SPECIAL STAINLESS STEELS 2205, 253MA, 254SMO, 904L

Descriptions and General Uses

Alloy 2205 (UNS S31803)	A ferretic-austenitic stainless steel with a duplex structure that features high strength, low thermal expansion, high heat conductivity, plus high resistance to stress corrosion, cracking, intergranular, corrosion fatigue and erosion. High contents of Cr and Mo results in high general corrosion resistance, pitting and crevice corrosion resistance plus good sulphide stress corrosion cracking resistance. Good weldibility. Typical applications include; boat shafting, heat exchangers and pipes for desalination plants, pressure vessels, pipes tanks and heat exchangers for processing and transport of various acids, and in process industries handling solutions containing chlorides. Rotors, fans and shafts for various rotating equipment where the high corrosion fatigue strength can be utilised.
Alloy 253MA (UNS S30815)	A very high temperature steel (1150-1200˚C) which is resistant to scaling and deformation even in wide, rapid temperature flucuations. Excellent creep properties and very good mechanical properties, even within the lower temperature ranges, where the creep properties are not decisive. Easy to form and weld. Typical applications include; all heat applications including furnace ducting and spray painting bays.
Alloy 254SMO (UNS N08904)	An austenitic stainless steel with a very high resistance to general, pitting and crevice corrosion especially designed for use in halide containing environments such as seawater. Mechanical strength is higher than other austenitic stainless steels. High ductility and impact strength as well as good weldibility. Typical applications include equipment for use in contact with seawater such as plate and tube heat exchangers, cooling pipes and similar components, even in cases where stagnation can occur. Equipment such as drums, vats and press rolls for filter washers, and pipelines for pulp and filtrate. Components such as gas cleaning systems eg. in pulp and metallurgical industries and in power stations. Tanks and pipelines for different chemicals with high halide levels. Equipment used for the distillation of tall oil.
904L (UNS S31254)	Intended for use under severe corrosive conditions such as dilute sulphuric acid. Resistant to stress corrosion cracking, pitting and crevice corrosion. Suitable for heat treatment and welding because of good resistance to intergranular corrosion. Typical applications include; process equipment in the chemical industry, fertiliser manufacturing equipment and gas turbines.

Chemical Composition to ASTM in % (figures are approximate only)

		2205	253MA	904L	254SMO
Carbon	C	0.03	0.10	0.02	0.02
Chromium	Cr	22.0	21.0	19.5	20.0
Nickel	Ni	5.5	11.0	25.0	18.0
Molybdenum	Mo	3.0	-	4.5	6.0
Silicon	Si	0.8	1.7	0.5	0.4
Manganese	Mn	2.0	0.8	1.8	0.5
Nitrogen	N	0.12	-	-	0.20
Copper	Cu	-	-	1.5	0.7
Other			N,R,E		

Typical Mechanical Properties

		2205	253MA	904L	254SMO
Tensile Strength	MPa	680	650	500	650
	psi	98600	94250	72500	94250
Yeild Strength	MPa	480	310	220	300
	psi	69600	44950	31900	43500
Elongation in 50.8mm (2")		25	45	35	35
Hardness	HB	240	190	155	180
Heat Resistance Scaling Temperature in Air ˚C		1000	1150	1000	1000

AQUAMET® BOAT SHAFTING

AQUAMET shafts are heat treated, centreless ground, polished and precision straightened ready for machining and installation.
AQUAMET shafts can be used in smaller diameters because of their extra strength - this means lighter struts and smaller bearings for less weight, less underwater drag and lower cost.
Cathodic protection, properly installed navy grade zinc anodes, is recommended for both AQUAMET 17 & AQUAMET 22.

Descriptions and General Uses

AQUAMET 17	Widely used in working boats such as trawlers, tenders, pilot and patrol boats. Corrosion resistance is similar to stainless steel T304. It is mostly used in working boats with a high duty cycle, as extended periods of inactivity make corrosion conditions more challenging and may lead to premature failure.
AQUAMET 22	A superior material for use in pleasure boats. It is also an excellent choice for commercial boats. AQUAMET22 has corrosion resistance equal to or better than any other boat shaft material, even better that most nickel alloys and is recommended for pleasure boats where corrosion conditions are most severe. The yield strength in torsion provided by AQUAMET 22 is up to 3-1/2 times better that of most boat shaft materials. AQUAMET 22 also exhibits excellent toughness.

