Carrs toolsteel technologies

TOOLOX 33

Typical Analysis

C	0.25	Si	0.60
Mn	0.90	Cr	1.20
V	0.13	Mo	0.40

Colour Codes

Characteristics

TOOLOX 33 is a pre-hardened, free machining steel with very high impact toughness and exceptional cleanliness. This steel may be polished and etched with excellent results. Because of the very low levels of internal stress, large sections may be machined without movement and stress relieving is neither necessary nor recommended.

Typical Applications

TOOLOX 33 is especially suited for plastic moulds having excellent polishing and photo-etching ability which are guaranteed to NADC207-97. Other applications include rubber moulds, bending tools and general engineering where high toughness, high impact strength and great stability are important. This material can substitute and will give better results than qualities such as 1.2311, 1.2738 and 1.2312.
See over for case studies.

Please see overleaf for case studies

Machining

For best results, it is important to select the appropriate high quality cutting tools and the correct speeds and feed rates. A considerable amount of information is available on request.

For milling it is important to use inserts with a positive cutting angle. Expect 25% faster cutting compared with 1.2312 and much more compared with 1.2311. At cutting speeds of 300m/min and a feed rate of 0.15mm using a Sandvik Coromill 200 with GC1025 inserts, we quarantee a maximum edge wear of 0.3mm in 10 minutes.

When drilling short holes, cemented carbide drills have proved to be best. For deep holes, straight flute, cemented carbide drills have been effective. Cooling channels should be drilled with HSS drills such as HS6-5-2-5 (M35) where the Cobalt content has proved beneficial. A drill tip angle of 118° rather than the conventional 130° has been found to provide a two to three times better service life.

Physical Properties (Guaranteed and Typical)

Hardness		HBW	280-330	300
		HRC	-	29
Impact Values (longitudinal)	=<130mm thick	J	27min	60
	>130mm thick	J	14min	27
Tensile Stregnth	at 20°C	R_m[Mpa]	-	1,080
	at 200°C	R_m[Mpa]	-	1,010
Yield Strength	at 20°C	R_{p02}[Mpa]	-	955
	at 200°C	R_{p02}[Mpa]	-	860
Coefficient of thermal expansion at:	+20°C to 200°C	10^{-6}/K	-	13.1

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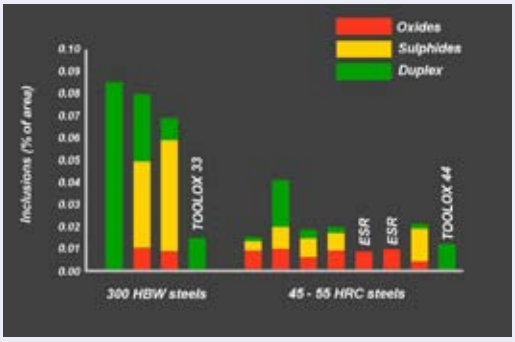
CASE STUDIES

Theka Formverktyg AB produced this plastic mould tool for vehicle number plates using Toolox 33 for the core and Toolox 44 for the cavity. The high stability and ease of machining was particularly noted.

Ursviken Pullmax produced this 3 metre long press-brake blade in Toolox 33 and measured only 0,7mm maximum deflection from end to end. Milling speed was also 25% faster than with the previous material 1.2312 (P20 with Sulphur).
This demonstrates both the superb stability of Toolox 33 and its free-cutting qualities.

The exceptional cleanliness of Toolox (see chart below) provides high quality polished finishes and etch-grain effects with very low risk.



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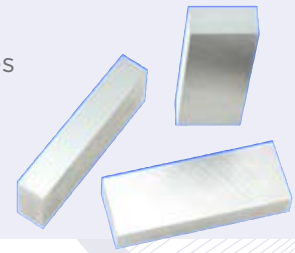
Rectangular sections from 25mm³ up to 430 X 430 X 150mm can be delivered fine milled on all six faces to - 0+0.1mm and with squareness guaranteed to 0.1mm/m.



Stock

TOOLOX 33 is stocked in plate and cut to individual customers requirements.

SSAB OXELÖSUND

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