

COBALT BASE COMPONENTS



Brand ID	Metal Grade	Chemical Composition(Weight%)									Hardness HRC	Application	Reference Standard
		C	Cr	W	Si	Fe	Mo	Mn	Ni	Co			
HCS 1Z	Co101	2.5	29	12	1	3	1	1	3	Bal	48-53	Used for working condition without thermal and mechanical shock exists, e.g. pump shaft sleeve, rotating sealing seat ring, wear-resistance gasket, bearing bush, homogenize pars, galvanized iron pot roller, plastics extruder gasket.	
HCS 3Z	Co103	2.5	30	12.5	1	3	1	1	3	Bal	48-53		
HCS 4Z	Co104	0.9	32	14	1	1	0.5	0.5	0.5	Bal	43-47	Used in hot pressing for mechanical shock, e.g. hot pressing and extruding copper/aluminum alloy die, zinc-plating equipment bearing, cell die, etc.	
HCS 6Z	Co106	1.2	29	4.5	1.5	3	1.5	1	3	Bal	≥37	Used to produce steam and chemical valve seats.	AMS 5387C UNS R30006
HCS12Z	Co112	1.6	29	8	1.5	2.5	1	1	3	Bal	45-50	Used to produce hot extruding die, zinc-plating equipment bearing, etc.	
HCS20Z	Co120	2.5	32	17	1	2.5	1	1	2.5	Bal	52-58	Used for working condition without thermal and mechanical shock exists, e.g. pump shaft sleeve, rotating sealing seat ring, wear-resistance gasket, bearing bush, homogenize pars, galvanized iron pot roller, plastics extruder gasket, Copper extrusion die core, plastics injection bushing.	
HCS21Z	Co121	0.25	27	--	1	3	3.5	1	2.75	Bal	≤34	Used in steam turbine blade, brass casting die, hot extruding die and orthopedic implant joint	AMS 5385G UNS R30021
HCS31Z	Co131	0.5	25.5	7.5	1	2	0.5	1	10.5	Bal	≤34	Used in steam turbine blade, shaft sleeve and hot extruding die, etc.	AMS 5382H UNS R30031
HCS33Z	Co133	2.3	33	17.5	1	2	--	0.8	1	Bal	≥52	Used in high temperature bushing of Fluidized bed thermocouples, food homogenizer collision ring, etc.	
HCS400Z	Co193	0.04	8	--	2.6	≤2	27	--	--	≥62	52-55	Engine Valve seat ring	SAE J775 UNS R30400 T400
HCS800Z	Co180	0.1	18	--	3	≤2	28.5	--	≤1	Bal	≥50	Used in high temperature and corrosion-resistant valve gate, valve board and plastics extruder gasket	T800

NICKEL BASE COMPONENTS



Brand ID	Metal Grade	Chemical Composition(Weight%)										Application	Reference Standard
		C	Si	Cr	Mo	Mn	Fe	Cu	Ti	Ai	Ni		
HCS 200Z	NI200	1	2	--	--	1.5	3	1.25	--	--	Bal	Used in sea water, lye, hydrofluoric acid and other corrosion liquid.	ASTM A494 CZ100
HCS 202	NI202	0.15	3.3	--	--	--	--	--	--	B2.3	Bal	Glass mould, plunger chip, plug, control ring, etc.	Dameron 40
HCS CZ	NI205	0.12	1	16.5	17	1	6.5	--	W4	V0.3	Bal	Chemical industrial pump and valve, sulphuric acid valve, mixed acid valve and oxygen valve.	ASTM A494 CW-12MW
HCS BZ	NI206	0.12	1	1	28	1	5	--	--	V0.4	Bal	Used in hydrochloric and gaseous hydrogen chloride-resistant parts of pump and valve for chemical industry.	ASTM A494 N-12MV
HCS207	NI207N	--	1.2	25	11	--	--	--	--	--	Bal	Dental Material	
HCS219	NI219	--	--	12.7	9	--	--	Be2	0.4	2	Bal	Dental Material	NiBe19 Ingot
HCS22	NI222	--	0.5	22	13	0.7	4	--	--	--	Bal	Mixed acid, sulphuric acid, chloride and acetic acid	ASTM A494 CX2MW
HCS30C	NI230	0.3	1.5	--	--	1.5	3.5	30	Nb2	--	Bal	Used in chemical pump and valve, sea water, hydrofluoric acid, lye, sulphuric acid.	ASTM A494 M-30C
HCS35-2	NI235	0.35	2	--	--	1.5	3.5	30	Nb0.5	--	Bal	Same as M-30C	ASTM A494 M-35-2
HCS35-1	NI240	0.35	1.25	--	--	1.5	3.5	29.5	Nb0.5	--	Bal	Used in sea water, sulphuric acid, hydrofluoric acid, lye and Oxygen valve.	ASTM A494 M-35-1
HCS255	NI255	0.05	0.5	12.5	3	1.5	1.7	Bi4	Sn4	--	Bal	For impeller in food industry	ASTM A494 CY5SnBiM
HCS600	NI260	0.4	3	15.5	--	1.5	11	--	--	--	Bal	Used in heat exchange pipe, valve and inner parts of ammonia compounding column, oxygen valve and etc.	ASTM A494 CY40

