

DIMO C45

UNALLOYED CARBON TOOL STEEL FOR HIGH QUALITY HOLDERBLOCK APPLICATIONS

Material data sheet, edition August 2025¹

DIMO C45 is an unalloyed carbon tool steel for the construction of plastic mold assemblies. DIMO C45 is designed for holder block applications requiring extensive machining and high dimensional stability as mold assemblies, ejector plates, supports, clamping plates and housings for diecasting dies.

Product description

Designation and range of application

DIMO C45 is a modified version of C45 in accordance with EN ISO 4957 (steel number 1.1730), EN ISO 683-1 (steel number 1.0503 or 1.1191) respectively Grade 1045 in accordance with ASTM A 830 in holder block quality.

DIMO C45 is available as plate with cut edges (sheared, flame cut or water jet cut) in the following dimensions:

Thickness t	Width B ^{a)}	Length L
10 ≤ t ≤ 130 mm	B ≤ 3000 mm	L ≤ 6000 mm
$\frac{3}{8}$ ≤ t ≤ 5 in	B ≤ 119 in	L ≤ 236 in
130 < t ≤ 305 mm	B ≤ 2050 mm	L ≤ 6000 mm
5 ≤ t ≤ 12 in	B ≤ 80½ in	L ≤ 236 in

^a Widths < 1500 mm (59 in) have to be ordered with an even number of plates.
Other dimensions available upon request.

Production

The DIMO C45 production route is designed to achieve good machinability, dimensional stability and high cleanliness. The good oxidic cleanliness and the modification of remaining inclusions by the calcium treatment lead to good machinability and minimize the tool wear. These properties can only be achieved by the combination of the following DIMO C45-production steps:

- hot metal desulphurization
- 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.

¹ The latest edition of this material data sheet is available at www.dillinger.de.

Chemical composition

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

	C	Si	Mn	P	S	Cu ^{a)}	Cr ^{a)}	Mo ^{a)}	Ni ^{a)}	Cr+Mo+Ni ^{a)}
limiting values	0.42 - 0.50	0.15 - 0.40	0.60 – 0.80	≤0.025	≤0.010	≤0.30	≤0.40	≤0.10	≤0.40	≤0.63
Auxiliary data	0.47	0.34	0.74	0.017	0.0020	≤0.025	0.040	0.012	0.040	0.09

^{a)} steel grades according to EN ISO 683-1.

Delivery condition

DIMO C45 is supplied in a stress relieved condition with a normalized ferrite-pearlite-microstructure. The normalizing can be replaced by a normalizing rolling. Cut edges are stress relieved by an appropriate heat treatment.

Mechanical and physical properties in the delivery condition

Hardness / Strength

Unless otherwise agreed the hardness at the surface in the delivery condition is 150 - 220 HBW. A tensile test acc. EN ISO 683-1 can be agreed. The requirements of the standard have to be met.

Physical properties (auxiliary data)

Specific heat		Thermal conductivity		Coefficient of thermal expansion	
at [°C] (°F) ^a	[kJ/(kg K)] (Btu/(lb °F)) ^a	at [°C] (°F) ^a	[W/(m K)] (Btu/(ft h °F)) ^a	between [°C] (°F) ^a	10 ⁻⁶ [m/(mK)] (10 ⁻⁶ (in/(in °F))) ^a
20 (68)	0.47 (0.11)	20 (68)	48 (27.7)	20 (68) and	
		100 (210)	49 (28.3)	100 (210)	11.1 (6.2)
		200 (390)	49 (28.3)	200 (390)	11.8 (6.8)
		300 (570)	48 (27.7)	300 (570)	12.8 (7.39)
		400 (750)	47 (27.2)	400 (750)	13.6 (7.86)
				500 (930)	13.7 (7.91)
				600 (1 110)	14.3 (7.94)

^{a)} The approximately converted values in brackets are for information only.

