ROVALMA

THE STEEL INNOVATOR

FECRONI®-1800

Remelted Stainless Steel with Enhanced Corrosion Resistance and Optimal Combination of Wear Resistance and Toughness

FECRONI®-1800

Fecroni®-1800 is a remelted martensitic stainless steel specially designed for plastic injection dies. It combines high corrosion resistance and toughness with a high level of polishability and good thermal conductivity. The typical usage hardness range is between 48 to 56 HRc, depending on the specific application. Starting with a careful selection of raw material, continuing with a controlled melting in an electric arc furnace, followed by a special re-melting step and advanced thermo-mechanical treatments, a very clean and fine microstructure is achieved. Furthermore, the dimensional change of Fecroni®-1800 during heat treatment is exceptionally low.

Applications

Fecroni®-1800 is mainly used in dies for the injection of corrosive thermoplastics or thermosets requiring high levels of polishability. It has also provided very good results when employed in cases of thin walls and critical zones where the toughness of the martensitic stainless steels should be increased. It has further showed beneficial in applications requiring maximum dimensional stability throughout the heat treatment process. Fecroni®-1800 has also been particularly successfully used in inserts for high durability dies in order to prevent re-polishing operations and to minimize problems in cooling areas. Finally, it has showed very advantageous in other engineering applications, where the above mentioned combination of properties is required from the tool like: tools for high-speed machines, numerical control or EDM; milling blades for corrosive products; all types of knives for the food industry.

Physical and Mechanical Properties

Properties	300 K	473 K	Unit
Density	7.74	7.70	g/cm^3
Mechanical Resistance	1790	1682	MPa
Yield strength 0,2 %	1520	1400	MPa
Elastic modulus	210		GPa

The values given in the tables are typical values (neither maximum nor minimum values), for properly heat treated materials at a hardness level of 50-52 HRc.

Thermal Properties

Properties	300 K	473 K	Unit
Linear Thermal Expansion Coefficient	-	11	$x10^{-6}$ /K
Thermal Diffusivity	5.9	5.7	mm^2/s
Thermal Conductivity	21	22	W/m·K
Specific Heat Capacity	0.46	0.50	J/g·K

The values given in the tables are typical values (neither maximum nor minimum values), for properly heat treated materials at a hardness level of 50-52 HRc. Thermal conductivity values are calculated on the basis of thermal diffusivity values measured by laser flash

Heat Treatment

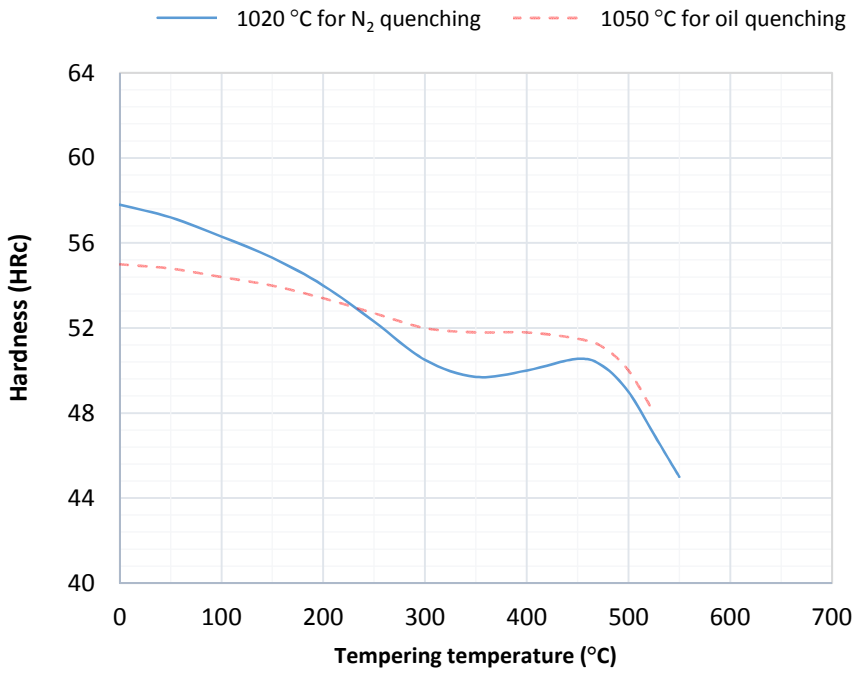
Like most tool and other specialty steel grades, Fecroni®-1800 obtains its optimized mechanical and physical properties through a corresponding heat treatment prior to final machining. Depending on application requirements and objectives, the heat treatment strategy can be adapted in order to obtain the best possible compromise of desired mechanical and physical properties for a given application and production environs. For more detailed heat treatment guidelines or recommendations for your specific application and production environs, please, do not hesitate to contact ROVALMA S.A. The following indications provide a general heat treatment guideline:

Hardening

- Slow heating (180 °C/h) from room temperature to 800 °C.
- Hold for homogenization until the core has reached 800 °C.
- Heating from 800 °C to 1020 °C - 1050 °C (duration 1 hour).
- Hold for austenization for 20 minutes.
- Cooling in oil, N2, ventilated air or salt bath at 200 °C.

Tempering

- Tempering cycles should be carried out immediately after the hardening, when the piece has cooled down to room temperature.



Note:

- We generally recommend that furnaces used for heat treatments should not be heated prior to the introduction of the material.
- Hardness after quenching of Fecroni®-1800 should be around 53-56 HRc.
- Holding times start when the core reaches specified temperature levels. If no thermocouple is available, allow one (1) minute for every millimetre of thickness.
- In order to relieve tensions from rough-machining, it is generally recommendable to perform a stress relief treatment after rough machining, such that distortions resulting from stresses brought into the piece through the rough-machining can be corrected prior to the heat treatment. This is particularly true for severely machined pieces.

Designer & Provider of First-Class Tool Materials

ROVALMA, S.A. provides innovation in tool materials. Thanks to comprehensive research, innovative design and development, most recent production techniques as well as in depth quality control, we have achieved significant advances in the knowledge about material forming processes and generated important know-how regarding the production and optimal usage of our materials for a specific application. As a result, we can provide you with **first-class tool steels** for cold and hot work material forming processes and outstanding technical assistance.

We are proud to make our High Performance Tool Steels available to you for your specific applications. Do not hesitate to contact us for the latest information.

Application Engineering Service

In order to fully exploit the advantages and the potentials of ROVALMA's High Performance Tool Steels, we offer our customers the support of our Application Engineering Service. Our highly qualified and dedicated engineers can assist you in selecting the optimized grade for your application and provide you with the corresponding technical recommendations. It is our mission to increase the competitive-advantage of our customers and support them in achieving the highest possible cost-effectiveness.

You can access our service directly by sending an email to: ae-fast@rovalma.com.

ROVALMA, S.A. carries out ongoing research for many applications regarding the usage of the materials here presented. This research often brings along significant advances in the knowledge of a given process and thus important information regarding the best possible usage of the materials for a specific application. We strongly recommend to get in contact with ROVALMA, S.A. for the latest information regarding a specific application.

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