

TOOLOX[®] 33

TOOLOX® 33

WHAT IS TOOLOX® 33?

Toolox® 33 is a hardened and tempered tool steel from SSAB in Sweden. Based on a low-carbon concept, Toolox® 33 features high impact toughness and a very low residual stress, whereby good dimensional stability is achieved after machining. Due to the nitriding ability of the material the surface hardness can be additionally increased and the service life can be extended. Toolox® 33 is therefore suitable for die casting, for plastic and rubber injection moulding, construction and wear parts or other mechanical components.

WHY TOOLOX® 33 FROM KNARR?

As a future-oriented company we trust the modern tool steel concept. While the alternative steel variants 1.2311 respectively 1.2312 qualify for particular machining processes, Toolox® 33 combines the positive properties of both steel grades. The clear advantages while chipping and processing are a detectable and objective criterion – we too have been convinced after extensive internal tests. In addition to reduced risks and potential cost reduction, the increasingly important basic idea of time saving is a major plus as Toolox® 33 is heat-treated and therefore ready for immediate use.

DATA

COMPOSITION

C	0,22 – 0,24 %
Si	0,60 - 1,10 %
Mn	0,80 %
P	max. 0,010 %
S	max. 0,003 %
Cr	1,00 – 1,20 %
Mo	0,30 %
V	0,10 – 0,11 %
Ni	max. 1,00 %
CE _{IIV}	0,62 – 0,71
CET	0,40 – 0,44

