

# TOOLOX® IN FORGED BARS

Toolox® made by Swedish steel producer SSAB ([www.ssab.com](http://www.ssab.com)) has been available in the market in plate shape in more than 10 years. During this time it has been proven to be an excellent choice for the applications such as mould, dies and machine parts working under most demanding conditions. Being delivered already heat treated to the final properties has made it possible to use where previously heat treatment had to be carried out. Thus saving time and giving a better control of the quality. SSAB is also offering Toolox® in round shape and from now on expanding the diameter range up to 353 mm.

It is not difficult to produce steel with high hardness. But they tend to be sensitive to cracks and difficult to machine. Toolox® is unique in combining a high hardness of 45 HRc with a guaranteed toughness making cracks very unlikely. The ultra-clean steel metallurgical concept based on low carbon and alloy content make it easy to machine for its hardness. In Table 1 below a comparison of Toolox® 44 with alloyed and tool steels typically used.

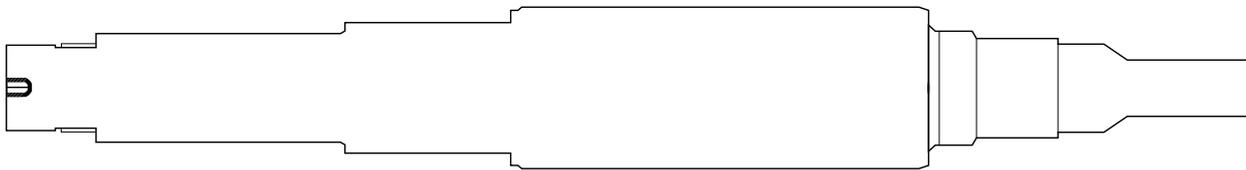


Shaft in 500 tonnes hydraulic press.

	R <sub>p0.2</sub> [MPa]	R <sub>m</sub> (MPa)	Hardness (HRc)	P	C	Mo	CE <sub>IIV</sub>
42CrMo4/4140	Min 500	700–900	25–30	Min 35 J @ RT	0.42	0.22	1.14
H13	1000–1380	1200–1580	45–50	5 – 10 J	0.40	1.40	2.00
TOOLOX® 44	1300	1450	45	Min 11 J @ RT	0.32	0.80	0.96

**Table 1. Typical mechanical properties and chemical composition**

Toolox® in forged diameters is already used in different demanding applications with huge improvements for the customers. In figure below, an exemple can be seen. The wheel forming drive shaft is made by Toolox® 44.



Previously, these shafts were made from 4140/4340/1.8550 Q&T alloyed steel forged bars. Problem was unpredictable life time. With early cracks due to several reasons such as material quality, non optimal heat treatment, strength and toughness or operational difficulties. After changing to Toolox® 44, the shafts are working 3-4 years without cracking problem.

Other typical applications for Toolox® bars in large diameters are aluminium extrusion and forging dies. Where avoiding heat treatment can save at least 1-2 weeks in lead time, take away the necessity to machine the dies two times and make it possible to better control the properties. The excellent surface hardening properties of Toolox® prolongs even more the lifetime of the dies.

### Availability

Toolox® is available from the local SSAB stock in the standard diameters 182, 202, 225, 242, 262, 282, 302, 323, 353 mm. Cut pieces of Toolox® can be obtained through the well-established global network of Approved Toolox® Distributors. Both SSAB and distributors can provide you with good application support as well as technical guidelines.



### Contact and more information

Contact your local sales representative to learn more, visit [www.toolox.com](http://www.toolox.com) or consult Tech Support at: [help@ssab.com](mailto:help@ssab.com)