

AISI 4340

4340 - A prehardened steel 280HB

4340 is a nickel, chromium molybdenum tool steel. The addition of Molybdenum is improving hardness (versus 4140) giving higher yield, better tensile strength along with good resistance to fatigue and impacts. 4340 can be delivered in prehardened conditions at 250-280HB or annealed.

This grade is typically used for:

This grade is typically used for Heavy duty parts, shafts, gears, pinions, connecting rods, crow bars, conveyors, wearing plates, heavy forgings, automotive parts.

PROPERTIES

ACCORDING TO STANDARD

> Astm A29 AISI : 4340

> Din ≈ 1.6565 (34CrNiMo6)

CHEMICAL ANALYSIS

Analysis in %		C	Si	Mn	Ni	Cr	Mo	S	P
4340	Min	0.38	0.15	0.60	1.65	0.70	0.20	-	-
	Typ	0.41	0.25	0.75	1.80	0.80	0.25	<0.020	<0.012
	Max	0.43	0.35	0.80	2.00	0.90	0.30	<0.040	<0.035

MECHANICAL PROPERTIES

Typical values for plates air quenched and tempered (thickness 45 mm - 1.8").

Density 7.85 g/cm³

	Hardness	YS 0.2		UTS		Elongation	Reduction of area	Chatpy V (20 °C)		KCU
	HB	MPa	KSI	MPa	KSI	%	Z%	J	Ft.Lbs	J/Cm ²
4340	250-300	660-760	110-130	800-900	116-130	17-20	>50	40	29.5	100-120

PHYSICAL PROPERTIES

Thermal conductivity		Thermal expansion coefficient		
W m ⁻¹ K ⁻¹	btu in/hr.ft ² .f	10 ⁻⁶ °C ⁻¹ /10 ⁻⁶ °K ⁻¹		
20 °C		20-100 °C	20-200 °C	20-300 °C
68 °F		68-212 °F	68-392 °F	68-572 °F
44.5	307	11.1	12.1	12.9

METALLURGICAL PROPERTIES

Internal soundness:

All plates are ultrasonically tested according to NFA 04305 Class C.- ASTM A 578-S9 2mm flat bottom hole.

Flatness:

3 mm/m

Even if this product is delivered in the prehardened condition it is possible to retreat this one.

HEAT TREATMENT

- > Transformation point AC1 705 °C
- > Transformation point AC3 760 °C
- > Annealing : heat at 830-850 °C +

Furnace cooling

HARDENING

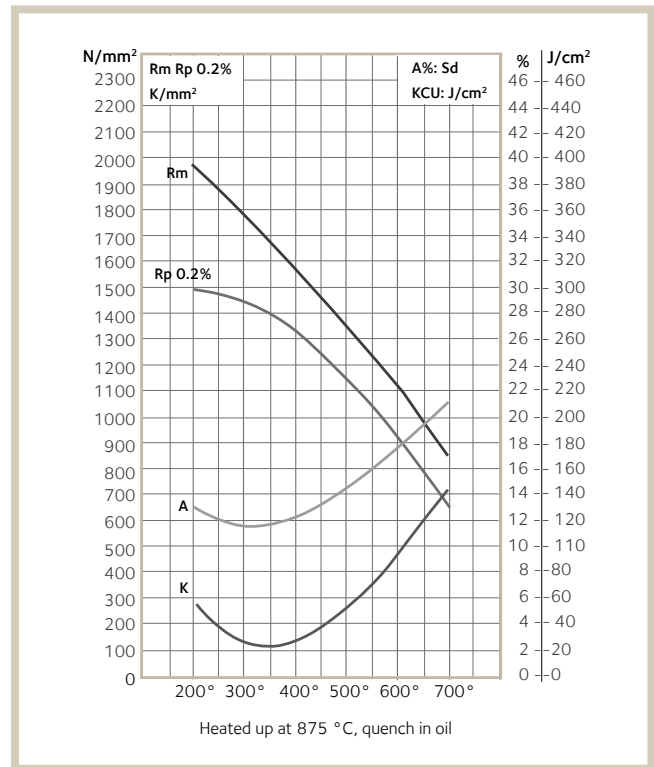
4340 can be hardened by heating up to 875 ° and then oil or water cooling (according to thickness and product shape)

TEMPERING:

Just after quenching and according to the wishes mechanical properties (avoid temperature between 250-450 °C-brittleness)
Stress relieve : heat to 600 °C / 2hrs max.

In case of doubt for heat treatment do not hesitate to contact us.

Tempering curve 4340



DELIVERY CONDITIONS

TYPICAL DELIVERY STAGES

Specification	Stage	Hardness in HB	Analysis	Decarb.	Grain	Magneto	Bending	Macro	Cleanness
AMS 6359 H	HT and T	250-280	y	y	y	y	y	y	
AMS 6359 + Iscar	Annealed	260 Max	y	y	y	y	y	y	
ASTM 6359	Annealed	250 Max	y	y	y	y	y	y	y
AMS STD 2154	Annealed	250 max							

DELIVERY CONDITIONS

DIMENSIONAL PROGRAM

Thickness	Width
20 - 120 mm (. 79" - 4.7")	1500 - 2500 mm (59 - 98.4")

HEAT TREATMENT

SURFACE TREATMENT :

4340 is suitable for :

- > Flame and induction hardening to improve wear resistance : heat around 870°C and quenching + temperature between 150-200°C to reduce stress.
- > Nitriding 500-5030°C (gas or plasma) we recommaned to remove the white layer by polishing or grinding.
- > coating like PVD or CVD are OK.

YOUR CONTACTS

Perrine Lavalley
Tel. +33 3 85 80 52 56
perrine.lavalley@arcelormittal.com

<http://industeel.arcelormittal.com>

Industeel France
Le Creusot Plant
56 rue Clemenceau
F-71202 Le Creusot Cedex

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.