

## General Product Description

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

Toolox<sup>®</sup> 33 is a pre-hardened steel suitable for tools and engineering components. It possesses good dimensional stability after machining.

Delivered in quenched and tempered condition, Toolox<sup>®</sup> 33 features high impact toughness and very low residual stresses to achieve good dimensional stability after machining. Toolox<sup>®</sup> 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<sup>®</sup> 33 is available as plates in thicknesses between 6 - 130 mm. Other dimensions can be available on request.

## Mechanical Properties

Thickness (mm)	Hardness <sup>1)</sup> (HBW)
6 - 130	275 - 325

<sup>1)</sup> Hardness is measured, according to EN ISO 6506-1, on a milled surface 0.5 - 2 mm below the plate surface.

## Impact Properties

Test temperature	Impact energy, Charpy-V, Min J <sup>2)</sup>
20 °C	35

<sup>2)</sup> Impact testing according to EN 10 025, EN ISO 148 with a 2 mm striker.

## Ultrasonic testing

Ultrasonic inspection is carried out according to : EN 10 160 with extra demands according to specification SSAB V6.

## Tolerances

More details are given in SSAB's brochure Toolox<sup>®</sup> Guarantees and on [www.toolox.com](http://www.toolox.com).

## Thickness

Tolerances according to Toolox® Thickness Guarantee. Toolox® Guarantees meets the requirements of EN 10 029 Class C but offers more narrow tolerances.

## Length and Width

Tolerances according to EN 10 029.

## Flatness

Tolerances are according to Toolox® Flatness Guarantees, which are more restrictive than EN 10 029 Class N (steel type L).

## Surface Properties

Surface properties of Toolox 33 are according to EN 10 163-2 Class B, Subclass 3.

## Delivery Conditions

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

On delivery from SSAB the plates meet the following specifications:

- free from mill scale
- not repair welded

Delivery requirements can be found in SSAB's brochure Toolox® Guarantees or on [www.toolox.com](http://www.toolox.com).

## Fabrication and Other Recommendations

### Welding, bending and machining

For information concerning welding and fabrication, see SSAB's brochures on [www.toolox.com](http://www.toolox.com) or consult Tech Support, [techsupport@ssab.com](mailto:techsupport@ssab.com).

Toolox® 33 is not intended for further heat treatment. If Toolox® 33 is heated above 590 °C after delivery from SSAB no guarantees for the properties of the steel are given.

Nitriding or surface coating may be carried out if the temperature is below 590 °C.

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

## Contact Information

[www.ssab.com/contact](http://www.ssab.com/contact)