



DILLINGER HÜTTE GTS

# DIMO 30H

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

Specification DH-E22-F  
Edition November 2006

DIMO 30H (Holderblock) is a prehardened CrMnMo S-alloyed tool steel for the construction of plastic molds. DIMO 30H 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 dimensional stability as well as good machinability. It is also suitable for molds with low surface requirements referring to polishability.

## Product description

### Designation and range of application

DIMO 30H is a modified version of AISI 4130 in holderblock quality.

DIMO 30H is available as plate with flame cut edges in the following dimensions:

|           |                  |                 |
|-----------|------------------|-----------------|
| Thickness | > 12 ≤ 200 mm    | > ½ ≤ 7¾ in     |
| Width     | ≥ 1250 ≤ 2500 mm | ≥ 49 ≤ 98 in    |
| Length    | ≥ 4000 ≤ 6000 mm | ≥ 157½ ≤ 236 in |

Other dimensions available upon request.

## Production

The DIMO 30H production route is designed to achieve the excellent machinability and dimensional stability of this holderblock steel type. The good oxidic cleanliness, the large number of sulfides and the modification of the few remaining inclusions by the calcium treatment lead to good machinability, high dimensional stability and minimize the tool wear. DIMO 30H should only be applied for molds if the surface requirements are low referring to polishability. DIMO 30H should not be applied for photoetching and spark erosion.

These properties can only be achieved by the combination of the following DIMO 30H-production steps:

- chemical analysis in dependence of dimensions
- vacuum degassing
- argon stirring for high sulfidic and oxidic cleanliness
- sulphur alloying
- 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                                 | 0.28 - 0.35 | 0.15 - 0.40 | 0.95 - 1.30 | ≤ 0.030 | 0.010 - 0.040 | 0.60 - 0.90 | 0.15 - 0.25 | ≥ 0.02 |
| auxiliary data<br>for 100 mm<br>plate thickness | 0.30        | 0.25        | 1.15        | 0.020   | 0.019         | 0.80        | 0.20        | 0.07   |

**DIMO 30H**

## Delivery condition

DIMO 30H is supplied in the prehardened ( water quenched + tempered) condition.

## Mechanical and technological properties in the delivery condition

### Hardness

Unless otherwise agreed the hardness at the surface in the delivery condition is 265 - 310 HB. According to EN 18265, table B2, this corresponds to a tensile strength of approximately 840 - 985 MPa (121 - 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<br>W/m · K                                   | 20 °C     |        |        |        |        |        |        |
|  | 46        |        |        |        |        |        |        |
| Btu/ft · h · °F  | 68 °F     |        |        |        |        |        |        |
|  | 26.6      |        |        |        |        |        |        |
| coefficient of thermal expansion between<br>10 <sup>-6</sup> m/m · K | 20 °C and | 100 °C | 200 °C | 300 °C | 400 °C | 500 °C | 600 °C |
|  | 68 °F and | 210°F  | 390°F  | 570°F  | 750°F  | 930°F  | 1110°F |
| 10 <sup>-6</sup> in/in · °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 30H)
- heat number
- number of mother plate and individual plate
- the manufacturer's symbol
- inspector's sign

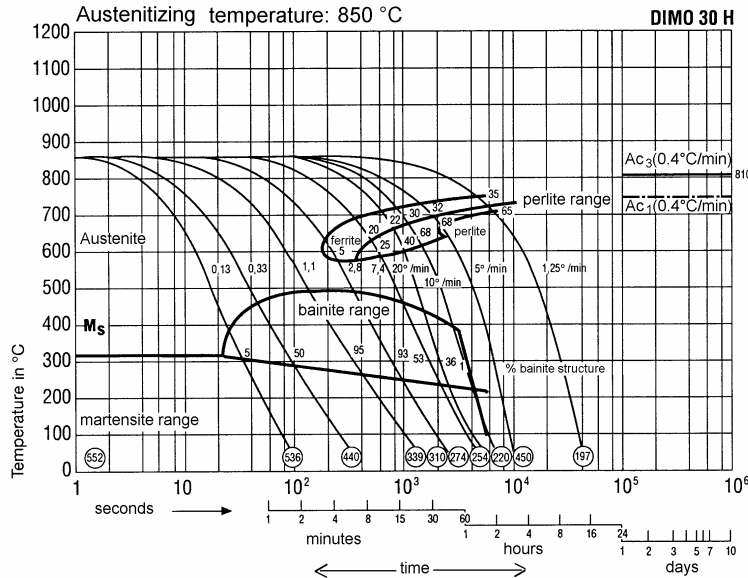
## Processing

### Heat treatment

DIMO 30H 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<br>(1290 - 1330 °F)<br>2 - 4 h,<br>furnace cooling<br>hardness about<br>230 HB | in the delivery<br>condition max.<br>600 °C (1110 °F)<br>1 - 2 h,<br>furnace cooling | 450 - 650 °C<br>(840 - 1200 °F) | 840 - 860 °C (1540 -<br>1580 °F)/oil; for low wall<br>thicknesses warm bath hardening<br>at 200 - 230 °C (390 - 450 °F) is<br>possible | in accordance with<br>tempering diagram to<br>required hardness<br>(min. 1 h/25 mm (1 in)<br>wall thickness) |

## Time Temperature Transformation diagram

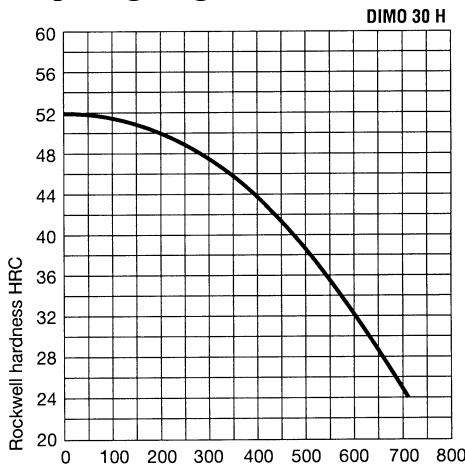


552 = hardness in HV

5 – 95 = % structure

0.13 – 7.4 = cooling parameters  
( $t^8/s$  – time in sec./100)

## Tempering diagram



Remark:

The values in the diagram are mean values on samples, diameter 20 mm (3/4 in), hardened at 850 °C (1560 °F) in oil

Tempering temperature [°C] (valid for soaking time 1 h, air cooling)

## 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:     | ≥ 1250 mm ≤ 1500 mm                             | ± 25 mm   | ≥ 49 ≤ 59 in | ± 1 in  |
|                  | > 1500 mm ≤ 2000 mm                             | ± 40 mm   | > 59 ≤ 79 in | ± 1½ in |
|                  | > 2000 mm                                       | ± 50 mm   | > 79 in      | ± 2 in  |
| plate length:    |   | ± 1000 mm |              | ± 40 in |
| flatness:        | ≤ 3 mm/m (1/8 in/40 in)                         |           |              |         |

Unless otherwise agreed, short lengths ≥ 2 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](http://www.dillinger.de).

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