NICKEL ALLOYS

HPW

Nickel Alloy Wires

HIGH PERFORMANCE WIRES

Nickel and nickel-based alloys are mainly used in the welding, lighting, electronic and optical as well as chemical and petrochemical industries. From electronic parts to spectacle frames, from wires for heating conductors to forging parts, from welding rods to reinforcements of cables: Our products have been developed for a wide range of very different applications and have been successfully used in various fields for many years. We develop alloys of Nickel, Cobalt and Copper using all elements from the spectrum of metals. These alloys are produced by ingot casting and used as semi-finished metal products from forging bars to fine wires for various applications. Our expertise is found in metallurgy and forming.

Melting Shop

In our in-house melting shop, we manufacture a broad range of over 50 different Nickel and Cobalt alloys. Our round and flat wires are customized in chemical composition and mechanical properties. The typical melting lot size of 2 metric tons allows cost efficient development of new alloys according to customer requirements. Our up cast melting process ensures to reach an optimized purity of each element according to the specified chemical composition. After internal melting operation, the hot rolling process into billets, bars and wire rods is done in cooperation with external subcontractors. Subsequent manufacturing such as annealing, drawing, surface treatment or machining into finished product is again done internally.

Two medium frequency induction furnaces with 2MT melt size.

Ingot or slab with up casting process.

Flexible melting operation offering customer specific chemistry and short lead times.

Broad range of Nickel and Cobalt alloys for a large variety of industrial applications.

Spark spectrometer and ICP testing of chemical elements.

Hot ingot rolling into billets, bars or wire rods.

Materials

Nickel

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
Ni 99.6	2.4060	17740						
LC-Ni 99.6	2.4061	17740						
Ni 99,2	2.4066	17740	N 02200	B 160		NA 11	3075, 3076	
LC-Ni 99	2.4068	17740	N 02201	B 160		NA 12	3075, 3076	
Ni 205			N 02205	F3				
NiMn 2	2.4110	17741	N 02212					
NiMn 5	2.4116	17741	N 02211	F 290				
SG-NiTi 4	2.4155	ISO 18274	N 02061		A 5.14 / ERNi-1	NA 32	2901	
NiAlY								Alloy 125
NiCr 2 Mn Si	2.4146	17741						

Nickel-Copper

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
NiCu 30 Fe	2.4360	17743	N 04400	B 164		NA 13	3075, 3076	
LC-NiCu 30 Fe	2.4361	17743	N 04402					
NiCu 30 Fe S			N 04405	B 164				
NiCu 30 Al	2.4375	17743	N 05500	B 865		NA 18	3075, 3076	
SG-NiCu 30 MnTi	2.4377	1736-T1	N 04060		A 5.14 / ERNiCu-7	NA 33	2901	

Compositions

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
Ni 99.6	99.65		0.05	0.03	0.15		0.05	0.05							
LC-Ni 99.6	99.65		0.05	0.01	0.15		0.05	0.05							
Ni 99,2	99.4		0.05	0.05	0.25		0.05	0.05							
LC-Ni 99	99.4		0.05	0.01	0.25		0.05	0.05							
Ni 205	99.4		0.05	0.03	0.25	0.03	0.05	0.05	0.03						
NiMn 2	97.5		0.1	0.01	1.9		0.05	0.05							
NiMn 5	94.5		0.1	0.01	4.8			0.1							
SG-NiTi 4	95.5		0.1	0.02	0.3		0.3	0.05	3	0.3					
NiAlY	97		0.1	0.03	0.1		1.1			1.2				0.005	Y: 0.1%
NiCr 2 Mn 2 Si	96	1.6		0.1	1.5		0.6								

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
NiCu 30 Fe	65		1.5	0.05	1.0		0.05	30							
LC-NiCu 30 Fe	65		1.5	0.02	1.0		0.05	30							
NiCu 30 Fe S	64.5		1.5	0.1	1.9		0.1	30						0.04	
NiCu 30 Al	64		0.8	0.1	0.7		0.15	29	0.6	3.0					
SG-NiCu 30 MnTi	63.5		0.7	0.03	3.1		0.1	30	2.1	0.2					

