

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