

Additional Locations:

Canada

voestalpine High Performance Metals Ltd.

2595 Meadowvale Blvd.

Mississauga, ON L5N 7Y3

T. +1 (888) 686-7686

F. +1 (905) 812-8658

www.voestalpine.com/hpm/canada

Mexico

voestalpine High Performance Metals S.A de C.V.

Cerrada de la Noria 200 Int. 14-A, Queretaro Park II

Parque Industrial Queretaro, 76220

T. +52 (442) 349 7945

www.voestalpine.com/hpm/mexico

voestalpine Specialty Metals

11929 Cutten Road

Houston, Texas 77066

T. +1 (800) 704-6866

F. +1 (800) 444-0021

www.voestalpine.com/specialtymetals



Material Solutions for the harshest
Oil and Gas environments

voestalpine
ONE STEP AHEAD.

voestalpine Specialty Metals
www.voestalpine.com/specialtymetals

voestalpine
ONE STEP AHEAD.

Your specialist for sour gas resistant material solutions:
Nickel, Duplex/Super Duplex, Stainless, Carbon Alloy, Copper Alloy

We also offer sawing, machining, turning,
trepanning, boring, drilling and thermal treatments.

Grade (UNS)	Specification/ Condition	Description	Size Range (in.)	UTS (KSI)	Yield 0.2% Offset (KSI)	EL (% Min)	RA (% Min)	Hardness (HRC)	Charpy Impact Min. ft-lbs
Alloy 718 ⁽¹⁾	API 6ACRA / NACE MR0175	High strength at high temperatures, high temp de-rating factors, excellent corrosion resistance in H2S and CO2 environments CA: valves, pump bodies & parts, hangers, multiple downhole, nuclear and surface applications etc.	0.5-14.0	150 Min	120-145	20	35	32-40	35 @-75°F
Alloy 925	API 6ACRA/ NACE MR0175	High Strength at high temperatures, high temp de-rating factors, excellent corrosion resistance in H2S and CO2 environments CA: valves, hangers, multiple downhole and surface applications etc.	0.5-12.0	140 Min	110 Min	18	25	26-38	35 @-75°F
Super Duplex ⁽³⁾ (S32750)	ASTM A182/ ASTM A479 NACE MR0175	High resistance to pitting, crevice and chloride stress corrosion, high resistance to general corrosion in acids, high corrosion fatigue and erosion corrosion, good weldability, High Pitting Resistance Equivalent Number (>40) CA: O&G equipment, offshore platforms, heat exchangers, water injection systems, chemical industries etc.	0.5-10.0	116-145	80 Min	25 Min	—	18-32	50 @-50°F
Duplex 2205 (S31803)	ASTM A484/ NACE MR0175	High chloride stress corrosion resistance at high strength, superior to 304/316 grades in corrosion performance, excellent notch toughness CA: chemical process vessels, pipe, scrubber systems and heat exchangers etc.	0.5-6.5	995 Min	65 Min	25 Min	—	—	—
Grade 660 (S66286)	ASTM A453 Gr 660 B+D/ ASTM A638 Gr 660 Type 2/ NACE MR0175	High temperature bolting material, expansion coefficient comparable to Austenitic Stainless Steels CA: bolting for piping and special purpose applications, boiler and pressure vessels etc.	0.5-6.5	145 Min	105 Min	15	20	30-35	20 @-100°C
Super 13Cr (S41427)	Cond. 95 KSI	High performance, excellent corrosion resistance in CO2 environment, limited resistance in H2S conditions CA: mandrels, packers, drill collars etc.	4.75-8.75	105	95-120	20	40	28 Max	44 @+14°F
Super 13Cr (S41427)	Cond 110 KSI	High performance, excellent corrosion resistance in CO2 environment, limited resistance in H2S conditions CA: mandrels, packers, drill collars etc.	4.75-8.75	125	110-140	15	40	32 Max	44 @+14°F
