

W 1.2085

W 1.2085: A resulfurized prehardened (300HB) and corrosion resistant mould steel

W 1.2085 is a 16%Cr mould steel with improved corrosion resistance properties, thanks to the chromium addition. Furthermore, specific sulfur improves the machinability response.

The grade delivered in quenched and tempered condition has a fully bainite martensite microstructure and typical hardness of 320 HB. The grade is not designed for highly polished or etched surfaces.

This steel is commonly used for mould steel applications including holders or support plates subjected to wet working and/or storage conditions. The grade is also used for the manufacturing of corrosive materials like PVC.

PROPERTIES

ACCORDING TO STANDARD

> Euronorm	X33Cr16+S
> Werkstoff	W1.2085

CHEMICAL ANALYSIS

	C	S	P	Si	Mn	Cr
Min	0.28	0.05	-	-	-	15.0
Typical	0.33	0.07	0.03	0.30	1.10	16.0
Max	0.38	0.10	0.03	1.00	1.40	17.0

MECHANICAL PROPERTIES

1.2085 is delivered **hardened and double tempered to 280 - 325 HB (29 - 33 HRC)**.

Typical mechanical properties are:

Hardness	Rp 0.2 Yield Strength		Rm Tensile strength		Elongation	Reduction of area	Elastic modulus	
	MPa	ksi	MPa	ksi			%	Z%
HB	MPa	ksi	MPa	ksi	%	Z%	GPa	ksi
320	905	131	1100	160	10	21	207	30023

Typical values

PHYSICAL PROPERTIES

Thermal conductivity W.m-1.K-1	Thermal expansion Coefficient (10-6.K-1)					Specific heat J/kg.°C
20°C	20-100°C	20-200°C	20-300°C	20-400°C		
24.3	11	11.1	11.4	11.7		460

Typical values

PROPERTIES

METALLURGICAL PROPERTIES

Transformation points

AC ₁		AC ₃		MS		V ₁ (cooling rate)	
°C	°F	°C	°F	°C	°F	°C	°F
800	1472	885	1625	245	473	100 000	180 032

PLATE PROCESSING

HEAT TREATMENT

W 1.2085 steel is delivered quenched and tempered to a hardness range of 280/325 HB. Subsequent heat treatment is therefore generally not necessary.

Hardening:

For applications demanding higher mechanical characteristics hardening can be performed in the following way.

- > heating between 985 and 1020 °C (1805 -1868 °F) with sufficient soaking time (V 1hour per inch)
- > oil or air cooling depending on the wall thickness.

Tempering

Tempering temperature depends on the required mechanical properties.

In a general way, the following instructions must be taken into account:

- > uniform heating to the selected temperature
- > soaking for one hour per inch of total thickness
- > double tempering with cooling to room temperature

NOTE: In case of complicated parts, holding time should be determined considering the thicker section.

DELIVERY CONDITIONS

THICKNESS	
15 -120 mm	Continuous casting hot rolled
121 - 350 mm	Ingot casting forged

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Technical data and information are to the best of our knowledge at the time of printing. However, they may be subject to some slight variations due to our ongoing research programme on steels. Therefore, we suggest that information be verified at time of enquiry or order. Furthermore, in service, real conditions are specific for each application. The data presented here are only for the purpose of description, and considered as guarantees when written formal approval has been delivered by our company. Further information may be obtained from the address opposite.