

TYPE	DIN 1913/ 8575/8529	AWS A5.1/5.5	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
6010	E 43 54 C4	E 6010	T ~ 520 Y > 380 E > 22% I > 47 J (-30°C)	6010 is a cellulose coated all positional pipe welding electrode designed especially for vertical down root pass welding on D.C. negative polarity and for subsequent passes on D.C. positive polarity. Apart from its excellent welding and gap bridging characteristics 6010 offers a weld deposit with outstanding impact strength values and thus offers the benefit of still more safety in field welding of pipelines. St: 37.2, 44.2, 37.3, 52.3, H1, H11, 37.0, 52.0, 37.4, 52.4, 35.8, 45.8, 210.7, 360.7, X42, X60, A-D
7010		E 7010-A1	T ~ 560 Y > 420 E > 22% I > 47 J (-20°C)	7010 is our cellulosic electrode used for root and filler pass welding of pipelines made of high-resistant, low alloy steels. It can be used in all positions especially suitable for vertical down position. St: 290.7, 415.7 TM, X42, X65, A-E
8010		E 8010-G	T ~ 610 Y > 460 E > 22% I > 47 J (-30°C)	8010 is our cellulosic electrode used for root and filler pass welding of pipelines made of high-resistant, low alloy steels. It can be used in all positions especially suitable for vertical down position. St: 290.7, 415.7 TM, X42, X65, A-E
6013 S	E 43 22 R(C)3	E 6012	T ~ 510 Y > 360 E > 22% I > 60J (20°C)	The 6013 S is a medium thick coated electrode for all kinds of steel structures and is particularly suited for welding jobs at poorly accessible points and badly prepared seams. The 6013 S weld in all positions, in particular it is ideally suited for vertical down welds. Viscous weld metal, hence good gap bridging. Easy slag removal and electrodes can be bent very well.
6013 Fall	E 43 22 R(C)3	E 6013	T ~ 570 Y > 480 E > 23% I > 47 J (0°C)	The 6013 Fall is a special coated electrode developed for welding in vertical down position on old and diluted plates such as in ship repair with badly prepared seams and/or deluted, galvanised or painted plates. The 6013 Fall may be used in all positions. Viscous weld metal, hence good gap bridging. Elektrodes can be bent and offers excellent resistance against moisture pick up!
6013 T	E 51 22 RR 6	E 6013	T ~ 590 Y > 360 E > 22% I > 47 J (0°C)	The 6013 T is a thick coated electrode for joining and surfacing steel structures of all kinds in mechanical engineering, body and wagon building, in the fabrication of vessels and containers, and in shipbuilding. The 6013 T is eminently weldable and possesses excellent welding properties in all positions except vertically down. Easy strike, no spatter losses. Very easy slag removal. Smooth, finely rippled seam surface and low fume.
7024 (150%)	E4332RR11150	E 7024	T > 510 Y > 390 E > 22% I > 47 J (0°C)	The 7024 is a high performance electrode with a thick rutile coating and a recovery of 150%. For joining and surfacing in mechanical engineering, body and wagon building as well as in the fabrication of vessels and containers and in shipbuilding. Moreover this electrode can be used for all kinds of steel constructions. The 7024 has a high current carrying capacity and good striking properties. This electrode is very economical thanks to low spattering losses and easy slag removal.
7024 (200%)	E4332RR11200	E 7024	T ~ 510 Y ~ 390 E > 22% I > 47 J (0°C)	The 7024 is a high performance electrode with a thick rutile coating and a recovery of 200%. For joining and surfacing in mechanical engineering, body and wagon building as well as in the fabrication of vessels and containers and in shipbuilding. Moreover this electrode can be used for all kinds of steel constructions. The 7024 has a high current carrying capacity and good striking properties. This electrode is very economical thanks to low spattering losses and easy slag removal.
7027 (Rutile acid)	E51 53AR11160	E 7027	T ~ 500 Y > 420 E > 22% I > 85 J (+20°C) I > 47 J (-40°C)	The 7027 is a high performance electrode with a thick rutile acid coating and a recovery of 150%. For welding in mechanical engineering, body and wagon building as well as in the fabrication of vessels and containers and in shipbuilding. Moreover this electrode is ideally suited for primer treated or rusty materials. The 7027 has a high current carrying capacity and self detaching porous slag.
7016	E 51 43 B (R) 10	E 7016	T ~ 570 Y > 400 E > 22% I > 47 J (-20°C)	Double-coated low-hydrogen electrode with excellent welding properties in difficult positions and high mechanical properties. It is particularly suited for poor welding machines with low voltage on AC and DC+. Excellently suited for old and rusty material.
7018-1	E 51 55B 10	E 7018-1	T ~ 600 Y > 440 E > 24% I > 47 J (-40°C)	The 7018-1 is a low-hydrogen electrode suitable for highly stressed joints with very easy weldability and extreme high mechanical properties for steels and castings up to 610 N/mm ² tensile strength. It is particularly suited for welding on AC and DC+. The 7018-1 is suitable for steels with up to 0.6% carbon and has very low hydrogen content. HD < 5ml/100gr
7018-A1	E Mo B 2	E 7018-A1	T ~ 590 Y > 450 E > 22% I > 47 J (-40°C)	Mo alloyed basic electrode for welding creep-resistant steels with yield strength up to 460 N/mm ² . Suited for working temperatures of -40°C to 525°C. Mostly used for the construction of boilers and pipes (15Mo3).
8018-B2	E CrMo 1 B 20+	E 8018-B2	T : 560-670 Y > 470 E > 20% I > 95 J (20°C)	Basic electrode for welding of steam production plants, steam pipes and similar joints made of Cr-Mo alloyed steels. The weld metal is resistant to working temperatures up to 550°C. For steels St: 13CrMo44, 15CrMo3, 13 CrMo V 42 etc.
8018-C2	EY 46 87 3NiBH 5 20	E 8018-C2		Basic, Nickel alloyed (above 3%) electrode with excellent welding characteristics, recommended for finegrained steels used at low temperature (-60 to -80°C). Guaranteed excellent mechanical properties at low temperatures. Excellent alloy for use in cryogenic and petrochemical industries. Stocking and distribution of liquid gas or products volatile. HD < 5 ml/100
9018-B3	E CrMo 2 B 20+	E 9018-B3	T : 620-670 Y > 520 E > 18% I > 95 J (20°C)	Basic, Nickel alloyed electrode with excellent welding characteristics, recommended for steel and steel castings with tensile strength up to 685 N/mm ² and fine-grained steels with yield strength up to 460 N/mm ² . Guaranteed excellent mechanical properties at low temperatures. HD < 5 ml/100
10018-G	EY 69 75 Mn2NiCrMoB	E 10018-G	T : 780-940 Y > 700 E > 17% I > 47 J (-20°C)	Extreme high strength electrode for welding similar alloyed steels with yield strength up to 685N/mm, extreme crack-resistant and low temperature-resistant down to -60°C. Preheating, interpass temperature and post weld treatment as required by the base metal. For steels St: N-A-XTRA 65, 63, 70, T1A, T1B etc.
505-15	E-CrMo 9 B20	E 505-15	T : 680-780 Y > 550 E > 15% I > 50 J (-20°C)	Basic, Cr and Mo alloyed electrode with excellent welding characteristics, recommended for welding creep-resistant steels and steel casting for working temperatures up to 600°C. The weld deposit offers a high-resistant against high hydrogen pressure. Commonly used in several applications in oil and chemical industry.
CrMo9V		E 9016-B9	T : 650-850 Y > 500 E > 16% I > 50 J (20°C)	Basic, Cr and Mo alloyed electrode with excellent welding characteristics, recommended for welding creep-resistant heat treated 9-12% Cr Steels, especially for steels T91 and T92, for working temperatures up to 600°C. Preheat and interpass temperatures 200-300°C.
Rail B			T : 690-890 Y > 620 E > 18% I > 47 J (-40°C)	Basic electrode for rapidly joining large cross section profiles. Joining of rails with a continues filling of the gap between two sections will be achieved due to the special basic coating. Suitable for rails, thick and concrete bars, profiles can be cut off straight before filling the gap.