Chemical Composition to ASTM in % (figures are approximate only)

		AQUAMET 17	AQUAMET 22
Carbon	C	0.07 max	0.06 max
Manganese	Mn	1.00 max	4.00-6.00
Silicon	Si	1.00 max	1.00 max
Chromium	Cr	14.50-16.50	20.50-23.50
Phosphorous	P	0.04 max	0.04 max
Sulfur	S	0.03 max	0.03 max
Nickel	Ni	3.00-5.00	11.50-13.50
Molybdenum	Mo	-	1.50-3.00
Nitrogen	N	-	0.20-0.40
Vanadium	V	-	0.10-0.30
Copper	Cu	3.00-5.00	-
Columbium + Tantalum	Co + Ta	0.15-0.45	-
Columbium	Co	-	0.10-0.30
Iron	Fe	Balance	Balance

Minimum Mechanical Properties

Shaft Sizes	mm	≤ 203	> 203 ≤ 305	>19.0 ≤31.8	> 31.8 ≤50.8	> 50.8 ≤ 63.5	> 63.5 ≤76.2	> 76.2 ≤ 30
Shaft Sizes	inch	≤ 8	> 8 ≤ 12	> 3/4 ≤ 1-1/4	>1-1/4 ≤ 2	> 2 ≤ 2-1/2	>2-1/2 ≤ 3	>3 ≤ 12
Ultimate Tensile Strength	MPa	931	931	1000	931	827	793	689
	psi	135,000	135,000	145,000	135,000	120,000	115,000	100,000
0.2% Yield Strength	MPa	724	724	896	724	655	517	379
	psi	105,000	105,000	130,000	105,000	95,000	75,000	55,000
Torsion	MPa	483	483	597	483	434	345	252
	PSI	70,000	70,000	86,600	70,000	63,000	50,000	36,600
Elongation, in 50.8mm (2")	%	16	12	18	20	20	25	30
Reduction of Area	%	50	35	45	50	50	50	50
Impact Charpy V-Notch Typical	J	68	68	108	136	136	136+	136+
	ft-lbs	50	50	80	100	100	100+	100+
Hardness Typical	Rockwell	C28/37	C28/37					
	Brinell	C28/37	C28/37					

Physical Properties

Density at 24°C	gm/cm³	7.838	7.886
	lbs/in³	0.284	0.285
Modulus of Elasticity (Tension)	MPa	200,600	199,000
	psi	29,100,000	28,900,000
Modulus of Rigidity (Torsion)	MPa	77,700	72,900
	psi	11,270,000	10,800,000
Poissons Ration		0.291	0.312
Magnetic		Yes	No

Availibility

25.4mm (1")	Available ex stock Australia.
19mm (3/4") to 127mm (5")	Available ex stock USA.
Over 127mm (5")	made to order.

MONEL, INCONEL & INCOLOY

Descriptions and General Uses

MONEL 400	High strength, good weldability, excellent corrosion resistance over a wide range of temperature and conditions. Typical applications include; valves, pumps, shafts, marine fixtures, fasteners, electrical and electronic components, processing equipment, petroleum refining and production equipment, feedwater heaters and other heat exchangers.
MONEL K-500	Age hardenable version of Monel alloy 400 for increased strength and hardness. Typical Applications include; pump shafts, doctor blades and scrapers, oil well drill collars and instruments, electronic components, springs, valve trims, fasteners.
INCONEL 600	High nickel, high chromium content for resistance to oxidising and reducing environments; severely corrosive environments at elevated temperatures. Typical applications include; furnace muffles, electronic components, chemical and food processing equipment, heat heating equipment, nuclear steam generator tubing.
INCONEL 601	Excellent high temperature properties, resistance to oxidising, carbizing, and sulphur-containing atmospheres. Typical applications include heat exchangers, heat treating baskets and fixtures, radiant tubes, thermocouple tubes, furnace muffles and retorts, combustion cans, aircraft engine parts.
INCONEL 625	High strength toughness from cryogenic temperatures to 980°C, good oxidation resistance, exceptional fatigue strength, and good corrosion resistance. Typical applications include; chemical and pollution control equipment, ash pit seals, nuclear reactors, marine equipment, ducting, thrust cover reverser assemblies, fuel nozzles, after burners, spray bars.
INCOLOY 800	Strong and resistant to oxidation and carburisation at elevated temperatures. Resists sulphur attack, internal oxidation, scaling and corrosion. Typical applications includes; heat exchangers, process piping, carburising fixtures and retorts, heating element sheathing, nuclear steam generator tubing.

