corner. In this study, an improved punch friction test eliminating the error due to the strain-rate effect was developed. This method enables the direct force measurement and the online evaluation of the friction coefficient. Also, an improved boundary friction model was introduced to predict the friction coefficients and the real contact areas around the punch nose portion. The predicted values were then compared with the experimental one obtained from the newly developed test for verification. A good agreement was obtained between the theoretical and the experimental results. Finite element simulation of the punch friction test under dry friction condition for annealed aluminium was performed using the experimental friction coefficients. Since the simulated force-displacement results are in good agreement with the experimental one, the accuracy of the test is high and reliable.

Keywords:

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