IRON BASE COMPONENTS



Brand ID	Metal Grade	Chemical Composition (Weight%)										Application	Reference Standard
		C	Si	Cr	Mo	Mn	Ni	N	Cu	Ti	Fe		
HCS 20#	Fe320	0.07	1.5	21	2.5	1.5	29	--	3.5	--	Bal	For concentrated sulphuric acid and alkylation valve.	ASTM A743M CN-7M
HCS 825	Fe325	0.05	1	21.5	3	1	41	--	2.5	Nb0.9	Bal	For sulfur resistant valve, heat exchanger, condenser and sulphuric acid environment with multiple ions.	ASTM A494 CU5MCuC
HCS 333	Fe333	0.8	1.5	33	1.5	2.5	10	0.25	0.25	RE0.2	Bal	For high temperature wear-resistant electric coupler sleeve.	GB/T 5235 ZG8Cr33Ni9N
HCS 340	Fe340	0.4	2	26	0.5	2	20	--	--	--	Bal	For the heat-resistant environment of furnace roller, trestle, frame and etc.	ASTM A297 HK
HCS 344	Fe344	0.025	1	20	6.5	1.2	18.5	0.2	1	--	Bal	For pump and valve under reductive acid medium condition and marine equipment, etc.	ASTM A451 CK3MCuN
HCS 351	Fe351	0.03	1	22	3	1.5	5.5	0.2	--	--	Bal	Offshore industry, coal chemical industry, petroleum pump and valve	ASTM A890 4A/CD3MN
HCS 353	Fe353	0.03	1	25	4.5	1.5	7	0.2	--	--	Bal	Offshore industry, coal chemical industry, petroleum pump and valve	ASTM A890 5A/CE3MN
HCS 354N	Fe354N	0.04	1	25	2	1	5	0.2	3	--	Bal	Offshore industry, coal chemical industry, petroleum pump and valve	ASTM A890 1B/CD4MCN
HCS 355	Fe355	0.03	1	25	3.5	1	7.5	0.25	0.7	W0.8	Bal	Offshore industry, coal chemical industry, pump and valve of petroleum and chemical fertilizer industry.	ASTM A890 6A/CD3MWCuN
HCS 374	Fe374	0.07	1	16.5	--	0.5	4	--	2.8	0.3	Bal	For wear-resistant scrapers, corrosive conditions valve cages, valve balls and other parts in the paper industry	ASTM A747 CB7CU-1
HCS 3C4	Fe3C4	0.03	4	14	--	0.5	14	--	--	--	Bal	Concentrated nitric acid pump valve, subsea valve	GB/T2100 ZG03Cr14Ni14Si4
HCS 342	Fe342	0.5	2	26	--	1	35	--	--	--	Bal	For heat treatment furnace, high temperature gals boiler, emission device, ad etc.	ASTM A297 HP
HCS Mo6	Fe356	0.02	0.8	21	6.5	1.5	25	0.22	--	--	Bal	For reductive acid valve pump body, seawater corrosion-resistant equipment	ASTM A451 CN3MN

COPPER BASE COMPONENTS



Brand ID	Metal Grade	Chemical Composition (Weight%)									Application	Reference Standard
		Al	Fe	Mn	Si	Ni	Pb	Sn	Zn	Cu		
HCS CuAlNi	Cu402	9	4	1.2	--	4.5	--	--	--	Bal	For seawater and oxygen valve.	ASTM B148 C95800
HCS CuAl	Cu403	10	1	--	--	--	--	--	--	Bal	Used in seawater	ASTM B148 C95300
HCS Cu408	Cu408	--	--	--	--	1	1.5	6	4	Bal	For Oil pumps, gears, bushings, valves, etc.	ASTM B61 C92200
HCS Cu409	Cu409	--	1.5	1	0.15	25	2	5	2	Bal	For Regulating ring of safty valve in steam environment.	ASTM B584 C97800
Cu410M	Cu410M	--	--	--	--	2	1.5	10	2	Bal	For marine valves, wear-resistant heavy-duty bearings, gears, pump plungers, elevator components	GB/T 1176 ZCSn10Zn2/10-2
HCS Cu4111	Cu411	--	--	--	--	1	5	5	5	Bal	For low pressure valve, pipe fittings, petroleum pipe fittings, fire fighting accessories, pinion gears, small pump parts	ASTM B62 C83600

CONSUMABLES - Electrodes



Cobalt-Base Electrodes

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness (HRC)	Application	Reference Standard
		C	Cr	W	Si	Fe	Mo	Mn	Ni	Co			
HCS ED1	EDCo101	2.10	29.00	14.00	1.00	5.00	1.00	2.00	3.00	Bal	50	Used for surfacing welding of parts that bear severe wear and low impact, such as rotating seal rings, cone bearings, valve seats, cutting edges, etc.	AWS A5.13 ECrCo-C
HCS ED6	EDCo106	1.00	29.00	4.50	1.00	5.00	1.00	2.00	3.00	Bal	40	Used for high temperature and high pressure valves, hot shear blades, turbine blades, etc.	AWS A5.13 ECrCo-A
HCS ED12	EDCo112	1.40	29.00	8.50	1.00	5.00	1.00	2.00	3.00	Bal	44	Used for scratch resistance and intermetallic wear resistance, such as high temperature and high pressure valves, hot shear edges, serrations, turbine blades, etc.	AWS A5.13 ECrCo-B
HCS ED21	EDCo121	0.20	27.00	/	1.00	5.00	5.00	2.00	3.00	Bal	20	Used to resist thermal shock, oxidation and reducing gas, such as guide roller, hot extrusion die and forging die, hydraulic turbine blade, etc.	AWS A5.13 ECrCo-E
HCS ED25	EDCo125	0.10	20.00	15.00	0.80	5.00	1.00	2.00	10.00	Bal	22	Used for high temperature corrosion resistant valve sealing surface, seamless pipe plug, die casting die, etc.	