Applications

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
	Lead wires for lamps, electronic components, strands and expansion wires	Weavings and filters for the chemical industry	Corrosion resistant cold heading parts with good thermal conductivity	Electrode core wires for welding pure Nickel and low Nickel alloys. Surface-layer and repair welding of cast iron
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	Strands and expansion wires	Weavings and filters for the chemical industry	Corrosion resistant cold heading parts with good thermal conductivity	
	Lead wires for lamps, electronic components, strands and expansion wires			
	Lead wires for lamps, electronic components, strands and expansion wires			
	Lead wires for lamps, electronic components, strands and expansion wires		Spark plug electrodes	
				MIG and TIG weldings, electrode core wires
			Spark plug electrodes	
			Spark plug electrodes	

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
	Lead wires for lamps	Saltwater proofed components, weavings for the chemical and petrochemical industry	Optical industry, aerospace and electric contacts	Electrode core wire
		Weavings and filters for the chemical industry		
		Machined parts and components		
		Age hardening alloys for the chemical and petrochemical industry		
				MIG and TIG welding

Materials

Nickel-Chromium

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
NiCr 80 20	2.4869	17470	N06003	B 344				
SG-NiCr 20	2.4639	ISO18274				NA 34	2901	
SG-NiCr 20 Nb	2.4806	ISO18274	N 06082		A 5.14 / ERNiCr-3	NA 35	2901	Alloy 82
SG-NiCr 21 Mo 9 Nb	2.4831	ISO18274	N 06625		A 5.14 / ERNiCrMo-3			Alloy 625

Nickel-Chromium-Iron

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
NiCr 15 Fe	2.4816	17742	N 06600	B 166		NA 14	3075, 3076	
NiCr 15 Fe Nb			N 06062		A 5.14 / ERNiCrFe-5			
NiCr 60 15	2.4867	17470	N 06004	B 344				
NiCr 30 20	1.4860	17470						
NiCr 15 Fe Ti								

Compositions

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
NiCr 80 20	79.5	19.5	0.2	0.02	0.2		0.1	0.1							
SG-NiCr 20	78.5	20	0.2	0.05	0.8		0.3	0.1							
SG-NiCr 20 Nb	73	20	0.5	0.02	3		0.2	0.1	0.3				2.5		
SG-NiCr 21 Mo 9 Nb	65	21	0.5	0.02	0.2		0.1	0.1	0.1	0.1	9		3.5		

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
NiCr 15 Fe	73.5	16	9	0.03	0.2		0.3	0.05	0.2	0.2					
NiCr 15 Fe Nb	75	15	6,5	0,006	0,98	0,03	0,15	0,02	0,13				1.9		
NiCr 60 15	60	15	23	0.05			1								
NiCr 30 20	30	20	47	0.05	1		1.5								
NiCr 15 Fe Ti	72.5	15.5	6.25	0.036	2.35		0.7		2.5	0.1					

Applications

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
	Heating elements			
				Electrode core wire
				MIG and TIG welding, electrode core wires
				MIG and TIG welding, electrode core wires

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
		Industrial furnaces, weavings and filters for the chemical industry	Spark plug electrodes	
		Industrial furnaces, weavings and filters for the chemical industry		
	Electrical heating elements			
	Electrical heating elements			
				MIG and TIG welding, electrode core wires

Materials

Nickel-Iron

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
Ni 36	1.3912		K 93601	B 388				SEW 385, MIL-I-23011
Ni 38 Mo 2								
Ni 41			K 94100	F 30				MIL-I-23011
Ni 42	1.3917	17745						SEW 385, MIL-I-23011
Ni 46	1.3920		K 94600	F 30				SEW 385, MIL-I-23011
NiFe 47 Cr 6	2.4486	17745						SEW 385
Ni 48	1.3922	17745	K 94800	F 30				SEW 385, MIL-I-23011
Ni 50								MIL-I-23011
Ni 52	1.3928		N 14052	F 30				SEW 385, MIL-I-23011
NiCo 29 18	1.3981	17745	K 94610	F 15				SEW 385, MIL-I-23011
SG-NiFe2		8573	W 82002		A 5.15 / ENiFe-CI			
NiFe 43								
NiFe 45								
Ni70								

