

## Metals

### PROFILE

Metal division supply various types of products and grades: Stainless steel strip, special metals strip, foil, shaped wire, fine wire, sheet, plate, bar, PV ribbon etc. As a sole agent of Ubrich in Korean market, we are ready to serve our customers with excellence in reliability and superior performance in critical applications. We provide various kinds of Chromite sands and we procure from South Africa which is needed in the melting process. We are also a sole agent for Standard Die and we provide full-service metal stamping and drawing. We specialize in small parts made from a wide range of specialty metals ranging from coppers to refractory metals and other exotic materials.

Product	Product Name	UNS	C Max	Ni	Cr	Mo	AMS	ASTM	Density	Product description
	Austenitic grade 201	S20100	0.15	3.5-5.5	16.0-18.0			A 240, A 666	0.28	Chromium nickel manganese steel was developed as a satisfactory alternate for Type 301 for many applications.
	301	S30100	0.15	6.0-8.0	16.0-18.0		5517, 5519, 5518	A 240, A 666	0.29	Chromium nickel steel, capable of attaining high tensile strength and ductility by moderate or severe cold working
	302	S30200	0.15	8.0-10.0	17.0-19.0		5516	A 240, A 666	0.29	General purpose chromium nickel stainless steel. Its corrosion resistance is superior to that of Type 301. It can be cold worked to high tensile strengths but with slightly lower ductility than Type 301.
	303(wire Only)	S30300	0.08	9.00	18.0		5640	A 262, A 314, A484, A582	0.29	Alloy 303 is a non-magnetic stainless steel that is not hardenable by heat treatment. Alloy 303 has much better free-machining capability verse 302 and 304, in addition to having good resistance to oxidation at temperatures up to 1700°F.
	304	S30400	0.08	8.0-10.5	18.0-20.0		5513	A 240, A 666	0.29	Low-carbon chromium nickel stainless and heat-resisting steel somewhat superior to Type 302 in corrosion resistance.
	304L	S30403	0.03	8.0-12.0	18.0-20.0		5511	A 240, A 666	0.29	Very low-carbon chromium nickel steel with general corrosion resistance similar to Type 304 but with superior resistance to intergranular corrosion following welding or stress relieving. It is recommended for use in parts which are fabricated by welding and which cannot be subsequently annealed
	305	S30500	0.12	10.0-13.0	17.0-19.0		5514	A 240	0.29	A high corrosion-resistant alloy with low rate of work hardening, designed for extra deep drawing and spinning.
	309	S30900	0.08	12.0-15.0	22.0-24.0		5523	A 240, A 167	0.29	High corrosion-resistant, chromium nickel grade with carbon limited to .08 to reduce carbon precipitation during welding
	310	S31000	0.25	19.0-22.0	24.0-26.0		5521	A 240, A 167	0.29	Similar to 309 with higher resistance to corrosion and oxidation at elevated temperatures.
	316	S31600	0.08	10.0-14.0	16.0-18.0	2.0-3.0	5524	A 240, A 666	0.29	Chromium nickel stainless and heat-resisting steel with superior corrosion resistance to other chromium nickel steels when exposed to many types of chemical corrosives; superior creep strength at elevated temperatures.
	316L	S31603	0.03	10.0-14.0	16.0-18.0	2.0-3.0	5507	A 240, A 666	0.29	Low-carbon chromium nickel stainless steel with general corrosion resistance similar to Type 316 but with superior resistance to intergranular corrosion following welding or relieving. It is recommended for use in parts which are fabricated by welding and cannot be subsequently annealed.
	316TI	S31635	0.08	10.0-14.0	16.0-18.0	2.0-3.0		A240	0.29	Ti-stabilized version of 316 with resistance to sensitization. (The formation of grain boundary chromium carbides at evaluated temperatures.)
	317L	S31703	0.03	11.0-15.0	18.0-20.0	3.0-4.0		A240	0.29	Similar to 316L but with additional molybdenum to improve corrosion resistance.
	321	S32100	0.08	9.0-12.0	17.0-19.0		5510	A240	0.29	Chromium nickel steel containing titanium. Recommended for parts fabricated by welding which cannot be subsequently annealed. Also recommended for parts to be used at temperatures between 800°F and 1850°F.
	347	S34700	0.08	9.0-13.0	17.0-19.0		5512	A240	0.29	Chromium nickel steel containing columbium and tantalum which is recommended for parts fabricated by welding which cannot be subsequently annealed. Also recommended for parts to be used at temperatures between 800°F and 1850°F.
