Numerical Simulation and Experimental Research on Cold Form Tapping Process of Internal Thread

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During the cold form tapping process of internal thread in high-strength-steel, the effect of bottom-diameter, extrusion speed, friction factor and extrusion times on extrusion temperature and torque have contributed to tap wear, break and manufacturing quality. The process of cold form tapping of internal thread for Q460 high-strength-steel is studied through numerical simulation and experimental research. The effect of different processing parameters, including the bottom-diameter, extrusion speed, friction factor and extrusion times, on temperature and torque during the process of cold form tapping of internal thread are analyzed to provide new basis for further choosing optimized processing parameters. The simulation and test results show that obvious stress-strain and higher temperature zone focuses on working area during the cold form tapping of internal thread for Q460 high strength steel. The simulation value is slightly lower than the measured value and the error is no more than 20%. With the increase of bottom-diameter and extrusion times and the reduction of extrusion speed and friction factor, the extrusion temperature and torque will decrease.

Keywords: Internal thread; Cold extrusion; Numerical simulation; Torque and temperature

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