Chemical Composition to ASTM in % (figures are approximate only)

		Monel 400	Monel K500	Inconel 600	Inconel 601	Inconel 625	Incoloy 800
Nickel	Ni	63-70[b]	63-70[b]	72.0[b]min	58.0[b]min	Balance	30.0min
Carbon	C	0.30max	0.25max	0.15max	0.1max	0.10max	0.10max
Manganese	Mn	2.00max	1.50max	1.0max	1.0max	0.50max	0.15max
Iron	Fe	2.50max	2.00max	6.00min	balance	5.0max	Balance
Sulphur, yellow	S	0.024max	0.01max	0.015max	0.015max	0.50max	0.015max
Silicon	Si	0.50max	0.50max	0.50max	0.50max	0.20min	1.0max
Copper	Cu	Balance	Balance	0.50max	1.0max	-	0.75max
Chromium	Cr	-	-	14.00min	21.0min	20.0min	19.0min
Aluminium	Al	-	2.3-3.15	-	1.0min	0.4max	0.15min
Titanium	Ti	-	0.35-0.85	-	-	0.4max	0.15min
Molydenum	Mo	-	-	-	-	8.0min	-
Columbium + Tantalum	Co+Ta	-	-	-	-	3.15min	-

b = Plus cobalt

Typical Mechanical Properties (Note: All values below are given for solution heat treated sheet at room temperature)

Density	kg/m³	8830	8460	8420	8060	8440	7950
	lb/cu in.	0.319	0.306	0.304	0.291	0.305	0.287
Ultimate Tensile Strength	MPa	480 - 620	970 - 1310	550 - 690	550 - 790	930	520 - 690
	psi	70 - 90	140 - 190	80 - 100	80 - 115	135	75 - 100
Yeild Strength 0.2%	MPa	170 - 340	760 - 1030	210 - 340	210 - 340	520	210 - 410
	psi	25 - 50	110 - 150	30 - 50	30 - 60	75	30 - 60
Elongation in 50.8mm (2")	%	60 - 35	30 - 20	55 - 35	70 - 40	45	60 - 30
Brinell Hardness		110 - 149	265 - 346	120 - 170	110 - 150	180	120 - 184

HASTELLOY® CORROSION RESISTANT ALLOYS

Descriptions and General Uses

HASTELLOY B-2	Superior resistance to hydrochloric acid, aluminium chloride catalysts and other strongly reducing chemicals.
HASTELLOY B-3	Same excellent resistance to hydrochloric acid and other strongly reducing chemicals as B-2 alloy, but with significantly better thermal stability, fabricability and stress corrosion cracking resistance.
HASTELLOY C-4	High temperature stability in the 650-1040°C (1200-1900°F) range as evidenced by good ductility and corrosion resistance. Virtually the same corrosion resistance as alloy C-276.
HASTELLOY C-22	Better overall corrosion resistance in oxidizing corrosives than C-4, C-276 and 625 alloys. Outstanding resistance to localized corrosion and excellent resistance to stress corrosion cracking. Best alloy to use as universal weld filler metal to resist corrosion of weldments.
HASTELLOY C-276	Versatile, corrosion resistant alloy. Very good resistance to reducing and mildly oxidizing corrosives. Excellent stress corrosion cracking resistance with very good resistance to localized attack.
HASTELLOY C-2000	Most versatile, corrosion resistant alloy with excellent resistance to uniform corrosion in oxidizing or reducing environments. Excellent resistance to stress corrosion cracking and superior resistance to localized corrosion as compared to C-276 alloy.
HASTELLOY D-205	Outstanding resistance to hot concentrated sulfuric acid, and other highly concentrated oxidizing acid media.
HASTELLOY G-30	Many advantages over other metallic and non-metallic materials in handling phosphoric acids, sulfuric acid, nitric acid, fluoride environments and oxidising acid mixes.
HASTELLOY N	Good resistance to aging and embrittlement and good fabricability. It has excellent resistance to hot fluoride salts in the temperature range of 705°C - 870°C (1300°F to 1600°F).