FERITIC & MARTENSITIC

TYPE	DIN 1913/ 8575/8529	AWS A5.1/5.5	ANALYSIS	APPLICATION / BASE METAL
4009B	E-4009B	E 410-16	C <0.07 Cr ~ 13	Electrode for welding ferritic and martensitic steels, cast steel and also for cladding of exhaust valves. W.Nr: 1.4000, 1.4002, 1.4006, 1.4024
4015 HL-Kb	E-4015 HL-Kb	E 430-15	C <0.10 Mn 0.5-1.0 Cr 16-18	Developed for joining and cladding of 17% chromium alloys and for cladding when temperature and corrosion resistance is necessary. W.Nr: 1.4057, 1.4740, 1.4742, 1.4059, 1.4741
4115 HL	E-4115 HL	EN 1600: ZE 17 1 R 53	C 0.18 Cr 16-17 Mo 1.0-1.5	Developed for joining and cladding of 17% chromium alloys and for cladding when temperature and corrosion resistance is necessary. W.Nr: 1.4115
4122 HL-Kb	E-4122 HL-Kb	EN 1600: EZ 17 1 1B 53	C <0.40 Cr 16-18 Mn <0.5 Mo 0.9-1.10 Ni <0.6	Developed for joining and cladding of 17% chromium alloys and for cladding when temperature and corrosion resistance is necessary. W.Nr: 1.4122

FOR CrNi STEELS

TYPE	R %	DIN 8556	AWS	ANALYSIS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
4302 Ti***	100	E 19 9 R 23	E 308-16	C < 0.06 Cr ~ 19 Ni ~ 9.5	T > 550 Y > 320 E > 35 I > 70	Developed for joining stainless steel types 18/8 Cr-Ni and surfacing as well, the weld metal can be polished and is suitable for working temperatures up to 300°C. Base metals: 1.4300, 1.4301, 1.4310, 1.4312, 1.4550, 1.4001, 1.4016, 1.4057
4302 HL	150	E 19 9 MPR 26 150	E 308-16			
4302 HLS*	150	E 19 9 R 26 150	E 308-16			
4316 Ti*	100	E 19 9 LR 23	E 308 L-16	C < 0.03 Cr ~ 19 Ni ~ 9.5	T > 550 Y > 320 E > 35 I > 70	Developed for joining stainless steel types 18/8 Cr-Ni and surfacing as well, the weld metal can be polished and is suitable for working temperatures up to 400°C. Base metals: 1.4300, 1.4301, 1.4306, 1.4541, 1.4543, 1.4550
4316 HL	150	E 19 9 L MPR 26 150	E 308 L-16			
4316 HLS*	150	E 19 9 LR 26 150	E 308 L-16			
4551 Ti***	100	E 19 9 Nb R 23	E 347-16	C < 0.03 Cr ~ 19 Ni ~ 9.5 Nb +	T > 580 Y > 350 E > 32 I > 70	Developed for welding stabilised CrNi-steels of the type 18/8. The weld metal can not be polished and is suitable for working temperatures up to 400°C. Base metals: 1.4301, 1.4310, 1.4541, 1.4543, 1.4550, 1.4878
4551 HL	150	E 19 9 Nb MPR 26 150	E 347-16			
4551 HLS*	150	E 19 9 Nb R 26 150	E 347-16			

* TUV approved ** Also available as lime basic

STICK ELECTRODES FOR STAINLESS STEELS
FOR CrNiMo(Cu) STEELS

TYPE	R %	DIN 8556	AWS	ANALYSIS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
4403 Ti***	100	E 19 12 3 R 23	E 316-16	C < 0.06 Cr ~ 19 Ni ~ 12 Mo ~ 2.7	T > 550 Y > 320 E > 35 I > 65	Developed for joining stainless steel types 18/8/2 CrNiMo and surfacing as well, the weld metal can be polished and is suitable for working temperatures up to 300°C. Base metals: 1.4301, 1.4401, 1.4413, 1.4436
4403 HL	160	E 19 12 3 MPR 26 160	E 316-16			
4403 HLS*	160	E 19 12 3 R 26 160	E 316-16			
4430 Ti*	100	E 19 12 3 L R 23	E 316 L-16	C < 0.03 Cr ~ 22.5 Ni ~ 12 Mo ~ 2.7	T > 540 Y > 320 E > 35 I > 70	For welding CrNiMo 18/8/2 steels with a very low carbon content. The weld metal can be polished and is suitable for working temperatures up to 400°C. Base metals: 1.4301, 1.4541, 1.4550, 1.4401, 1.4435, 1.4571, 1.4580, 1.4404, 1.4436, 1.4573
4430 Ti Fall Vertical down	100	E 19 12 3 L R 13	E 316 L-16			
4430 HL	160	E 19 12 3 MPR 26 160	E 316 L-16			
4430 HLS*	160	E 19 12 3 LR 26 160	E 316 L-16			
4430 H	100	E 19 12 3 R 12	E 316 H-16	C < 0.05 Cr ~ 19.0 Ni ~ 12.0 Mo ~ 2.7		Corrosion-resistant alloy for CrNiMo steels with increased Si-content. The electrode is suitable for welding corrosion-resistant CrNiMo steels for working temperatures up to 400°C.
4440 AC	100	E9-UM-300-CKR	E 317L-17	C < 0.03 Cr ~ 18 Ni ~ 17.5 Mo ~ 4.50		Designed for joining corrosion-resistant CrNiMoN steels as well as for austenitic-ferritic joints. Base Metals: 1.3941, 1.3952, 1.3953, 1.3955, 1.3958, 1.4406, 1.4429, 1.4435, 1.4438, 1.4439, 1.446, 1.448, 1.449
4462 Ti	110	E 22 9 3 L R 23	E 2209-17 (duplex)	C < 0.04 Cr ~ 22.5 Ni ~ 9 Mo ~ 3	T > 680 E > 25 I > 50	Designed for welding wrought, forged or cast 'standard' duplex stainless steels for service in the as-welded condition. The weld metal offers a high strength, very good resistance to chloride induced stress corrosion cracking and pitting attack from seawater. Base metals: 1.4417, 1.4460, 1.4462, 1.4582
4539 Ti	110	E 20 25 5 Cu L R 23	E 385-16 (904)	C < 0.03 Si ~ 0.5 Mn ~ 1.5 Cr ~ 20 Ni ~ 25 Mo ~ 4.5 Cu ~ 1.5	T > 650 E > 30 I > 80	Designed for joining exceptional corrosion-resistant CrNiMoCu steels at temperatures from -196°C to 350°C. Base metals: 1.4500, 1.4505, 1.4506, 1.4531, 1.4536, 1.4539, 1.4573, 1.4585, 1.4586
4576 Ti***	100	E 19 12 Nb R 23	E 318-16	C < 0.05 Cr ~ 19 Ni ~ 11.5 Mo ~ 2.7 Nb +	T > 580 E > 370 R > 32 K > 65	For welding stabilised CrNiMo steels of the type 18/8/2, can not be bright polished. Working temperatures up to 400°C. Base metals: 1.4301, 1.4541, 1.4550, 1.4401, 1.4436, 1.4571, 1.4580, 1.4404, 1.4435, 1.4473
4576 HL	160	E 19 12 3 MPR 26 160	E 318-16			
4576 HLS*	160	E 19 12 3 NbR26 160	E 318-16			

