

Chemical analysis

	C	Si	Mn	S	P	Cr	Ni	V	Mo	Nb	N
Min.			4.0			20.5	11.5	0.15	1.5	0.1	0.2
Max.	0.06	1.0	6.0	0.03	0.04	23.5	13.5	0.3	3.0	0.3	0.4

Microstructure

XM-19 is a Nitrogen strengthened austenitic steel, with good corrosion resistance and mechanical properties.

Comparable standard

Standard	Designation/Type
UNS	S20910
AISI	XM-19
EN	1.3964
DIN	X2CrNiMnMoNNb21-16-5-3

Main features and applications

General areas of application are:

- Petroleum and petrochemical industries.
- Pulp and paper industries.
- Chemical industries.
- Oil & gas applications.

These areas take advantage of:

- Good mechanical strength and high corrosion resistance.
- Good mechanical properties at elevated and sub-zero temperatures.
- Low magnetic permeability.

Process

Produced from scrap and alloys. Melting process: Electric Arc Furnace + AOD.
 Forged on a free-form 1600 t hydraulic press.

Minimum mechanical properties at room temperature

Yield strength Rp _{0.2} [MPa]	Tensile strength Rm [MPa]	Fracture Elongation A [%]	Area contraction Z [%]	Hardness BHN [kg/mm ²]
380	690	35	55	227*- 293

*Lower limit for material ordered according to AMS 5764

Typical values for Charpy-V at -196 °C is >100 J.

Corrosion properties:

Method	ASTM A262 practice E	ASTM G48 practice A (50 °C, 24h)	EN-ISO3651-2 Method C
Acceptance criteria	Shall pass Copper / Copper sulfate / Sulfuric acid test	- No pitting detected at 20X magnification - Weight loss < 4.0 g/m ²	No cracking*

*See EN-ISO3651-2 Method C, paragraph 7.

Heat treatment

Solution annealing (1052-1079 °C) followed by water quenching.

Weldability

XM-19 belongs to group 8.3, Manganese austenitic stainless steel with 4%<Mn≤24%, according to ISO/TR 15608:2005. The weldability of XM-19 is good.

Physical properties at room temperature (typical values)

Density, 20 °C [kg/m ³]	Relative magnetic permeab.	Coefficient of thermal expansion		Specific heat, 20°C [J/(kg K)]	Thermal conductivity [W/m K]	Electrical resistivity [Ωmm ² /m]	Young's modulus, 20 °C [GPa]
		Range [°C]	Coefficient [K ⁻¹]				
7890	-	20 – 100	15.7·10 ⁻⁶	475	14	0.82	199
		20 – 200	17.0·10 ⁻⁶				
		20 – 300	17.5·10 ⁻⁶				
		20 – 400	17.8·10 ⁻⁶				