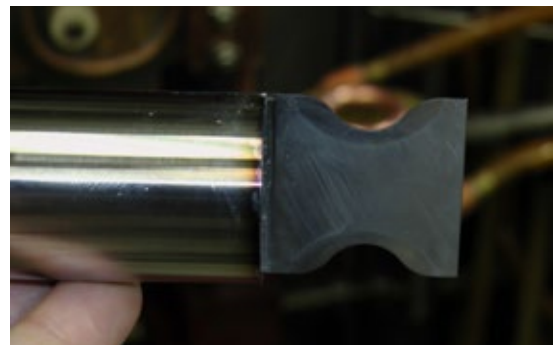


# INDUCTION HARDENING OF TOOLOX®

Toolox® is an excellent steel for the production of high performance machine components. Toolox® is based on a 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 all types of machine parts working under the strictest demands. The guaranteed toughness as well as the plate per plate quality control minimizes the risk for early failures.

For some applications, the surface properties need to be further improved. In such cases, induction hardening is a common and very efficient method, giving a high surface hardness with a relatively large thickness. The combination of induction hardening and Toolox® 44 is especially interesting due to the uniquely high yield strength of Toolox®. Below the induction hardened layer there will be a very resistant material.

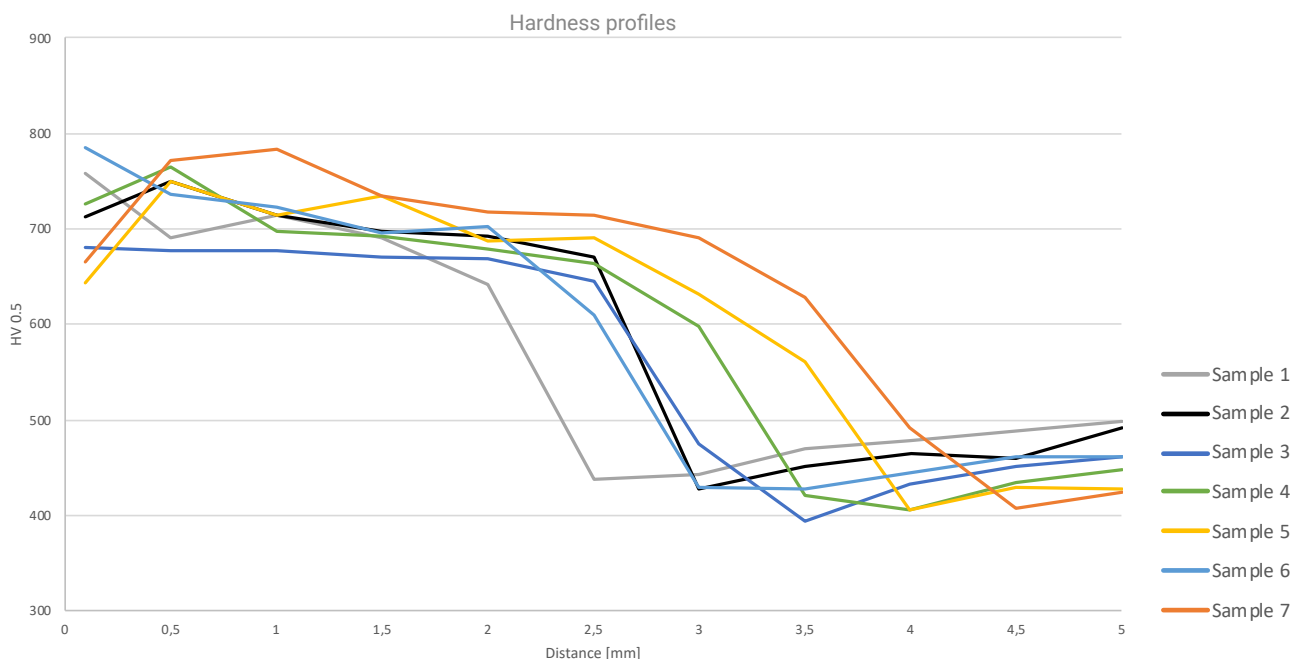
To increase the knowledge of the induction hardening behavior of Toolox® 44, testing was made at the Swedish Induction hardening specialist Teknoheat AB ([www.teknoheat.se](http://www.teknoheat.se)). Teknoheat is since more than 50 years specialized in designing cutting-edge induction hardening equipment. Therefore they know perfectly well how to optimize the induction hardening result.



In table 1, the different parameters used for the induction hardening testing can be seen. Water can and should be used always for the cooling. The high crack resistance of Toolox® make the usage of that most efficient cooling method possible.

Sample	% voltage	Heating time	Power	Frequency	Quenching
1	72	4.1 s	70 kW	22 kHz	Water
2	72	4.6 s	70 kW	22 kHz	Water
3	72	5.1 s	70 kW	22 kHz	Water
4	77	4.6 s	80 kW	22 kHz	Water
5	82	4.6 s	90 kW	22 kHz	Water
6	67	5.6 s	63 kW	22 kHz	Water
7	67	6.6 s	63 kW	22 kHz	Water

**Table 1.** Induction hardening test parameter



**Figure 1.** The hardness profiles for the different samples

**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 the 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).