

STEEL 1.4106 MOD

Free machining steel, non heat-treatable.

Reduced corrosion resistance thanks to its high sulfur content. However, high molybdenum content means excellent resistance to acid and chloride corrosion.

Its particular chemical composition allows for excellent magnetic characteristics: silicon content gives high magnetic permeability and consistent electric resistivity.

Main application: electrovalves for corrosive environments.

Other applications: pistons, earthing system components, sheathing, high-temperature pressure containers for corrosive environments, magnetic cores for transformers, dynamo poles, flow regulators, relays, parts for industrial and domestic ovens, transformer laminations.

Trafitec has one of the few industrial furnaces able to carry out magnetic annealing on ground and cold-drawn material. This treatment creates an oriented ferritic structure, reduces the hysteresis curve and removes residual magnetism.

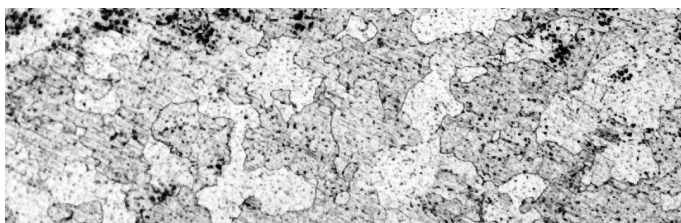
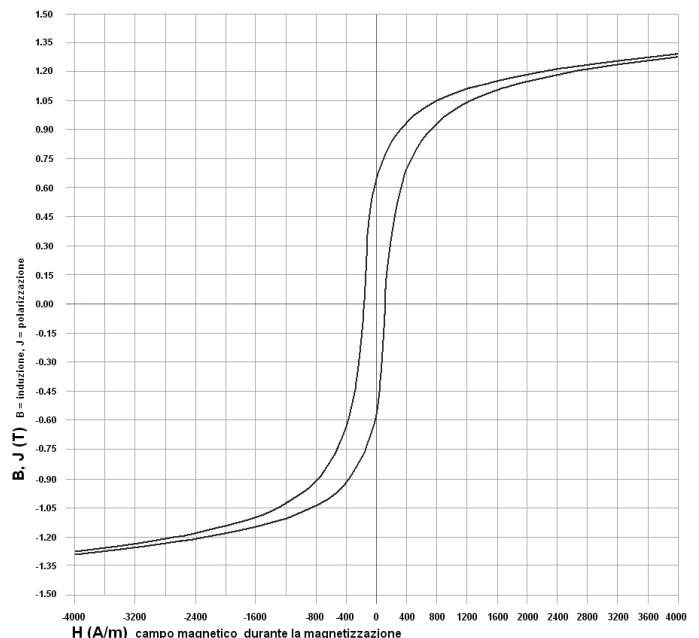
This process takes place in a protected atmosphere; bars, moved by means of motorized rollers, undergo the following heat cycles:

- slow heating in the radiant tubes chamber;
- permanence at the settled temperature;
- final and quick cooling in the water jacket chamber.

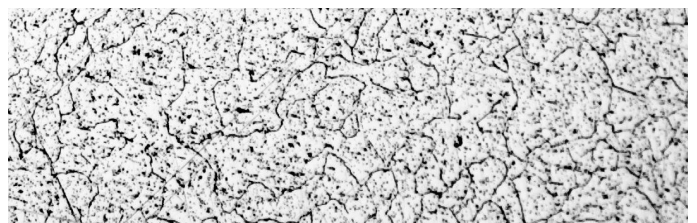
HYSTERESIS CURVE

This curve is obtained by measuring induction "B" (air + material) in the presence of the magnetic field "H". It describes a complete cycle among the limits established for the induction or the saturation magnetization.

MAGNETIC CHARACTERISTICS ON MAGNETICALLY ANNEALED BARS			
Coercitive force	Hc	max 200 A/m	max 2.5 Oe
Residual magnetic induction	Br	0.35 - 0.80 Tesla	
Saturation magnetic induction	Bs	1.6 Tesla	
Relative magnetic permeability	μ_r	1100-2000 max	



Untreated material structure (x100) Hc = 4,5 Oersted.



Magnetic annealed material structure (x100) Hc = 1,6 Oersted.

QUALITY X2CrMoSi18-2-1

Free machining ferritic stainless steel. Number 1.4106 MOD

CHEMICAL COMPOSITION							
C% max	Si%	Mn%	P% max	S%	Cr%	Mo%	N% max
0,03	1,25-1,50	0,30-0,60	0,040	0,25-0,30	17,5-18,5	1,50-2,00	0,04

AFNOR FD A 35-570: 1996

TEMPERATURE °C						
MELTING RANGE	HOT FORMING	RECRYSTALLIZATION	SOFT ANNEALING	MMA Welding - AWS electrodes		
				preheating	annealing after w.	
1490-1480	1150-900	810-700 cooling to 300, then air	820-750 air	not recommended		
ISOTHERMAL ANNEALING	QUENCHING	TEMPERING	ANNEALING FOR MAGNETIC PROPERTIES	joint with steels		
				carbon	CrMo alloyed	stainless
Not suitable	Not suitable	Not suitable	860-840 protected atmosphere	not recommended		

Curie temperature 660 °C

MECHANICAL PROPERTIES - Hot-rolled (ASTM A 582 582M-05 steel XM-34)							
Size mm		Testing at room temperature					
		R	Rp 0.2	A%	Kv +20 °C	HB ^{a)}	^{a)} for information
over	to	N/mm ²	N/mm ²		J	max	
		540	350	26		262	+A annealed material
							+A+C / +A+C+SL Trafitec experience

Thermal expansion	$10^{-6} \cdot K^{-1}$	▶	12.0					
Modulus of elasticity ^{b)}	longitudinal GPa	225						
Poisson number	ν	0,27-0,30~						
Electrical resistivity	$\Omega \cdot mm^2/m$	0.76						
Electrical conductivity	Siemens•m/mm ²	1.31						
Specific heat	J/(Kg•K)	500 ~						
Density	Kg/dm ³	7.75						
Thermal conductivity	W/(m•K)	15						
Relative magnetic permeability	μ_r	1200 ~						
Temperature	°C	20	100	200	300	400	600	800

The symbol ▶ indicates temperatures between 20 °C and 100 °C, 20 °C and 200 °C.

^{b)}As cold worked, the modulus is lowered; it may be increased by stress relief heat treatment.

CORROSION RESISTANCE	Atmospheric		Chemical			^x environment with acids and chlorides
	industrial	marine	mild	oxidizing	reducing	
Fresh water						
x	x					

Magnetic	yes
Machinability	high
Hardening	cold drawn and other cold plastic deformations
Service temperature in air	continuous service up to ~ 850 °C; intermittent service up to ~ 740 °C