

Standard dimensions TOOLOX44



Thickness mm	Width and Length
8	The standard width is 2100 mm and lengths between 4 and 5.8 m. Plates are delivered with mill edges. If necessary, the plates can be divided.
9.5	
11.5	
14	
18	
22	
28	
35	
40	
43	
50	
53	
60	
66	
80	
84	
Thickness mm	Width and Length
104	The standard width is 1700 mm and lengths between 4 and 5.8 m. Plates are delivered with mill edges. If necessary, the plates can be divided.
120	
130	
Thickness mm	Width and Length
180	Forged bars in widths of 600-1200 mm, dependent on thickness, and lengths of approximately 2.8 m. Please contact SSAB or representatives for further information.
220	
270	
320	

If you require smaller sizes than those offered in the stock list please contact your Approved TOOLOX Dealer. See our home page www.toolox.com.
If larger formats are required, please contact SSAB Oxelösund AB.

TOOLOX is the registered trademark for tool steels produced by SSAB Oxelösund AB. For more information about TOOLOX 44, contact SSAB Oxelösund AB.

TOOLOX[®]
PREHARDENED TOOL & MACHINE STEEL

SSAB
OXELÖSUND

Product sheet: TOOLOX44[®] 45 HRC with ESR properties



Specification

Hardness	HBW 410 - 475		
Impact toughness	Test temperature °C	Impact energy, Charpy-V-test for plate, longitudinal direction; min J ≤ 130 mm	Impact energy, Charpy-V-test for forged bar, thickness direction; min J > 130 mm
	20	18	11
Milling	At a cutting speed of 140 m/min, feed 0.15 mm and 10 min effective machining time using Sandvik Coromill 200 and inserts GC 1025, we guarantee maximum edge wear of 0.3 mm.		
Ultrasonic inspection	All plates and forged bars tested in accordance with SSAB Standard V6.		
Etching	TOOLOX 44 fulfils the etching requirements of NADCA 207-2003.		
Dimensions	TOOLOX 44 is supplied as plate in thicknesses between 5 - 130 mm, or as forged bars in thicknesses between 150 - 300 mm.		
Delivery condition	Quenched and tempered at a minimum temperature of 590 °C		
Heat treatment	TOOLOX 44 is not intended for further heat treatment. If TOOLOX 44 is heated above 590°C after delivery from SSAB Oxelösund AB no guarantees for the properties of the steel are given.		
Nitriding/coating	Nitriding or surface coating may be carried out if the temperature is below 590 °C.		
Testing	Testing according to EN 10 025 and EN ISO 6506-1. Hardness is measured on a milled surface 0.5 - 2 mm below the original surface.		
Tolerances	Plate;	According to EN 10 029 - thickness tolerance according to Class C. - flatness tolerance according to Class N, steel type L.	
	Forged bars;	According to DIN 7527	
Surface finish	On delivery from SSAB Oxelösund AB the plate meets the following specifications: - free from mill scale - not repair welded - surface defects deeper than the nominal ordered thickness are not permitted. Forged bars according to DIN 7527		

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Technical information TOOLOX44



Usage

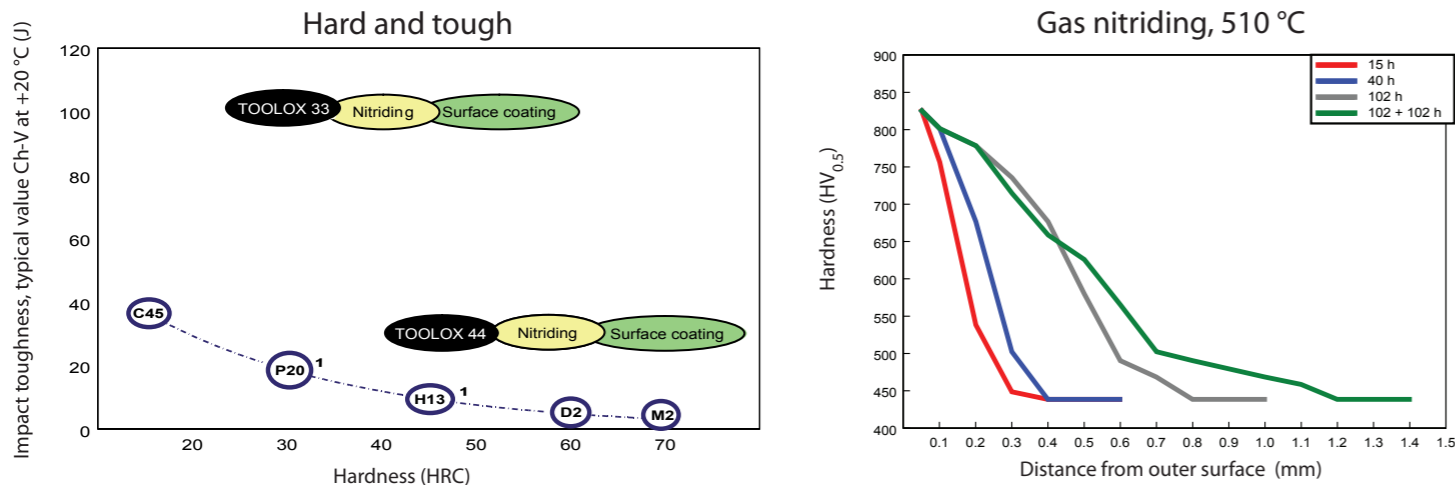
TOOLOX 44 is a new steel delivered quenched and tempered with high impact toughness and very low residual stresses to get good dimensional stability. Despite its hardness of 45 HRC, TOOLOX 44 is easily machined.