Nickel-Base Electrodes

Brand ID	Metal Grade	Chemical Composition (Weight%)									HRC	Application	Reference Standard
		C	Si	Cr	Mo	Mn	Fe	Co	W	Ni			
HCS EDC	EDNi205	0.10	0.60	16.50	17.00	1.00	5.00	2.50	4.00	Bal	35	Used to resist high temperature wear and impact working conditions, such as hot pressing die, hot forging die, guide roller, etc.	AWS A5.13 ENiCrMo-5A

Iron-Base Electrodes

Brand ID	Metal Grade	Chemical Composition (Weight%)				Hardness (HRC)	Application	Reference Standard
		C	Cr	Fe	Other			
HCS	EDCr-B	0.20	13.00	Bal	5.00	≥45	Used for surfacing welding of parts with wear between metals and weak acid and cavitation corrosion, such as valve sealing surface, shaft and mixer slurry.	GB/T 984-2001

CONSUMABLES - Cobalt Bare Rods



Cobalt-Base Bare Rods

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness (HRC)	Application	Reference Standard
		C	Si	Mn	Mo	Cr	W	Ni	Fe	Co			
HCS 1	Co101	2.50	1.00	≤1.00	≤1.00	29.00	12.50	≤3.00	≤3.00	Bal	50-60	Used for rotating sealing rings, cone bearing sleeves, drill bits, etc.	AWSA5.21 ERCoCr-C
HCS 3	Co103	2.40	1.00	≤1.00	≤1.00	30.00	13.00	≤3.00	≤3.00	Bal	50-56	Used for crusher knife edge, wear panel, centerless grinder workpiece frame, valve seat, rolling guide roll, etc.	AWSA5.21 ERCoCr-C
HCS 4	Co104	1.00	0.80	≤1.00	≤0.50	32.00	14.00	≤3.00	≤1.00	Bal	45-50	Used for hot pressing dies of copper and aluminum alloy , dry battery dies, etc.	
HCS 6	Co106	1.15	1.00	≤1.00	≤1.00	29.00	4.50	≤3.00	≤3.00	Bal	40-46	Used for engine valves, sealing surfaces of high temperature and high pressure valves, hot shear edges, turbine blades, etc.	AWSA5.21 ERCoCr-A
HCS 8	Co108	0.20	1.00	≤1.00	6.50	28.00	/	2.00	≤3.00	Bal	30-35	Used for gas turbine blades, copper casting dies, extrusion dies, etc.	
HCS 12	Co112	1.40	1.20	≤1.00	≤1.00	29.00	8.00	≤3.00	≤3.00	Bal	44-50	Used for high temperature and high pressure valves, cutting edges, serrations, screw push rods, etc.	AWSA5.21 ERCoCr-B
HCS 19	Co119	3.30	0.90	≤1.00	≤1.00	26.00	14.00	≤1.00	≤2.50	Bal	≥54	Used for special purposes such as oil drill bits	AWSA5.21 ERCoCr-G
HCS 20	Co120	2.50	0.80	≤0.50	≤1.00	32.00	17.00	≤3.00	≤3.00	Bal	55-60	Used for high-pressure valve seats, wear panels, rotary sealing rings, etc.	
HCS 21	Co121	0.20	0.90	≤1.50	5.50	27.00	0.50	3.50	≤2.00	Bal	20-42	Used for various liquid valves, valve seats, turbine blades, hot forging dies, etc.	AWSA5.21 ERCoCr-E
HCS 25	Co125	0.05	1.00	≤1.50	≤1.00	20.00	15.00	10.00	≤2.00	Bal	≤24	Used for high temperature corrosion resistant valve sealing surface, seamless pipe piercing head, die casting die, etc.	
HCS 31	Co131	0.45	1.00	≤1.00	≤1.00	26.00	7.00	10.00	≤3.00	Bal	30-35	Used for various brass casting dies, extrusion dies, gas turbine blades, etc.	
HCS 32	Co132	1.60	1.00	≤0.50	≤1.00	25.00	12.00	22.00	≤1.35	Bal	40-45	Specially used for repairing and pre-protecting sealing surface of intake and exhaust valves of internal combustion engines.	AWSA5.21 ERCoCr-F
HCS 37	Co137	2.00	1.10	≤1.00	≤1.00	33.00	5.00	24.00	≤1.35	Bal	44-50	Used for protection and repair of sawtooth, scissor blade, screw push rod, etc.	
HCS T-400	Co140	0.08	2.60	≤1.00	28.00	8.50	-	1.00	≤1.50	Bal	50-60	Used for valves, tracks, extruders, etc. for use in highly corrosive media.	
HCS 50	Co150	0.08	0.80	≤1.00	-	28.00	-		21.00	Bal	20-30	Has good corrosion resistance and fatigue resistance at high temperature.	
HCS T-800	Co180	0.08	3.50	≤1.00	28.00	18.00	-	1.50	≤1.50	Bal	52-56	Used for valves, tracks, extruders, etc. for use in highly corrosive media	

