Industeel

W 1.2316

ArcelorMittal

W 1.2316: A prehardened corrosion resistant mold steel

Material properties

W 1.2316 is a mold steel with improved corrosion resistance properties, thanks to the addition of chromium and molybdenum. The high cleanliness/homogeneity of the steel makes it specially adapted to fine polishing (mirror finish).

For which applications

This steel is commonly used for mold steel applications including cores, inserts and mold cavities working or stored in humid environments. For any corrosion application, manufacturing of corrosive materials (PVC).

Properties

Standard according to en 4957

> DIN EN 4957 X38 CrMo16
> WERKSTOFF 1.2316
> AFNOR Z40 CD16

Chemical Analysis (*% Weight*).

	C	S	P	Si	Mn	Cr	Mo
Min	0.33	-	-	-	-	15.5	0.80
Typical	0.40	0.002	0.020	0.350	0.90	16.0	0.90
Max	0.45	0.030	0.030	1.00	1.50	17.5	1.30

Mechanical Properties (*typical values*).

W 1.2316 is delivered **quenched and tempered to 280 – 325 HB (29 – 33 HrC).**

Hardness	Rp 0.2 Yield Strength		Rm Tensile strength		Elongation	Reduction of area	KCV 20°C	Elastic modulus	
HB	MPa	ksi	MPa	ksi	%	Z%	J	GPa	ksi
300	855	124	1020	148	13	38	35	205	29733

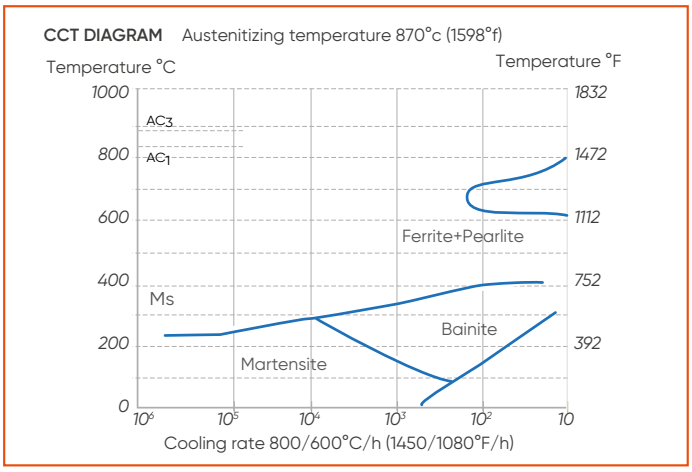
Physical Properties (*typical values*).

Thermal conductivity $W.m^{-1}.K^{-1}$	Thermal expansion Coefficient $(10^{-6}.K^{-1})$			
20°C	20/100°C	20/200°C	20/300°C	Specificheat J/kg.°C
24.3	11.0	11.1	11.4	460

Metallurgical properties

Metallurgical transformation points

AC_1	AC_3	M_S	V_1	V_2
810°C 1490°F	883°C 1621°F	235°C 455°F	8000°C 14430°F	150°C 302°F



Corrosion resistance

Thanks to its homogenous microstructure (no pearlite) **W 1.2316** exhibits a high corrosion resistance. A corrosion test performed in hydrochloric acid (HCl = 1% T=20°C) shows higher resistance for **W 1.2316** than W1.2083 steel.

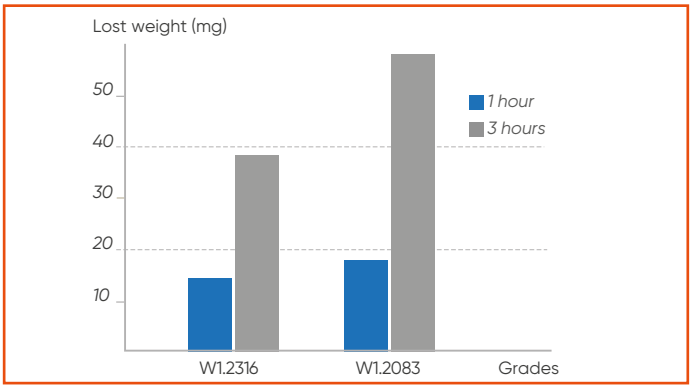


Plate processing

Heat treatment

W 1.2316 steel is delivered quenched and tempered. Subsequent heat treatment is therefore not necessary, unless other characteristics are needed.

Hardening

For applications requiring higher mechanical characteristics, hardening can be performed in the following way:

- Heating between 985 and 1020°C (1805 -1868°F) with sufficient soaking time (≈ 1 hour per inch)
- Oil or air cooling depending on wall thickness (refer to CCT diagram in order to prevent any pearlite constituent)

Tempering

Tempering temperature depends on the required mechanical properties. In a general way, the following instructions should 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

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

Dimensions

Typical delivery sizes

Manufacturing process	Thickness
Ingot casting	15- 185 mm

Your contact

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