Usual Forms Available

	B2	B3	C4	C22	C276	C2000	D205	G30	N
Sheet	▲	▲	▲	▲	▲	▲	▲	▲	◆
Plate	▲	▲	▲	▲	▲	▲	▲	▲	◆
Sections	▲	▲	▲	▲	▲	▲	▲	▲	◆
Wire	▲	▲	▲	▲	▲	▲	▲	▲	◆
Tube	▲	▲	▲	▲	▲	▲		▲	
Pipe	▲	▲	▲	▲	▲	▲		▲	

▲ Available on Indent only
◆ Available on Indent only as Special Order with Appropriate Quantities

Chemical Composition to ASTM in % (figures are approximate only)

		B2	B3	C4	C22	C276	C2000	D205	G30	N
Nickel	Ni	69[a]	65[b]	65[a]	56[a]	57[a]	59[a]	65[a]	43[a]	71[a]
Molybdenum	Mo	28	28.5	16	13	16	16	2.5	5.5	16
Iron	Fe	2*	1.5	3*	3	5	-	6	15	5*
Cobalt	Co	1*	3*	2*	2.5*	2.5*	-	-	5*	0.2*
Chromium	Cr	1*	1.5	16	22	16	23	20	30	7
Manganese	Mn	1*	3*	1*	0.5*	1*	-	-	1.5*	0.8*
Silicon	Si	0.1*	0.1*	0.08*	0.08*	0.08*	0.08*	5	.08*	1*
Carbon	C	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*	0.03*	0.03*	0.08*
Columbium	Cb	-	-	-	-	-	-	-	1.5*	-
Copper	Cu	-	-	-	-	-	1.6	2	2*	0.35*
Aluminium	Al	-	0.5*	-	-	-	-	-	-	0.5*
Titanium	Ti	-	0.2*	0.7	-	-	-	-	-	-
Tungsten	W	-	3*	-	3	4	-	-	2.5	0.5*
Vanadium	V	-	-	-	0.35*	0.35*	-	-	-	-

a = as balance b = minimum * = maximum

Typical Mechanical Properties (Note: All values below are given for solution heat treated sheet at room temperature)

		B2	B3	C4	C22	C276	C2000	D205	G30	N
Tensile Strength	MPa	914	860	790[2]	800	7921	752[1]	786	690[2]	796[1]
	KSi	132.5	125.0	114.6[2]	116.0	114.9[1]	109.0[1]	114	100[2]	115.4[1]
0.2% Yeild Strength	MPa	396	420	376[2]	407	356[1]	358[1]	338	352[2]	340[1]
	KSi	57.5	60.6	54.6[2]	59.0	51.6[1]	52.0[1]	49	51[2]	49.3[1]
Elongation in 50.8mm (2")%		55	53.4	56[2]	57	61	64	56.5	56	46.8