	CARPENTER® 20 CB	N08020	0.06	32.5-35.0	19.0-21.0	2.0-3.0		-B 463	0.289	A highly corrosion-resistant alloy used in the chemical industry for applications where corrosion resistance is extremely critical, superior to the general run of 300-type stainless.
Stainless steel	Ferritic Grades 430	S43000	0.12		16.0-18.0		5503	A240	0.28	General purpose grade, corrosion-resistant, straight chromium grade, non-heat-treatable.
	430LI	S43000	0.022		16.0-18.0				0.28	Similar to straight 430 in corrosion and mechanical properties. The low interstitials provide improved transverse bending over straight 430.
	434	S43400	0.12		16.0-18.0	0.75-1.25		A240	0.28	Modification of Grade 430 designed for automotive trim and resistance to atmospheric corrosion.
	444	S44400	0.025	1.0 max.	17.5-19.5	1.75-2.50		A240	0.28	A low-carbon, low-nitrogen, ferritic that provides pitting and crevice corrosion resistance superior to most ferritic grades.
	Duplex Grades 2304	S32304	0.03	3.0-5.5	21.5-24.5			A240	0.28	A lean austenitic-ferritic duplex stainless steel with general corrosion resistance similar to 316, but with yield strength nearly double that of austenitic stainless steels.
	2205	S32205	0.03	4.5-6.5	22.0-23.0	3.0-3.5		A240	0.28	A nitrogen-, molybdenum-enhanced austenitic-ferritic duplex stainless steel with general corrosion resistance similar to 904L, but with a yield strength nearly double that of austenitic stainless steels.
	2507	S32750	0.03	6.0-8.0	24.0-26.0	3.0-5.0		A240	0.28	A super austenitic-ferritic duplex stainless steel with exceptional strength and corrosion resistance ideal for chemical process, petrochemical, and seawater applications.
	Martensitic Grades 410	S41000	0.15		11.5-13.5		5504	A240	0.28	General-purpose, corrosion- and heat-resisting chromium steel. Good corrosion resistance and fair machining properties. Can be treated to RC35/45.
	416 (wire only)	S41623	0.015		12.0-14.0			A 582	0.282	A highly machinable stainless that is hardenable
	420	S42000	0.15 min.		12.0-14.0		5506	A 176	0.28	Chromium steel capable of hardening to a maximum of approximately RC53/58.
440A	S44002	0.60-0.75		16.0-18.0				0.28	High carbon grade, high chromium, capable of being heat-treated to a hardness range of RC51/62.	
Precip Hardening Grades 17-7PH®	S17700	0.09	6.5-7.75	16.0-18.0		5528	A 693	0.282	A chromium nickel stainless steel with characteristics of good workability, easy hardening, high-strength, and excellent mechanical properties at elevated temperature, can be heat-treated at relatively low temperature for high-strength properties.	

	17-4PH®	S17400	0.07	3.0–5.0	15.0–17.5		5604	A 693 (Type 630)	0.28	Precipitation-hardening stainless steel with high-strength and good corrosion resistance to 600°F. Used in aerospace, chemical, petrochemical, paper and metalworking industries.
	18-8LW	S30430	0.1	8.0–10.0	17.0–19.0			A493	0.29	High-temperature alloy with high-temperature strength. The alloy has good resistance to oxidation and corrosion. It also has good fatigue performance.
	PH15-7Mo®	S15700	0.09	6.50–7.7	14.0–16.0	2.0–3.0	5520	A693	0.282	Similar to 17-7PH® alloy, but with molybdenum added for higher strength during heat treatment.
	A286	S66286	0.08	24.0–27.0	13.5–16.0	1.0–1.75	5525		0.286	An iron nickel chromium alloy designed for service up to 1300°F where high strength and corrosion resistance are required.
	AM 350	S35000	0.07–0.11	4.0–5.0	16.0–17.0	2.5–3.2	5548	A693	0.286	Similar to 17-7PH® alloy and PH15-7Mo® alloy, but with slightly higher elevated temperature capability.
Nickel Alloys	NICKEL 200	N02200	0.15	99.0 min.				B 162	0.322	Commercially pure nickel. High corrosion resistance. Used in food handling and electronics.
	NICKEL 201	N02201	0.02	99.0 min.			5533	B 162	0.322	Similar to Nickel 200 except with a lower carbon content for better formability. Most applications in chemicals.
	PERMANICKEL 300	N03300	0.4	Bal					0.316	Age-hardenable, high-nickel alloy, with very good thermal electrical conductivity.
