Abstract:
Shear-cutting is one of the most important manufacturing processes involving sheet metal. The local pressure on the tools as well as the sliding speed between tools and work piece are much larger in shear cutting than in typical forming processes such as deep-drawing. This makes the prediction of tool life more critical in a shear-cutting simulation, in contrast to a forming simulation. A FE-program for wear prediction was used so far in the forming simulation. This tool was adjusted to the shear-cutting process through modifications of the shear-cutting simulation and of the interpolation algorithm to stabilize the wear calculation for the process. Endurance tests for the validation of the simulation results were performed with a hardened cold working steel (1.2379, 58 HRC) as tool material and a dual phase steel (DP600) with a thickness of 1 mm as sheet material. The FE-tool permits the qualitative prediction of the wear of the active elements in shear-cutting processes.