Information source:

alloy wire international®

ALLOY	AWS / W.Nr / UNS	APPLICABLE STANDARDS	APPROX CHEMICAL COMPOSITION (%)	TYPICALLY CHOSEN FOR		KEY FEATURES
				HIGH TEMPERATURE	CORROSION RESISTANT	
45/55 NiCu	2.0842	-	**Ni 45 Cu 55**			• 'Electrical Resistance' alloy, used mainly for its medium range electrical resistivity (49 microhms.cm). VERY low temperature-coefficient of resistance. • Good for precision resistors
80/20 NiCr	2.4869 N06003	-	**Ni 80 Cr 20**			• 'Electrical Resistance' alloy (108 microhms.cm), used at operating temperatures up to approx. 1200° C (2200° F) • Good for electric heating elements, control resistors
Alloy 20 CB3	AWS 130 2.4660 N08020	NACE MRO175 ISO 15156	**Fe bal Cr 19 – 21 Ni 32.5 – 35 Cu 3 – 4 Mo 2 – 3**		✓	• Excellent resistance to hot sulphuric acid & many other aggressive environments that would attack ST/ST 316 • Superior resistance to stress corrosion cracking in boiling 20 – 40% sulphuric acid
Duplex 2205	AWS 167 1.4462 S31803	NACE MRO175 ISO 15156	**Fe bal Cr 21 – 23 Ni 4.5 – 6.5 Mo 2.5 – 3.4 N 0.1 – 0.22**		✓	• Greater corrosion resistance than stainless steel 300 series. • Greater pitting resistance and uniform corrosion resistance to stress corrosion cracking than stainless steel 300 series • Good weldability
Hastelloy B-3▫	AWS 051 2.4600 N10675	ASTM B335 ASTM B619	**Ni bal Mo 27 – 32 Cr 1 – 3 Fe 1 – 3**		✓	• Excellent corrosion resistance to hydrochloric acid at all concentrations and temperatures • Withstands sulphuric, acetic, formic & phosphoric acids & other non-oxidising media • Excellent resistance to pitting corrosion & stress corrosion cracking
Hastelloy C-2000▫	AWS 055 2.4675 N06200	ASTM B619 ASTM B574	**Ni bal Cr 22 – 24 Mo 15 – 17 Cu 1.3 – 1.9**		✓	• Developed to resist corrosion in a wider range of media • Resistant to an extensive range of corrosive chemicals including sulphuric, hydrochloric & hydrofluoric acids • Superior pitting resistance and crevice corrosion resistance to Hastelloy C-276 • Excellent corrosion resistance to reducing media • Good oxidising resistance
Hastelloy C-22▫	AWS 053 2.4602 N06022	ASTM B619 ASTM B574 NACE MRO175 ISO 15156	**Ni bal Cr 20 – 22.5 Mo 12.5 – 14.5 Fe 2 – 6 W 2.5 – 3.5**		✓	• Better overall corrosion resistance than Hastelloy C-4 & C-276 and Inconel 625 • Outstanding resistance to pitting, crevice corrosion and stress corrosion cracking
Hastelloy C-276▫	AWS 054 2.4819 N10276	ASTM B619 ASTM B574 NACE MRO175 ISO 15156	**Ni bal Mo 15 – 17 Cr 14.5 – 16.5 Fe 4 – 7 W 3 – 4.5**		✓	• Excellent corrosion resistance in a wide range of corrosive media including, sulphur compounds and chloride ions • Excellent resistance to pitting, crevice corrosion and stress corrosion cracking • Withstands the corrosive effects of wet chlorine gas, hypochlorite and chlorine dioxide • Good for sea water applications.
Hastelloy C-4▫	AWS 052 2.4610 N06455	ASTM B574 ASTM B619	**Ni bal Cr 14 – 18 Mo 14 – 17**		✓	• Excellent resistance to stress-corrosion cracking and to oxidizing atmospheres at high temperature • Exceptional resistance to a wide variety of chemical process environments including, hot contaminated mineral acids, solvents, chlorine, formic and acetic acids, and salt waters.
