

FLAME HARDENING OF TOOLOX®

The Toolox® steels are based on an ultra-clean steel metallurgical concept that gives their extraordinary properties. Toolox® 44 is delivered already heat treated to a very high strength as well as a good and guaranteed crack resistance. The excellent fatigue resistance make sure the properties are kept during the whole service time. These characteristics makes Toolox® 44 an ideal choice for all types of machine parts and tools working under the strictest demands.

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

To increase the knowledge of the hardening behavior of Toolox® 44, testing was made at the Brazilian flame hardening specialist Combustol Tratamentos Térmicos (www.combustol.com.br). Flame hardening is a process that has its limitation in the difficulties to control the parameters exactly. Therefore its extra important to cooperate with professionals like Combustol Tratamentos Térmicos to achieve optimum results.

Combustol Tratamentos Térmicos being doing quality heat treatment since 1975 knows perfectly how to get such results.



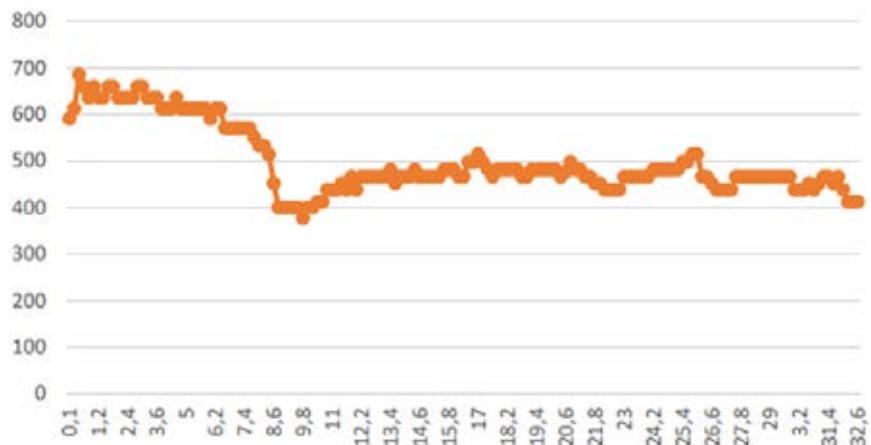
Picture: Combustol Tratamentos Térmicos.



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The test specimen was heated from one side at a temperature of 870° C during a time of 2.0 minutes. The cooling was done with water directly on the test pieces. Finally, a stress relieving was done at 180° C during 2 hours.

CP01 - dureza em HV1



Graphic developed by Combustol Tratamentos Térmicos engineering and R&D department.

As can be seen in the hardness curve, a surface hardness of 650 HV1 was obtained. The case depth defined as 80 % of the surface hardness was estimated to 8.6 mm. Repeating the testing, similar result was obtained showing the consistency of the hardening.

Flame hardened Toolox® 44 is especially suitable for heavy loaded components such as large size gears, wheels and rollers. Also, different part of tooling for metal forming. Such as dies and knives.

Availability

Plates from 6 – 165 mm. Bars between 16 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