

Prediction of Impact Marks for a Stamped Panel with LS-DYNA

Fen Ren, Yinong Shen and Z Cedric Xia
Ford Motor Company

David J. Wynn and Philip Ho
Livermore Software Technology Corporation

Abstract

Impact marks are the visible damage to the metal surface left by stamping tools sliding across a formed panel. The severity of such impact marks is an important quality measure in part buyoff, particularly for class A panels such as doors, body sides, hoods and deck lids. This paper presents a predictive simulation tool which has been developed to characterize and quantify the impact marks. It is based on the concept of accumulative frictional energy density between the panel/tool interface during a forming cycle. The tool itself provides an indication of the relative severity of the tooling impact on the panel surface, and can be used to fully assess production panel quality during draw development and also help a draw developer seek alternative design if necessary. The simulation tool has been implemented in LS-DYNA and the impact mark can be visualized and animated in LS-PrePost.

