Nickel and cobalt superalloys

Stooss specification	Trade mark	UNS-Nr.	ASTM	Alloy	DIN material no.	Alloy type	BS	AFNOR		Stooss chemical analysis in weight per cent																	
										Ni	Fe	Cr	Co	Mo	W	C	Si	Mn	P	S	Nb	Al	Zr	Cu	Ti	Other alloying elements
Nickel copper alloy																											
Monel 400	Monel 400	N 04400	B 164 B 564	Ni-Cu	2.4360	NiCu30Fe	NA 13	NU 30	min. max.	63.00	1.00 2.50		1.00			0.30	0.50	1.25	0.020	0.020		0.50		28.0 34.0	0.30	
	Excellent corrosion resistance in flowing sea-water, and good corrosion resistance in non-oxidising acids, alkaline solutions and saline solutions, dry gasses like chlorine and hydrochloric gas. Offshore (housings for legs and ascending pipes on extraction platforms, desalinisation, nuclear technology (reactor fuel processing), high-pressure feed water heaters in conventional power stations, mineral oil industry (crude oil distillation), chemical industry e.g. centrifuges, environment technology e.g. steam installations and crystallizers in sewage technology.																										
Monel K-500	Monel K-500	N 05500	B 865	Ni-Cu-Al	2.4375 LW 2.4374	NiCu30Al	NA 18	NU 30 AT	min. max.	64.00	0.50 2.00		1.00			0.18	0.50	1.50	0.015	0.010		2.30 3.15		27.0 33.0	0.35 0.85	
	Hardened nickel copper alloy which combines the excellent corrosion resistance of Monel 400 with distinctly higher mechanical properties. Offshore, deep drilling technology, aviation, aerospace, ship technology, e.g. propeller and pump shafts, valve parts, springs, bolts, measuring apparatus housing, drill rods, condensers, valves.																										
Solution treated nickel chrome alloy and nickel chrome iron alloy																											
Inconel 600	Inconel 600	N 06600	B 564	Ni-Cr	2.4816	NiCr15Fe	NA 14	NC 15 Fe	min. max.	72.00	6.00 10.00	14.00 17.00				0.08	0.50	1.00	0.015	0.015		0.30		0.50	0.30	B max. 0.006
	High corrosion resistant Ni-Cr-Fe alloy with a broad area of application from deep temperature ranges up to approx. 1050°c. Standard material for furnace construction (nitriding furnaces); chemical equipment manufacture e.g. ammonia separators, gas carburising plants, production plants for chlorinated and fluoridated carbon hydrides and for alkalis, reactors, heat exchangers equipment producing vinyl chlorides; nuclear technology e.g. steam generating pipes. Low carbon version with excellent resistance to intercrystalline corrosion and exceptional indifference to stress corrosion cracking.																										
Inconel 625	Inconel 625	N 06625	B 564 B 446	Ni-Cr	2.4856	NiCr22Mo9Nb	NA 21	NC 22 D Nb	min. max.	58.00	3.00	21.00 23.00	1.00	8.00 10.00		0.10	0.50	0.50	0.015	0.015	3.20 3.80	0.40		0.50	0.40	
	Ni-Cr-Mo alloy with excellent resistance to very many organic and mineral acids, excellent resistance to localised, crevice, stress and vibrational corrosion (alloy 625 LCF). Installations for processing natural gas, crude oil on offshore oil rig platforms, flue gas desulfurizing plants, garbage burning, equipment for the production and processing of mineral and organic acids and alkalis, aerospace.																										
Hastelloy C-22	Hastelloy C-22	N 06022	B 564 B 574	Ni-Cr-Mo	2.4602	NiCr21Mo14W			min. max.	Rest	2.00 6.00	20.00 22.50	2.50	12.50 14.50	2.50 3.50	0.010	0.08	0.50	0.020	0.010						V: max. 0.35
	High corrosion-resistant Ni-Cr-Mo-W alloy with excellent resistance in oxidising and reducing media, also at high temperatures. Environment technology equipment e.g. agitators, blowing engines, heat exchangers, pipe lines, exhaust gas cleaning systems in waste burning equipment and power stations, waste water treatment systems; chemical industry, chlorine devices, centrifuges, paper and pulp processing.																										
Hastelloy C-276	Hastelloy C-276	N 10276	B 564 B 574	Ni-Mo	2.4819	NiMo16Cr15W		NCD 17 WY	min. max.	Rest	4.00 7.00	15.00 16.50	2.50	15.00 17.00	3.00 4.50	0.010	0.08	1.00	0.025	0.010						V: 0.10–0.30
	High corrosion-resistant Ni-Cr-Mo-W alloy with good resistance against many corrosive, oxidising and reducing media. Excellent resistance to hot, contaminated, mineral and organic acids such as sea water. Critical procedures in the chemical and petrochemical industries; paper and pulp industries; crude oil industry; conveying systems; environmental technology, waste burning and flue gas desulfurizing equipment.																										
