

The movement towards lightweight materials in the construction of automotive bodies is leading to an increase in parts made from extruded aluminum and other materials with a large degree of anisotropic behavior. The need to model these anisotropic properties and predict the behavior of these materials is increasing rapidly. Material Type 36 has a history of use in forming applications and shows promise as a valuable tool for modeling anisotropic behavior in high strain, high velocity simulation applications as well. An investigation into this application of the material model revealed fundamental limitations in the stability of the model, particularly in cases of high anisotropy. Through the support of an LS-Dyna developer, updates were made to the material model which should improve both accuracy and stability. Ongoing investigations based upon single element, coupon and component level simulation will validate the robustness of the updated material model and its predictive capabilities for simulation with large deformation and high strain rates. Once the model is fully validated, the intention of the project is to predict the anisotropic strength and fracture of extruded aluminum.