

Abstract Precision hard machining is an interesting topic in manufacturing die and mold, automobile parts, and scientific research. While the hard machining has benefit advantages such as short cutting cycle time, process flexibility, and low surface roughness, there are several disadvantages such as high tooling cost, need of rigid machine tool, high cutting stresses, and residual stresses. Especially, tool stresses should be understood and dealt with to achieve successful performance of finish hard turning with ceramic cutting tool. So, the influence of cutting parameters on cutting stresses during dry finish turning of hardened (52 HRC) AISI H13 hot work steel with ceramic tool is investigated in this paper. For this aim, a series finish turning tests were performed, and the cutting forces were measured in tests. After literature procedure about finite element model (FEM), FEM is established to predict cutting stresses in finish turning of hardened AISI H13 steel with Ceramic 650 grade insert. As shown, effect of the cutting parameters on cutting tool stresses in finish turning of AISI H13 steel is obtained. The suggested results are helpful for optimizing the cutting parameters and decreasing the tool failure in finish turning applications of hardened steel.