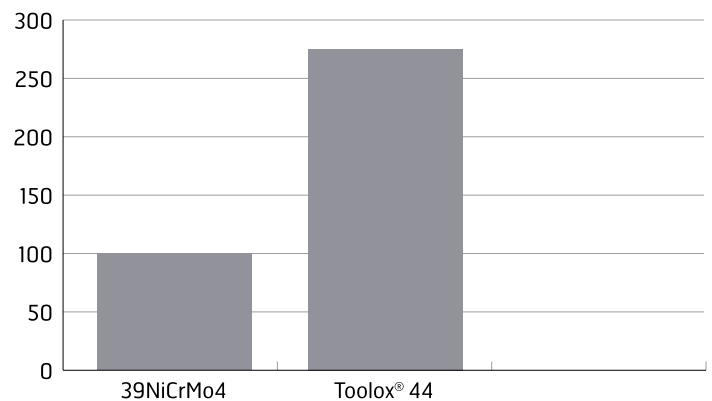


# TOOLOX® IN HAMMER PINS

Hammer pins are a critical part of auto shredders. Not only do they need to have a long average life time, early failures are forbidden. The Toolox® bars fulfill both demands. Furthermore, Toolox® is delivered with an ultra-high strength. The guaranteed crack resistance and unique quality control minimize the risk for production stops.

Toolox® is made in Sweden by SSAB, which for more than 40 years has been the market leader in the wear resistant steel Hardox®. Just like Hardox®, Toolox® gives the opportunity to increase pin lifetime with full service reliability. Something experienced by an auto shredder plant in Italy, running Newell 3000 KW shredders. Typically they use alloyed steel 39CrNi-Mo4 in the 126 mm and 150 mm diameter pins. During production they experience a lot of issues requiring maintenance. Changing to Toolox® 44 the maintenance was reduced dramatically at the same time the life increased with almost 3 times.

Part of the low maintenance needed is due to the fact that Toolox® bars don't experience the typical burr at the places the hammers are situated. In the photos on opposite page from a Spanish recycling plant, this is shown. The plant is handling 1000 tons of scrap per day, running a WINDMILL 4000 CV shredder with 6 126 mm diameter pins. Both pins on the photos had worked two weeks. On the standard 4340 alloyed steel pin, the burr needed to be grinded away before the pin could be put into use again. That was not at all necessary for the Toolox® 44 pin. This, combined with the 100% lifetime increase from maximum 3 months in operation to an average of 6 months, made the customer change all their hammer pins to Toolox® 44.



**Amount of metal scrap recycled. Standard pin amount 100 as reference.**



The unique combination of strength and crack resistance comes from an extremely clean steel. Carbon content is lowered to a minimum and instead more effective alloy elements such as molybdenum are used. In Table 1 below, a comparison between Toolox® and typically used alloy steel 4340 is shown. The yield strength of Toolox® is double and yet the crack resistance is similar. Heat treating the 4340 type of steel to a similar strength as Toolox® will drastically reduce the crack resistance.

Using Toolox® gives the guarantee of knowing the origin of the steel. All bars are ultrasonically tested. The hardness and crack resistance are guaranteed for all bars delivered.



**Standard 4340 hammer pin**



**Toolox® 44 hammer pin**

	$R_{p0.2}$ (MPa)	$R_m$ (MPa)	Toughness	C	Mo	P	$CE_{IIW}$
4340/36CrNiMo4	850	980	50 J @ RT	0.40	0.25	Max 0.035 %	0.85
TOOLOX® 44	1300	1450	30 J @ RT	0.32	0.80	Max 0.010 %	0.96

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

**Availability**

Plates from 6 – 130 mm. Bars between 21 and 172 mm with lengths up to 5000 mm. Toolox® is available from the local SSAB stock. Cut pieces of Toolox® can be obtained through the well-established global network of Approved Toolox® Distributors. Both SSAB and distributors can also 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).