	MONEL® 4002	N04400	0.3	63.0 min.				B 127	0.318	A solid-solution alloy with high strength and toughness over wide temperature ranges. Used in electronic components, springs. Corrosion resistant and oxidation resistance to 1000°F.
	MONEL® 401	N04401	0.5	44.0 min.					0.321	An alloy used for thermal and electronic applications. This alloy is sometimes called Constantan and is 44% Nickel and 56% Copper.
	MONEL® K-500	N05500	0.25	63.0 min.					0.305	Similar to Monel® 400 and 8482; but with higher tensile strength; a precipitation hardening alloy. Used in oil well drilling collars, doctor blades. Good strength and ductility 423°F to 1200°F.
	INCONEL® 600	N06600	0.15	72.0 min.	14.0–17.0		5540	B 168	0.304	Has high corrosion and heat resistance combined with excellent strength and workability. Mainly used in corrosive atmospheres. Oxidation resistance to 2150°F.
	Nimonic 75	N06075	0.08–0.15	Bal	18.0–21.0				0.302	A nickel chromium alloy with good mechanical properties and oxidation resistance at high temperatures. Used for sheet-metal fabrications in gas-turbine engines, for components of industrial furnaces, for heat-treating equipment and fixtures, and in nuclear engineering.
	INCONEL® 625	N06625	0.1	58.0 min.	20.0–23.0	8.0–10.0	5599, 5869, 5879	B 443	0.305	Outstanding corrosion resistance with excellent fabricability. Good for cryogenic- to high-temperature applications up to 2000°F.
	601	N06601	0.1	58.0–63.0	21.0–25.0			B 168 Din 17750	0.293	This Ni Cr Fe alloy is a good alloy for heat- and corrosion-resistant applications. It is an excellent alloy selection for resistance to high-temperature oxidation. The alloy has good resistance to aqueous corrosion, and has high mechanical strength, and is easily formed, welded and machined. It has good resistance to oxidation at high temperatures up to 1250°C and is resistant to carburization and carbon nitriding conditions.
	INCONEL® 718	N07718	0.08	50.0–55.0	17.0–21.0	2.80–3.30	5596, 5597	B 670	0.296	High strength and corrosion resistance for use in temperature ranges from -423°F to 1300°F. Nuclear applications
	INCONEL® X-750	N07750	0.08	70.0 min	14.0–17.0		5542, 5598		0.3	A precipitation-hardening nickel chromium alloy with useful strength to 1500°F. Good corrosion and oxidation resistance.
	INCOLOY® 800	N08800	0.1	30.0–35.0	19.0–23.0		5871	B 409	0.29	Nickel iron chromium alloy that is carburization-resistant at elevated temperatures.
	INCOLOY® 825	N08825	0.05	38.0–46.0	19.5–23.5	2.5–3.5		B 424	0.293	An alloy that is highly resistant to aggressively corrosive environments such as sulfuric, phosphoric acids and seawater.
	Ni-SpanC® 902	N09902	0.06	41.0–43.5	4.9–5.75				0.293	A nickel iron chromium alloy used in precision spring applications subject to severe temperature fluctuations.
	HASTELLOY® C-276	N10276	0.01	Bal	14.5–16.5	15.0–17.0		B 575	0.321	Used in chemical industry for resistance to oxidizing agents. Replaces Hastelloy® C and 8482; with better fabricability
	HASTELLOY® C-4	N06455	0.01	65	14.0–18.0	14.0–17.0			0.312	This Ni Cr Mo alloy has excellent high-temperature stability with good ductility and corrosion resistance. Alloy resists grain boundary precipitates in weld zone making it suitable for chemical processing applications in the as-welded condition. Has excellent resistance to stress corrosion cracking and oxidizing atmospheres to 1900°F.
	HASTELLOY® C-22	N06022	0.015	Bal	20.0–22.5	12.5–14.5		B 575	0.314	A versatile nickel chromium molybdenum tungsten alloy with resistance to a variety of industrial chemicals. Superior weldability.
	HASTELLOY® G-30	N06030	0.03	Bal	28.0–31.5	4.0–6.0		B 582	0.297	High chromium nickel base alloy with superior corrosion resistance to phosphoric acids and environments with highly oxidizing acids.
	HASTELLOY® B-3	N10675	0.01	65.0 min.	1.0–3.0	27.0–32.0			0.333	Used in chemical industry for resistance to hydrochloric acid, sulfuric acid, phosphoric acid. Oxidation atmosphere resistant to 1400°F.
	HASTELLOY® X	N06002	0.05–0.15	Bal	20.5–23.0	8.0–10.0			0.297	Jet engine components for afterburner sections, blades, tailpipes, furnace applications, honey-comb, bellows, ducting. Good strength and oxidation resistance to 2200°F.
