

ROVALMA

THE STEEL INNOVATOR



FASTCOOL[®]-10

Pre-Hardened Tool Steel with
Exceptional Thermal Conductivity

FASTCOOL[®]-10

FASTCOOL[®]-10 is a new tool steel grade of the high thermal conductivity tool steel family. It has been designed to be the most cost-effective solution for applications benefiting from exceptionally high thermal conductivity while requiring good mechanical properties, including very large cross-section applications – thickness ≥ 1000 mm is possible. FASTCOOL[®]-10 provides significant advantages for plastic injection applications due to its outstanding thermal conductivity (twice as high as conventional tool steels), elongation, very high degrees of polishability, and its great potential for reducing cycle time and improving part quality by eliminating warpage and sink marks. Moreover, the usage of advanced melting technologies combined with a careful selection of highest quality raw materials ensures a very low impurities content, which, together with the very fine and homogenous microstructure, enables very good polishability, excellent texturability and extremely homogenous properties. The material has also been specially tailored for the application of high performance mould heating and cooling technologies.

FASTCOOL[®]-10 is supplied in pre-hardened condition at a typical hardness level of 300 ± 30 HB, offering great opportunities to reduce manufacturing costs as no further hardening process is required. For applications requiring higher hardness FASTCOOL[®]-10 HH at $\sim 330 - 360$ HB is available.

Physical and Mechanical Properties

Properties	300 K	Unit
Density	7.89	g/cm ³
Mechanical Resistance	980	MPa
Yield Strength 0.2 %	850	MPa
Elastic Modulus	210	GPa

The values given in the table are typical values (neither maximum nor minimum values), at a hardness level of 300 HB.

Thermal Properties

Properties	300 K	473 K	Unit
Linear Thermal Expansion Coefficient		12.6	$\times 10^{-6} / K$
Thermal Diffusivity	15.6		mm ² /s
Thermal Conductivity	58		W/m·K
Specific Heat Capacity	0.47		J/g·K

The values given in the table are typical values (neither maximum nor minimum values), at a hardness level of 300 HB. Thermal conductivity values are calculated on the basis of thermal diffusivity values measured by laser flash.

Polishability

- Unique microstructure features provides high polishability.
- Polishability levels comparable to special tool steels for plastic injection applications - mirror polish better than mesh 3000 is possible.

Welding

Bear in mind that when welding a working zone and High Thermal Conductivity and High Toughness are to be maintained in the weld:

- The usage of FASTCOOL[®] welding consumables is recommended.
- If welding has been carried out at places between the object to be cooled and the cooling media, the whole piece should be tempered twice after welding in order to restore the thermal properties in the welded area.

Machining Parameters

The values presented herein are recommended for the machining of FASTCOOL®-10 in the pre-hardened delivery condition (300 ± 30 HB). The machining data given in this datasheet are general guidelines that may have to be adjusted to the actual conditions of a specific machining operation, employed machining equipment and tools.

Face Milling and Square Shoulder Milling

	Rough Milling	Fine Milling	Unit
Cutting Speed (v_c)	80 - 170	160 - 200	m/min
Depth of Cut (a_p)	1 - 5	0.1	mm
Feed (f_z)	0.2 - 0.5	0.05 - 0.2	mm/tooth
Tool Designation	P20 - P30 Coated Carbide	P30 Coated Carbide	ISO

End Milling

		Cutting Parameters	Unit
Solid Carbide	Cutting speed (v_c)	220 - 280	m/min
	Feed (f_z)	0.006 - 0.12	mm/tooth
Carbide Indexable Insert	Cutting speed (v_c)	160 - 240	m/min
	Feed (f_z)	0.3 - 0.9	mm/tooth

Turning

	Rough Turning	Fine Turning	Unit
Cutting Speed (v_c)	90 - 220	160 - 230	m/min
Depth of Cut (a_p)	1 - 5	0.2 - 2.5	mm
Feed (f_n)	0.1 - 0.8	0.02 - 0.3	mm/rev.
Tool Designation	P20 - P30 Coated Carbide	P30 Coated Carbide	ISO

Drilling

Cutter Diameter		1 - 5	5 - 10	10 - 15	15 - 20	Unit
Uncoated HSS	Cutting Speed (v_c)	14 - 18	14 - 18	14 - 18	14 - 18	m/min
	Feed (f_z)	0.05 - 0.15	0.15 - 0.25	0.25 - 0.30	0.3 - 0.35	mm/rev
Carbide Drill (IC)	Cutting Speed (v_c)	24 - 28	24 - 28	24 - 28	24 - 28	m/min
	Feed (f_z)	0.05 - 0.15	0.15 - 0.25	0.25 - 0.30	0.3 - 0.35	mm/rev

Threading

	M8	Unit
Threading speed	6 - 12	m/min

Machinability

FASTCOOL®-10 can be machined by conventional methods, using High Speed Steels, or by electrical discharge machining (EDM). The machining parameters are comparable to those employed for other hot work tool steels at the same hardness level. For further recommendations regarding machining parameters for specific application conditions, you can contact the technical department of ROVALMA, S.A. under : ae-fast@rovalma.com.

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.

Rovalma S.A.
HT
C/ Apol·lo, 51
08228 Terrassa (Barcelona)
SPAIN
Tel. (+34) 935 862 949
Fax (+34) 935 881 860

Rovalma S.A.
Head Office
C/ Collita, 1-3
08191 Rubí (Barcelona)
SPAIN
Tel. (+34) 935 862 949
Fax (+34) 935 881 860

Rovalma GmbH
German Office
Geibelstraße 5
12205 Berlin
GERMANY
Tel. +49 (0)30 810 59 717
Fax +49 (0)30 810 59 715

www.rovalma.com

© ROVALMA, S.A. 2021. All rights reserved. This brochure may not be, entirely or partially, reproduced, copied, distributed or modified, without the explicit authorization by ROVALMA, S.A. In particular, it is prohibited to alter the contents and/or use, any information provided herein, out of context. **NOTICE:** All information provided herein is for general information purposes only. The optimal choice of a tool steel depends on many factors, including, but not limited to individual process parameters, allowable tolerances and other production process factors, work conditions and preferences. **DISCLAIMER:** All information provided in this datasheet is provided "AS IS" and "As available" and without warranty, express or implied, of any kind regarding completeness, faultlessness, accuracy, up-to-dateness, individual interpretations, merchantability or fitness for any purpose and no representation contained in this datasheet shall be binding upon ROVALMA, S.A. All information shall be provided and accepted at Reader's / Receiver's risk.