Haynes 25▫ **/ L605**	AWS 060 2.4964 R30605	AMS 5796 AMS 5759 ASTM F90 NACE MRO175 ISO 15156	**Co bal Cr 19 – 21 W 14 – 16 Ni 9 – 11 Mn 1 – 2**	✓		• Good resistance to oxidising environments at high temperatures for long exposures • Excellent resistance to sulphidation *High temperature static applications
Incoloy 800HT•	AWS 021 1.4958 1.4959 N08811	BS 3076 NA 15H	**Fe bal Ni 30 – 35 Cr 19 – 23 Al 0.15 – 0.6 Ti 0.15 – 0.6 C 0.05 – 0.1**	✓	✓	• Higher creep rupture strength than Incoloy 800 due to close control of C, Al, Ti • Excellent resistance to oxidation and carburisation at high temperatures • Corrosion resistant in many aqueous environments *High temperature static applications
Incoloy 825•	AWS 022 2.4858 N08825	BS 3076 NA 16 ASTM B425	**Fe bal Ni 38 – 46 Cr 19.5 – 23.5 Mo 2.5 – 3.5 Cu 1.5 -3 Ti 0.6 – 1.2**		✓	• Resistant to reducing environments such as those containing sulphuric and phosphoric acids • Resistant to a variety of oxidising substances such as nitric acid and nitrates • Resistant to chloride-ion stress corrosion cracking and, pitting and crevice corrosion • Good for chemical processing.
Incoloy A-286•	AWS 023 1.4944 1.4980 S66286	AMS 5731 AMS 5734 AMS 5737 AMS 5853 BS HR 52 BS HR 650 NACE MRO175 ISO 15156	**Fe bal Ni 24 – 27 Cr 13.5 – 16 Ti 1.9 – 2.35 Mo 1 – 1.5**	✓		• High strength and good corrosion resistance at high temperatures • Age hardenable • Good for high temperature fasteners *High temperature static applications
Inconel 600•	AWS 010 2.4816 N06600	AMS 5687 ASTM B166 BS 3075 NA 14 BS 3076 NA 14	**Ni bal Cr 14 – 17 Fe 6 - 10**	✓		• Good oxidation resistance • Good corrosion resistance at high temperatures *High temperature static applications
Inconel 601•	AWS 011 2.4851 N06601	ASTM B166	**Fe bal Ni 58 - 63 Cr 21 – 25 Al 1 – 1.7**	✓		• Outstanding resistance to oxidation & other forms of high temperature corrosion • Higher mechanical properties at elevated temperatures than Inconel 600 *High temperature static applications
Inconel 625•	AWS 012 2.4856 N06625	AMS 5666 ASTM B446 BS 3076 NA 21 NACE MRO175 ISO 15156	**Ni bal Cr 20 – 23 Mo 8 – 10 Nb 3.15 – 4.15**		✓	• Excellent corrosion resistance in a wide range of corrosive media • Especially resistant to pitting and crevice corrosion • Good for sea water applications
Inconel 718•	AWS 013 2.4668 N07718	AMS 5662 AMS 5663 AMS 5832 AMS 5962 ASTM B637 NACE MRO175 ISO 15156	**Fe bal Ni 50 – 55 Cr 17 – 21 Nb+Ta 4.75 – 5.5 Mo 2.8 – 3.3 Ti 0.65 – 1.15 Al 0.2 – 0.8**	✓		• Good creep rupture strength at high temperatures • Higher strength than Inconel X-750 • Better mechanical properties at lower temperatures than Nimonic 90 & Inconel X-750 • Age hardenable #High temperature dynamic applications
Inconel X-750•	AWS 014 2.4669 N07750	AMS 5667 AMS 5698 AMS 5699 ASTM B637 BS HR 505 NACE MRO175 ISO 15156	**Ni 70 min Cr 14 – 17 Fe 5 – 9 Ti 2.25 – 2.75 Nb+Ta 0.7 – 1.2 Al 0.4 – 1.0**	✓		• Good creep rupture strength at high temperatures • Not as strong as Nimonic 90 • Very good at cryogenic temperatures • Age hardenable #High temperature dynamic applications
Monel 400•	AWS 040 2.4361 2.4360 N04400	ASTM B164 BS 3075 NA 13 BS 3076 NA 13 DTD 204B NACE MRO175 ISO 15156 QQ-N-281	**Ni+Co 63 – 70 Cu 28 – 34**		✓	• Excellent corrosion resistance in a wide range of acidic & alkaline environments • Especially suitable for reducing conditions • Good ductility & thermal conductivity • Good for sea water applications
Monel K-500•	AWS 041 2.4375 N05500	BS 3075 NA 18 BS 3076 NA 18 NACE MRO175 ISO 15156 QQ-N-286	**Ni 63 min Cu 27 – 33 Al 2.3 – 3.15 Ti 0.35 – 0.85**		✓	• Corrosion resistance similar to Monel 400 but with higher strength and hardness • Low permeability and is non-magnetic to temperatures as low as -101°C (-150°F) • Age hardenable • Good for sea water applications