* TUV approved ** Also available as lime basic

FOR HEAT-RESISTANT STEELS

TYPE	R %	DIN 8556	AWS	ANALYSIS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
4820 Ti 4820 HL	100 150	E 25 5 R 23 E 25 5 MPR 26 150	E 327	C < 0.05 Cr ~ 25 Ni ~ 4	T > 650 Y > 450 E > 20 I > 35	Scale-resistant up to 1100°C and resistant to reducing sulphurous furnace gasses. Choice electrode for welding sealing runs. Base metals: 1.4821, 1.4822, 1.4823
4332 Ti	100	E 23 12 LR 23	E 309L-16	C < 0.04 Cr ~ 23 Ni ~ 13 Si ~ 0.9	T > 600 Y > 400 E > 35 I > 70	Electrode for welding non-similar, stainless and heat-resistant steels such as dissimilar joints.
4829 MoTi 4829 MoHL	100 170	E 23 12 3 R 23 E 23 12 3 MPR 26 170	E 309 Mo E 309 Mo	C < 0.04 Cr ~ 23 Ni ~ 12 Mo ~ 3	T > 560 Y > 330 E > 35 I > 65	Joint weldings of heat-resistant steel of the same kind and high and low alloy steels. Scale-resistant up to 1100°C.
4842 Ti 4842 HL 4842 HLS	100 160 170	E 25 20 R 26 E 25 20 MPR 26 160 E 25 20 R 26 170	E 310-16 E 310-16 E 310-16	C < 0.10 Cr ~ 25 Ni ~ 20	T > 600 Y > 350 E > 30 I > 90	Joint-welding of heat-resistant CrNi steels of the same kind. Scale-resistant up to 1200°C. Base metals: 1.4841, 1.4846, 1.4848, 1.4837, 1.4762, 1.4845, 1.4849
310 Mo	100	E 25 22 2 NLB	E 310 Mo-16	C < 0.10 Cr 22-25 Ni ~ 20 Mo 2-3	T ~ 540 Y ~ 380 E ~ 35 I ~ 70	Ceweld 310Mo is similar to Ceweld 4842 Ti, but with molybdenum added for improved high temperature creep properties. Base metals: 1.4832, 1.4837, 1.4841, 1.4845, 1.4846, 1.4849, 1.4848, 1.4828, 1.4713, 1.4726, 1.4710, 1.4745, 1.4823
4850 Kb	130	DIN EN 1600: EZ 21 32 Nb B32		C Min:0,12 Max:0,1 Cr ~ 22 Ni ~ 33,5		Heat-resistant stainless steel alloy for MMA welding. Joining and cladding heat-resistant CrNi steels of the same kind and Cast steels. Base metals: 1.4876, 1.4861, 1.4859
4853 Kb	130	E 9-UM-200 RZ DIN EN 1600: EZ 25 35 Nb B32		C < 0.50 Cr ~ 26 Ni ~ 35		Joining heat-resistant CrNi steels of the same kind and Cast steels. Base metals: 1.4852, 1.4849, 1.4859, 1.4876, 1.4865

FOR STEELS DIFFICULT TO WELD

TYPE	R %	DIN 8556	AWS	ANALYSIS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
4370 Kb	100	E 18 8 Mn 6 B 20 +	E 307-15	C < 0.08 Cr ~ 18 Ni ~ 8 Mn ~ 6	T > 580 Y > 350 E > 40 I > 100	Fully austenitic electrode for welding steels with difficult weldability. The deposit has high plasticity and acts as a shock absorbing layer. Heat-resistant up to 900°C. Highly insensible for cracks! Excellently suited for overlays on train and tram tracks.
4370 Ti	100	E 18 8 Mn 6 R 26	E 307-16			
4370 HL	160	E 188Mn6MPR26160	E 307-16			
Croni 29/9 S	100	E 29 9 R 23	E 312-16	C < 0.10 Cr ~ 29 Ni ~ 9	T > 800 Y > 600 E > 20 I > 50	Special austenitic/ferritic electrode for joining base materials with extreme difficult weldability, such as manganese steel, spring steel and high-speed tool steels. Suitable as buffer layer before hardfacing.
29/9 HL	160	E 29 9 MPR 26 160	E 312-16			
Cronimo Ti	100	E 19 9 3 R 23	E 308 Mo	C < 0.05 Cr ~ 19 Ni ~ 9 Mo ~ 3	T > 600 Y > 400 E > 30 I > 60	Special electrode for joining base metals with risk of cracking. Especially suited for joint welding between ferritic and austenitic materials. Corrosion- and acid-resistant.
Cronimo HL	160	E 19 9 3 MPR 26 160	E 308 Mo			

FOR NICKEL BASED ALLOYS

TYPE	DIN 1736 UNS	AWS	W.NR.	APPLICATION
Nicro 600	EL-NiCr15FeMn W86182	ENiCrFe3	2.4807	Electrode for welding Ni and NiCr alloys (Inconel, Hasteloy, Nimonic etc.) and stainless steel with each other or with mild steel. Resistant to corrosion and high temperatures. Temperatures from -196 to +600°C. Also suitable for metal refining. The welding material has thermoshock-resistant properties. Also available as Mig, Tig and S.A. wire and strip.
Nicro HLS	EL-NiCr19Nb	ENiCrFe3	2.4548	
Nicro 625	EL-NiCr20Mo9Nb W86112	ENiCrMo-3	2.4321	Electrode for welding Inconel 625, 825 and alloy 25-6Mo and nickel alloys or different metals with each other. NiCrMo alloys and joint weldings with low and high alloyed steels; austenitic steels with high corrosion resistance for temperatures above 300°C. Also available as Mig, Tig and S.A. wire and strip.
NiTi 3	EL-NiTi3	ENi-1	2.4156	Special electrode for welding pure nickel and nickel clad steel sheet and joining of pure copper and band copper alloys with unalloyed or stainless steel. Especially suitable for joint welding of nickel and steel. Brazing cracks will not occur. Also available as Mig, Tig and S.A. wire and strip.
NiCu30Mn	EL-NiCu30Mn	ENiCu-7	2.4366	Electrode for welding NiCu30Fe, CuNi alloys and joining these alloys with steels such as Monel 400, R-405 and K-500. Also available as Mig, Tig and S.A. wire and strip.
Nicro 135/65	EL-NiCr28Mo		2.4653	Electrode for joining Incoloy 825 and other NiFeCrMoCu alloys of comparable composition. The weld metal has good resistance against general corrosion and pitting in many chemical solutions including sulphuric and phosphoric acids. Also available as Mig, Tig and S.A. wire and strip.
NiCrCo 617	EL-NiMo15Cr	ENiCrCoMo-1	2.4628	Electrode for welding Inconel 617. The weld metal has high mechanical properties and is extremely resistant to corrosion at very high temperatures. Applicable to Inconel 600 and 601, alloy 800HT and 802 and cast alloys such as HK-40, HP, HP-45 modified. Also available as Mig, Tig and S.A. wire.
NiCrMo 686	EL-NiMo15Cr	EL-NiCu30Mn		Special alloy for joining Duplex, Superduplex and super-austenitic stainless steel as well as nickel alloys such as N06059, N06022, Hasteloy C-276 and Inconel 622, 625 and 686. This alloy offers a wide range of applications in the chemical and petrochemical industries. Also available as Mig, Tig and S.A. wire and strip.
NiCrMo 622	EL-NiMo15Cr	ENiCrMo-10	2.4813	Electrode for joining Inconel 622 en 625, alloy 25-6Mo and Incoloy 825. Excellently suitable for joining different metals including: Inconel 625 and Hasteloy C-276. The weld metal offers good corrosion resistance when used with molybdenum-containing stainless steels. Also available as Mig, Tig and S.A. wire.
Alloy C 276	EL-NiMo15Cr15W	ENiCrMo-4	2.4877	Electrode for Hasteloy C-276 and similar NiCrMo alloys. Typically used for surfacing on steel. The weld deposit has excellent corrosion resistance in aggressive media and is especially resistant to pitting and crevice corrosion. This alloy is useful for various dissimilar joints involving nickel alloys, stainless steels and low alloyed steels.
Alloy HX	N06002	ENiCrMo-2		Electrode used for welding Hasteloy X and similar NiCrMo alloy. Also used for surfacing steel and joining of Hasteloy X, nickel alloys, stainless steel, carbon steel and low alloy steels. The weld deposit is very strong and has excellent oxidation resistance at high temperatures up to 1200°C.
Dur 6Ni	DIN 8555: E22-UM-40-CTZ			Electrode with excellent gliding properties (metal to metal) and high resistance to erosion, corrosion and wear from abrasive minerals. Field of application is similar to that of Stellite, however, this alloy cannot be used in connection with hydrochloric acid. The hardness of the weld deposit is maintained even at great temperature changes.
Dur AlTi	DIN 8555: E23-UM-350-PTZ		1.2714	Basic clad electrode for overlays on hot cutting tools. The weld deposit has good scale and thermoshock resistance as well as is high-wear resistant at high temperatures. Application: overlays on forging hammers etc.