Testing

- Heat analysis
- Dimension control
- Surface inspection
- Hardness
 - The hardness (HBW) is tested on surface of a rolled mother plate
- Tensile test acc. EN ISO 683-1 can be agreed
- Ultrasonic testing

Unless otherwise agreed, ultrasonic testing is performed on each plate in accordance with EN 10160, class S2/E3, 100% of the surface.

Upon request, an ultrasonic testing in accordance with ASTM A 578, Level C + S1 is possible. In this case the desired testing standard 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 C45)
- heat number
- number of mother plate and individual plate
- the manufacturer's symbol
- inspector's sign

Processing

Flame cutting

Due to their chemical composition common die and mold steels will be cut by plasma, waterjet or saw. In case of thermal cutting, we recommend contacting Dillinger prior to processing.

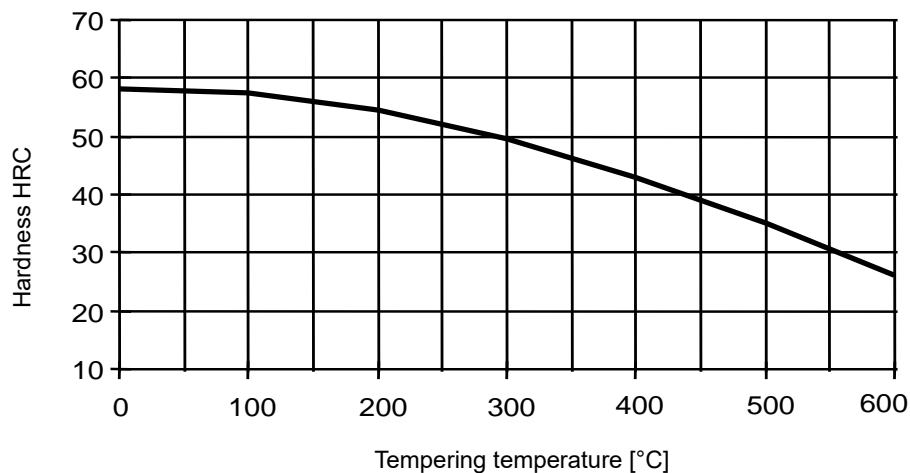
Heat treatment

DIMO C45 is generally applied in the delivery condition. Should a heat treatment become necessary, the following data are recommended depending on the complexity of the products:

soft annealing	stress relieving	hardening	tempering
680 - 710 °C (1260 - 1310 °F) ^a 2 - 4 h, furnace cooling	in the delivery condition approx. 600 °C (1112 °F) ^a 1 - 2 h, furnace cooling	820 - 860 °C (1508 -1580 °F) ^a / min. 30 min., water	in accordance with tempering diagram to required hardness

^a The approximately converted values in brackets are for information only.

Tempering diagram



Remark Tempering temperature valid for soaking time 1 h, air cooling
the values in the diagram are mean values on samples,
diameter 25 mm (1 in), length 50 mm (2 in), hardened at 800 °C (1470 °F) in water

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 with the following restrictions:

Plate thickness	in accordance with EN 10029, class C			
Plate width B	$B \leq 1\,500\text{ mm}$	$\pm 25\text{ mm}$	$B \leq 59\text{ in}$	$\pm 1\text{ in}$
	$1\,500\text{ mm} < B \leq 2\,050\text{ mm}$	$\pm 40\text{ mm}$	$B \leq 80.7\text{ in}$	$\pm 1.6\text{ in}$
	$B > 2\,050\text{ mm}$	$\pm 50\text{ mm}$	$B > 80.7\text{ in}$	$\pm 2\text{ in}$
Plate length		$-500/+80\text{ mm}$		$-19.7/+3.15\text{ in}$
Flatness	$\leq 3\text{ mm/m}$ ($0.1\text{ in}/39.4\text{ in}$)			

The approximately converted values in inch are for information only.

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 covered in this material data sheet, 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 data sheet is a product description. This data sheet is updated at irregular intervals. The current version is relevant. The latest version is available from the mill or as download at www.dillinger.de.

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