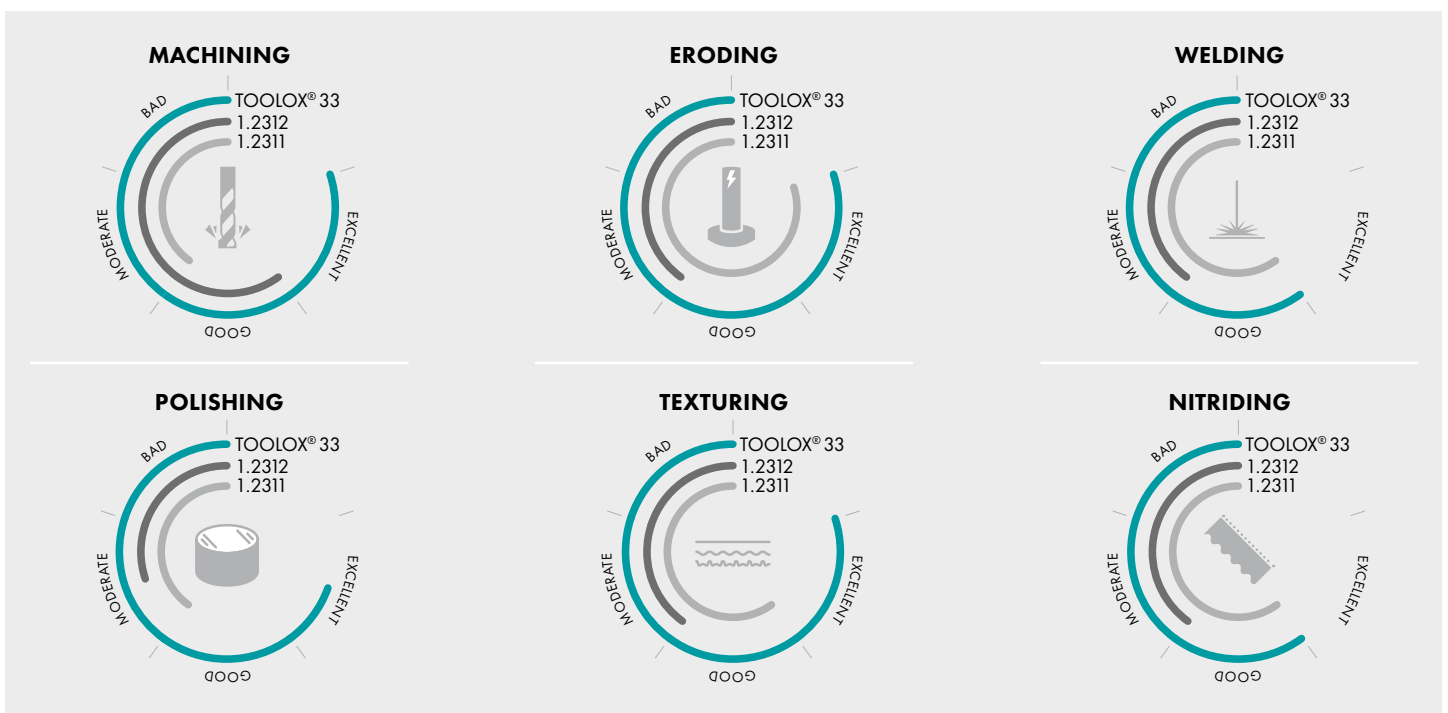
MECHANICAL PROPERTIES

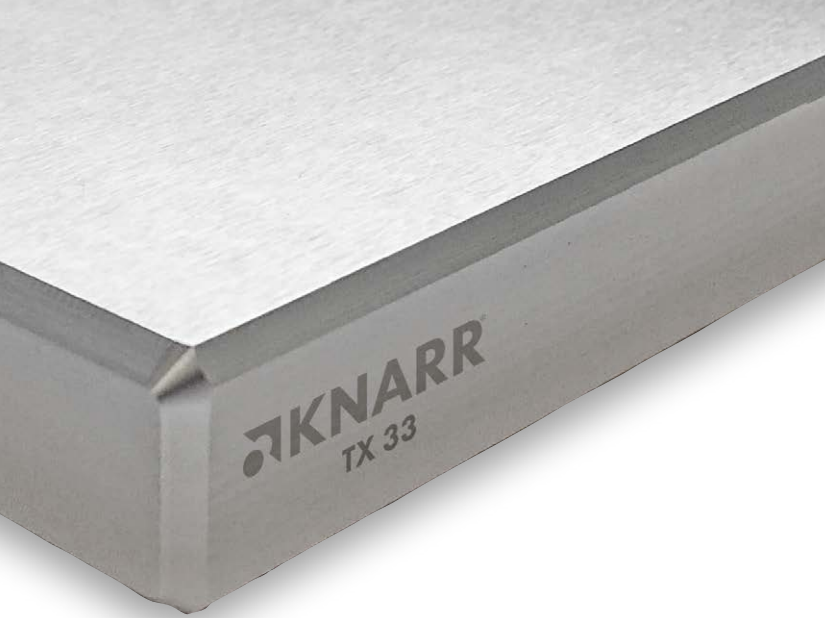
	+ 20°C	+ 200°C	+ 300°C	+ 400°C	+ 500°C
tensile strength, R _m [MPa]	980	900			
yield point, R _{p0,2} [MPa]	850	800			
stretch at break, A ₅ [%]	16	12			
offset yield strength, R _{s0,2} [MPa]	800	750	700	590	560
impact energy [J]	100	170	180	180	
hardness [HBW]	300				
hardness [HRC]	29				

PHYSICAL PROPERTIES

	+ 20°C	+ 200°C	+ 400°C
thermal conductivity [W/m · K]	35	35	30

PROCESSING





TOOLOX® 33 - AT A GLANCE

- › Hardened and tempered tool steel (from SSAB, Sweden)
- › Combines the positive properties of 1.2312 and 1.2311
- › Very constant and homogeneous structure (similar to ESR)
- › Extremely low distortion even with high chipping volume
- › Excellent for polishing, texturing and eroding
- › Excellent machinability with low tool wear
- › Nitriding at temperatures up to 590 °C
(Achievable surface hardness approx. 60-65 HRC)