FOR CORROSION-RESISTANT HASTELOY ALLOYS

TYPE	AWS	W.NR.	UNS	APPLICATION
Alloy B2	ENiMo-7	2.4617	N10665	The B-2 alloy is a nickel-base wrought alloy with excellent resistance to hydrochloric acid at all concentrations and temperatures. It also withstands hydrogen chloride, sulfuric, acetic and phosphoric acids. The alloy has excellent resistance to pitting, to stress-corrosion cracking and to knife-line and heat-affected zone attack. It resists the formation of grain-boundary carbide precipitates in the weld heat-affected zone, thus making it suitable for most chemical process applications in the as-welded condition.
Alloy B3	ENiMo-10	2.4600	N10675	The B-3 alloy is an additional member of the nickel-molybdenum family of alloys with excellent resistance to hydrochloric acid at all concentrations and temperatures. It also withstands sulfuric, acetic, formic and phosphoric acids, and other nonoxidizing media. B-3 alloy has a special chemistry designed to achieve a level of thermal stability greatly superior to that of its predecessors, e.g. B-2 alloy. B-3 alloy has excellent resistance to pitting corrosion, to stress-corrosion cracking and to knife-line and heat-affected zone attack.
Alloy C22	ENiCrMo-10		N06022	Most versatile nickel-chromium-molybdenum-tungsten alloy available today with improved resistance to both uniform and localized corrosion as well as to a variety of mixed industrial chemicals. The C-22 alloy exhibits superior weldability and is used as overall filler wire and weld overlay consumables to improve resistance to corrosion.
Alloy C-276	ENiCrMo-4	2.4819	N10276	Excellent corrosion-resistance to both oxidizing and reducing media and excellent resistance to localized corrosion attack.
Alloy C-2000	ENiCrMo-17	2.4675	N06200	Most versatile, corrosion-resistant alloy with excellent resistance to uniform corrosion in oxidizing or reducing environments. Excellent resistance to stress corrosion cracking and superior resistance to localized corrosion as compared to C-276 alloy.
Alloy C-4	ENiCrMo-7	2.4610	N06455	The C-4 alloy is a nickel-chromium-molybdenum alloy with outstanding high-temperature stability as evidenced by high ductility and corrosion resistance even after aging in the 1200 to 1900°F (649 to 1038°C) range. This alloy resists the formation of grain-boundary precipitates in the weld heat-affected zone, thus making it suitable for most chemical process applications in the as-welded condition. C-4 alloy also has excellent resistance to stress-corrosion cracking and to oxidizing atmospheres up to 1900°F (1038°C).
Alloy G-30	ENiCrMo-11	2.4603	N06030	The G-30 alloy is a high chromium nickel-base alloy which shows superior corrosion resistance over most other nickel- and iron-base alloys in commercial phosphoric acids as well as many complex environments containing highly oxidizing acids such as nitric/hydrochloric, nitric/hydrofluoric and sulfuric acids.
Ultimet Alloy		2.4681	R31233	Ulti alloy is cobalt-chromium alloy which offers excellent corrosion resistance comparable to that of the NiCr alloys. Ulti alloy exhibits outstanding wear resistance similar to that of the NiCr alloys. Also, Ulti alloy possesses high tensile strength comparable to many duplex stainless steels combined with excellent impact toughness and ductility.
Alloy X	ENiCrMo-2	2.4665	N06002	X alloy is a nickel-chromium-iron-molybdenum alloy that possesses an exceptional combination of oxidation resistance, fabricability and high-temperature strength. It has also been found to be exceptionally resistant to stress-corrosion cracking in petrochemical applications. X alloy exhibits good ductility after prolonged exposure at temperatures of 1200, 1400, 1600F (650, 760 and 870°C) for 16,000 hours.
Alloy 25	AMS 5797	2.4964 / 2.4967	R30605	Excellent high-temperature strength and good oxidation resistance alloy 25 is a cobalt-nickel-chromium-tungsten alloy that combines excellent high-temperature strength with good resistance to oxidizing environments up to 1800°F (980°C) for prolonged exposures and excellent resistance to sulfidation. It can be fabricated and formed by conventional techniques and has been used for cast components. Other attractive features include excellent resistance to metal galling.
Alloy 188			R30188	Alloy 188 is a cobalt-nickel-chromium-tungsten alloy that combines excellent high temperature strength with very good resistance to oxidizing environments up to 1095°C. For prolonged exposures, and excellent resistance to sulfate deposit hot corrosion. It is readily fabricated and formed by conventional techniques and has been used for cast components. Other attractive features include excellent resistance to molten chloride salts and good resistance to gaseous sulfidation.
Alloy 230		DIN NR. 2.4733	N06230	The 230 alloy is a nickel-chromium-tungsten-molybdenum alloy that combines excellent high-temperature strength, outstanding resistance to oxidizing environments up to 2100°F (1149°C) for prolonged exposures, premier resistance to nitriding environments and excellent long-term thermal stability. It is readily fabricated and formed and is castable. Other attractive features include lower thermal expansion characteristics than most high-temperature alloys and a pronounced resistance to grain coarsening with prolonged exposure to high temperatures.
Alloy 242			N10242	242 alloy is an age-hardenable nickel-molybdenum-chromium alloy which derives its strength from a long-range-ordering reaction upon aging. It has tensile and creep strength properties up to 1300°F (705°C) which are as much as double those for solid solution strengthened alloys, but with high ductility in the aged condition. The thermal expansion characteristics of 242 alloy are much lower than those for most other alloys and it has very good oxidation resistance up to 1500°F (815°C). Other attractive features include excellent low cycle fatigue properties, very good thermal stability and resistance to high-temperature fluorine and fluoride environments.
Alloy 263			N07263	263 alloy is an age-hardenable nickel-cobalt-chromium-molybdenum alloy designed specifically to combine very good aged strength properties with excellent fabrication characteristics in the annealed condition. While its strength at elevated temperature is not quite as high as materials such as Waspaloy alloy or alloy R-41, it is far easier to form or weld than these alloys. Alloy 263 exhibits excellent intermediate temperature tensile ductility and is not normally subject to strain age cracking problems common for gamma prime strengthened alloys.
Alloy 556		DIN NR. 1.4883	R30556	556 alloy is an iron-nickel-chromium-cobalt alloy that combines effective resistance to sulfidizing, carburizing and chlorine-bearing environments at high temperatures with good oxidation resistance, fabricability and excellent high-temperature strength. It has also been found to resist corrosion by molten chloride salts and other salts, and is resistant to corrosion from molten zinc.
Multimet	AMS 5795		R30155	The Multi alloy (also known as alloy N-155) is a solid-solution-strengthened superalloy with excellent high-temperature strength and good oxidation resistance up to 1800°F (980°C). It has been widely used for forged or fabricated components in order aircraft and land-based turbine engine applications. For modern engine applications, it has been largely replaced by newer materials, such as the H-3140 alloy, which have improved properties. Multi alloy may be cold- or hot-formed by a variety of techniques and is weldable by most standard methods.

FOR CAST IRON AND GOUGING

TYPE	DIN 1736 UNS	AWS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
Ni(-)	E Ni-BG 22	E Ni-C 1	T = 240-290 H ~ 160 HB	Special electrode with a pure nickel core wire for joining and repair welding of grey iron castings and malleable cast iron components. Flat deposit with a smooth surface without notches. Current: = DC(-) or AC.
FeNi 60 N	E Ni Fe-1-BG 23	E Ni Fe-C1	T = 380-480 H ~ 200 HB	Coated electrode with a core wire of 60% Ni and 40% Fe, especially suited for welding of spheroidal cast iron. The weld deposit is free from porosity and has the highest resistance to cracking. Current: = DC(+) or AC.
NiFe 2	E Ni Fe-1-BG 23	E NiFe-C1	T = 400-480 H ~ 200 HB	Coated electrode with a bi-metal core wire of 60% Ni and 40% Fe, especially suited for welding of spheroidal cast iron. The weld deposit is free from porosity and has the highest resistance to cracking. Very well suited for diluted and old cast iron. Current: = DC(+) or AC.
HGW	E Fe-1-S-13	E St	T = 340-390 H ~ 300 HB	Special coated electrode for welding of cast iron when subsequent machining of the weld is not necessary. Excellently suited for oil-drenched grey cast iron. Current: = DC(+) or AC.
GGG			T = 620-680 H ~ 200 HB	Special electrode without nickel. Well suited for cast iron welding. Colour and corrosion resistance properties are the same as those of the cast alloy. Therefore, repair of blow holes and other damage cannot be seen afterwards. Current: = DC(+).
GUTS S/B2				Special electrode for chamfering and cutting of all conductive metals such as alloyed and unalloyed steels, cast iron, aluminium and copper alloys. Has a non-conductive coating and is therefore ideally equipped for use in places that are difficult to reach or for drilling holes. Current: = DC(-) or AC.