TOOLOX 44 has high strength at elevated temperature and is suitable for dies and tools such as plastic, rubber, die casting, bending and sheet forming tools. TOOLOX 44 is also well suited as machine components such as wear parts, guide rails, hot applications. With proper surface treatment, the service life of the tool/component can be prolonged.

Typical values

Chemical composition		Mechanical properties				
C	0.32%					
Si	0.6-1.1%					
Mn	0.8%					
P	max 0.010%					
S	max 0.003%					
Cr	1.35%					
Mo	0.80%					
V	0.14%					
Ni	max 1%					
CE _{IIW}	0.92-0.96					
CET	0.55-0.57					
		+20°C	+200°C	+300°C	+400°C	+500°C
		Tensile strength, R _m [MPa]	1450	1380		
		Yield strength, R _{p0.2} [MPa]	1300	1200		
		Elongation, A ₅ [%]	13	10		
		Compressive yield strength, R _{co2} [MPa]	1250	1120	1120	1060
		- after 170 h soaking time			1060	910
		Impact toughness [J]	30	60	80	80
		Hardness, [HBW]	450			
		Hardness, [HRC]	45			
Inclusions		Physical properties				
Inclusion size (equiv. diam)	6µm	+20°C	+200°C	+400°C	+600°C	
Area fraction	0.015%	Heat conductivity [W/m·K]	28	29	29	
Aspect ratio	1.2	Thermal expansion coefficient [10 ⁻⁶ /K]	13.5	13.5	13.5	

Surface technology



Footnote 1: P20 = W.Nr 1.2311 and H13 = W.Nr 1.2344

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Machining TOOLOX44



TOOLOX 44 can be machined using conventional machines. It is important that sharp tools are used, with a positive cutting angle and that vibration is avoided. Use the following recommendations as guidelines and the starting point for your own evaluation of best practice.

Milling

Cemented carbide cutter ISO class P 20

Always use a positive cutting angle

$V_c = 100-150$ m/min

Feed $f = 0.10-0.15$ mm/tooth

Speed (rpm) $n = \frac{V_c \times 1000}{\pi \times D}$



Roughing

Use milling cutters with circular inserts



Finishing

Use milling cutters with a 45° setting angle

Drilling

Carbide

Cutting speed $V_c = 30-40$ m/min

$f = 0.10-0.15$ mm/revolution

Feed (f) and speed (rpm) (n) are dependent on the drill bit diameter D

Use coolant



High speed steel HSS-Co

Cutting speed $V_c = 6-8$ m/min

Speed (rpm) $n = \frac{V_c \times 1000}{\pi \times D}$

Use coolant



D [mm]	Feed, f [mm/revolution]
5	0.05
10	0.09
15	0.15
20	0.20
25	0.25
30	0.30

Threading

Thread milling

Cutting speed $V_c = 30$ m/min

Feed (f) = 0.03 mm/tooth



Threading HSS-Co

Cutting speed $V_c = 2.5-4$ m/min



Dimension	Speed (rpm)
M6	160
M8	120
M10	95
M12	80
M16	60
M20	50

Gas cutting / Welding

Recommended preheat temperature when gas cutting and welding.

Minimum 250 °C

Recommended stress relief annealing (after slow cooling to room temperature)

after gas cutting and welding.

580 °C

For further information see Best Practice or please contact SSAB Oxelösund.

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