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THYSSEN SPECIALTY STEELS, INC.

THYSSEN 4140 HOLDER

Comparable Standard: AISI 4140

Chemical Composition

Typical Analysis (%)

C	Mn	Si	S	P	Cr	Mo
.40	.85	.30	.15 max.	.035 max.	1.0	.20

Characteristics

Thyssen 4140 Holder material is supplied preheat treated to Rc 24/32 (248-302 BHN). It is a free machining alloy tool steel designed especially for plastic mold base material and for holder blocks for die casting dies. It can also be used in non-critical molds where a #2 finish is acceptable.

Properties

Deep cavities can be easily and quickly machined in **Thyssen 4140 Holder** due to its excellent machinability. Supplied heat treated to Rc 24/32 (248-302 BHN) **Thyssen 4140 Holder** has a yield strength of 110,000 psi approx. and a tensile strength of 140,000 psi approx. Impact values of approximately 35 ft.-lbs. makes this a tough holder material compatible with Thyroplast 2311; Thyroplast 2798; Thyssen P20 Super mold materials, together with Thyrotherm 2344 EFS Supra as a die casting die. Designed as a holder material, it can also be used for non-demanding plastic molds which require no better than a #2 finish.

Physical Properties

Coefficient of thermal expansion - $\times 10^{-6}/^{\circ}\text{F}$

70-400°F	70-600°F	70-800°F
7.0	7.25	7.5

Thermal conductivity - BTU in/ft²hr. °F.

70°F	400°F	750°F
202	209	216

Applications

Thyssen 4140 Holder is, as its name suggests, a holder material primarily for both plastic molds and for die casting dies. Its mechanical strength is ideally suited for this type of application and its free machining characteristics reduces the cost of manufacturer to create a reliable, strong economical holder material. It can also be employed as a non-critical mold where finish is not a prime criterion in both the plastics and rubber molding industries. **Thyssen 4140 Holder** can also be used in construction parts and support plates.

Heat Treatment

Thyssen 4140 Holder is supplied in the heat treated condition to Rc 24/32 (248-302 BHN) and should be used at this level. No further heat treating is necessary.

Welding

Welding is often an integral part of the production of mold base or holder material. When welding **Thyssen 4140 Holder**, the part should be preheated to 900°F and welded at this temperature. After cooling in air, stress relieving at 1,000°F is necessary. The use of a well dried basic electrode is strongly recommended. The electrode should be of the Cr-Ni-Mo basic type, typically used for structural steels.

Flame or Induction Hardening

Thyssen 4140 Holder can be surface hardened to Rc 50 by flame or induction methods. Air cooling is adequate and should be followed immediately by tempering at 300°F.

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Worcester 1-800-523-1310; Atlanta 1-800-981-8284; Los Angeles 1-800-826-6513

Hard Chrome Plating

If required, **Thyssen 4140 Holder** can be hard chrome or nickel plated. The tool should be tempered at 400°F for 4 hours following plating to avoid hydrogen embrittlement.

Nitriding

Nitriding **Thyssen 4140 Holder** by conventional means is acceptable. The depth of the nitrided layer should normally not exceed .002".

Machining

Typical machining values for **Thyssen 4140 Holder** are:

Milling

Operation	Depth of cut (C)		Feed (S)		Tool Type	Cutting Speed (V)	
	in	mm	in/tooth	mm/tooth		fpm	m/min
Rough Milling	0.08 min	2 min	0.008 min	.2 min.	P.30-P.40 H.S.S.	230-330 50-100	70-100 15.30
Finish Milling	0.08 max	2 max	0.008 max	.2 max.	P.10-P.20 H.S.S.	295-380 65.115	90-115 20-35

Drilling

HOLE DIAMETER

DEPTH OF HOLE

in.	mm	2 x D	6 x D	8 x D	10 x D
		r.p.m./feed		(in/rev or mm/rev)	
.16	4	1720 (.003)	1435 (.003)	1310 (.002)	1190 (.002)
		1720 (.08)	1435 (.08)	1310 (.05)	1190 (.04)
.32	8	1080 (.006)	900 (.004)	820 (.003)	740 (.003)
		1080 (.14)	900 (.11)	820 (.08)	740 (.07)
.32	16	570 (.010)	475 (.008)	435 (.006)	395 (.005)
		570 (.25)	475 (.19)	435 (.15)	395 (.12)
1.0	25	370 (.012)	310 (.009)	285 (.007)	260 (.006)
		370 (.29)	310 (.22)	285 (.17)	260 (.15)

When the hole depth is equal to or greater than 4 x D, chip removal is recommended. When drilling **Thyssen 4140 Holder**, always flush cool.

NOTE: The above values are for guidance purposes only. Optimum feeds and speeds must be determined by trials.

All statements as to the properties or utilization of the materials and products mentioned in this catalog are only for the purpose of description. Guarantees in respect of the existence of certain properties or utilization of the material mentioned are only valid if agreed upon in writing.