AGAINST SHOCKS AND ABRASION

TYPE	R %	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
E 250 Kb	100	E 1-UM-250	250-275 HB	C ~0.1 Mn ~1.5 Cr ~1.0	Lime basic coated electrode for applications which are subject to slight wear. Can be applied in several layers and has good machineable properties.
E 300 Kb	120	E 1-UM-300	275-325 HB	C ~0.1 Mn ~1.0 Cr ~3.0	Lime basic coated electrode for applications which are subject to heavy impact loads. The welding material has good machineable properties and can additionally be flame hardened.
E 350 Kb	120	E 1-UM-350	350-400 HB	C ~0.15 Mn ~1.0 Cr ~3.0	Lime basic coated electrode for machine parts which are subject to wear. The overlays are well machineable with carbide tipped tools!
E 580	110	E 2-UM-60		C ~1.5 Cr ~3	Rutile coated electrode. The weld metal is tough, hard and abrasion proof. It can be used for hardfacing layers on dredger teeth, crusher jaws and impact strips.
E 60 Kb	130	E 6-UM-60-PS	57-61 HRc	C ~0.5 Mo ~1.5 Cr ~9 V ~1.5	Lime basic coated electrode for applications which are subject to high friction wear. Also suitable for repairs on cold cutting tools and on austenitic manganese steel.
E 60 Ti	120	E 6-UM-60-PS	57-61 HRc	Mo ~0.8-1.0 Cr ~7-8 V ~0.2-0.3	Rutile basic coated electrode for applications which are subject to high friction wear. Also suitable for repairs on cold cutting tools and on austenitic manganese steel.
E 60 Ti 160	150				

FOR CUTTING EDGES

TYPE	R %	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
WA 45	130	E 3-UM-45-T	Untreated: 45 HRc Treated: 48 HRc	C ~0.2 Cr ~2.5 W ~4.5 V ~0.6	Lime basic coated electrode for repair welding on tools of hotwork steels of the same type or for lining of working surfaces on hot working tools of low-alloyed or unalloyed steels. Machining of the weld deposit is possible.
SS 60 Ti	130	E 4-UM-60(65w)-ST	Untreated: 59-62 HRc Treated: 63-65 HRc	C ~1.0 Mo ~8 V ~1.5 Cr ~4.5 W ~2	Rutile coated electrode in high-speed tool steel quality for the reinforcement of cutting edges, for tool bodies, for overlaying of hot cutting tools. The weld deposit can be heat-treated like high-speed tool steel. Good tempering properties up to 550°C.

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HARDFACE ELECTRODES

MANGANESE BASED

TYPE	R %	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
MN 14	120	E 7-UM-250-K	200-250 HB After hardening: 450-550 HB	C ~ 1 Mn ~ 13 Ni ~ 3	Lime basic coated austenitic manganese steel electrode for welding of austenitic manganese steel which is mainly subject to impact loads. Strain-hardening improves the hardness considerably.

STELLITE (COBALT BASED ALLOYS)

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur 1 U	E 20-UM-55-CTZ R Co Cr-C	53-55 HRc	C ~ 2.5 Cr ~ 30 Co ~ 52 W ~ 15	Stellite alloy with high resistance to abrasion, oxidation and erosion. Especially resistant to seizing on case of friction of metal to metal. Even up to red hot this alloy retains high hardness properties. Completely tempering-resistant.
Dur 6 U	E 20-UM-40-CTZ R Co Cr-A	43-45 HRc	C ~ 1.1 Cr ~ 28 Co ~ 65 W ~ 5	Tough and high tensile Stellite alloy for overlays in case of wear as well as temperature shocks, impact loads or corrosion.
Dur 12 U	E 20-UM-50-CSTZ R Co Cr-B	46-48 HRc	C ~ 1.3 Cr ~ 28 Co ~ 59 W ~ 10	In hardness and toughness this Stellite alloy lies between Dur 1 U and 6 U. As compared to 6 U it is somewhat more resistant to wear and as compared to 1U it is more resistant to temperature shocks and impact loads.

WITH HIGH WEAR RESISTANCE

TYPE	R %	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur 50	130	E 3-UM-50-T	50-53 HRc	C ~0.4 W ~2,5 Cr ~3 V ~1.5	Rutile basic coated electrode for applications against high friction wear.
Dur 55	200	E 10-UM-60-Z	54-58 HRc	C ~5.5 Nb ~7 Cr ~24	Extremely thick coated electrode for wear-resistant overlays which are subject to abrasion.
Dur 60	160	E 10-UM-60-Z E Fe Cr-A 1	57-60 HRc	C ~4 Cr ~32	Extremely thick coated electrode for wear-resistant overlays which are subject to abrasion. The electrode produces smooth and bright seam surfaces. Covering slag.
Dur 62	170	E 10-UM-65-Z E Fe Cr-A 1	60-63 HRc	C ~5 Cr ~35	Thick coated electrode for high wear-resistant overlays which are subject to abrasion. The welding properties are equally good with DC(+) and AC. Non-covering slag.
Dur 62 S	200	E 10-UM-65-Z E Fe Cr-A 1	60-64 HRc	C ~6 Cr ~35 + Specials	Very thick coated electrode for high wear-resistant overlays which are subject to abrasion.
Dur 63	210	E 10-UM-65-Z E Fe Cr-A 1	60-64 HRc	C ~4.5 Cr ~32 + Specials	Very thick coated electrode for high wear-resistant overlays which are subject to abrasion. The welding properties are equally good with DC(+) and AC. Hardness HRc=60-64 can be achieved in one layer. Non-covering slag.
Dur 64	230	E 10-UM-65-Z	62-65 HRc at 600°C ~40HRc	Cr-Mo- W-V-Nb Carbide	Very thick coated electrode for high wear-resistant overlays which are subject to abrasion up to working temperatures of 600°C.

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SINTERED HARDFACE ELECTRODES

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur 71	E 21-UM-65-G	68-72 HRc	Tungsten + chromium carbides	For extremely tough high wear-resistant overlays that are not subject to heavy impact. Extremely resistant to wear by minerals and ceramic materials. Deposit not thicker than 4 mm. Preheating is recommended for hard steels. Sandwich layers are possible. Current: DC(-) or AC.

TUNGSTEN CARBIDE ALLOYS (EXTREME WEAR)

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur R	G 21-GF-65	ca. 65 HRc	Steel tube filled with Tungsten carbide WSC approx 60% Fe - rest	High wear-resistant tungsten-carbide based hard-facing alloy. Suitable for rotary drilling and for mining. The alloy can be applied with little preheat of the surface and welding with a slight excess acetylene flame.
Dur RU	E 21-GF-(UM)-65	ca. 65 HRc	Steel tube filled with Tungsten carbide	Same alloy as Dur R, but coated for electric welding. The current should be kept as low as possible.
Dur R (Ni) Dur RU (Ni)	G-21-GS-350 GR E-21/22-UM-60 CG	Matrix - 56 HRc	NiCrBSi = matrix WSC approx = 60% WSC - 500-1600 um WSC - 2800 HV	Same as Dur R or RU, but with corrosion-resistant matrix for application with acids and other corrosive media. Due to the low melting point of the matrix this alloy has good bonding properties and it can be applied on almost every surface. Applications: wear in chemical and/or food industries, stabilisers, deep drilling, mixers, scratchers, bentonit mixers etc.
Dur CS			CuZnNi matrix + Tungsten lumps approx 65%	The gas weldable Dur CS contains broken massive lumps of hard metal which are fixed in a matrix of CuZnNi with a melting point of approx 900°C. This alloy is used in deep drilling technique (hardfacing of drill point), stone mills, paper or pulp shredders, scratchers etc. Available grain sizes: 2-4 mm, 4-6 mm, 6-8 mm, 10-12 mm in lengths of 450 mm.

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ALUMINIUM BRONZE ELECTRODES

TYPE	DIN 1736 / AWS	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
CuAl8	E 31-UM-150 E Cu Al-A 1	~ 150 HB 10	Al ~9 Fe ~2 Cu : Rest	Suitable for wear- and corrosion-resistant overlays. The weld material has excellent properties as bushing metal with high surface loads. It is acid-, corrosion and seawater-resistant.
CuMnAlNi	E 31-UM-200-CN	~ 200 HB	Al ~8 Ni ~2 Fe ~2.5 Mn ~14 Cu : Rest	Aluminium bronze electrode containing manganese and nickel for joining brass, bronze and ferrous metals. Resistant to seawater and very high mechanical properties. Current: DC (+) only.

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TIN BRONZE ELECTRODES

	TYPE	DIN	AWS	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Zibro	E 30-UM-100-CNR	E Cu Sn-C	~ 100 HB 10	Sn ~7 Cu : Rest	For overlays on bushing metal, copper, copper alloys, tin bronze, mild steels and cast steels.	

