

## AUSTENITIC STAINLESS STEEL

### TYPICAL APPLICATIONS

Shafts, stems and pins in valves, chokes and pumps in oil & gas industry.  
Mechanical components in nuclear installations.  
Boat shafting, bolting and rigging.

### PRODUCT DESCRIPTION

This highly alloyed austenitic stainless steel offers a combination of good mechanical strength (approaching twice that of Type 316 stainless steel) and high corrosion resistance. The mechanical properties at both elevated and sub-zero temperatures are very good and, unlike many austenitic stainless steels, the alloy does not become magnetic when cold worked or cooled to sub-zero temperatures. In the cold-worked condition the material possesses a yield strength up to over three times that of Type 316 stainless steel.

### CORROSION RESISTANCE

UNS S20910/XM-19 stainless steel provides outstanding resistance to general corrosion and is superior in this respect to Types 316/316L and 317/317L in many media. The 1950<sup>o</sup>F (1066<sup>o</sup>C) annealed condition provides adequate corrosion resistance for many applications combined with a high strength level. Where material is to be employed in the as-welded condition or in very corrosive media, the 2050<sup>o</sup>F (1121<sup>o</sup>C) annealed condition should be chosen. Material in the high strength cold-worked condition is often specified bolting and shafting but there is some small compromise in terms of corrosion resistance in some environments when compared with the annealed condition.

The resistance to selective attack such as crevice corrosion for UNS S20910/XM-19 stainless steel (annealed) is superior to that of Type 316/316L. In common with most austenitic stainless steels, for example Types 304 and 316, XM-19 steel may suffer stress corrosion cracking in hot chloride ion containing environments.

### MATERIAL SPECIFICATIONS

- UNS S20910 in various ASTM product form specifications
- XM – 19
- 23Cr-13Ni-5Mn (generic designation)
- NACE MR01-75 (latest revision)

### FABRICATION

Machining and welding of this austenitic steel is achieved by use of similar techniques to that for type 316/317 steels. Machining should be carried out employing slow speeds, positive feeds and with copious quantities of cooling fluid. Welding can be performed using all standard welding techniques and a variety of austenitic stainless steel consumables. However, optimum mechanical strength and corrosion resistance of weldments are only possible with the use of matching (or very similar) chemical composition filler material/consumables.

### AVAILABILITY

Bar, wire, sheet, plate, forgings.

### CHEMICAL COMPOSITION

Weight %	C	Mn	Si	P	S	Cr	Ni	Mo	N	Cb	V
Min.		4.00				20.50	11.50	1.50	0.20	0.10	0.10
Max.	0.06	6.00	1.00	0.40	0.30	23.50	13.50	3.00	0.40	0.30	0.30

### MINIMUM MECHANICAL PROPERTIES (UNS S20910 - annealed)

UTS, MPa	690
0.2% PS, MPa	380
Elongation, % on 2 in.	35
Reduction of area, %	55

### TECHNICAL SALES ASSISTANCE

Our resident team of qualified metallurgists and engineers will be pleased to assist further on any technical topic.

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