ROVALMA

THE STEEL INNOVATOR

Universal High Performance Cold Work Tool Steel

Universal

The Tool Steel UNIVERSAL is a cold work tool steel with simultaneously increased levels of hardness, toughness and wear resistance, which has been developed by ROVALMA, S.A., along with the tool steel HWS®, to overcome the difficulties in the conformation of DP (dual phase), CP (complex phase), TRIP (transformation induced plasticity) and Mart (martensitic steels), and with the aim of providing a material solution that features improved properties compared to traditionally used tool steels like EN/DIN 1.2379 or other ledeburitic steel.

Applications

UNIVERSAL has been used very successfully in applications like: cutting dies and punching tools, deep drawing and bending tools for Advanced High Strength Steels (AHSS) such as Dual Phase, Complex Phase, Trip, Mart, Twip, press hardened, Q&P, stainless steels, cold worked strip, materials of high mechanical resistance, precision cutting (double acting), but also for other conventional sheet material when aiming at increasing production levels considerably; die inserts to inject Bakelite or plastics with abrasive components; rolls, jaws and combs for rolling threads; forging stamps; rolling and straightening rolls; rolls for cold work; blades for rotary cutting; shear blades.

Physical and Mechanical Properties

Properties	300 K	Unit
Mechanical Resistance	2590	MPa
Yield Strength 0.2 %	2220	MPa
Compression Yield Strength 0.2%	2900 – 3085	MPa
Density	7.89	g/cm^3
Elastic Modulus	219	GPa

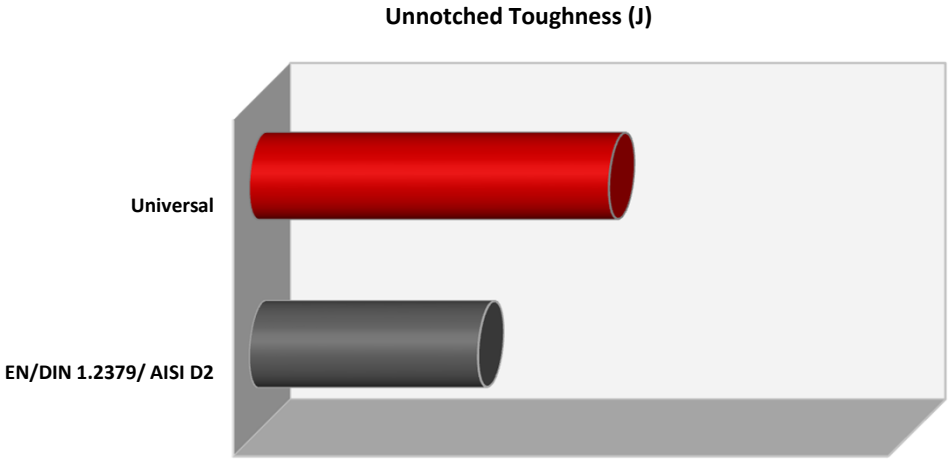
The values given in the tables are typical values (neither maximum nor minimum values), for properly heat treated materials at hardness level of 61 HRc.

Thermal Properties

Properties	300 K	573 K	Unit
Linear Thermal Expansion Coefficient		10.0	$x10^{-6}/K$
Thermal Diffusivity	7.2		mm^2/s
Thermal Conductivity	26		W/m·K
Specific Heat Capacity	0.46		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 61 HRc. Thermal conductivity values are calculated on the basis of thermal diffusivity values measured by laser flash.

Typical Impact Strength



All specimens were taken from the center of Ø100 mm bar and tested in transversal direction at room temperature and at hardness level of 61 HRc .

Heat Treatment

Like most tool and other specialty steel grades, UNIVERSAL obtains its optimized mechanical and physical properties through a corresponding heat treatment prior to final machining. Depending on application requirements and objectives, UNIVERSAL can be heat treated by means of oil or vacuum quenching.

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. It is recommended to directly contact ROVALMA S.A., or its local distribution partners, regarding the optimized heat treatment for a given application.

For more detailed heat treatment guidelines please refer to our: “General Guidelines & Recommendations for the processing of UNIVERSAL.

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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