	HAYNES® 214	N07214	0.05	Bal	15.0–17.0	0.5 max			0.29	Nickel-based, precipitation-strengthened alloy with oxidation resistance to 2200°F. For furnace parts exposed to carburizing, chlorine-contaminated and oxidizing atmospheres; gas turbine parts.
	HAYNES® 230	N06230	0.05–0.15	Bal	20.0–24.0	1.0–3.0			0.319	Nickel chromium tungsten molybdenum alloy with outstanding resistance to oxidizing environments up to 2100°F for prolonged periods.
HAYNES® 242	N10242	0.03	Bal	7.0–9.0	24.0–26.0			0.327	Age hardenable, nickel alloy for use up to 1300°F. Low thermal expansion, good oxidation resistance and excellent aged ductility. Suited for gas turbine engines and chemical process plants.	
HAYNES® 188	R30188	0.05–0.15	20.0–24.0	21.0–23.0				0.324	A cobalt-based alloy with excellent high-temperature strength and oxidation resistance to 2000°F, combined with outstanding post-standing ductility.	
HAYNES® 25 L-605	R30605	0.05–0.15	9.0–11.0	19.0–21.0				0.33	Jet engine components, combustion chambers, afterburner parts. Oxidation and carburization resistant to 1900°F. Good high temperature strength	

Cobalt Alloys	Ulbraseal 29-17	K93610		29	0.20 max	0.20 max			F 1466	0.302	A nickel alloy with low rates of thermal expansion
	Ulbraseal 36	K93600	0.05	35.5 – 36.5	0.25 max				F 1684	0.291	A nickel alloy with low rates of thermal expansion. Retains good strength at cryogenic temperatures
	Ulbraseal 42	K94100	0.05	41	0.25 max				F 1684	0.297	A nickel alloy with low rates of thermal expansion.
	HAYNES® 263	N07263	0.06	52.0	20.0	6.0				0.302	This alloy is an age-hardenable, nickel-based superalloy with moderate strength at temperatures up to 1500°F. Used for fabricated aircraft and land-based gas turbine engine parts. Has excellent weldability and ease of cold and hot forming. Good resistance to oxidizing combustion gas environments at temperatures to 1600°F.
	WASPALOY	N07001	0.03-0.10	Bal	18.0-21.0	3.5-5.0	5544			0.294	Good for high temperature applications. Jet engine turbine wheels, buckets, spacers, shafts
<b>Product</b>	<b>Product Name</b>	<b>N</b>	<b>C</b>	<b>H</b>	<b>Fe</b>	<b>O</b>	<b>Pd</b>	<b>Ti</b>	<b>Density</b>	<b>Product description</b>	
Titanium Alloys	Ti 35A G1	0.03max	0.08max	0.015max	0.20max	0.18max			Bal	0.163	Alpha-phase grades of commercially pure titanium with oxygen equivalents resulting in strength levels from low to high. ASTM B265/F67. UNS R50250
	Ti 40A G2	0.03max	0.08max	0.015max	0.30max	0.25max			Bal	0.163	Alpha-phase grades of commercially pure titanium with oxygen equivalents resulting in strength levels from low to high. ASTM B265/F67. UNS R50400
	Ti 55A G3	0.05max	0.08max	0.015max	0.30max	0.35max			Bal	0.163	Alpha-phase grades of commercially pure titanium with oxygen equivalents resulting in strength levels from low to high. ASTM B265/F67. UNS R50550
	Ti 75A G4	0.05max	0.08max	0.015max	0.50max	0.40max			Bal	0.163	Alpha-phase grades of commercially pure titanium with oxygen equivalents resulting in strength levels from low to high. ASTM B265/F67. UNS 50700
	Ti G7/11	0.03max	0.08max	0.015max	0.30max	0.25max			Bal		A commercially pure titanium with a small amount of palladium added to enhance corrosion resistance in a reducing atmosphere. ASTM B265 7/11. UNS R52400
<b>Product</b>	<b>Product Name</b>	<b>V</b>	<b>AL</b>	<b>SN</b>	<b>Mo</b>	<b>Nb</b>	<b>Cr</b>	<b>Zr</b>	<b>Ti + Residuals</b>	<b>Product description</b>	
Titanium Alloys	Ti 15-3-3-3	14-16	2.5-3.5	2.5-3.5			2.5-3.5		Bal		A cold-formable metastable beta alloy available in foil and strip which is typically aged to high strengths after fabrication. AMS 4914. UNS R58153
	Ti 3-2.5 G9	2-3	2.5-3.5						Bal		Alpha-Beta alloy, considered very weldable. Superior to high-strength C.P.Ti of equivalent strength level in weld toughness and useful temperature range. May be strengthened by cold working. ASTM B265 G9. UNS R56320
	Ti Beta 21S, G21		2.5-3.5		14-16	2.3-3.2			Bal		A cold-formable metastable beta alloy available in foil and strip with improved oxidation resistance, elevated temperature strength and creep resistance. ASTM B265 G21. UNS R58210
	Ti 6-4 G5 (wire only)	3.5-4.5	5.5-6.75						Bal		Grade 5 titanium is the workhorse of all the titanium grades. It is also known as Ti-6AL-4V or simply Ti 6-4. Its high strength, light weight and corrosion resistance enables Ti 6-4 to be used in many applications. The most common application is for aerospace components. The alloy is also age hardenable by heat treatment to achieve even higher strengths. ASTM B265 G5. UNS R56400.