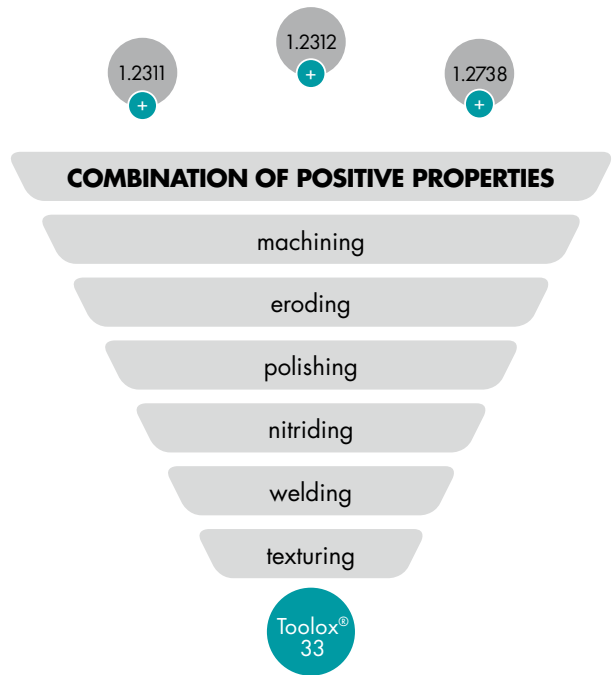
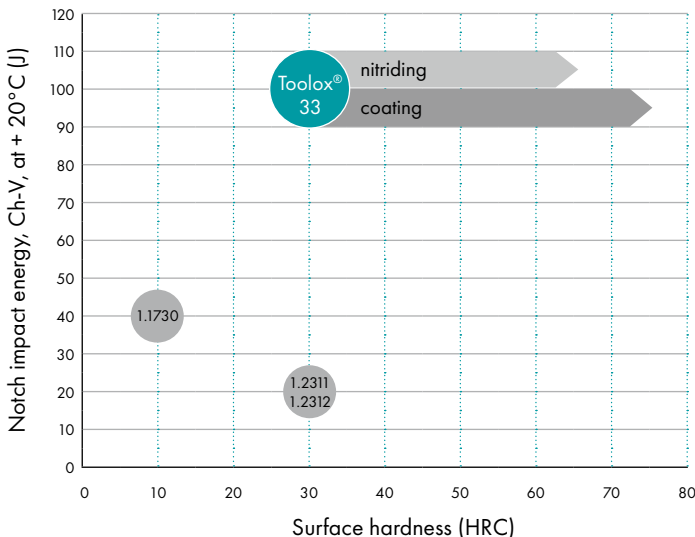
PROPERTIES

FORM STABILITY

The idea behind Toolox® 33 is delivering steel which is already tempered, hardened and endowed with guaranteed physical properties. Very strict quality guidelines during the manufacturing process are necessary for such a high metallurgical purity, which achieves a slag-freeness as corresponding to ESR-material. Toolox® 33 can be processed directly and requires no further post processing. The tempering guarantees stable characteristics. Toolox® 33 also shows extremely low distortion while chipping with high volume. The hardness of the steel creates the requirements for precise contours and surfaces.

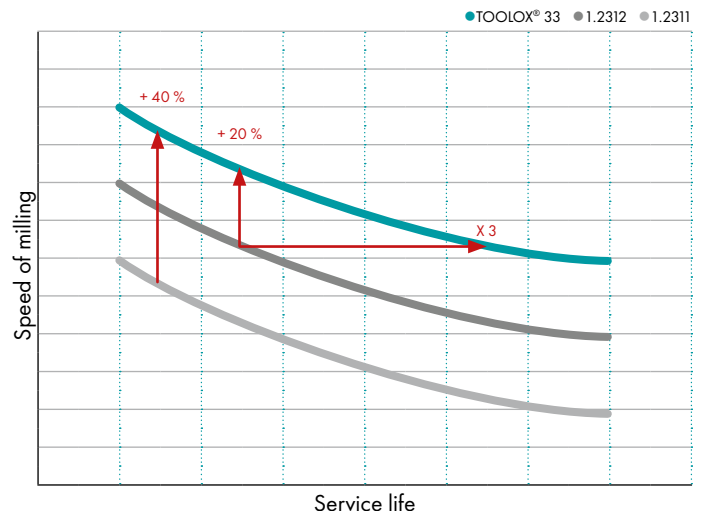
TENACITY AND HARDNESS

In the delivery state, Toolox® 33 has a hardness of about 29 HRC on a comparable level of the two alternatives 1.2311 and 1.2312, but possesses a remarkable higher toughness. Thanks to a pure metallurgy and the hardening, Toolox® 33 provides unique fatigue properties. The homogeneous steel structure ensures a consistently accurate dimensional accuracy and minimizes the risk of cracking.



ECONOMY AND EFFICIENCY

Constant and stable material qualities provide continuity and shorter production time of mould tools. The elimination of stress relief annealing alone leads to a time and cost advantage. Through the use of suitable methods for surface treatment, for example nitriding or PVD coating, the service life of the tools can be additionally extended.



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