

TOOLOX® IN STEEL PRODUCTION

Toolox® is an excellent steel for the production of high performance machine components. Toolox® is based on an ultra-clean steel metallurgical concept that gives it extraordinary properties. A combination of high strength, crack resistance and optimized workshop properties make it an ideal choice for steel equipment. The guaranteed toughness as well as the plate per plate quality control minimizes the risk for early failures.

Toolox® is used in more and more steel plants around the world. At the SSAB Oxelösund plant, 100 tons of Toolox® are used per year for maintenance and in design of new equipment. In Fig 1, a part of a redesigned continuous casting machine can be seen. The support beams are made in Toolox® 33. To improve wear and corrosion resistance black nitriding is done.



Fig 1. Toolox® 33 support beams



Fig 2. Toolox® 44 shear blades

All long flat pieces are very suitable Toolox® applications. Toolox® is tempered at 590°C, which removes all stresses from the steel, making it possible to obtain remarkable precision when machining. An example is shown in Fig 2, where shear blades are used for cutting high strength plates.

Toolox® is based on a low-carbon and alloy metallurgical concept. Minimizing carbon and instead using more efficient elements such as molybdenum makes it possible to produce a steel that has a high crack and fatigue resistance. The lower carbon content also makes welding and hot cutting, like oxy cutting, easier. The lower the CEIIV value, the lower the risk for cracks.

Table 1. Typical mechanical properties and chemical composition

	R _{p0.2} (MPa)	R _m (MPa)	Toughness	C	Mo	P	CE _{IW}
TOOLOX® 33	850	980	100 J @ RT	0.23	0.30	Max 0.010 %	0.66
42CrMo4/4140	550–800	850–1000	~ 60-90 J @ RT	0.42	0.22	Max 0.035 %	1.27
TOOLOX® 44	1300	1450	30 J @ RT	0.32	0.80	Max 0.010 %	0.96



Fig 3. Toolox® 44 steering wheel



Fig 4. Cooling bed made in Toolox® 33

An example of how gas cutting can be used to improve component production can be seen in Fig. 3.

Previously, these crane steering wheels were made from 34 CrNiMo6 alloyed steel forged bars. The strength of that steel was not sufficient so induction hardening was made. Today the wheels are produced from oxy cutting of Toolox® 44. After very limited machining the wheels are ready to use. SSAB uses this concept as standard for 15 different types of wheel design.

The high tempering temperature of Toolox® makes it also a very suitable steel for applications where hot strength is needed. The SSAB coking plant experienced the typical problems with the standard wear solution of ceramic tiles. The tiles cracked and deformed making maintenance costly and time consuming. Instead a solution based on 20 mm Toolox® 33 plates was developed. A free moving design with the plates only fixed with bolts at the top was used. As a result the lifetime was improved and the number of maintenance stops was significantly reduced.

Availability

Plates and square blocks from 6–320 mm. Bars between 21 and 405 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 or consult Tech Support at: help@ssab.com.