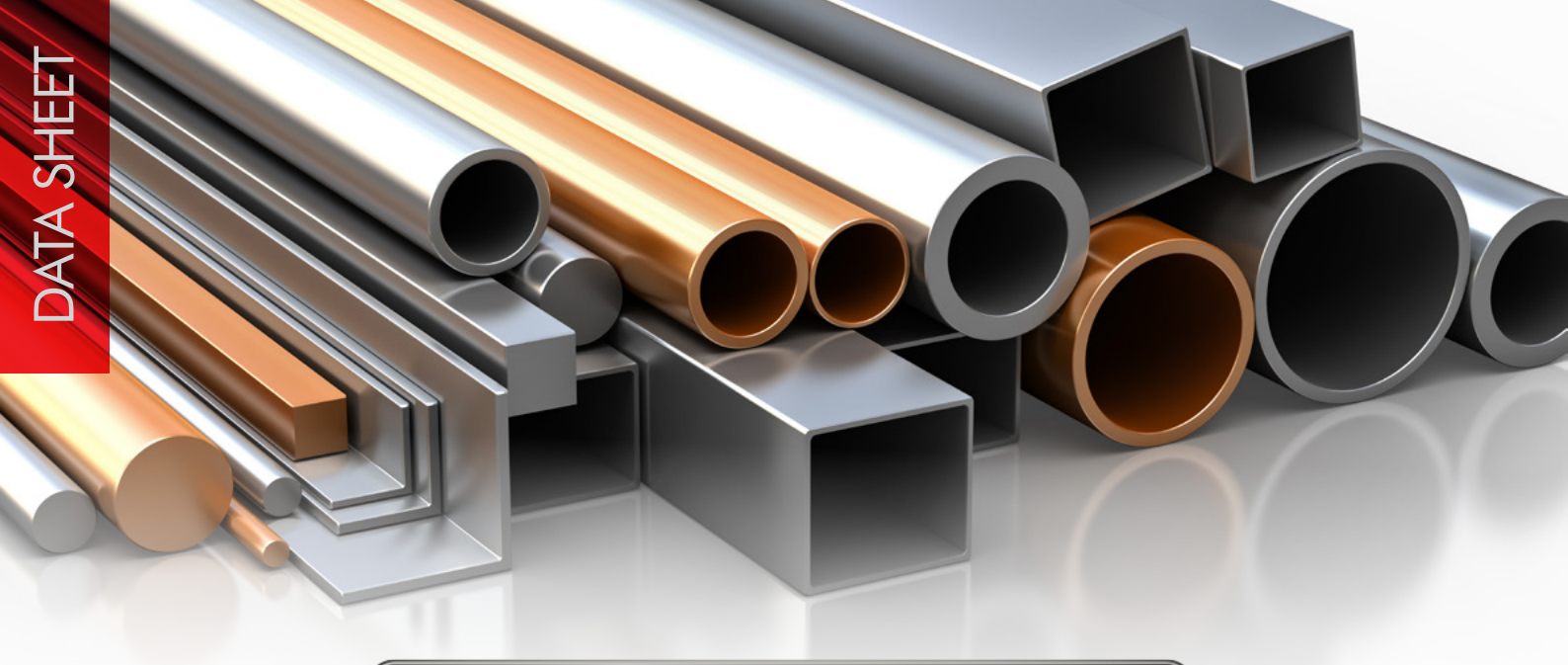
DATA SHEET



NITRONIC® 50

UNS No - S20910

Common name: XM-19

NITRONIC 50 Stainless Steel gives a combination of corrosion resistance and strength not found in any other commercial material available in its price range. This austenitic stainless steel has corrosion resistance greater than that provided by Types 316 and 316L, plus approximately doubles the yield strength at room temperature. Likewise, NITRONIC 50 Stainless Steel has good mechanical properties at both high and sub-zero temperatures. Furthermore, unlike various austenitic stainless steels, NITRONIC 50 does not become magnetic when cold worked.

Applications

- Superior corrosion resistance
- Almost double the yield strength
- Exceptionally low magnetic permeability
- Outstanding cryogenic properties
- Outstanding corrosion resistance gives Armco's NITRONIC 50 Stainless Steel the leading edge for applications where Types 316. 316L, 317 and 317L are only marginal. It's an effective alloy for the petroleum, petrochemical, chemical, fertilizer, nuclear fuel recycling, pulp and paper, textile, food processing and marine industries
- Components using the combination of excellent corrosion resistance and high strength currently include pumps, valves and fittings, fasteners, cables, chains, screens and wire cloth, marine hardware, boat and pump shafting, heat exchanger parts, springs and photographic equipment
- Fastener - High strength, and higher strength fasteners can improve the durability of you equipment
- Marine hardware - Mastings, tie downs
- Marine and Pump shafts - better corrosion than types 304 and 316, with double the yield strength
- Valves and fittings - better corrosion than types 304 and 316, with double the yield strength
- Down hole rigging - better corrosion than types 304, 316 and 17-4, with double the yield strength in annealed condition
- Reduced cross sections - better corrosion than types 304, 316 and 17-4

Characteristics

- High strength austenitic alloy
- Good corrosion resistance

SUNMACH™
shaping exotic metals

NITRONIC® 50

Machining
Slow speeds, positive feeds and abundant resulfurized lubricant is significant to success in machining this alloy. Speeds and positive feeds are comparable to those employed with 316 or 317 stainless steel are appropriate here. Each and every common machining practice can be utilized in this material. Chips will be tough and stringy and it is recommended these curlers or breakers are used.

Welding
With this material pre-heating is not required and all frequent welding technique, including gas tungsten arc, gas metal arc and submerged arc are obtained. Filler metal selection should be similar chemistry for maximum strength and resistance to intergranular attack.

Forging
Heat to 2000 F, soak to equalize, then heat to 2150 and equalize prior to forging.

Forming
With this alloy all frequently forming methods can be utilized. Spring back will be more prominent than with standard austenitic and should be contemplated while picking the proper shaping forces. Process annealing is recommended to remove stresses resulting from this alloys' high work hardening rate. Heat to 1950 F (1065 C) for intermediate anneals.

Annealing
Soak at 1900-2050 F, quench rapidly in air or water.

Hardening
Hardening this alloy requires cold working. It won't harden with exposure to thermal treatment.

NITRONIC® 50

Chemical Properties

C	Mn	P	S	Si	Cr	Ni	Mo	N	Cb	V
0.06	4.0 - 6.0	0.040	0.030	0.75	20.5 - 23.5	11.5 - 13.5	1.5 - 3.0	0.20 - 0.40	0.10 - 0.30	0.10 - 0.30

Mechanical Properties

Tensile Strength (ksi)	0.2% Yield Strength (ksi)	Elongation% in 2 inches
105	60	30

Physical Properties

Properties	Units	Temperature in °C
Density	7.88 g/cm^3	Room
Specific Heat	0.11 Kcal/kg.C	22°
Melting Range	1415-1450 °C	-
Modulus of Elasticity	199 KN/mm^2	20°
Electrical Resistivity	492 µΩ.cm	Room
Coefficient of Expansion	16.2 µm/m °C	20-100°
Thermal Conductivity	15.6 W/m-°K	149°

ASTM Specifications

Sheet / Plate	Bar / Forging	Fitting
A 240	A 193, A 194, A 276, A 479	A 182

Availability

MANUFACTURING
Fasteners
Custom Machining
Custom Fabrication
Stamped Parts
Flanges

RAW MATERIALS
Bars
Sheets
Plates