

Has your CNC got pulling power?

For precision machining it is important that spindle or tool run-out concentricity is excellent. In particular, for deep boring it is important that the tool doesn't suffer any oscillation out of axis.

There are several causes of tool run-out most of them often mistakenly blamed on the tool itself. The most important but probably the least considered is the force with which the tool-holder cone is pulled into the machine spindle's conical seat.

The cone angle in the ISO/BT/SK system is of $8^{\circ} 17' 50''$. Therefore the clamping forces along the rotation axis have to be considered in the force generated from the axial thrust radial component.

The clamping force that offers the minimum run-out for ISO/BT/SK 50 machine spindles is a force greater than 1500kg and for ISO/BT/SK 40, greater than 900kg. At the same time there is a maximum limit as the F_r component can cause machine spindle cone deformation.

Every machine tool manufacturer gives force values. The values are the result of structural bending calculations. The traction systems are composed of spring parcels, and although reliable, over time and under continuous loading and unloading operations, the original performance value of the springs can obviously deteriorate.

As this loss of performance is reached, tool-holders exposed to very strong radial thrusts (high depth machining on tough material) can break, causing machine damage as well as endangering operator safety. Therefore periodic spring force checks, during routine maintenance, will ensure consistent working accuracy and could avoid a possible accident.



New Elbo Controlli spindle pulling force metre or PFM

The PFM is a measuring instrument that allows, in a simple and quick way, the measurement of machine tool spindle clamping force. The unit comes with a range of common spindle configurations and measures minimum and maximum values in kilograms on an easy-to-read display.

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