



Mecasteel 15 - 5 PH (UNS S15500)

Mecasteel 15 - 5 PH : prehardened engineering stainless steel

Mecasteel 15 - 5 PH is a precipitation hardening stainless steel grade. It combines high strength and hardness, with good toughness and corrosion resistance.

Mecasteel 15 - 5 PH is delivered in age - hardened condition, with yield strength ranging from 125 ksi to 175 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 15 - 5 PH meets chemical analysis requirements of ASTM A705/ 705M for grade 630 (UNS S15500). Mecasteel 15-5 PH is delivered with very low sulphur, to enhance isotropic ductility.

	C	P	S	Cr	Ni	Cu	Nb+ Ta
Min	0.035	-	-	14.0	3.50	2.50	-
Typ	0.26	0.020	0.0005	15.3	4.80	3.40	0.30
Max	0.070	< 0.030	< 0.001	15.5	5.50	4.50	-

MECHANICAL PROPERTIES

Mecasteel 15-5 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		
					(J)		(ft.lb)
129 (890)	146 (1003)	17	45	300 - 340	Average at 22°F	Length direction 42	Length direction 31
						Transverse direct... 28	Transverse direct...21

Minimum values whatever the location.

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 15-5 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:

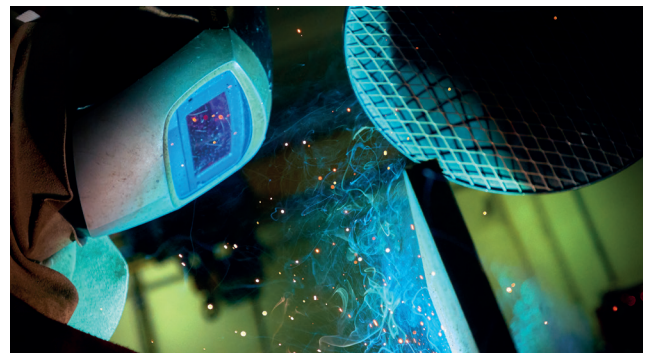
- > electrodes type E 630 (AWS A5.4) for SMAW
- > wires type ER 630 (AWS A5.9) for GMAW and GTAW

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 H₂ 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.



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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.