FOR ALUMINIUM AND ALUMINIUM ALLOYS

TYPE	DIN 1732	AWS/SFA 5.10	APPLICATION / PROPERTIES
EL-Al 99,8	EL-AL 99,8	E 1100	Electrode for welding mostly pure aluminium with max. 0.2% alloying elements. The material can also be used when high corrosion resistance is required.
EL-ALSi5	EL-ALSi5	E 4043	Aluminium alloy for welding aluminium with a maximum of 2% alloying elements and for castings containing up to 7% Si. Excellent flow characteristics and penetration. Recommended if a good looking result is preferred over good mechanical properties and corrosion resistance. Welding ALMg alloys with more than 3% Mg is not recommended because of the risk of cracking. (DC+) . Suitable for wall thickness from 2 mm and up.
EL-ALSi12	EL-ALSi12	E 4047	Aluminium alloy for cast alloys with more than 7% Si. In special circumstances the so-called moulded alloys can be welded also. (DC+) . Suitable for wall thickness from 2 mm and up.
EL-ALMn1	EL-ALMn1	E 3003	Aluminium electrode for joint welding and overlays on aluminium manganese and aluminium magnesium alloys with a maximum of 3% Mg. Of all available aluminium electrodes this type has the highest seawater resistance. DC+ only . Suitable for wall thickness from 2 mm and up.

Do not use ALSi welding materials if the weld will be anodised afterwards. The weld will then discolour. Alternatively use an ALMg alloyed welding wire.

METAL FLUX-CORED WIRES
FOR UNALLOYED AND LOW ALLOYED STEELS

CODE	EN	AWS	DESCRIPTION
710M	T 46 6 M M 1 H5	E 70 C-6M E 71 T-1	Flux-cored wire without slag for general use and robot applications.
235M	T 46 2 Mo M M 1 H5	E 81 T1-A1 E 80 C - G	Flux-cored wire without slag for creep-resistant steels like 15Mo3 etc.
236M	T CrMo1 M M 1 H5	-	Flux-cored wire without slag for creep-resistant steels like 13CrMo44, 24CrMo5 etc.
240M	T 50 4 Z M M 1 H5	E 80 T1-G E 80 C - G	Flux-cored wire without slag with 1,4% nickel for crane, steel, vessel and apparatus construction.
741M	T 55 4 1NiMoMM 3 H5	E 90 T1-G E 80 C - G	Flux-cored wire without slag for heat-resistant fine grain steels such as 1.6368, 1.5403 etc.
940M	T 55 6 Z M M 1 H5	E 90 T1-G E 80 C - G	Medium alloyed flux-cored wire without slag with 2,0% Ni. For steels like HY 80, X42, X80, EStE 550 etc.
250M	T 69 6 Z M M 1 H5	E 111 T1-G E 110 C - G	Medium alloyed flux-cored wire without slag with 3,0% Ni. For steels like HY 1000, X80, EStE 690, Weldom 700 etc.
742M	T 69 6 Mn2NiCrMo M M 1 H5	E 111 T1-K4 E 110 C - G	Medium alloyed high strength flux-cored wire without slag for steels like Naxtra 70, Weldom 700, EStE 690, EstE690 V, XABO 620 etc.
807M	T 89 4 Z M M 1 H5	E 120 T1-G E 110 C - G	Medium alloyed high strength flux-cored wire without slag for steels like XABO 90, StE890 V, Weldom 700, Weldom 900, 42CrMo4 etc.
1100M	T 89 4 Z M M 1 H5	E 120 T1-G E 110 C - G	Medium alloyed high strength flux-cored wire without slag for steels like XABO 90, StE890 V, StE890 VA, StE960 TM, Weldom 700, Weldom 900 etc.

RUTILE FLUX-CORED WIRES

FOR UNALLOYED AND LOW ALLOYED STEELS

CODE	EN	AWS	DESCRIPTION
713R	T 46 2(4) P C(M) 1 H5	E 71 T1	Flux-cored wire with slag and excellent all positional welding properties. Remarkable mechanical properties.
781R	T 46 A Z P C(M) 1 H5	E 81 T1-G	Flux-cored wire with slag and excellent all positional welding properties for welding Corten, Patinax etc.
822R	T 46 6 1Ni P M 1 H5	E 81 T1-Ni1	Flux-cored wire with slag and excellent all positional welding properties for low temperatures up to -60°C.
825R	T 46 A P M H5	E 81 T1 -A1	Flux-cored wire with slag for creep-resistant steels like 15Mo3 etc.
836R	T CrMo 1 P M 1 H5	E 81 T1-B2	Flux-cored wire with slag for creep-resistant CrMo steels like 13CrMo44 etc.
690 R	T 69 6 Mn2,5Ni P M 2 H5	E 110 T5-K4	Micro-alloy rutile flux-cored wire with rapidly solidifying slag for CO ₂ and Ar-Co ₂ mix. Excellent weld puddle manipulation, thus superior all-position welding. Using temperature up to -60C. Particularly suited for MAG orbital welding applications and all-position welding on ceramic backing. Low spatter loss, easy slag removal. Recommended for offshore applications that requires yield strength up to 690 N/mm ² . The first seamless flux-cored wire for StE 690 on the market!

BASIC FLUX-CORED WIRES

FOR UNALLOYED AND LOW ALLOYED STEELS

CODE	EN	AWS	DESCRIPTION
731B	T 42 4 B C(M) 3 H5	E 70 T-5	Flux-cored wire with slag for extremely crack-resistant joints on high carbon and mild steels applications such as, St52-3, X70, 17Mn4 etc.
735B	T 46 2 Mo B C(M) 3 H5	E 80 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on steels like, 15Mo3, 16Mo5, GS 60 etc.
736B	T CrMo1 B C(M) 3 H5	E 80 T5-B2	Flux-cored wire with slag for extremely crack-resistant joints on CrMo steels like, 13CrMo44, 24CrMo5 etc.
737B	T CrMo2 B C(M) 3 H5	E 80 T5-G	Flux-cored wire with slag for extremely crack-resistant joints of high temperature and compressed hydrogen content 2,25% Cr 1%Mo steels.
838B	T CrMo1 B C(M) 3 H5	E 80 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on high-temperature resistant CrMoV steels such as GS-17CrMoV 5 11, 21CrMoV 5 11 etc.
740B	T 46 6 1Ni B C(M) 3 H5	E 80 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on steels like StE460, TstE460, X70 etc.
741B	T 55 4 1NiMo B C(M) 3 H5	E 90 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on steels like X65, X70, StE500, 15NiCuMoNb5, 17MnMoV 6-4, 11NiMoV53 etc.
742B	T 69 4 Mn2NiCrMoBC(M)3H5	E 110 T5-K4	Flux-cored wire with slag for extremely crack-resistant joints on high strength steels like Naxtra 70, Weldox 700, EstE 690, EstE690 V, XABO 620, HY 100 etc.
745B	T 89 4 Mn2NiCrMo B M 3 H5	E 120 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on high strength steels like StE890, XABO 90, WELDOX etc.
807B	T 89 4 Z B M 3 H5	E 120 T5-G	Flux-cored wire with slag for extremely crack-resistant joints on high-strength steels like StE890, XABO 90, WELDOX, 25CrMo4, 34CrMo4, 42CrMo4, 28NiCrMo44 etc.

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SELF SHIELDING FLUX-CORED WIRES

CODE	AWS	DESCRIPTION
OAS-71-TGS	E 71 T-GS	Flux-cored wire for welding without gas on sheet metal up to 5 mm wall thickness. Excellent results on painted, rusty or otherwise diluted plates.
OAS-71-T11	E 71 T-11	Flux-cored wire for welding without gas on sheet metal > 5 mm wall thickness. Excellent results on painted, rusty or otherwise diluted plates.
OAS-70-T4R	E 70 T-4	Flux-cored wire for welding without gas. Excelent high speed welding deposit with good mechanical properties. Suitable for C-Mn steels such as rails, fabrication of machinery.