CONSUMABLES - Nickel Bare Rods



Nickel-Base Bare Rods

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness (HRC)	Application	Reference Standard
		C	Si	Cr	Mn	Mo	Fe	B	Co	Ni			
HCS 22	Ni201	≤0.10	2.50	≤0.50	≤0.50	Al≤0.01	≤1.00	1.40	≤0.40	Bal	19-24	Used for glass grinding tools, brick molds, various forming dies, etc.	
HCS 22M	Ni201M	≤0.10	2.50	4.00	≤0.50	Al≤0.01	8.00	1.50	≤0.40	Bal	19-24	Used for glass grinding tools, brick molds, various forming dies, etc.	
HCS 40	Ni202	0.50	2.25	11.00	/	/	2.25	2.50	≤1.50	Bal	35-42	Used for feeding screw, pump shaft, stirring blade, valve sealing surface, etc.	AWS A5.21 ERNiCr-A
HCS 40M	Ni202M	0.45	3.80	11.00	0.50	/	14.00	2.50	≤1.50	Bal	35-40	Used for feeding screw, pump shaft, stirring blade, valve sealing surface, etc.	
HCS 50	Ni203	0.60	3.60	12.00	/	/	4.00	2.50	≤1.25	Bal	48-54	Used for pump shaft, pulp knife, valve, various extrusion bolts, shaft sleeve plunger, etc.	AWS A5.21 ERNiCr-B
HCS 6325	Ni203M	0.80	3.80	16.00	0.50	3.00	4.50	3.00	Cu: 3.00	Bal	53-58	Used for molds, cams, plungers, exhaust valves, corrosion-resistant pumps, etc.	
HCS 60	Ni204	0.80	4.50	15.00	/	/	4.00	3.50	≤1.25	Bal	54-60	Used for pump shaft, pulp-cutter, valve, various extrusion bolts, wire drawing roller shaft, cam pump blade, bushing, plunger, etc.	AWS A5.21 ERNiCr-C
HCS 60M	Ni204M	0.80	4.00	16.00	0.50	/	14.00	3.50	≤1.25	Bal	50-56	Used for pump shafts, pulp-cutter, valves, various extrusion bolts, wire drawing roller shafts, convex shaft pump blades, bushings, plungers, etc.	
HCS C	Ni205	0.12	1.00	16.50	≤1.00	17.00	5.50	V:0.30 W:5.50	≤2.50	Bal	/	Used for heat resistance, scratch resistance, inter-metal wear resistance and other working conditions, such as hot pressing die, etc.	AWS A5.21 ERNiCrMo-5A
HCS B	Ni206	0.12	1.00	≤1.00	≤1.00	28.00	5.00	V:0.40	≤2.50	Bal	/	Used for sealing surfaces of chemical valves, etc.	
HCS 207	Ni207	0.80	3.40	15.00	1.00	32.00	2.00	/	2.00	Bal	/	Used in nuclear industry and other working conditions with radioactive pollution.	
HCS 208	Ni208	0.80	5.40	10.00	1.00	W: 2.00	3.00	0.50	1.50	Bal	/	Can replace Shield 6	
HCS 209	Ni209	0.30	6.00	21.00	1.00	W: 2.00	8.00	1.00	1.50	Bal	/	Can replace Shield 6	

CONSUMABLES - Iron Bare Rods



Iron-Base Bare Rods

Brand ID	Metal Grade	Chemical Composition (Weight%)								Hardness (HRC)	Application
		C	Si	Cr	Mn	Mo	B	Ni	Fe		
HCS 90	Fe301	2.50	1.40	26.50	1.20	/	/	/	Bal	50-54	Used in wear-resistant, oxidation-resistant or cavitation-resistant working conditions, such as bucket teeth, pump sleeves, diesel engine intake and exhaust valves, sawteeth, etc.
HCS 90M	Fe301M	2.50	3.50	28.00	≤1.40	/		4.00	Bal	48-54	Used in wear-resistant, oxidation-resistant or cavitation-resistant working conditions, such as bucket teeth, pump sleeves, diesel engine intake and exhaust valves, sawteeth, etc.
HCS 94	Fe302	3.20	1.70	30.00	1.60	/	0.80	3.50	Bal	56-60	Used in working conditions with strong wear, such as small shaft of roller cone bit, excavator, crusher roller, etc.
HCS 94M	Fe302M	3.50	2.00	28.50	1.00	Co:5.00	0.70	/	Bal	56-64	Used in working conditions with strong wear, such as small shaft of roller cone bit, excavator, crusher roller, etc.
HCS 303	Fe303	3.00	0.90	17.00	/	2.50	/		Bal	48-52	Used for wear-resistant parts in agriculture, metallurgical mines and building materials industries, such as plows, sand mixer scrapers, blades, etc.
HCS T-1	Fe304	1.10	5.00	30.00	≤1.00	≤0.25	Co:12.0 W:0.25	10.00	Bal	38-44	Has good wear resistance, high temperature resistance and thermal shock resistance; Can replace Shield 6
HCS 305	Fe305	2.00	5.00	35.00	≤1.00	0.25		10.00	Bal	50-54	Has good wear resistance, high temperature resistance and thermal shock resistance; Can replace Shield 12
HCS 306	Fe306	3.00	4.40	35.00	≤1.00	/	Co:12.0	10.00	Bal	49-55	Higher hardness at room temperature and high temperature, better wear resistance and corrosion resistance, can replace Shield 1.
HCS 307	Fe307M	2.15	1.00	17.00	≤1.00	14.00	Co:6.00	V:1.90	Bal	55-65	Used in working conditions with strong wear, such as small shaft of roller cone bit, wear parts of crushers and mixers, can replace Shield 19.
HCS 308	Fe308	0.30	0.50	17.00	16.00	/	/	0.70	Bal	30-38	Has good resistance to high temperature, corrosion, thermal shock and high temperature strength, can replace Shield 21.