420 Mod (S42000)	NACE MR0175/ ASTM A484	High performance Martensitic Stainless Steel, excellent resistance in sweet environment CA: structural and pressure containing tools, packers, drill collars, mandrels etc.	2.5-10.0	100 Min	80 Min	20	40	23 Max	—
316L (S31603)	ASTM A276	Austenitic Stainless Steel with excellent machinability and weldability CA: mud motors, fishing tools etc.	0.5-11.0	75-115	30 Min	40 Min	50 Min	22 Max	—
17-4PH ⁽²⁾ (S17400)	ASTM A564 H1150D	Age Hardened Martensitic Stainless Steel, excellent machinability CA: valves, pump shafts, rotors etc.	0.5-15.0	135 Min	110 Min	18 Min	55 Min	28-32	20 @-75°F
XM19-HS (S20910)	ASTM A276	Austenitic Stainless Steel with high strength and corrosion resistance, better corrosion resistance than 316 CA: non-mag mud motors, drill collars, fishing tools, pumps etc.	0.5-9.5	100 Min	55 Min	35 Min	55 Min	25-35	—
XM19 ANN (S20910)	ASTM A276	Austenitic Stainless Steel with high strength and corrosion resistance, better corrosion resistance than 316 with higher strength CA: non-mag mud motors, drill collars, fishing tools, pumps etc.	1.0-10.5	125	105	20 Min	50 Min	25-35	40@RT
XM19 HS Tubing (S20910)	ASTM A276	Austenitic Stainless Steel with high strength and corrosion resistance, better corrosion resistance than 316 with higher strength CA: non-mag mud motors, drill collars, fishing tools, pumps etc.	1.875 X 1.50	125	105	20 Min	50 Min	25-35	—
N60 (S21800)	ASTM A276	Austenitic Stainless Steel with high strength and corrosion resistance, galling and wear resistant, better pitting resistance than 316 CA: non-mag mud motors, drill collars, fishing tools, pumps etc.	0.5-7.5	100 Min	50 Min	35 Min	55 Min	22 Max	—
F22 NQT (K21590)	ASTM A182 NACE MR0175	Low Alloy Steel, meets NACE MR0175 requirements for hardness max of 22 HRC CA: wellhead applications in oil patch, such as connectors, hangars and block valves etc.	12.25-23.75	95 Min	75 Min	18 Min	35 Min	22 Max	—
8630 Mod	ASTM A322/ ASTM A788 NACE MR0175	Low Alloy Steel, meets NACE MR0175 requirements for hardness max of 22 HRC CA: wellhead applications in oil patch, such as connectors, hangars and block valves etc.	9.0-19.5	105 Min	80 Min	20 Min	25 min	22 Max	40 @-20°F
Ni Al Bronze (C63000)	ASTM B150	Excellent bearing properties, good corrosion resistance in loaded condition at room and elevated temperatures CA: valve parts, chemical processing equipment/ parts etc.	4.25-5.75	110 Min	60 Min	10	—	93 HRB-24 HRC	—
CuBe (C17200)	ASTM B196/ B251/ B643 Cond AT & HT	Non-magnetic, anti-galling, high strength, high thermal and electrical conductivity, high corrosion and wear resistance CA: housings, bearings, couplings, actuator stems etc.	1.875 & 2.0	110-200	90-175	15	—	95 HRB-39 HRC	—
CuBe Tubing (C17200)	ASTM B196/ B251/ B643 Cond HT	Non-magnetic, anti-galling, high strength, high thermal and electrical conductivity, high corrosion and wear resistance CA: housings, bearings, couplings, actuator stems etc.	1.875 & 1.5	120-225	100-200	13	—	95 HRB-45 HRC	—
ToughMet [®] 3 ⁽⁴⁾ (C72900)	ASTM B505	High strength Copper Alloy, retains properties at high temperature and pressure, high corrosion resistance in most sour environments, low friction, anti-galling, high erosion and wear resistance CA: instrument housings, bearings, couplings and actuator stems.	0.505-6.0	120-160	90-150	15	—	26-36	—