	Ti 6-2-4-2 (wire only)		5.5-6.75	1.5-2.5	1.5-2.5			3.5-4.5	Bal		Ti 6Al-2Sn-4Zr-2Mo has good tensile creep and fatigue properties up to 1000°F. It is the most commonly used high-temperature titanium alloy in jet engine compressors and airframe structures. AMS 4975. UNS R54620.
<b>Product</b>	<b>Product Name</b>							<b>ASTM</b>	<b>Density</b>	<b>Product description</b>	
Other Alloys	NITINOL (wire only)							F 2063-05	0.233	Nitinol is a metal alloy of nickel and titanium, where the two elements are present in roughly equal atomic percentages. Nitinol exhibits unique behavior such as "shaped memory" and "superelasticity."	
	NIOBIUM TYPE 1	NIOBIUM						B 393	0.31	Pure niobium, reactor-grade, high melting point, corrosion resistant for use in medical and high-temperature industrial applications.	
	Zirconium 702							B 551	0.235	Exhibits a superior corrosion resistance and high heat-transfer efficiency. Zirconium has good ductility, formability and strength comparable with 17 common engineering alloys.	
<b>Product</b>	<b>Product Name</b>	<b>Composition</b>								<b>Product description</b>	
Chromite sand	Cromtec 40	<b>-Guaranteed Properties</b>								In every steel plant the steel is handled with 'Jadies'. The steel must be released in a safe and controlled manner. The tap hole must be protected with well filler sand which is a mixture of Chromite Sand and Silica Sand. The composition is customised to each customer's requirements. Range from 8% Cr2O3 up to 100%. Adjustment of carbon for better fill behaviour in a small increments is possible.	
		Cr2O3 : min.46%, SiO2 : Max. 1%									
		<b>-Typical Properties</b>									
		Cr2O3 : 46.2%, SiO2 : 0.7%, Al2O3 :14.8%, Fe2O3:28.2%, TiO2:0.7%, MgO: 9.5%									
		Fines(<0.125mm): 1.0%, Density: 2.6 (kg/l), AFS-number: 39									
	Cromtec 50	<b>-Guaranteed Properties</b>									
		Cr2O3 : min.46%, SiO2 : Max. 1%									
		<b>-Typical Properties</b>									
		Cr2O3 : 46.4%, SiO2 : 0.7%, Al2O3 :14.8%, Fe2O3:28.2%, TiO2:0.7%, MgO: 9.5%									
		Fines(<0.125mm): 1.8%, Density: 2.6 (kg/l), AFS-number: 48									
		<b>-Guaranteed Properties</b>									

		Cr2O3 : min.46%, SiO2 : Max. 1.1%	
	Cromtec 65	<b>Typical Properties</b>	
		Cr2O3 : 46.2%, SiO2 : 1%, Al2O3 :14.9%, Fe2O3: 27.5%, TiO2:0.7%, MgO: 9.5%	
		Fines(<0.125mm): 11%, Density: 2.6 (kg/l), AFS-number: 64	
<b>Product</b>	<b>Product Name</b>	<b>size &amp; Tolerance</b>	<b>Product description</b>
Precision Stamping	Cobalt (Co)	Size: 0.0508mm -3.175mm (0.002" - 0.125")	We provide full-service metal stamping & drawing which is unique premium parts needed for manufacturing synthetic diamond, PCD and PDC in high pressure high temperature environments.
	Copper (Cu)		
	Molybdenum (Mo)		
& Deep Drawing	Tantalum (Ta)	Tol: +/-0.01mm (0.0004")	
	Titanium (Ti)		
	Zirconium (Zr)		