CONSUMABLES - Cobalt Powders



Cobalt-Based Welding Powders

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness (HRC)	Application	Reference Standard
		C	Si	Cr	Mn	Mo	Fe	Ni	W	Coi			
HCS 1F	Co101F	2.50	1.00	31.00	≤0.25	≤1.00	≤3.00	12.50	Bal	43-58	Used for repairing and pre-protecting parts such as screw propeller, rotary sealing ring, pump sleeve, bearing sleeve, valve seat, drill bit, etc..	AWS A5.21 ERCoCr-C	
HCS 6F	Co106F	1.10	1.10	29.00	≤0.50	≤1.00	≤3.00	4.00	Bal	37-47	Used for repairing and pre-protecting parts such as valves, valve seats, blades and screw push rods.	AWS A5.21 ERCoCr-A	
HCS 12F	Co112F	1.40	1.45	29.50	≤1.00	≤1.00	≤3.00	8.25	Bal	40-50	Used for abrasive wear of cutting edges, such as plastic, paper making, chemical fiber, cutting tools, pre-protection of cutting edges and pre-protection of valve sealing surfaces, exhaust valve cone surfaces of internal combustion engines and high temperature and high pressure valves.	AWS A5.21 ERCoCr-B	
HCS 19F	Co119F	3.25	0.50	26.50	≤1.00	≤1.00	≤5.00	14.20	Bal	52-62	Used for special purposes such as oil drill bits.	AWS A5.21 ERCoCr-G	
HCS 20FB	Co120FB	2.50	0.90	32.50	≤0.50	≤1.00	≤3.00	17.00	Bal	55-60	Used for pre-protection of valve seat, knife edge, wear panel, rotating seal ring, etc.		
HCS21F	Co121F	0.25	1.50	27.30	≤0.50	5.50	1.50	2.00	≤0.50	Bal	20-35	Used for repairing and pre-protecting various liquid valves, valve seats, turbine blades, etc.	AWS A5.21 ERCoCr-E
HCS 32F	Co132F	1.55	1.10	26.00	≤1.00	≤1.00	≤3.00	22.80	12.00	Bal	36-46	Used for pre-protection of exhaust valve cone and valve seat of internal combustion engine.	AWS A5.21 ERCoCr-F
HCS 37	Co137F	1.65	1.10	26.00	≤1.00	≤1.00	≤3.00	22.50	12.00	Bal	40-50	Used for pre-protection of exhaust valve cone and valve seat of internal combustion engine.	AWS A5.21 ERCoCr-F
HCS 58F	Co158F	0.90	1.80	26.00	0.20	0.50	3.00	3.00	5.50	Bal	40-46	Used for repairing and pre-protecting the sealing surface of high-pressure exhaust valve and exhaust valve of internal combustion engine.	