1 = 1.6mm sheet , 2 = 3.2mm sheet

HASTELLOY® AND HAYNES® HEAT RESISTANT ALLOYS

Descriptions and General Uses

HASTELLOY B	Material used in older gas turbines & rocket engines. Good strength at temperature up to about 1095°C (2000°F), but limited to low temperatures by lack of oxidation resistance.
HASTELLOY S	Excellent thermal stability, good thermal fatigue resistance, good oxidation-resistance & relatively low expansion characteristics. Used in low-stress gas turbine parts. Excellent dissimilar filler metal.
HASTELLOY W	Excellent for welding dissimilar high temperature alloys. Used extensively in aircraft engine repair and maintenance.
HASTELLOY X	Very good balance of strength, oxidation-resistance & fabricability. Most widely used material for aircraft, marine and industrial gas turbine engine combustors and fabricated parts.
HAYNES 25	Excellent strength, good oxidation resistance to 980°C (1800°F), very good sulfidation resistance and relatively good resistance to wear and galling. Used in gas turbine parts, bearings and various industrial applications.
HAYNES R-41	Age-hardenable alloy with excellent strength in the 540°C-980° (1000°F-1800°F) temperature range. Used for critical gas turbine engine components.
HAYNES 75	Basic heat-resistant alloy used in low-stress gas turbine and industrial applications.
HAYNES HR-120	High strength economical alloy, with good resistance to industrial environments. Designed for use in treating fixture and industrial heating applications as an upgrade from 330 alloy, 800H alloy and stainless steels. Excellent carburization and sulfidation resistance.
HAYNES HR-160	Outstanding resistance to sulfidation and other high-temperature aggressive environments. Used in waste incineration, boiler, high- temperature reaction vessel and rotary calciner applications.
HAYNES 188	Excellent strength with superior oxidation resistance and thermal stability compared to HAYNES 25 alloy. Good sulfidation resistance. Used extensively in demanding military and civil aircraft gas turbine engine combustors and other key components
HAYNES 214	Outstanding oxidation resistance to 1260°C (2300°F), excellent resistance to carburization and excellent resistance to chlorine-bearing environments. Used in demanding industrial heating applications and specialized gas turbine parts, such as honeycomb seals.
HAYNES 230	Best balance of strength, thermal stability, oxidation resistance, thermal cycling resistance and fabricability of any major high-temperature alloy. Used in gas turbine combustors and other key stationary components. Also used for heat treating and industrial heating applications and in the chemical/petrochemical process industry and in fossil energy plants. For welding, use 230-W™ filler wire.
HAYNES 242	Age-hardenable alloy with excellent strength to 705°C (300°F), low thermal expansion characteristics, good oxidation resistance to 815°C (1500°F) and excellent fabricability. Also has excellent resistance to high-temperature fluorine and fluoride-bearing environments. Used in gas turbine seal rings, containment structures and high-strength fasteners. Also used in fluoropolymer plastics production and CPI applications.
HAYNES 263	Age-hardenable alloy with excellent strength in the 540°C-870°C (1000°F-1600°F) temperature range and excellent forming and welding characteristics.
HAYNES 556	High-strength alloy with broad spectrum of resistance to high-temperature corrosive environments. Used in waste incineration, heat-treating, calcining, chemical processing, galvanizing, refinery, boiler and gas turbine components of various types. Excellent fabricability and excellent as a dissimilar filler metal for welding nickel or cobalt alloys to ironbase alloys.
HAYNES 625	Widely used in various aerospace, chemical process and industrial heating components.
HAYNES 718	Age-hardenable alloy with excellent strength to 650°C (1200°F). Used extensively in gas turbine components.
HAYNES X-750	Age-hardenable alloy with good strength to 815°C (1500°F).
MULTIMET	Predecessor of 556™ alloy, used extensively in older aircraft gas turbines.
WASPALOY	Age-hardenable alloy with excellent strength in the 540°C-980°C (1000°F-1800°F) temperature range. Used for critical gas alloy turbine engine components.

HASTELLOY® AND HAYNES® HEAT RESISTANT ALLOYS

	Hastelloy				Haynes															
	B	S	W	X	25	R-41	75	HR-120	HR-160	188	214	230	242	263	556	625	718	X-750	Multimet	Waspaloy

Usual Forms Available

Sheet	◆	▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Plate	◆	▲		▲	▲	▲	◆	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Sections	◆	▲		▲	▲	◆	◆	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	◆	◆	◆
Wire	◆	▲	▲	▲	▲	▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	◆	▲	▲
Tube		◆		▲	▲			◆	▲	▲		▲	◆		◆	◆	◆			
Pipe		◆		▲	▲			◆	▲	▲		▲	◆		◆	◆	◆			

▲ Available on Indent only
◆ Available on Indent only as Special Order with Appropriate Quantities

Chemical Composition to ASTM in % (figures are approximate only)

Nickel	Ni	67[a]	67[a]	63[a]	47[a]	10	52[a]	76[a]	37	37[a]	22	75[a]	57[a]	65[a]	52[a]	20	62[a]	52[a]	70[b]	20	58[a]
Molybdenum	Mo	28	15	24	9	-	10	-	2.5*	1.0	-	-	2	25	6	3	9	3	-	3	4.3
Iron	Fe	5	3*	6	18	3*	5*	5	33[a]	3.5	3*	3	3*	2*	0.7*	31[a]	5*	19	8	30[a]	2*
Cobalt	Co	2.5*	2*	2.5*	1.5	51[a]	11	-	3*	30	39[a]	-	5*	2.5*	20	18	1*	1*	1*	20	13.5
Chromium	Cr	1*	16	5	22	20	19	20	25	28	22	16	22	8	20	22	21	18	16	21	19
Manganese	Mn	1*	0.5	1*	1*	1.5	0.1*	1*	0.7	0.5	1.25*	0.5*	0.5	0.8*	0.6*	1	0.5*	0.35*	0.35*	1.5	0.1*
Silicon	Si	1*	0.4	1*	1*	0.4*	0.5*	1*	0.6	2.75	0.35	0.2*	0.4	0.8*	0.4*	0.4	0.5*	0.35*	0.35*	1*	0.15
Carbon	C	0.05*	0.02*	0.12*	0.1	0.1	0.09	0.11	0.05	0.05	0.1	0.05	0.1	0.03*	0.06	0.1	0.1*	0.05	0.08*	0.12	0.08
Aluminium	Al	-	0.25	-	-	-	1.5	-	0.1	-	-	4.5	0.3	0.5*	0.6*	0.2	0.4*	0.5	0.8	-	1.5
Boron	B	-	0.015*	-	0.008*	-	0.006	-	0.004	-	0.015	0.01*	0.015*	0.006*	-	-	-	0.009	-	-	0.006
Copper	Cu	0.5*	-	-	-	-	-	0.5*	-	-	-	-	-	0.5*	0.2*	-	-	0.1*	-	-	-
Lanthanum	La	-	0.02	-	-	-	-	-	-	-	-	0.07	-	0.02	-	-	0.02	-	-	-	-
Nitrogen	N	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2	-	-	-	0.15	-
Titanium	Ti	-	-	-	-	-	3.1	0.4	-	-	-	-	-	-	2.4*	-	0.4*	0.9	2.5	-	3
Columbium	Cb	-	-	-	-	-	-	-	0.7	1.0	-	-	-	-	-	-	} 3.7	} 5	} 1	} 1	-
Tantalum	Ta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6					-
Tungsten	W	-	1*	-	0.6	15	-	-	2.5*	1.0	14	-	14	-	2.5	-	-	-	2.5	-	-
Vanadium	V	0.3	-	0.6*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zicronium	Zr	-	-	-	-	-	-	-	-	-	-	0.1*	-	-	-	0.02	-	-	-	-	0.05
Yttrium	Y	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-