STAINLESS STEEL FLUX-CORED WIRES

TYPE	AWS	ANALYSIS	MECHANICAL PROPERTIES	CLASSIFICATION EN-NORM	APPLICATION / BASE METAL
AA 307	E 307T0-1 E 307T0-4			18 8 MnM M 3(C3)	High-alloyed tubular wire for steels that are difficult to weld and that workharden during use weldable without protective gas. Especially suited for buffer layers before hardfacing. The deposit distinguishes itself by very high ductility and crack-resistance. It is rust, wear- and heat-resistant up to 900°C. Applications include: joining between manganese hard steels and steels difficult to weld, buffer layers before hardfacing, hardfacing of parts subject to impact and deposits on rail tracks.
AA 308L	E 308-LT0-1 E 308-LT0-4	C <0.03 Cr ~18-21 Ni ~9-11		T19 9 LRM 3 T19 9 LRC 3	Tubular austenitic wire for joining and overlays on 18/8 CrNi steels, unalloyed and low-alloy steels. The welding material is capable of taking a high polish. Suitable for working temperatures up to 300°C.
AA 308H	E 308-LT0-1 E 308-HT0-4		T : 540-650 Y : 310-350 E : 35 I : 70-90	T19 9 NRM 3 T19 9 NRC 3	Welding of 304H and 304H derivatives that operate at temperatures up to 750°C.
AA SD 100				T Z 25 9 4 N LM M 1	Metal cored super duplex stainless steel welding wire with high mechanical properties for gas shielded arc welding. Welding wrought, forged or cast super duplex stainless steels for service in the as-welded condition. Heterogeneous welding between super duplex stainless steels and dissimilar welds between other stainless and mild or low alloyed steels. Developed for: Super Duplex, Zeron 100, SAF 2507, ASTM S322760, S32550 and S31260.
AA 22 09 Duplex	E 2209 T0-1/-4	C ~0.02 Cr ~22.74 Ni ~8.89 Mo ~2.99 Si ~0.66	T : 789 E : 25%	T 22 9 3 N LRC (M) 3	High-alloy tubular wire for joining stainless steel. Duplex steels, high resistance to general corrosion, pitting and stress corrosion. Maximum working temperature: 280°C.
AA 309L	E 309-LT0-1 E 309-LT0-4	C ~0.05 Cr ~20-23 Ni ~10-13 Mn ~1	T : 540 Y : 400 E : 30 H : 180	T 23 12 LRM 3 (C3)	Austenitic tubular wire for joining dissimilar metals or cladding. The deposit has excellent ductility and crack-resistance. It is rust-, wear- and heat-resistant up to 1050°C. Often used for cladding if a 18/8 alloy in the first layer is desired.
AA 309LNb	E 309LCb T0-1			TZ 23 12 Nb RM 3 TZ 23 12 Nb RC 3	Rutile flux-cored stainless steel welding wire with exceptional weldability for use with Co2 and Argon / Co2 mixed gas. Cladding mild and low alloyed steels in offshore and/or chemical plants in case AISI 347 or AISI 321 are required as clad layer.
AA 309L Mo	E 309-LMoT0-1 E 309-LMoT0-4	C ~0,05 Cr ~20-23 Ni ~10-13 Mo ~2-2.5 Mn ~1	T : 540 Y : 320 E : 35 I : 80 ZH : 350 HB	T 23 12 2 LRM 3 (C3)	Austenitic tubular wire for cladding unalloyed or low-alloy steels such as cast steel, fine grain steel, machine steel and refined steel etc. The deposit has excellent ductility and crack-resistance. It is rust, wear- and heat-resistant up to 1050°C. Often used for cladding if a 18/8/3 alloy in the first layer is desired.
AA 316L	E 316-LT 1-4 E 316-LT0-4	C <0.03 Cr ~17-20 Ni ~10-13 Mo ~2-2.5	T : 540-650 Y : 310-350 E : 35 I : 70-90	T 19 12 3 LPM1/ LPC1 (0.9 mm) T 19 12 3 LRM1/ LRC3 (1.2 mm)	Tubular wire with austenitic structure. The welding material is capable of taking high polish. Suitable for working temperatures up to 350°C. Used for joining and cladding on 18/8/2,5 stainless steels and generally all steels, alloy composition of which is between 16/21% Cr, 6/13% Ni and 0 and 3% Mo. See electrode 4430 for base materials.
AA 312	E 312 T0-1 E 312 T0-4	C <0.10 Cr ~27-30 Ni ~7-10	T : 800 Y : 600 E : 20 I : 50	T 29/9 RM3 (C3)	High-alloyed austenitic/ferritic tubular wire for joining base materials with extreme difficult weldability, such as manganese steel, spring steel and high-speed tool steels. Suitable as buffer layer before hardfacing and joining unknown alloys.
AA 329 M				TZ 25 4 MM 1	High-alloyed tubular wire based on a 25% Chromium and 4% Nickel deposit for cladding and joining components against corrosion, high-heat and wear resistance. Developed for gas shielded arc welding.
AA 410	Cr 13 E 410				Metal cored gas-shielded wire for joining, rebuilding and cladding, stainless martensitic and martensitic/ferritic rolled, forged and cast steels.
AA 410 NiMo	G 13 4 E 410 NiMo				Metal cored gas-shielded wire for joining, rebuilding and cladding, stainless martensitic and martensitic/ferritic rolled, forged and cast steels. Used in steam power plants and for the fabrication and rebuilding of Francis and Pelton turbines. The deposit is martensitic. It combines good toughness with excellent resistance to cavitation and stress corrosion cracking.

AA = Weldable with gas protection OA = Self shielded

FOR NICKEL BASED ALLOYS

TYPE	W.NR.	APPLICATION
Nicro 600	2.4807	Flux-cored wire for welding of Ni and NiCr alloys (Inconel, Hasteloy, Nimonic etc.) and stainless steel with each other or with mild steel. Resistant to corrosion and high temperatures. Temperatures from -196 to +600°C. Also suitable for metal refining. The welding material has thermoshock-resistant properties. <i>Also available as Mig, Tig and S.A. wire and strip.</i>
Nicro 625	2.4321	Flux-cored wire for welding of Inconel 625, 825 and alloy 25-6Mo and nickel alloys or different metals with each other. NiCrMo alloys and joint weldings with low and high alloyed steels; austenitic steels with high corrosion resistance for temperatures above 300°C. <i>Also available as Mig, Tig and S.A. wire and strip.</i>
NiTi 3	2.4156	Special flux-cored wire for welding of pure nickel and nickelclad steel sheet and joining of pure copper and band copper alloys with unalloyed or stainless steel. Especially suitable for joint welding of nickel and steel. Brazing cracks will not occur. <i>Also available as Mig, Tig and S.A. wire and strip.</i>
NiCrCo 617	2.4628	Flux-cored wire for welding Inconel 617. The weld metal has high mechanical properties and is extremely resistant to corrosion at very high temperatures. Applicable to Inconel 600 and 601, alloy 800HT and 802 and cast alloys such as HK-40, HP, HP-45 modified. <i>Also available as Mig, Tig and S.A. wire.</i>
Alloy C 276	2.4877	Flux-cored wire for the welding of Hasteloy C-276 and similar NiCrMo alloys. Typically used for surfacing on steel. The weld deposit has excellent corrosion resistance in aggressive media and is especially resistant to pitting and crevice corrosion. This alloy is useful for various dissimilar joints involving nickel alloys, stainless steels and low alloy steels.
Dur 6Ni		Flux-cored wire with excellent gliding properties (metal to metal) and high resistance to erosion, corrosion and wear from abrasive minerals. Field of application is similar to that of Stellite, however, this alloys cannot be used in connection with hydrochloric acid. The hardness of the weld deposit is maintained even at great temperature changes.

There is no classification system for nickel based flux-cored wires.

STELLITE (COBALT BASED ALLOYS)

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur 1	MSG 20-GF-55-CTZ	53-55 HRc	C ~ 2.5 Cr ~ 30 Co ~ 52 W ~ 15	Stellite alloy with high resistance to abrasion, oxidation and erosion. Especially resistant to seizing on case of friction of metal to metal. Even up to red hot this alloy retains high hardness properties. Completely tempering-resistant.
Dur 6	MSG 20-GF-40-CTZ	43-45 HRc	C ~ 1.1 Cr ~ 28 Co ~ 65 W ~ 5	Tough and high tensile Stellite alloy for overlays in case of wear as well as temperature shocks, impact loads or corrosion.
Dur 12	MSG 20-GF-50-CTZ	46-48 HRc	C ~ 1.3 Cr ~ 28 Co ~ 59 W ~ 10	In hardness and toughness this Stellite alloy lies between Dur 1 and 6. As compared to 6 it is somewhat more resistant to wear and as compared to 1 it is more resistant to temperature shocks and impact loads.