Compositions

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
Ni 36	36		63	0.05	0.4		0.3								
Ni 38 Mo 2	38	0.7	58	0.2							2				
Ni 41	41		58	0.03	0.5		0.2								
Ni 42	42		56.5	0.05	0.8		0.2								
Ni 46	46		53	0.03	0.5		0.2								
NiFe 47 Cr 6	47.5	6	45.5	0.01	0.4		0.15								
Ni 48	48		51	0.03	0.5		0.2								
Ni 50	50		49	0.02	0.5		0.1								
Ni 52	51		48	0.02	0.5		0.1								
NiCo 29 18	29		53	0.02	0.3		0.1					17.5			
SG-NiFe2	54		40	0.08	3.5		0.2	1.5	0.3						
NiFe 43	58		40.5	0.05	0.8		0.1	0.1							
NiFe 45	56		42.5	0.05	0.8		0.1	0.1							
Ni70	69,5		29	0,03	0,2		0,14	0,23	0,22						

Applications

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
	Measuring and control technology			
	Over head lines			
	Components for lamps, thermobimetals, glass to metal sealings			
	Components for lamps, thermobimetals, glass to metal sealings			
	Components for lamps, thermobimetals, glass to metal sealings			
	Glass to metal sealings			
	Glass to metal sealings			
	Glass to metal sealings			
	Glass to metal sealings			
				Cast iron welding
				Cast iron welding
				Cast iron welding
	Glass to metal sealings			

Materials

Copper-Nickel

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
CuNi 1	2.0842	17471	N 04401					
CuNi 2	2.0802	17471	C 70200					
CuNi 6	2.0807	17471	C 70300					
CuNi 10	2.0811	17471	C 70700					
CuNi 10 Fe 1 Mn	2.0872	17664	C 70600	B 151		CN 102	2873	
SG- CuNi 10 Fe	2.0873	1733	C 16 2901			C16	2901	
CuNi 15								
CuNi 20						CN 104	2873	
CuNi 23 Mn	2.0881	17471						
CuNi 30 Mn	2.0890	17471		B 151				
CuNi 30 Mn 1 Fe	2.0882	17664	C 71500	B 151		CN 107	2873	
SG-CuNi 30 Fe	2.0837	1733	C 71581		A 5.7 / ERCuNi	C 18	2901	
CuNi 40Mn 5Fe 5Cr2*								HPW400
CuNi 44	2.0842	17471	N 04401					

* patent-registered

Cobalt-Iron

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
CoFe 5								
CoFe 5 Ni								

Compositions

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
CuNi 1	1							98.5							
CuNi 2	2							97.5							
CuNi 6	5.5							94							
CuNi 10	9.8							89.5							
CuNi 10 Fe 1 Mn	10.5		1.5		0.7			87							
SG- CuNi 10 Fe	10		0.8		0.8			87.5	0.4						
CuNi 15	14							85							
CuNi 20	19.5							79.5							
CuNi 23 Mn	23				1.5			75							
CuNi 30 Mn	30				3			66							
CuNi 30 Mn 1 Fe	30.5		0.6		0.7			67.5							
SG-CuNi 30 Fe	31		0.5		0.8			66.5	0.4						
CuNi 40Mn 5Fe 5Cr2*	40	2	5		5			47							
CuNi 44	43.5				0.6			55.5							

Applications

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
	Electrical resistances			
	Electrical resistances			
	Electrical resistances			
	Electrical resistances			
		Parts for heat exchangers and capacitors	Parts for cold heading in offshore and electronic applications	
				Welding material
	Electrical resistances			
	Electrical resistances		Parts for cold heading in offshore and electronic applications	
	Electrical resistances			
		Parts for heat exchangers and capacitors		
				Welding material
		Saltwater proofed components, weavings for chemical and petrochemical industry	Optical industry, aerospace	
	Electrical resistances, thermocouples		Parts for cold heading in offshore and electronic applications	

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
				Welding material
				Welding material

Materials

Composite materials

Alloy	Mat. No	DIN	UNS	ASTM	ANSI/AWS	BS Alloy	BS No.	Others
ICN 43								
ICN 45								
ICN 60								
CCS 40				B 452				
CCS 50								
CCS 55								
CCS 60								
CCS 70								
CCS 80								
CCCN32								
CCAM50								

Compositions

Alloy	Ni	Cr	Fe	C	Mn	Mg	Si	Cu	Ti	Al	Mo	Co	Nb	S	Others
ICN 43	57		42	0.04	0.3		0.05								
ICN 45	55		44	0.04	0.3		0.05								
ICN 60	40		59	0.05	0.3		0.05								
CCS 40	Copper Clad Steel Wires 40 % IACS														
CCS 50	Copper Clad Steel Wires 50 % IACS														
CCS 55	Copper Clad Steel Wires 55 % IACS														
CCS 60	Copper Clad Steel Wires 60 % IACS														
CCS 70	Copper Clad Steel Wires 70 % IACS														
CCS 80	Copper Clad Steel Wires 80 % IACS														
CCCN 32	Copper Clad Coppernickel Wires 32 % IACS														
CCAM 50	Copper Clad AlMg 1 Wires 22 % IACS														

