

PHYSICAL PROPERTIES

Other physical properties of corrosion resistant steel, stainless steel and mild steel

Over and above the usual mechanical properties of tensile strengths, proof stresses and elongation other ancillary properties of stainless steel are often required.

Note : the values given below are typical. Stainless steels within the same classification (e.g. Austenitic stainless steels) will have similar values, but even slight variations of chemical composition within the specification limits of the same steels will affect the actual value. Reported values are often slightly different, depending on the reference. Many of these properties are temperature dependant. The values given below should not be used as guaranteed or minimum values.

Property and units		Mild steel	304	310	316	321	400	430	3CR12
Density: kg/m ³		7870	7900	7900	8000	7900	7700	7800	7700
Modulus of elasticity Gpa	Tension	200	195	205	195	195	200	200	207
	Torsion	65	85	70	70	72	77	65	77
Specific heat capacity at 100°C	J/kg °C	455	415	452	480	503	460	460	460
Thermal conductivity W/m°C	at 100 °C	73	15.7	13.4	14.5	15.7	23	21	30
	at 300 °C	70	17.4	15.2	16.4	-	-	23	-
	at 500 °C	65	21.2	18.9	20.0	21.2	25	24	40
Mean Co-efficient of Thermal Expansion µΩm/m°C	0° -100°C	12.5	17.0	15.5	16.5	17.0	11.1	10.4	11.1
	0° -300°C	13.0	17.75	16.5	17.5	17.8	11.7	11.0	11.7
	0° -500°C	13.8	18.5	17.25	18.25	18.25	12.3	11.3	12.3
Resistivity µΩm at 100°C		0.16	0.73	0.89	0.75	0.75	0.61	0.60	0.57
Recommended maximum Service (Oxidising Conditions)	Continuous	500°C	925°C	1150°C	925°C	950°C	620°C	750°C	600°C
	Intermittent	600°C	850°C	1035°C	870°C	870°C	730°C	850°C	700°C
Endurance Limit MPa		-	241	217	269	262	-	276	-
Relative Magnetic Permeability		²⁰⁰ /3800	1.02	1.02	1.02	1.02	-	⁶⁰⁰ /1100	²⁰⁰ /1000