The Ulbrich Family of Alloys: Meeting All Your Stock and Custom Needs with Precision

ALLOY NAME	PRODUCT	UNS	C MAX	NI	CR	OTHER	AMS	ASTM	DENSITY	DESCRIPTION
301	S F ShW	S30100	0.15	6.0–8.0	16.0–8.0		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	S F ShW FW	S30200	0.15	8.0–10.0	17.0–19.0		5516	A 240, A 666, A 313, A 276, A 580	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.
304 / 304V*	S F ShW FW	S30400	0.08	8.0–10.5	18.0–20.0		5513	A 240, A 666, A 313, A 276, A 580	0.29	Low carbon chromium nickel stainless and heat resisting steel somewhat superior to Type 302 in corrosion resistance. *Vacuum Arc Remelted (VAR).
304L / 304LV*	S F ShW FW	S30403	0.03	8.0–12.0	18.0–20.0		5511	A 240, A 666, A 313, A 276, A 580	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. *Vacuum Arc Remelted (VAR).
305	S F ShW	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.
316	S F ShW FW	S31600	0.08	10.0–14.0	16.0–18.0	2.0–3.0 MO	5524	A 240, A 666, A 313, A 276, A 580	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 corrodents; superior creep strength at elevated temperatures.
316L	S F ShW FW	S31603	0.03	10.0–14.0	16.0–18.0	2.0–3.0 MO	5507	A 240, A 666, A 313, A 276, A 580	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.
316LVM	S F ShW FW	S31673	0.03	13.0–15.0	17.0–19.0	0.50 CU, 2.0–3.0 MO		F 139 A 240, A 666, A 313, A 276, A 580	0.29	A highly refined medical grade of stainless steel designed for implant applications. Vacuum Arc Remelted (VAR).
410	S F ShW FW	S41000	0.15		11.5–13.5		5504	A 240	0.28	General purpose corrosion and heat resisting chromium steel. Good corrosion resistance and fair machining properties. Can be treated to RC35/45.
420	S F ShW FW	S42000	.15 min.		12.0–14.0		5506	A-176	0.28	Chromium steel capable of hardening to a maximum of approximately RC53/58.
440A	S F ShW	S44002	.60–.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	S F ShW FW	S17700	0.09	6.5–7.75	16.0–18.0	0.75–1.5 AL	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	S F ShW	S17400	0.07	3.0–5.0	15.0–17.5	3.0–5.0 CU	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.
Nickel Alloys NICKEL 201	S F ShW FW	N02201	0.02	99.0 min.			5553	B 162	0.322	Similar to Nickel 200 except with a lower carbon content for better formability. Most applications in chemicals.
MONEL® 400[1]	S F ShW FW	N04400	0.3	63.0 min.		28.0–34.0 CU		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.
INCONEL® 625[1]	S F ShW FW	N06625	0.1	58.0 min.	20.0–23.0	8.0–10.0 MO	5599, 5869, 5879	B 443	0.305	Outstanding corrosion resistance with excellent fabricability. Good for cryogenic to high temperature applications up to 2000°F.
Cobalt Alloys HAYNES® 25 (L-605)[2]	S F ShW FW	R30605	0.05–0.15	9.0–11.0	19.0–21.0	BAL CO			0.33	Jet engine components, combustion chambers, afterburner parts. Oxidation and carburization resistant to 1900°F. Good high temperature strength.
MP35N®	ShW FW	R30035	0.02	33.0–37.0	19.0–21.0	BAL CO	5758, 5844, 5845	F 562	0.304	An age hardenable Nickel-Cobalt base alloy that has a unique combination of properties – ultra high strength, toughness, ductility and outstanding corrosion resistance. Used in fasteners, springs, nonmagnetic electrical components medical instruments, medical and dental devices, seawater, oil and gas well, and chemical and food processing environments.
Titanium Grade 1–4	S F ShW	R50250 R50400 R50550 R50700						F 67, B 265	0.163	Alpha phase grades of commercially pure titanium with oxygen equivalents resulting in strength levels from low to high.
Grade 9, Ti 3-2.5	S F ShW	R56320	0.05					B 265	0.163	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.
Titanium Alloys Ti 15-3-3-3	S F ShW	R58153	0.05					B 265	0.172	A cold formable metastable beta alloy available in foil and strip which is typically aged to high strengths after fabrication.
Grade 5, Ti 6-4	ShW	R56400	0.08					B 265	0.16	Grade 5 titanium is the workhorse of all the titanium grades. It is also know 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.
Other* NITINOL	ShW FW	NITINOL	0.05						0.235	NITINOL (an acronym for Nickel TItanium Naval Ordnance Laboratory) is a family of intermetallic materials, which contain a nearly equal mixture of nickel (55 wt. %) and titanium. Other elements can be added to adjust the material properties. Nitinol exhibits unique behavior such as "Shape Memory" and "Superelasticity". NITINOL is used for both consumer and medical applications.
NIOBIUM TYPE 1	S F	NIOBIUM						B 393	0.31	Pure niobium, reactor grade, high melting point, corrosion resistant for use in medical and high temperature industrial applications.

S Strip F Foil ShW Shaped Wire FW Fine Wire (Round and Flat)

[1] Trademark of Special Metals Corporation group of companies. [2] Trademark of Haynes International, Inc.
* Other materials available for medical designers include copper alloys, silver plated copper, tungsten and gold plated tungsten.

In addition to the alloys produced by sources identified herein by trademarks, Ulbrich can, in many cases, offer equivalent or similar alloys produced by alternate sources.