Toolox® 33

General Product Description

The pre-hardened, exceptionally clean tool and engineering steel.

Thanks to its low carbon and alloy content, Toolox® 33 is perfectly adaptable for welding as well as hot cutting. Giving the possibility to product components more cost efficient by saving machining time.

Delivered in quenched and tempered condition, Toolox 33 features high impact toughness and very low residual stresses to achieve good dimensional stability after machining. Toolox® 33 is suitable for mold and dies as well as tooling and engineering components. By using the proper surface engineering methods, you can significantly extend the service life of your tools and components.

Dimension Range

Toolox® 33 is available as plates in thicknesses between 6.0 - 130.0 mm. Other dimensions can be available on request.

Mechanical Properties

Thickness (mm)	Hardness [1] (HBW)	Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (min MPa)	Elongation A_5 (min %)
6.0 - 130.0	275 - 325	700	800	10

[1] Hardness is measured, according to EN ISO 6506-1, on a milled surface 0.5 - 2 mm below the plate surface.

Impact Properties

Thickness (mm)	Min impact energy for transversal testing, Charpy V 10x10 mm test specimen [1]
6.0 - 130.0	35 J / 20 °C

[1] Unless otherwise agreed, transverse impact testing according to EN 10025-6 option 30 will apply. For thicknesses between 6 - 11.9 mm, sub-size Charpy V-specimens are used. The specified minimum value is then proportrional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

Ultrasonic testing

Ultrasonic inspection is carried out according to: EN 10160 with extra demands according to specification SSAB V6.

Tolerances

More details are given in SSAB's brochure Toolox® Guarantees and on www.ssab.com.

Thickness

Tolerances according to Toolox® Thickness Guarantee.

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

Length and Width

Tolerances according to EN 10029.

Flatness

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

Surface Properties

According to EN 10163-2 Class B, Subclass 3.

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

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