CONSUMABLES - Nickel Powders



Nickel-Based Welding Powders

Brand ID	Metal Grade	Chemical Composition (Weight%)							Hardness (HRC)	Application	Reference Standard
		C	Si	Cr	Mn	Fe	B	Ni			
HCS	Ni212F	0.70	3.60	14.00	W:16.00	3.80	2.90	Bal	/	Glass molds, various forming dies.	BNi-12
	Ni212F-1	<0.02	2.40	/	Cu: 18.0	/	1.10	Bal	/	Glass molds, various forming dies.	SP22Cu
HCS 20F	Ni220F	2.50	2.00	4.50	/	3.00	0.70	Bal	18-22	Glass molds, various forming dies.	
	Ni220F-1	<0.05	2.20	4.00	P: 2.10	< 0.50	0.70	Bal	20-24	Glass molds, various forming dies.	
HCS 25F	Ni225F	0.15	3.50	10.00	/	8.00	1.20	Bal	22-28	Glass molds, various forming dies.	
HCS 30F	Ni230F	0.15	2.70	2.50	0.30	3.00	1.40	Bal	28-32	Glass molds, various forming dies.	
HCS 35F	Ni235F	0.20	3.20	4.50	0.10	2.50	1.60	Bal	33-37	Glass molds, various forming dies.	
HCS 37F	Ni237F	0.18	3.00	4.50	P:2.65	1.00	1.15	Bal	35-42	Glass molds, various forming dies.	
HCS 40F	Ni240F	0.30	3.30	7.50	0.10	2.00	1.70	Bal	38-42	Mold, cam, plunger, exhaust valve, corrosion resistant pump, etc.	Deloro 40
HCS4 5F	Ni245F	0.40	3.60	8.50	0.10	3.50	2.00	Bal	42-48	Feeding screw, pump shaft, exhaust valve sealing surface, plunger, etc.	Deloro 45
HCS 50F	Ni250F	0.45	4.00	11.00	0.10	3.00	2.30	Bal	47-53	Feeding screw, pump shaft, exhaust valve sealing surface, plunger, etc.	Deloro 50
HCS 55F	Ni255F	0.60	4.00	12.00	/	4.50	2.70	Bal	53-59	Mold, cam, plunger, exhaust valve, corrosion resistant pump, etc.	
HCS 60F	Ni260F	0.70	4.30	15.00	/	4.50	3.20	Bal	57-62	Pump shaft, pulp-cutter, extrusion bolt, wire drawing roller shaft, cam, pump blade, bushing, plunger and other mechanical vulnerable parts.	Deloro 60
HCS60MF	Ni6325F	0.80	4.30	15.50	Cu:3.0 Mo:2.5	4.50	3.50	Bal	57-62	Feeding screw, pump shaft, exhaust valve sealing surface, plunger, etc.	
HCS62F	Ni262F	1.00	4.00	16.00	/	16.00	3.80	Bal	59-65	Mechanical vulnerable parts such as grinding discs of paper machines and shovel teeth of forklifts.	

CONSUMABLES - Iron Powders



Iron-Based Welding Powders

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness (HRC)	Application	Reference Standard
		C	Si	Cr	Mn	Mo	B	Ni	Co	Fe			
HCS	Fe300F	<0.05	0.60	15.00	/	15.00	0.30	4.00	15.00	Bal	/		
HCS	Fe355F	2.30	3.00	29.00	0.90	/	P、S<0.03	4.20	O:<0.05	Bal	44-48		
HCS	Fe356F	1.80	1.30	28.00	0.70	4.50	P、S<0.03	17.00	O:<0.01	Bal	38-44		Eaton 6# Or EMS253
HCS	Fe356FH	2.25	1.30	30.50	0.70	4.50	P、S<0.03	17.00	O:<0.01	Bal	≥38		
HCS	Fe361F	<0.02	1.15	15.00	0.30	1.00	1.20	1.70		Bal	53-58		

CONSUMABLES - Nickel Cored Wires



Brand ID	Metal Grade	Chemical Composition (Weight%)											Application	Reference Standard
		C	Si	Cr	Mn	Mo	Fe	Al	Ti	Cu	Nb+Ta	Ni		
HCS Ni-1	Ni201S	0.15	0.75	/	1.00	/	/	1,50	3.0	0.25	/	93.0 min	Used to weld 200, 201 nickel alloys, nickel-plated steel sheets, different type material welding(iron and nickel), iron hard-surfacing.	AWSA5.14 ERNi-1
HCS NiCr-4	Ni204S	0.05	0,20	44.00	0.20	/	0.50	/	0.60	0.50	/	Bal	Used to weld NI-Fe-Cr pipes and tubes, repair welding for castings	AWS A5.14 ERNiCr-4
HCS NiMo-7	Ni206MS	0.02	0.10	1.00	1.0	28.00	2.00	W:1.00	/	0.50	/	Bal	Used to weld N7M and Ni-Mo anti-corrosion alloys; Iron hardsurfacing	AWS A5.14 ERNiMo-7
HCS NiCrMo -10	Ni222S	0.015	0.08	21.50	0.50	13.50	3.50	V: ≤0.35	Co: ≤2.50	0.50	W: 3.50	Bal	Used to weld HC22 and Ni-Cr-Mo anti-corrosion alloys; Iron hard-surfacing	AWS A5.14 ERNiCrMo -10
HCS NiCu-8	Ni250S	0.25	1.00	/	1.50	/	2.00	0.30	0.60	Bal	/	65.00	Used to weld age-hardening Ni-Cu alloys like M k500	AWS A5.14 ERNiCu-8
HCS NiCr-3	Ni260S	0.10	0.50	20.00	3.00	/	3.00	/	0.75	/	2.50	67.0min	Used to weld Inconel 600 and inconel 800 as well as welding between carbon steel and stainless steel	AWS A5.14 ERNiCr-3
HCS NiCrMo-3	Ni262S	0.10	0.50	22.0	0.50	9.00	5.00	0.40	0.40	0.50	3.65	58.0min	Used to weld In625, In825, In25-6Mo, Monel 400 alloys and welding between Nickel alloys and stainless steels as well as iron hardsurfacing	AWS A5.14 ERNiCrMo-3
HCS NiCu-7	Ni270S	0.15	1.25	/	4.00	/	2.50	1.25	2.25	Bal	/	64.00	Used to weld monel alloys, welding between monel alloys and iron as well as iron hard-surfacing	AWS A5.14 ERNiCu-7