MP35N*	AWS 110 R30035	AMS 5844 ASTM F562 NACE MRO175 ISO 15156	**Co bal Ni 33 – 37 Cr 19 – 21 Mo 9 – 10.5**		✓	• Combination of high strength, ductility and good mechanical properties at ambient temperatures • Excellent corrosion resistance in hydrogen sulphide • Excellent resistance to crevice and stress corrosion cracking in sea water • Age hardenable (Spring Temper only)
Ni-Span C-902•	AWS 080 N09902	AMS 5225 AMS 5221 HS 261	**Fe bal Ni+Co 41 – 43.5 Cr 4.9 – 5.75 Ti 2.2 – 2.75 Al 0.3 – 0.8**			• Outstanding controllable thermoelastic coefficient characteristics • Can be processed to have constant modulus of elasticity from from -45 to +65°C (-50 to +150°F) • Good for springs in watches and weighing equipment • Age hardenable
Nimonic 75•	AWS 032 2.4951 2.4630 N06075	BS HR 5 BS HR 504	**Ni bal Cr 18 – 21 Fe 2 - 5 Ti 0.2 – 0.6 C 0.08 – 0.2**	✓		• Good corrosion resistance • Good heat resistance *High temperature static applications
Nimonic 80A•	AWS 031 2.4952 2.4631 N07080	ASTM B637 BS HR 601 BS 3076 NA 20	**Ni bal Cr 18 – 21 Ti 1.8 – 2.7 Al 1 – 1.8 C 0.04 – 0.1**	✓		• Largely superseded by Nimonic 90 & Inconel X-750 • Still specified for nuclear applications due to low cobalt content • Age hardenable #High temperature dynamic applications
Nimonic 90•	AWS 030 2.4632 2.4969 N07090	AMS 5829 BS HR 501 BS HR 502 BS HR 503 NCK 20TA BS 3075 NA 19 NACE MRO175 ISO 15156	**Ni bal Cr 18 – 21 Co 15 – 21 Ti 2 – 3 Al 1 - 2**	✓		• High stress rupture strength and high creep resistance at high temperatures • Good resistance to high-temperature corrosion and oxidation • Age hardenable #High temperature dynamic applications
Nitronic 60×	AWS 166 UNS S21800	-	**Fe bal Cr 16 – 18 Ni 8 – 9 Mn 7 – 9 Si 3.5 – 4.5 N 0.08 – 0.18**			• Anti galling • Wear resistant • Good for thread inserts
Phynox†	AWS 100 2.4711 R30003	AMS 5833 ISO 5832 AMS 5834 NACE MRO175 ISO 15156	**Fe bal Co 39 – 41 Cr 19 – 21 Ni 14 – 16 Mo 6 – 8 Mn 1.5 – 2.5**		✓	• Combination of high strength, ductility and good mechanical properties at ambient temperatures • Excellent fatigue life • Excellent corrosion resistance in numerous environments • Non magnetic • Age hardenable (Spring Temper only) • Good for sea water applications
Rene 41∞	AWS 120 2.4973 N07041	AMS 5545 AMS 5800	**Ni bal Cr 18 – 20 Co 10 – 12 Mo 9 – 10.5 Ti 3 – 3.3 Al 1.4 – 1.6**	✓		• Very high strength at elevated temperatures • Good oxidation resistance • Age hardenable #High temperature dynamic applications
Titanium Gr.5 / 6Al4V	AWS 151 3.7165 3.7164 UNS R56400	ASTM B348 AMS 4928	**Ti bal Al 5.5 – 6.75 V 3.5 – 4.5**		✓	• Good tensile properties at ambient temperatures compared with other titaniums • Good creep resistance up to approx 300°C (570°F). • Outstanding resistance to corrosion in most natural and many industrial process environments • Approx half the density of nickel alloys
Waspaloy☆	AWS 170 2.4654 N07001	AMS 5544 AMS 5708 AMS 5828	**Ni bal Cr 18 – 21 Co 12 – 15 Mo 3.5 – 5 Ti 2.75 – 3.25 Al 1.2 – 1.6**	✓		• Very high strength at elevated temperatures • Strength is generally comparable to that of Rene 41 and generally superior to Inconel 718 • Age hardenable #High temperature dynamic applications

#Dynamic applications = active / lively / changing *Static applications = still / fixed / motionless / rigid

• Trade names of Special Metals Group of Companies. ▫ Trade names of Haynes International. † Trade name of Imphy Ugine Precision. * Trade name of SPS Technologies. ∞ Trade name of General Electric Inc. ☆ Trade name of United Technologies Corp. × Trade name of AK Steel.