TOOLOX®
PREHARDENED TOOL STEEL

2009-05-15

Best Practice
Machining of Toolox®

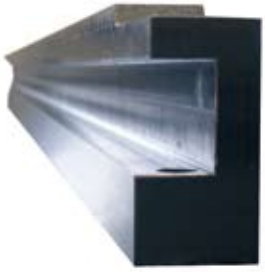
SSAB Plate is neither an expert in machining nor a cutting tool supplier. We do not claim to have optimum solutions in machining, but we happily share our experience with you as suggestions for your machining optimization. Cutting tool suppliers are experts to contact regarding machining.

Machining

Normally, machining in Toolox is no problem when using positive cutting angles. As Toolox has a tendency to deformation hardening, the window for optimal cutting conditions is a bit smaller. It is important to keep the feed, and reduce cutting speed if cutting edge wear is too high. Our recommendations are published on **www.toolox.com**.

Blue chips

The machinability of Toolox has been improved. During milling you will notice it as the chips produced are very bluish. We have modified the carbide morphology as compared to traditional tool steels, using less carbon in Toolox. Thereby the heat generated during milling is transferred into the chip and not into the cutting edge.



Clamping

Toolox has very low level of residual stresses. To get the full effect make sure to use deformation free clamping. If blanks are gas cut, mill off 5-10 mm from the gas cut edge to get a blank free from residual stresses.

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Drilling of cooling channels
20-30 times the drill diameter

The latest technology is cemented carbide drills with internal cooling. A new internal cooled cemented carbide drill which works extremely well has been presented by Wirth and is marketed by Hoffmann, see www.hoffmann.com, item No. 123695 for further information.

When using high speed drills we suggest use of cobalt alloyed grades, plenty of coolant and "wood pecker drilling". Use of mechanical feed is important. A re-shaping of the tip angle to 110-118° prolongs the service life by 2-3 times as compared to a standard tip angle of 130°. The explanation for this increase in service life is a change in wear pattern from peripheral wear to tip wear. Further information is given on **www.guehring.de**.

Deep hole drilling
10-12 times the drill diameter

When drilling deep holes with high demands on surface tolerances, straight fluted internal cooled cemented carbide drills have been successfully used. The surface quality of these holes is as they were reamed. The drill used, Futura Coated M2612 12xD, is made by Miller. Further information is given on **www.miller-tools.de**.

Tapping

The most critical machining operation in Toolox 44 is tapping. A good alternative, when possible, is thread milling. When using thread taps it is crucial to find the correct tap. Very good results have been achieved with taps from Emuge-Franken, see www.emuge-franken.de, with their:

- **M5 Rekord 1A-Z-TiCN**
- **M6 Rekord 1A-Z-TiCN**

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