

Modeling of self-piercing riveted joints for crash simulation – state of the art and future topics

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1 Abstract

The requirements for energy efficiency and lightweight construction in automotive engineering rise steadily. Therefore a maximum flexibility of different materials is necessary and new joining techniques are constantly developed. The resulting large number of joints with different properties leads to the need to provide for each type of joint an appropriate modeling method for crash simulation.

In the recent years the *CONSTRAINED_INTERPOLATION_SPOTWELD was modified to realize a better modeling of the behavior of self-piercing riveted joints. The modified version will be available in LS-Dyna soon. This paper will give a short overview about the background of this model and will show the benefits and limitations of the model. Furthermore, the future research topics will be shown for increasing the model quality. Topics like the influence of deformations in the surrounding sheets and the local loading situation on the model behavior will be discussed. For this purpose simulation results of variations of the lap shear specimen and the peeling specimen will be shown and compared with experimental data.

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