COBALT BASE FORGINGS



Cobalt-base forgings

Brand ID	Metal Grade	Chemical Composition (Weight%)									Hardness HRC	Application	Reference Standard
		C	Si	Cr	Mo	Mn	Fe	Ni	W	Co			
HCS 21MB2	Co121MB2	0.35	1	28	6	1	0.75	1	/	ball		Medicine using,casting bar,etc	
HCS 25B	Co125B	0.1	1	20	1	2	2	10	15	ball		used where fatigue,intermetal wear-resistance	AMS 5796
HCS 35B	Co135B	0.025	0.15	20	10	0.15	1	35	/	ball		used making part for high-temperature and sulphidization-resistance service	AMS 5844

NICKEL BASE FORGINGS



Nickel-base forgings

Brand ID	Metal Grade	Chemical Composition (Weight%)											Application	Reference Standard
		C	Si	Cr	Mo	Mn	Fe	Co	Cu	Ti	Al	Ni		
HCS 200B	Ni200	≤0.15	≤0.35	-	-	≤0.35	≤0.4	-	≤0.25	-	-	Bal	used to make pump valve in chemical industry e.g.caustic soda.compound fber,etc	ASTM B564 UNS N02200
HCS CB	Ni 205	≤0.08	≤1	15.5	16	≤1	6	≤2.5	V:0.35	W:0	-	Bal	used to make in chemical industry and the petroleum craft equipment,heat exchanger,etc	AMS 5750C
HCS BB	Ni206	0.05	1	1	28	1	5	2.5	V:0.3	-	-	Bal	used to make heat-resistinghydrochloric acidand the installment and equipment of hydrogenechloride	ASTM B619 UNS N10001
HCS M400B	Ni240	0.3	0.5	-	-	2	2.5	-	31	-	-	Bal	used to make equipment for chemical industry	ASTM B564 UNS N04400
HCS K500B	Ni250	0.18	0.5	-	-	1.5	2.00	-	30	0.6	2.7	Bal	Applie sin high-strength, high-corrosion-resisting, specially in parts of non-magnetic,e.g.shipping popller:spiral push rod,impeller,spring, shipping heat exchanger,etc.main product:bar,wire,high strength corrosion-resisting bll,etc	ASTM B865 UNS N05500
HCS 600B	Ni260	0.15	0.5	16	-	1	8	-	0.5	-	-	Bal	used in heat-treatment and chemistry process-ing equipment.	ASTM B564 UNS N06600
HCS 625B	Ni262	0.1	0.5	22	9	0.5	0.5	-	Nb3.6 5	0.4	0.4	Bal	used in making chemical industry environment-al.protection equipment and astronavigationstructure	ASTM B446 UNS N06625
HCS C -4B	Ni274	0.015	0.08	16	16	1	3	2	-	0.70	-	Bal	used in chlorine, hypochlorous aid,hydrochloric acid, mixed acid,the installment of chloride and applies directly after welding	ASTM B619 UNS N06455
HCS 750B	Ni275	0.08	0.5	16	Nb:1	1	7	1	0.5	2.5	0.7	Bal	used in resistance against corrosion and oxidation, high change-breaking strength under 816℃ simultaneously as one of good elastic-materials,products including spring.torsional spring.etc.	ASTM B637 UNS N07750
HCS 276B	Ni276	0.02	0.08	16	16	1	5.5	2.5	W3.50	V0.35	-	Bal	advanced version of Shield CB alloy,excellent resistance against corrosion,spot corrosion and stress corrosion main products:bar,wire	ASTM B619 UNS N10276
HCS 718B	Ni278	0.08	0.35	19	3	0.35	-	1	0.3	0.9 Nb:5	0.5	55	high resistance against corrosion,and oxidization,high yield strength below 650℃.extremely broad use for heat-resisting alloy,products:die forged item,bar,wire and spring.etc	ASTM B637 UNS N07718
HCS 80A	Ni280	0.07	1	19	-	1	3	2	0.2	2.3	1.4	Bal	used in turbine blade,overall air valve,etc	DIN EN10090 2.4952
HCS 90B	Ni290	0.13	1	20	-	1	1.5	16.5	0.2	-	-	Bal	Be used to make gas turbine blade and spring	AMS 5829E UNS N07090
HCS 92B	Ni292	0.06	1	5.5	-	0.8	Bal	1	-	W :4	0.6	42	Be used to make precision springs, mechanical resonators and other precision spring parts.	AMS 5225E UNS N09902
HCS 95B	Ni295	0.03	0.5	21	3	1	22	Nb:0.5	2.2	2.2	0.3	44	Be used to make Valve, hanging rod,flowline and cylinder that applied to the corrosive mine with H2O, CO2 and brine etc.	ASTM B637 UNS N09925
HCS G3B	Ni2G3	0.03	0.08	30	5	1.5	15	5	2	W3.5	Nb1.2	Bal	Be used to phosphoric acid, wet-process phosphoric acid, nuclear fuel reprocessing, nuclear waste treatment etc.petrochemical industry and other industrial sectors that are in contact with strong corrosive environment, such as pipeline, pumps and valve components	ASTM B462 UNS N06030
HCS X2B	Ni2X2	0.07	1	22	9	1	18.5	1.5	-	W0.6	-	Bal	Be used to make the tail pipe of aircraft engine, combustor and afterburner components etc.	ASTM B472 UNS N06002

