Abstract:
In blanking operations the cut edge of the sheet metal is not clear due to fracturing and burr formation by the shearing process. For precision parts with high quality and dimensional accuracy, often secondary machining is necessary. Shaving, in particular, counter-shaving, is a shearing operation to improve the cut edge quality of a blanked part or punched hole in two stages. This paper introduces a progressive die tool to realize the counter-shaving process on a single acting press. In order to realize the shaving operation in the opposite punching direction, the punch needs to move in counter direction. The burr and fracture zone left on the sheet metal after the first stage will be removed by the counter-shaving operation. By choosing the right process parameter a sharp-edge transition is formed, without any rollover, between the upper surface of the sheet metal and the sheared-edge. Different punch geometries as well as the corresponding process parameters were part of the research work in order to improve the cut edge. Experimental and FEM results are presented for two sheet metal materials at three thicknesses.

Stichworte:
Blanking; Counter-shaving; Production process