Toolox® 44

General Product Description

Pre-hardened, precise, predictable steel.

Toolox® 44 is a steel already heat treated to the final properties.Thus saving time, costs and risks associated with heat treatment.

The very high strength is combined with a high and guaranteed toughness as well as an excellent fatigue resistence. Making Toolox® 44 the ideal choice for the most demanding engineering and mould and die applications.

Toolox® 44 can be surface hardened with methods like nitriding, laser and induction. Giving the possibilities to even further improve the performance.

Dimension Range

Toolox® 44 is available as plates in thicknesses between 6.0 - 130.0 mm, as forged block in thicknesses between150.0 - 320.0 mm, and as round bars in diameters between 21.0 - 353.0 mm. Other dimensions can be available on request. For more information concerning dimensions and tolerances, see Toolox® round bars or Toolox engineering & tool steel dimensional program

Mechanical Properties

Product	Thickness (mm)	Diameter (mm)	Hardness [1] (HBW)	Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (min MPa)	Elongation A_5 (min %)
Plate	6.0 - 130.0	–	410 - 475	1150	1300	8
Forged block	15.0 - 320.0	–	410 - 475	–	–	–
Round bar	–	21.0 - 141.0	410 - 475	1100	1250	8
Round bar	–	142.0 - 353.0	410 - 475	–	–	–

[1] Hardness is measured, according to EN ISO 6506-1. The measurement is performed on a milled surface 12.5 mm below the ordered surface for forged blocks and round bars. Bar hardness is measured with indents positioned as impact test according to EN 10083. For plate the measurment is preformed on a milled surface 0.5 - 2 mm below the surface.

Impact Properties

Product	Thickness (mm)	Diameter (mm)	Min impact energy for transversal testing, Charpy V 10x10 mm test specimen [1]	Min. impact energy for longitudinal testing, Charpy V 10x10 mm test specimen [2]
Plate	6.0 - 130.0	–	18 J / 20 °C	–
Forged block	150.0 - 320.0	–	11 J / 20 °C	–
Round bar	–	21.0 - 141.0	–	18 J / 20 °C
Round bar	–	142.0 - 353.0	–	11 J / 20 °C

[1] Impact testing according to EN 10 025, EN ISO 148 with a 2 mm striker.

[2] Impact testing according to EN 10083.

Ultrasonic testing

Ultrasonic inspection is carried out according to: EN 10160 for plate, EN 10228-3 for forged blocks and EN 10308 for round bars . All of them with extra demands according to specification SSAB V6.

Tolerances

For more information concerning dimensions and tolerances, see Toolox® dimensional programs or Toolox® Guarantees available at www.ssab.com or www.toolox.com.

Thickness

Tolerances according to Toolox® Thickness Guarantee.

Toolox® Guarantees meets the requirements of EN 10029 Class C, but offers more narrow tolerances for plates.

Thickness tolerances for Toolox® forged blocks are according to 0/+3.2 mm.

Bar Diameter

Tolerances according to EN 10060.

Length and Width

Length and width tolerances according to EN 10029 for Toolox® plates.

Length tolerances for Toolox® forged blocks are -500/+500 mm.

Length tolerances for Toolox® round bar are according to EN 10060 with tolerances -0/+200 mm.

Flatness

Tolerances for Toolox® plates are according to Toolox® Flatness Guarantees, which are more restrictive than EN 10029 Class N (steel type L).

Maximum accepted flatness deviation for Toolox® forged blocks are 1 mm/m.

Bar Straightness

Tolerances according to EN 10060, with a maximum allowed deviation of 2mm/m.

Surface Properties

According to EN 10163-2 Class B, Subclass 3 for Toolox® plate.

Surface condition for Toolox® forged blocks are milled to roughness of max Ra 12.5 um, and oiled as corrosion protection.

Surface condition for Toolox® round bars are turned and oiled.

Delivery Conditions

Quenched and Tempered at a minimum temperature of 590 °C.

On delivery from SSAB, Toolox® material meet the following specifications:

- Free from mill scale
- Not repair welded

Delivery requirements can be found in SSAB's brochure Toolox® Guarantees or at www.ssab.com.

Fabrication and Other Recommendations

Welding, bending and machining

For information concerning welding and fabrication, see SSAB's brochures on www.ssab.com or consult Tech Support.

Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on the product. Grinding, especially of primer coated products, may produce dust with high particle concentration.

Surface Hardening

Toolox® is an excellent steel for different type of surface hardening. The high yield strength and ductility of Toolox make it an ideal base material Microcracks in the hardened layer stops when reaching the base material. Surface hardening such as laser or induction when done in the right way only changes the properties locally. The steel below the hardened layer keeps its original properties intact.

Nitriding and surface coatings represent a very interesting way to increase hardness, lower friction and some cases improve corrosion resistance When done below 590 °C the material properties are not affected.

Contact Information

www.ssab.com/contact

OUR PRESENCE

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