C (Wt %)	Mn (Wt %)	P (Wt %)	S (Wt %)	Si (Wt %)	Ni (Wt %)	Co (Wt %)	Cr (Wt %)	Mo (Wt %)	Nb (Cb) + Ta (Wt %)	Ti (Wt %)	Cu (Wt %)	Al (Wt %)	Fe & Others (Wt %)
0.045	0.35	0.010	0.010	0.35	50.0-55.0	1.00 Max	17.0-21.0	2.8-3.30	4.87-5.20	0.80-1.15	0.23 Max	0.40-0.60	Fe- Balance, B-0.0060, Pb- 0.0010 Max, Se-0.0005 Max, Bi-0.00005 Max, Ca-0.0030 Max, Mg-0.0060 Max
0.03 Max	1.00 Max	0.03 Max	0.03 Max	0.5 Max	42.0-46.0	—	19.5-22.5	2.5-3.5	0.5 Max	1.9-2.4	1.5-3.0	0.1-0.5	Fe- 22.0 Min.
0.030 Max	1.2 Max	0.025 Max	0.015 Max	0.8 Max	6.0-8.0	—	24.0-26.0	3.0-4.0	—	—	—	—	PREN- 40 Min, Nitrogen- 0.3, Fe- Balance
0.03 Max	2.0 Max	0.03 Max	0.02 Max	1.0 Max	4.5-6.5	—	22.0-23.0	3.0-3.5	—	—	—	—	Fe- Balance, Nitrogen- 0.14- 0.2
0.08 Max	2.0 Max	0.040 Max	0.030 Max	1.0 Max	24.0-27.0	—	13.5-16.0	1.0-1.5	—	1.9-2.35	—	0.35 Max	Fe- Balance, V- 0.10-0.50, B- 0.001-0.010
0.03 Max	1.00 Max	0.02 Max	0.005 Max	0.50 Max	4.5-6.0	—	11.5-13.5	1.5-2.5	—	0.01 Max	—	—	Fe- Balance, V- 0.10-0.50
0.03 Max	1.00 Max	0.02 Max	0.005 Max	0.50 Max	4.5-6.0	—	11.5-13.5	1.5-2.5	—	0.01 Max	—	—	Fe- Balance, V- 0.10-0.50
0.18-0.22	1.00 Max	—	0.005 Max	—	—	—	—	—	—	—	—	—	Fe- Balance
0.03 Max	2.00 Max	0.040 Max	0.030 Max	1.00 Max	10.0-14.0	—	16.0-18.0	2.00-3.00	—	—	—	—	Fe- Balance
0.07 Max	1.00 Max	0.040 Max	0.030 Max	1.00 Max	3.00-5.00	—	15.0-17.5	—	0.15-0.45	—	3.00-5.00	—	Fe- Balance
0.060 Max	4.00-6.00	0.04 Max	0.03 Max	1.00 Max	11.5-13.5	—	20.5-23.5	1.5-3.00	0.10-0.30	—	—	—	N- 0.20-0.40, V- 0.10-0.30
0.060 Max	4.00-6.00	0.04 Max	0.03 Max	1.00 Max	11.5-13.5	—	20.5-23.5	1.5-3.00	0.10-0.30	—	—	—	N- 0.20-0.40, V- 0.10-0.30
0.060 Max	4.00-6.00	0.04 Max	0.03 Max	1.00 Max	11.5-13.5	—	20.5-23.5	1.5-3.00	0.10-0.30	—	—	—	N- 0.20-0.40, V- 0.10-0.30
0.10 Max	7.00-9.00	0.06 Max	0.03 Max	3.5-4.5	8.0-9.0	—	16.0-18.0	—	—	—	—	—	N- 0.08-0.18
0.05-0.15	0.30-0.60	0.040 Max	0.040 Max	0.50 Max	—	—	2.0-2.5	0.87-1.13	—	—	—	—	Fe- Balance, V- 0.050 Max
0.28-0.33	0.7-1.0	0.040 Max	0.040 Max	0.20-0.35	0.40-1.10	—	0.40-1.75	0.15-0.50	—	—	—	—	Fe- Balance
—	1.5 Max	—	—	0.25 Max	4.00-5.50	—	—	—	—	—	Balance	9.0-11.0	Fe-2.0-4.0, Sn-0.20 Max, Zn- 0.30 Max
—	—	—	—	—	—	—	—	—	—	—	Balance	—	Be- 1.8-2.00, Co+Ni- 0.20 Min, Co+Ni+Fe- 0.60 Max
—	—	—	—	—	—	—	—	—	—	—	Balance	—	Be- 1.8-2.00, Co+Ni- 0.20 Min, Co+Ni+Fe- 0.60 Max
—	—	—	—	—	15 Max	—	—	—	—	—	Balance	—	Sn- 8.00 Max

CA-Critical Application

⁽¹⁾ Alloy 718 also available in AMS5662 Annealed condition and AMS 5663 High Strength condition

⁽²⁾ 17-4PH grade material available in Annealed, H900, H1025 and H1075 conditions in addition to HH1150.

⁽³⁾ PREN= Cr + 3.3*Mo + 16*N

⁽⁴⁾ ToughMet[®] 3 is a registered trademark of Materion Corporation. Products include Toughmet 3[®] AT 110, Toughmet TS 150 Tube, Toughmet 160

voestalpine Specialty Metals

+1 (800) 704-6866

www.voestalpine.com/specialtymetals

voestalpine

ONE STEP AHEAD.