Hastelloy X	Hastelloy X	N 06002	B 572 B 435	Ni-Cr	2.4665	NiCr22Fe18Mo	HR 6	NC 22FeD	min. max.	Rest	17.00 20.00	20.50 23.00	0.50 2.50	8.00 10.00	0.20 1.00	0.05 0.15	1.00	1.00	0.015	0.015		0.10		0.50	0.15	B: 0.002–0.008
	Ni-Cr-Fe-Mo alloy with first-rate oxidisation resistance and excellent mechanical properties up to 1200°c. Components for gas turbines in jet engine and turbine construction in the form of rods, rings, disks; industrial furnaces, holding devices, conveyor rollers, chemical industry; catalyst carriers, gas regulators etc.																										
Hastelloy C-4	Hastelloy C-4	N 06455	B 574	Ni-Cr	2.4610	NiMo16Cr16Ti			min. max.	Rest	3.00	14.50 17.50	2.00	14.00 17.00		0.009	0.05	1.00	0.025	0.015				0.50	0.70	
	High corrosion resistant Ni-Cr-Mo alloy with excellent thermal stability. Applicable at working temperatures up to 400°c. Environmental technology, sewage processing, waste burning and flue gas desulfurizing equipment; chemical industry; heat exchangers, pipe lines, valves, centrifuges for neutralisers.																										
Solution treated iron nickel alloys																											
Incoloy 825	Incoloy 825	N 08825	B 425 B 564	Ni-Fe-Cr	2.4858	NiCr21Mo			min. max.	38.00 46.00	22.00	19.50 23.50	1.00	2.50 3.50		0.025	0.50	1.00	0.020	0.010		0.20		1.50 3.00	0.60 1.20	
	Titanium stabilised Ni-Fe-Cr alloy with excellent resistance to stress corrosion cracking and good resistance to reducing and oxidising hot acids. Chemical industry, phosphoric and sulphuric acid evaporators, pickling plants, pump parts, filter systems, salt processing, centrifuges, pipe lines, bars, storage and transport tanks for acids; on and offshore technology, heat exchangers, product lines, conveyor pipes; nuclear technology; installations for processing used fission material.																										
Heat treatable nickel base alloys																											
Nimonic 80A	Nimonic 80A	N 07080	B 637	Ni-Cr	2.4952 2.4631	NiCr20TiAl	HR 1 (NA 20)	CN20TA	min. max.	65.00	1.00	19.00 21.00	2.00			0.040 0.090	1.00	1.00	0.020	0.015		1.10 1.70		0.20	2.00 2.60	B: max. 0.008, Pb: max. 0.0020
	Heat treatable, high temperature Ni-Cr alloy with similar corrosion resistance to Alloy 75 and higher creep resistance and long-time rupture strength up to 815°c. Rings, disks, screws and blades for steam turbines, exhaust valves for diesel engines.																										
Inconel 718 Inconel 718 FG	Inconel 718 Inconel 718 FG	N 07718	B 637 B 670	Ni-Cr	2.4668	NiCo19NbMo	HR 8	NC19FeNb	min. max.	50.00 55.00	 Rest	17.00 21.00	1.00	2.80 3.30		0.03 0.08	0.35	0.35	0.015	0.015		0.40 0.70		0.10	0.70 1.15	Nb+Ta 4.75–5.50 B: 0.002–0.006
	Heat treatable, high temperature Ni-Cr-Fe alloy with excellent corrosion resistance to many acids, caustic solutions and sulphuric compounds at high and low temperatures, good resistance to localised and stress corrosion cracking and particularly high alternating stability and long-time rupture strength up to 700°c. Aviation and aerospace: highly stressed building components in gas turbines and rocket engines, turbine disks, parts for liquid boosters; nuclear technology, nuclear reactor components; offshore drilling head and drill hole equipment for oil and gas production, pump shafts and other highly stressed components.																										
Incoloy 925	Incoloy 925	N 09925	B 637	Ni-Fe-Cr					min. max.	42.00 46.00	22.00	19.50 22.50		2.50 3.50		0.03	0.50	1.00	0.030	0.030	0.50	0.10 0.50		1.50 3.00	1.90 2.40	
	Heat treatable, high temperature Ni-Fe-Cr alloy with excellent corrosion resistance to localised, stress corrosion cracking in countless media - including media containing sulphide and chloride. Offshore, surface and drill hole fittings in acid gas fields as well as for oil extracting equipment.																										

Details on material application are for description purposes only. They are provided to the best of our knowledge, but without any guarantee. Special agreements in writing are always required.