

# Technical information

## TOOLOX33



### Usage

TOOLOX 33 is a new steel delivered quenched and tempered with high impact toughness and very low residual stresses to get good dimensional stability. TOOLOX 33 has a low carbide content, and is therefore excellent to machine. TOOLOX 33 is suitable for plastic moulding, for rubber moulding and machine components. With proper surface treatment, the service life of the tool/component can be prolonged.

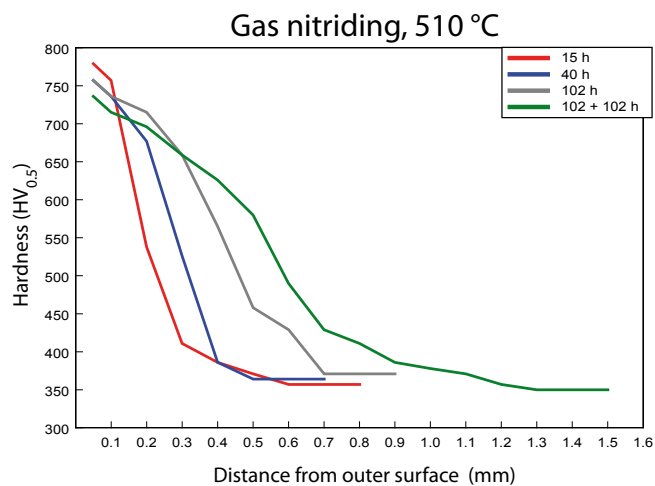
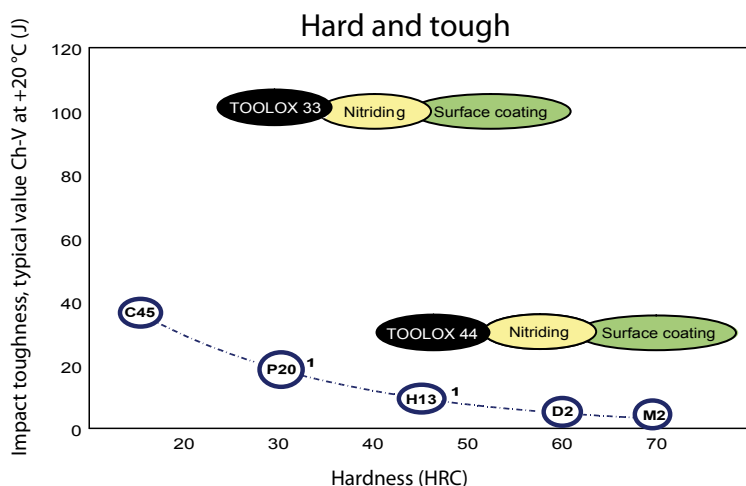
### Typical Values

Chemical composition		Mechanical properties					
C	0.22-0.24%		+20°C	+200°C	+300°C	+400°C	+500°C
Si	0.6-1.1%	Tensile strength, $R_m$ [MPa]	1080	1000			
Mn	0,8%	Yield strength, $R_{p0,2}$ [MPa]	950	860			
P	max 0.010%	Elongation, $A_5$ [%]	16	12			
S	max 0.003%	Compressive yield strength, $R_{c0,2}$ [MPa]	880	750	700	590	560
Cr	1.0-1.2%	Impact toughness [J]	100	170	180	180	
Mo	0.30%	Hardness, [HBW]	310				
V	0.10-0.11%	Hardness, [HRC]	29				
Ni	max 1%						
CE <sub>IIW</sub>	0.62-0.71						
CET	0.40-0.44						

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]	35	35	30	23
Aspect ratio	1.2	Thermal expansion coefficient [10 <sup>-6</sup> /K]	13.1	13.1		

### Surface technology



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