Industeel

ArcelorMittal

Mecasteel 17-4 PH (UNS S17400)

Mecasteel 17-4 PH: prehardened engineering stainless steel

Mecasteel 17-4 PH is a precipitation hardening stainless steel grade. It combines high strength and hardness, with good toughness and corrosion resistance.
Mecasteel 17-4 PH is delivered in age - hardened condition, with yield strength ranging from 100 ksi to 145 ksi. It is available directly from the mill either in forgings of large dimensions, width 78" (2000 mm), thickness up to 25" (635 mm), or custom blocks saw cut from master blocks ready to machine.
This grade can be used for massive steel components, especially for oil and gas exploration and production (pump fluid ends, manifolds,...).

PROPERTIES

CHEMICAL ANALYSIS - WEIGHT%

Mecasteel 17-4 PH meets chemical analysis requirements of ASTM A705/ 705M for grade 630 (UNS S17400). Mecasteel 17-4 PH is delivered with very low sulphur, to enhance isotropic ductility.

		C	Cr	Ni	Cu	Si	Mg	Nb	P	S
17-4 PH	Min		15.0	3.00	3.00			0.15		
	Max	0.07 max	17.5	5.00	5.00	1.0 max	1.0 max	0.45	0.04 max	0.03 max
	Typ	0.035	15.5	4.80	3.40	<0.8	<0.8	0.30	0.020	0.001

MECHANICAL PROPERTIES

Mecasteel 17-4 PH is delivered with a solution annealed heat treatment, followed by age - hardening treatment. Temperature of age - hardening treatment is adjusted depending on targeted level of mechanical properties.

YS 0.2% min ksi (MPa)	UTS min ksi (MPa)	Elongation (%)	RA (%)	Hardness (HB)	Charpy V Notch ft.lb (J)	
145 (1000)	155 (1070)	10	25	340 - 380	Single at - 20°F Average at - 20°F	15 (20) 20 (27)
125 (860)	145 (1000)	12	35	310 - 350	Single at - 20°F Average at - 20°F	20 (27) 25 (34)
100 (690)	125 (860)	14	45	290 - 330	Single at - 40°F Average at - 40°F	20 (27) 25 (34)

Minimum guaranteed properties, in transverse direction, on a prolongation, at 2.0" below skin of the solid block. For other levels of mechanical/ toughness properties, please contact us.

UTRASONIC SOUNDNESS

All blocks are ultrasonic tested according to ASTM A578 S9, with acceptance criterion FBH 1/8" (3 mm)

DELIVERY CONDITIONS

MANUFACTURING PROGRAMME

> Square blocks with thickness up to 25" (635 mm), width up to 78" (2000 mm), length up to 160" (4000 mm)
> Custom saw cut blocks are also available

PLATE PROCESSING

WELDING

Mecasteel 17-4 PH is weldable by SMAW, GTAW and GMAW processes. SAW should not be used without preliminary testing.
Homogeneous filler metals have to be used to obtain high mechanical properties and toughness in welded joints:

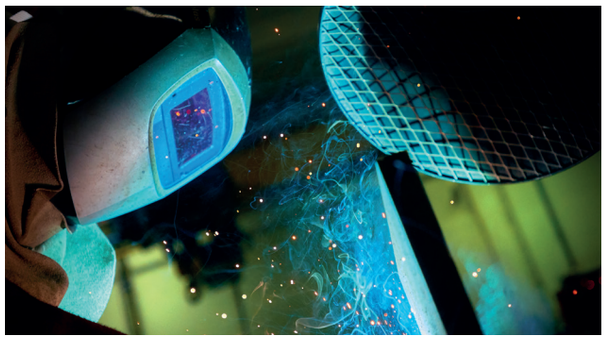
> electrodes type E 630 (AWS A5.4) for SMAW
> wires type ER 630 (AWS A5.9) for GMAW and GTAW

Welding conditions are as follows:

> No preheating
> Interpass temperature limited to 250°F (120°C) max
> Heat input limited to 38 kJ/inch (1.5 KJ/mm)
> Electrode's diameter limited to 5/32" (4 mm)
> To avoid cold cracking, it is necessary to limit introduction of hydrogen in the weld: baking of coated electrodes/no H_2 nor humidity in welding gas
> To increase ductility, a low oxygen content in the weld is preferable

Post welding heat treatment

PWHT is necessary to increase Charpy values in the heat affected zone (HAZ). A full solution annealing, 1920°F (1050°C) plus air cooling, and precipitation hardening treatment allows optimising toughness properties of welded joints. Please contact us for guidance on the temperature and duration of age hardening treatment.



YOUR CONTACTS

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