Applications

	Wires for the electric and electronic industry	Semi-finished products for chemical plants, pressure vessels and constructions	Optical and cold heading applications	Welding consumables
				Electrode core wires for cast iron welding
				Electrode core wires for cast iron welding
				Electrode core wires for cast iron welding
		Lead wires for electronic components		
		Lead wires for electronic components		
		Lead wires for electronic components		
		Lead wires for electronic components		
		Lead wires for electronic components		
		Lead wires for electronic components		
		Lead wires for electronic components		

Nickel Alloy and Cobalt Iron Flat Wires

Our decades of experience in the production of high precision flat wires of Nickel and Cobalt alloys guarantees the best in class quality with smooth-rounded burr-free edges.

The large vertical range of manufacture – from our own melting shop for Nickel and Cobalt Iron alloys to modern rolling mills – enables us to react flexibly to special customer requirements regarding chemical composition of the material, special surface characteristics, wire dimensions or mechanical properties. With our in-house melting shop we are a preferred partner when it comes to customized solutions depending on the specific requirements of each single application.

Our cold-rolling skills are supported by the latest measuring technology which enables us to produce up to 400kg without any welds. Application of these alloys include armoring of cables used in oil rigs or fluxed cored welding wires.

Dimensions

Dimensions as rolled	**rolled strip with edges**	
Thickness	0,10 – 2,00 mm > 2,00 – 9,50 mm	± 0,01 mm ± 0,02 mm
Width	1,5 – 13 mm > 13 – 23,0 mm	± 0,10 mm ± 0,20 mm
Maximum Width/Thickness Ratio		50:1
Other dimensions on request		
Material Types		
Ni, Cu, NiFe-Alloys, NiCr-Alloys, NiCu-Alloys, CuNi-Alloys, CoFe5/CoFe5Ni, NiAlY/NiCr2Mn2Si, FeCrAl-Alloys		
Other materials on request		

Delivery forms	**Wooden spool 630**	**Coils 160**	**Coils 400**	**VMV 630**
Outer Diameter	630 mm	850 mm	750 mm	630 mm
Bore Diameter	400 mm	400 mm	400 mm	127 mm
Inner Width	250 mm	160 mm	400 mm	380 mm
Max. Filling Weight	200 kg	430 kg	800 kg	350 kg
Min. Width of Strip	5,0 mm	8,0 mm	8,0 mm	5,0 mm
For smaller dimensions following spools are possible: K100/K125/ K1607K200/K250				

Resistance Alloy Wires

We offer resistance wires like NiCr, FeCrAl and NiCu. Our round and flat resistance wires are customized in chemistry and mechanical properties according to customer's requirement. Heating elements, due to its flexibility, durability and tensile strength are commonly used in consumer goods or in a large variety of industrial applications.

NiCr
Nickel Chromium is corrosion-resistant and has a high melting point of about 1,400°C. When exposed to elevated temperatures, it develops an outer layer of chromium oxide, which is thermodynamically stable in air, mostly impervious to oxygen and protecting the heating element from further oxidation. NiCr resistance wires are used in various industrial applications such as motorcycle mufflers, microbiological lab apparatus, extrusion machines or electronic cigarettes.

CuNi
Copper Nickel alloys are medium to low resistance materials typically used in applications with maximum operating temperatures up to 400°C. They mechanically feature good ductility, are easily soldered and welded and show an outstanding corrosion resistance. Typically CuNi alloys are used in high current applications such as heating elements in electrofusion pipe fittings, wire-wound precision resistors, potentiometers, winding heavy-duty industrial rheostats or electric motor resistances.

FeCrAl
Iron Chromium Aluminum shows high thermal conductivity but it is an electrical insulator, so special techniques may be required to manufacture good electrical connections. This alloy has a melting point of 1,425°C. Typical applications include, high temperature load resistors, braking and starting resistors, and domestic appliances such as hot plates, irons, and electric furnaces. It is also used in resistors, lab furnaces, and heavy relay switches.

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