IRON BASE FORGINGS



Iron-base forgings

Brand ID	Metal Grade	Chemical composition (Weight%)											Application	Reference Standard
		C	Si	Cr	Mo	Mn	Ni	N	Cu	Ti	Al	Fe		
HCS 310MB	Fe310M	0.03	0.4	25	2.5	2	22	0.13	-	-	-	Bal	mainly used in the structural material of urea production, e.g.heat exchanger etc.	ASTM A182 F310MoLN
HCS 319B	Fe319	0.06	1	22	2	5	12	0.3	Nb: 0.2	-	V:0.2	Bal	mainly used in the equipment and component of good corrosion-resisting and strong load-or attrition withstanding, e.g.shaft for ship, heat exchanger etc.	ASTM A182 FXM-19
HCS 320B	Fe320	0.07	1.00	20	2.5	2	35	-	3.5	Nb: 8* C/1.00	-	Bal	Used in sulfuric acid heat exchanger,vessel and the fuel-refining equipment	ASTM A182 F20
HCS 825B	Fe325	0.05	0.5	22	3	1	44	-	2	0.9	0.2	Bal	Used in heat exchanger condenser	ASTM B564 UNS NO8825
HCS2132	Fe332	0.08	1	14	1	2	25	.	V:0.3	2	0.4	Bal	used to make strength part under high temperature,e.g.fastener、 blade etc, main product:bar,wire and ring.etc	ASTM A638 UNS S66286
HCS 344	Fe344	0.02	0.8	20	6	1	18	0.2	0.8		-	Bal	mainly used in valve, marine equipment	ASTM A276 F44
HCS 351	Fe351	0.03	1	22	3	2	5	0.1	-		-	Bal	used to make parts of pump and valve	ASTM A182 F51
HCS 353	Fe353	0.03	0.8	25	4	1.2	7	0.28	0.5		-	Bal	used to make pump. valve and heat exchanger	ASTM A182 F53
HCS 355	Fe355	0.03	1	25	4	1	7	0.25	0.8		W: 0.8	Bal	Used in petroleum and fertilizer industry	ASTM A182 F55
HCS256Mo	Fe356	0.02	0.5	20	6.5	2	25	0.2	1		-	Bal	used to make heat exchanger,pipe,etc.the product including forging, bar	ASTM A625 UNS NO8926
HCS 360	Fe360	0.03	1	22.5	3.5	2	5.5	0.15	-		-	Bal	used to make heat exchanger,synthetic ammonia chiller,etc	ASTM A182 F60
HCS174	Fe374	0.07	1	16.5	-	1	4	-	4		-	Bal	used to make valve parts under corrosive condition	ASTM A705 17-4PH
HCS177	Fe377	0.09	1	17	-	1	7	-	-	-	1	Bal	used to make kinds of vessel,spring with good corrosion resistance and comparatively high strength.	ASTM A705 17-7PH
HCS 800H	Fe380	0.08	1	21	-	1.5	33	-	0.75	0.4	0.35	Bal	used in the synthetic fiber project of heat pipe, furnace tube and heat-resisting component and so on	ASTM B564 UNS NO8811
HCS 904L	Fe390	0.02	1	21	4.5	2	26	0.10	1.5		-	Bal	Used to make equipment of heat exchanger and pipe,the products including bar and wire	ASTM A182 F904L
HCS 3C4B	Fe3C4	0.08	4	18	-	2	13	-	-	-	-	Bal	used in the production. the storage and transport installment and equipment of nitric acid, like dissolves of nuclear reactor system.	GB1220-92 0Cr18Ni13Si4
HCS 58B	Fe358	0.03	1	24	5.7	3	22.5	0.45	2	W:2	-	Bal	Applied to the reactors ,pipeline,pump and valve which are used to process the Halogens Compound in the petrochemical and other chemical industries	ASTM A182 UNS S31266
HCS 62B	Fe362	0.03	1	21	6.5	2	24.5	0.22	0.75	-	-	Bal	Used to pump and valves applied in sea water and Halogen compund medium	ASTM A182 UNS NO8367
HCS 28B	Fe328	0.03	1	27	3.5	2.5	31	-	1	-	-	Bal	Used to pump and valves applied in redox mediators	ASTM B668 UNS NO8028

COPPER BASE FORGINGS



Copper-base forgings

Brand ID	Metal	Chemical composition (Weight%)									Application	Reference standard
	Grade	Al	Fe	Mn	Si	Ni	Pb	Sn	Zn	Cu		
HCS Cu407	Cu 407	/	1.2	1	/	10	0.05	/	1	Ball	used to make heat exchanger, pump valve of maritime industry .	ASTM B151 UNS C70600
HCS Cu412	Cu 412	8.7-9.5	3.5-4.3	1.2-2	0.1	4-4.8	0.02	/	1	Ball	used in chemical industry ,propeller blade,hub and valve etc.	ASTM B150 UNS C63200
HCS Cu414	Cu 414	8.5-11	3-5	1	0.2	4-6	0.05	0.1	0.4	Ball	used in maritime industry .Gear axes,valve	GB/T20078 CuAl10Ni5Fe4