

TOOLOX® IN COLD WORK TOOLS

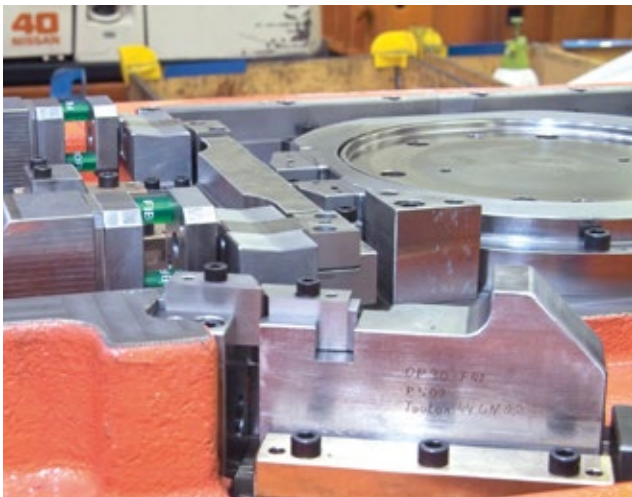
Toolox® is a unique steel for production of mold, die, tool and engineering applications. Toolox® is based on the low-carbon and ultra-clean steel metallurgical concept which gives it extraordinary properties. Toolox® is delivered in quenched and tempered (at 590°C) and has guaranteed and tested hardness and impact toughness. There are 3 different hardness level for Toolox®: 30, 40 and 45 HRC.

Toolox® is used in cold work mainly for forming, bending and drawing where its combination of high strength, fatigue resistance and toughness values creates an optimum result. Toolox® is also successfully implemented for other die components such as guide plates, supporter plates and staple holder plate.

Compared to materials such as 1.2379, Toolox® eliminates the time losses, distortion, cracking, etc. related to heat treatment. It gives fast tool production and short commissioning time advantages.

Eliminating heat treatment also provides the opportunity to use longer parts (pic.2) without distortion risk. This eliminates the need to make segments with extensive CNC machining work on the tool. It also makes other costly operations such as CAD/CAM programming easier.

The low-carbon concept of Toolox® grades make them suitable for oxy, plasma, laser and wire EDM cutting. This makes it possible to cost-effectively produce non-square components. Also, welding is much easier to carry out.



Pic.1: Washing machine die.



Pic.2: No segment (monoblock) on drawing edge.

Surface hardening and tool life expectation

Toolox® is an ideal steel for surface-hardening processes such as nitriding, PVD coating and induction hardening. Depending on the expected tool life, one of the surface treatment processes in the tables below can be chosen. The data below is based on extensive SSAB experience. It is not to be seen as a guarantee. Instead it is to meant to be an indication of what can be achieved.

Table 1: Forming, Drawing, Bending Applications

Sheet Metal Thickness	Suitable Grade			Surface Hardness/Condition			
	TX33	TX40	TX44	Polishing	Nitriding	Induction Hardening	PVD Coating
0-3 mm	Ok	Ok	Ok	Ok	+++	++	+++
3-6 mm	-	Ok	Ok	Ok	+++	++	+++
6-10 mm	-	-	Ok	-	++	+++	+
10-15 mm	-	-	Ok	-	-	++	-

Table 2: Cutting Applications

Sheet Metal Thickness	Suitable Grade	Surface Hardness/Condition			
	TX44	No Treatment	Nitriding	Induction Hardening	PVD Coating
0-3 mm	Ok	+	-	++	++
3-6 mm	Ok	+	++	++	+
6-10 mm	Ok	-	+	++	+
10-15 mm	Ok	-	--	++	--

Table 3: Hardness and Hardened Layer Depth Correlation

Surface Hardening Method	TOOLOX® 33	TOOLOX® 44
	Hardness/Depth	
Nitriding	740 HV1-0,3 mm	850 HV1-0,3 mm
Induction Hardening	50 HRC-2 mm	55 HRC-2 mm
Laser Ind. Hardening	56 HRC-1 mm	64 HRC-1 mm

Availability

Plates and square blocks from 6–320 mm. Bars between 21 and 405 mm with lengths up to 5000 mm. Toolox® is available from the local SSAB stock. Cut pieces of Toolox® can be obtained through the well-established global network of Approved Toolox® Distributors. Both SSAB and the distributors can provide you with good application support as well as technical guidelines.

Contact and more information

Contact your local sales representative to learn more, visit www.toolox.com or consult Tech Support at: help@ssab.com.