State of the Art Ball Screw Trends

for Machine Tool Applications

Abstract

This paper reviews the latest technical trends in precision ball screws, which are especially used in the machine tool industry. At the JIMTOF (the Japanese International Machine Tool Fair) 2012, an obvious juxtaposition of demands, high axial speed and high positioning accuracy, were observed in the latest machine tools. NSK has suggested some new solutions to improve machine performance in these areas. The NSK HSS (high speed SS) series ball screws, equipped with the SRC (Smooth Return Coupling) return components, contribute to exceeding 60 m/min feed rates with a d ・ n value (d : diameter of a ball screw shaft, n : 1 / minute) of over 160,000. A hybrid lead table unit is another solution, overcoming a physical speed limitation of ball screws. Meanwhile, nut cooling ball screws have also been developed in order to reduce a temperature increase on overall feed components. The effective heat dissipation of this design leads to high positioning accuracy, less distortion of the machine structure and also excellent machining integrity.