2312 Holder

Technical Datasheet

Chemistry

Comparable Standard: DIN 1.2312

Typical	C	Mn	Cr	Mo	S
Analysis %	0.4	1.5	1.9	0.2	0.060

Description

2312 Holder is a pre-hardened steel designed for the plastic mold industry, with a specific sulfur addition to improve machinability. Supplied hardness of 280 – 325 HB (29-33 HRc)

Characteristics

Excellent hardenability resulting in good uniformity of hardness and microstructure. 30% increase in milling speed and 300% increase in drilling speed can be expected, compared to 1.2311 grade.

Applications

Plastic injection mold cores and cavities, extrusion dies for thermoplastics, thermosetting plastics, transparent melts.

Physical Properties

Density: 0.283 lbs/in³ (room temperature)

Coefficient of Thermal Expansion	70°F - 200°F 6.8 x 10^{-6} /°F	70°F - 400°F 7.2 x 10^{-6} /°F	70°F - 575°F 7.6 x 10^{-6} /°F
Thermal Conductivity	212°F 276Btu/in/ft²/hr/°F	400°F 280Btu/in/ft²/hr/°F	575°F 270Btu/in/ft²/hr/°F

Mechanical Properties

Hardness HRc	51	50	48	46	42	36	32	28
Tensile Strength KSI	251	242	228	215	193	165	134	123

General Note

All statements regarding the properties or utilization of the materials or products mentioned are for the purpose of description only. Guarantees regarding the existence of certain properties or a certain utilization are only valid if agreed upon in writing.

Heat Treatment

Soft Annealing

Temperature	Cooling	Hardness
1310°F – 1365°F	Furnace	235 HB Max.

Hardening

Temperature	Cooling	Hardness
1544°F – 1598°F	Oil	51 HRc Max.

Tempering (see tempering diagram below)

Temperature °F	212	392	572	752	932	1112	1292
Hardness HRc	51	50	48	46	42	36	28

For specific applications where mechanical properties higher than 300HB are required, hardening can be performed in the following way:

-heating with sufficient holding time (1 hour/inch)

-water, oil and air quenching depending on thickness)

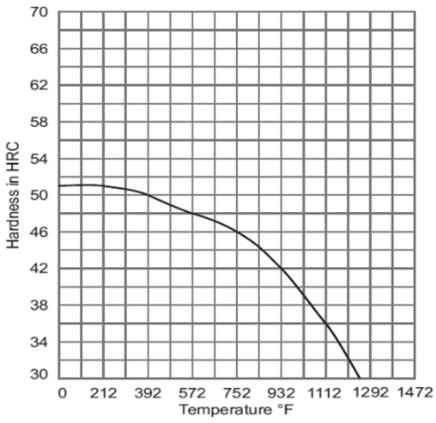
The following instructions must be followed to obtain an efficient tempering:

-Uniform heating at the selected tempering temperature

- Holding time of one hour per inch of total thickness

- Double tempering with complete cooling to room temperature for each treatment

Tempering diagram



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Welding
Preheat insert to 600°F - 700°F. Maintain temperature above 600°F during welding.
Use TIG with D.C. positive polarity.
Depending on the application, various welding rods can be used. P20 filler which will match the hardness of the base metal after welding and tempering commonly used. Please contact your Swiss Steel heat treatment facility for recommendations.
Slowly cool down to 100°F - 150°F, preferably under an insulating blanket, before post heat.
Post heat at 1000°F one hour per inch of weld depth plus one additional hour – double temper if possible. Exceeding 1050°F could result in the loss of hardness.

Machining
2312 Holder shows high performance in drilling and milling using high speed steel or carbide tools. The machinability of 2312 Holder is increased (compared to 2311) by a controlled sulfur addition which aims at:

-500% increase in milling tool life (at constant cutting speed)
-300% increase in drilling speed
-30% increase in milling speed

Polishing

Not suitable for polishing requirements.

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