In hammering tools heavy loaded elastomer damping elements are used to reduce impact loads. The achieved strain levels as well as the occurring strain rates are unusually high.

In a previous work a new material model was developed and implemented in LS-Dyna. The model shows good results for dynamic O-Ring simulations with one specific elastomer.

The numerical effort of the model needs to be educed to enable its applicability in tool simulations.

The new material model requires also the definition of new evaluation criteria and limits to ensure lifetime robustness of elastomer elements. As a basis existing tools should be resimulated and evaluated.

Objectives & Tasks

- The existing LS-Dyna “user-defined” material model should be improved in terms of numerical efficiency
- Experimental determination of material parameters for additional elastomers
- Find criteria and limits to evaluate the robustness of elastomer damping elements in Hilti TE-Tools