a = as balance b = minimum * = maximum

Typical Mechanical Properties (Note: All values below are given for solution heat treated sheet at room temperature)

Tensile Strength	MPa	925	844	-	755	1005	1260	792	735*	758	945	-	860	1365	1050	815	905	1395	1325	815	1335
	KSi	134.1	129.8	-	109.5	146	183.1	114.4	106.5*	110	137.2	-	124.9	198	152.3	118.1	131.1	202.3	192.2	118.1	193.5
0.2% Yeild Strength	MPa	460	444	-	385	475	820	407	375*	353	465	-	390	930	635	410	490	1175	975	400	910
	KSi	67.0	64.5	-	55.9	69	119.2	59.4	45.6*	51.2	67.3	-	56.9	135	91.9	59.5	71.1	170.4	141.1	58.0	131.8
Elongation in 50.8mm (2")%		51	49	-	45	51	21.5	31	50*	63	53	-	47.7	31.8	35.7	47.7	48.5	22.3	23.6	49	26.6

* Plate
For further detail on the Mechanical Properties of these alloys, please contact your Mico Metals team for specifications.

ULTIMET® AND HAYNES® WEAR RESISTANT ALLOYS

Descriptions and General Uses

ULTIMET	High yield strength alloy with excellent resistance to pitting corrosion and general corrosion, especially in oxidizing acids, coupled with exception wear resistance (cavitation erosion, galling and abrasion).
HAYNES 6B	A high-cobalt alloy which offers hardness, strength and wear resistance even at red heat 480°C (900°F).

Usual Forms Available

	Ultimet	Haynes 6B
Sheet	▲	▲
Plate	▲	▲
Sections	▲	▲
Wire	▲	
Tube		
Pipe		

▲ Available on Indent only

Chemical Composition to ASTM in % (figures are approximate only)

		Ultimet	Haynes 6B
Nickel	Ni	9	2.5
Molybdenum	Mo	5	1.5*
Iron	Fe	3	3*
Cobalt	Co	54[a]	58[a]
Chromium	Cr	26	30
Manganese	Mn	0.8	1.4
Silicon	Si	0.3	0.7
Carbon	C	0.06	1
Nitrogen	N	0.08	-
Tungsten	W	2	4

a = as balance b = minimum * = maximum

Typical Mechanical Properties (Note: All values are given for solution heat treated sheet at room temperature)

		Ultimet	Haynes 6B
Tensile Strength	MPa	931[1]	1005
	KSi	135[1]	146
0.2% Yeild Strength	MPa	497[1]	635
	KSi	72[1]	92
Elongation in 50.8mm (2")%		42	11

1 = 1.6mm sheet

HAYNES TITANIUM TUBULARS

HAYNES Tl-3Al-2.5V	94Ti[a]-3Al-2.5V-0.25Fe*-0.120H**-0.05C*0.02N* Alloy used where strength/weight ratio is of prime importance (43 percent lighter than 21-6-9 stainless steel). Used mostly in the form of seamless tubing for aircraft hydraulic systems.