



DILLINGER HÜTTE GTS

DIMO 42H

PREHARDENED CR MN MO-ALLOYED STEEL IN HOLDERBLOCK QUALITY FOR
THE CONSTRUCTION OF PLASTIC MOLDS

Specification DH-E31-E
Edition November 2006

DIMO 42H (Holderblock) is a prehardened CrMnMo-alloyed tool steel for the construction of plastic molds. DIMO 42H is applied by the customers for accessories with such holderblock requirements as ejector plates, supports, clamping plates and housings for diecasting dies. It is characterized by excellent polishability, photoetchability, spark erosion behaviour and dimensional stability as well as good machinability.

Product description

Designation and range of application

DIMO 42H is a modified version of AISI 4142 in holderblock quality.

DIMO 42H is available as plate with sheared or flame cut edges in the following dimensions:

Thickness	> 12 ≤ 130 mm	> ½ ≤ 5 in	> 130 ≤ 205 mm	> 5 ≤ 8 in
Width ¹⁾	≥ 1000 ≤ 2500 mm	≥ 40 ≤ 98¼ in	≥ 1000 ≤ 2050 mm	≥ 40 ≤ 80½ in
Length	≥ 4500 ≤ 6000 mm	≥ 177½ ≤ 236 in	≥ 4000 ≤ 6000 mm	≥ 157½ ≤ 236 in

¹⁾ Widths < 1250 mm (49 in) have to be ordered with an even number of plates

Other dimensions available upon request.

Production

The DIMO 42H production route is designed to achieve the excellent machinability and dimensional stability of this holderblock steel type. The good oxidic cleanliness and the modification of the few remaining inclusions by the calcium treatment lead to good machinability and minimize the tool wear. DIMO 42H should not be applied for photoetching and spark erosion.

These properties can only be achieved by the combination of the following DIMO 42H-production steps:

- chemical analysis in dependence of dimensions
- vacuum degassing
- argon stirring for high sulfidic and oxidic cleanliness
- calcium treatment for inclusion shape control
- special casting conditions to assure the high cleanliness and homogeneity
- High Shape Factor Rolling (high thickness reduction) to realize a closely packed structure
- appropriate heat treatment parameters according to analysis and dimensions to assure homogeneous hardness distribution over the plate and to minimize residual stresses

Chemical composition

For the ladle analysis the following limiting values in % are applicable

	C	Si	Mn	P	S	Cr	Mo	V
limiting values	0.38 - 0.46	0.15 - 0.30	0.70 - 1.70	≤ 0.035	≤ 0.035	0.75 - 1.20	0.15 - 0.30	¹⁾
auxiliary data for 100 mm plate thickness	0.42	0.30	1.45	0.020	0.004	1.00	0.18	0.06

¹⁾ alloyed depending on dimensions

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Delivery condition

DIMO 42H is supplied in the prehardened (air hardened + tempered) condition.

Mechanical and technological properties in the delivery condition

Hardness

Unless otherwise agreed the hardness at the surface in the delivery condition is 260 - 310 HB. According to EN 18265, table B2, this corresponds to a tensile strength of approximately 830 - 985 MPa (119 - 142 ksi).

Physical properties (auxiliary data)

specific heat at 20 °C: 0,46 kJ/kg · K (at 68 °F: 0.11 Btu/lb · °F)							
thermal conductivity at W/m · K	20 °C						
	46						
Btu/ft · h · °F	68 °F						
	26.6						
coefficient of thermal expansion between 10 ⁻⁶ m/m · K	20 °C and	100 °C	200 °C	300 °C	400 °C	500 °C	600 °C
	10 ⁻⁶ in/in · °F	210°F	390°F	570°F	750°F	930°F	1110°F
		6.27	6.77	7.16	7.49	7.71	7.71

Testing

- Heat analysis
- Dimension control
- Surface inspection
- Hardness

The hardness (HB) is tested on surface of each rolled mother plate.

- Ultrasonic testing

Unless otherwise agreed, 100 % ultrasonic testing is performed on each plate in the delivery condition in accordance with ASTM A 578, Level B.

Upon request, an ultrasonic testing in accordance with EN 10160 is possible. As admissible limit apply quality class 3 for thicknesses ≤ 150 mm (6 in) and quality class 2 in table 5 of EN 10228-3 for thicknesses > 150 mm (6 in). In this case the desired testing type has to be indicated on the order.

Unless otherwise agreed, the results are documented in an inspection certificate 3.1 in accordance with EN 10204.

Identification of plates

Unless otherwise agreed the marking is carried out via steel stamps with at least the following information:

- steel grade (DIMO 42H)
- heat number
- number of mother plate and individual plate
- the manufacturer's symbol
- inspector's sign

Processing

Heat treatment

DIMO 42H is delivered in the prehardened condition; therefore further heat treatment is generally not necessary. This avoids the risks and costs involved by the hardening and tempering of a mold after processing. Should a heat treatment become necessary, the following data are recommended:

soft annealing	stress relieving	preheating before hardening	hardening	tempering
700 - 720 °C (1290 - 1330 °F) 2 - 4 h, furnace cooling hardness about 230 HB	in the delivery condition max. 580 °C (1080 °F) 1 - 2 h, furnace cooling	450 - 650 °C (840 - 1200 °F)	840 - 860 °C (1540 - 1580 °F)/oil; for low wall thicknesses warm bath hardening at 200 - 230 °C (390 - 450 °F) is possible	according to required hardness (min. 1 h/25 mm (1 in) wall thickness)

General technical delivery requirements

Unless otherwise agreed, the general technical delivery requirements in accordance with EN 10021 apply.

Tolerances

Unless otherwise agreed, tolerances are in accordance with EN 10029 / ASTM A 6 with the following restrictions:

plate thickness:	in accordance with EN 10029, class C / ASTM A 6			
plate width:	$\geq 1000 \text{ mm} \leq 1500 \text{ mm}$	$\pm 25 \text{ mm}$	$\geq 40 \leq 59 \text{ in}$	$\pm 1 \text{ in}$
	$> 1500 \text{ mm} \leq 2050 \text{ mm}$	$\pm 40 \text{ mm}$	$> 59 \leq 80\frac{1}{2} \text{ in}$	$\pm 1\frac{1}{2} \text{ in}$
	$> 2050 \text{ mm}$	$\pm 50 \text{ mm}$	$> 80\frac{1}{2} \text{ in}$	$\pm 2 \text{ in}$
plate length:		$\pm 1000 \text{ mm}$		$\pm 40 \text{ in}$
flatness:	$\leq 3 \text{ mm/m} (\frac{1}{8} \text{ in}/40 \text{ in})$			

Unless otherwise agreed, short lengths $\geq 2 \text{ m}$ (79 in) are part of the delivery.

Surface quality

Unless otherwise agreed, the specifications will be in accordance with EN 10163-2 class A, subclass 3. Shot blasting of upper and lower surface of the plate and shop priming are possible on request.

General note

If special requirements, which are not listed in this specification, are to be met by the steel due to its intended use or processing, these requirements are to be agreed before placing the order.

The information in this specification is a product description. This specification is updated if necessary. The latest version is available from the mill or as download at www.dillinger.de.

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