FLUX-CORED WIRES
FOR HARDFACING

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
OA MnCr	MF 7-250-KNP	250-500 HB	C < 0.04 Mn ~ 13-15 Cr ~ 13-15 Mo ~ 0.5	Austenitic tubular wire for deposits subject to hard impact wear that is weldable without protective gas. Deposit thickness as required. Especially suited for layers before hardfacing. The deposit is non-magnetic and cannot be flame cut. Extremely good welding properties. Buffer layers, crusher jaws, dredger teeth, blast furnace mantles, rails etc.
OA Mn 14	MF 7-200-KNP	250-450 HB	C ~ 1 Cr ~ 2.5-3 Ni ~ 2-2.5 Mn ~ 13-15	Manganese based high-alloyed tubular wire with Cr and Ni additives that is weldable without protective gas. Austenitic joints therefore non-magnetic. Deposit thickness as required. The welding should be done as cold as possible. Buffer layers before hardfacing on steel with a high C-content. Manganese hard steels and parts that are mainly subject to impacts.
OA Mn18Cr	MF 7-300-KNP		C ~ 1,0 Cr ~ 14 Ni ~ 1,2 Mn ~ 18	Tubular wire weldable without protective gas for rebuilding and buffer layers before hard-facing with extreme resistance to heavy impact loads. Rebuilding, buffer layers, rails, rails crossings, dredger teeth, blast furnace mantles.
OA 300 AA 350	MF 1-300-P	280-320 HB	C ~ 0.15 Cr ~ 1.5-2 Si ~ 0.6-0,8 Mo ~ 0.4-0.6 Mn ~ 2-3	Low-alloyed tubular wire for deposits on parts subject to medium wear, weldable without protective gas. The deposit is tough and without cracks and resistant to metal-to-metal wear. Deposit thickness as required. Not suitable for manganese steels. The deposit is machinable. Buffer layers before hardfacing, rope pulleys, rails, crane wheels, shafts, wheel flanges, chutes etc.
OA 400 A 740 M	MF 1-GF-40-KN MSG 5-GF-40-P	38-40 HRc	C < 0.15 Cr ~ 2-3 Mo ~ 0.4-0.6 Mn ~ 2-3	Medium-alloyed tubular wire for deposits on parts subject to heavy impact and shock strains that is weldable without protective gas. Deposit thickness as required. A buffer layer is only required for sensitive base materials. The deposit can be machined with tungsten carbide cutting tools. (A 740 M is a metal type). Wheels, rope pulleys, crane wheels etc.
OA 550-VW	MF 6-60-PT	55-58 HRc	C ~ 0.5 Cr ~ 6.0 Mo ~ 1.5 Mn ~ 3.0 W ~ 1.0	Medium-alloyed tubular wire on a C-Cr-Mo-W basis for high hardness up to 550°C. Recommended for parts subject to strong mineral abrasion and erosion, weldable without protective gas. Cement pumps, crusher bars, hammer and blooming, table rolls, mineral and brick industry.
MAG 600	MF 6-55-RP	600 HB	C = 0.45 Cr = 9.5 Mn = 0.5 Si = 3.0	Tubular hardfacing wire for tough and wear-resistant deposits on parts subject to abrasive wear and heavy impacts. Several layers can be applied. Homogenous and crack free deposits that can be applied almost everywhere without any trouble. Car shredders, suction dredgers, dredger buckets, crushers etc.
A 760 M A 760 B	MSG6-60 MSG 6-GF-60-P	600 HB	C = 0.5 Cr = 6.5 Si = 1.8 Mn = 3.0 Mo = 0.8 V = 0.4	Tubular hardfacing wire for wear-resistant deposits with a hardness of 60HRc. The deposit is resistant to abrasive wear as well as to heavy impacts. (Available in metal and basic type). Refuse disposal, snowploughs, hammers, dredger buckets etc.

OA = self shielding wire

AGAINST HIGH ABRASION FOR HARDFACING

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
OA 55	MF 10-GF-55	56-60 HRc	C ~4.5 Mn ~3.5 Cr ~20-25	High-alloyed tubular wire on a Cr-carbide basis for wear-resistant deposits subject to heavy abrasive wear that is weldable without protective gas. Best results are obtained with a two-layer weld. The deposit should be about 5 to 6 mm thick. A buffer deposit with OA 4370 is recommended for sensitive base materials or remainders of old hardface layers. Screw conveyors, mixer blades, dredger pumps, crusher rolls, agitator arms etc.
OA 13-8 Mn	MF 7-GF-250-KNR	250-450 HB	C ~1 Cr ~7-9 Mn ~14-16 Nb ~3-3.5	Manganese-based high-alloyed tubular wire with Cr and Nb additives that is weldable without protective gas. The austenitic matrix has equally diffused Nb-carbides, which give a high hardness and resistance to heavy abrasive wear. As the alloy has a high ductility and crack resistance it is qualified for hardfacings on packing rings, especially in the blast furnace technology.
OA 55 TC	MF 6-60-GP	54-56 HRc	C ~2 Ti ~4.5 Mn ~1-2 Mo ~1-1.5 Cr ~5-7	Alloyed tubular wire on a chromium-titanium-carbide basis that is weldable without protective gas. The special alloy gives resistance to abrasive wear and impacts simultaneously. 3 layers can be applied without cracks. Deposits up to 10 mm thick are possible, mainly free of cracks. Radling crusher screw conveyors, dredger teeth, crusher hammers, gravel pumps, bucket collars etc.
OA 612	MF 10-GF-55	54 HRc	C ~0.5 Cr ~12.5 Mn ~0.5 Si ~0.9	Alloyed tubular wire for wear-resistant deposits subject to heavy abrasive wear that is weldable without protective gas. Up to 3 layers are possible. Sand pumps, valve sittings, dredger material etc.
OA 58	MF 10-60-G	56-60 HRc	C ~4 Cr ~20-25 Mn ~0.5-1 Mo ~1.0-1.5	High-alloyed tubular wire for overlays resistant to heavy abrasive wear by minerals. Weldable without protective gas. Best results are obtained with a two-layer weld. Corrosion-resistant and scale-resistant properties are good. Repairs of mining machines as well as of steel mill equipment. Also suitable for hard-facings on machine parts in construction and agricultural industries.
OA 59	MF 10-60-G	58-64 HRc very good wear- resistance	C ~5 Nb ~7 Cr ~22 Si ~0,9 Mn ~0,5	High-alloyed tubular wire on a Cr-Nb-carbide basis for wear-resistant deposits on parts subject to heavy abrasive wear by minerals. Weldable without protective gas. A buffer layer with OA 4370 is necessary in case of remainders of hardface layers. High resistance to wear, even with one layer. With two layers the deposit should have a maximum thickness of approx 6 mm. Mixer blades, dredger teeth, dredger buckets, sand blasting equipment, suction dredgers, cement industry etc.

WITH EXTREME WEAR-RESISTANCE FOR HARDFACING

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
OA 59 H	MF 10-65-G	64-66 HRc	C ~5,5 Cr ~23-25 Nb ~6-8 B ~+	High-alloyed tubular C-Cr-Nb-B based wire for extremely wear-resistant deposits on parts subject to heavy abrasive wear by minerals. Mixer blades, dredger teeth, dredger buckets, sand blasting equipment, suction dredgers etc.
OA 62	MF 10-65-Z MF 10-70-CGZ	64-68 HRc	C ~5-6 Cr ~31-35 B ~1	High-alloyed tubular Cr-carbide based wire for extremely wear-resistant deposits subject to heavy abrasive wear by minerals. Weldable without protective gas. An intermediate layer with OA 4370 is necessary for sensitive basis. High resistance to abrasion right from the first layer. Mixer blades, dredger buckets, sand blasting equipment, suction dredgers etc.
OA 63	MF 10-65-G	63-67 HRc high wear-resistance	C ~5 B ~2 Cr ~20-25 Nb ~4.5-6	High-alloyed tubular C-Cr-Nb-B based wire for extremely wear-resistant deposits on parts subject to heavy abrasive wear by minerals. Mixer blades, dredger teeth, dredger buckets, sand blasting equipment, suction dredgers etc.
OA 64	MF 10-65-GZ	60-64 HRc high wear-resistance	C ~5 Nb ~5-7 Cr ~19-22 W ~1-2 Mo ~5-7 V ~0.5-1	High-alloyed tubular Cr-Mo-Nb-carbide based wire for extremely hard deposits on parts subject to excessively abrasive wear weldable without protective gas. Best wear-resistance even at high temperatures. More than 1 or 2 layers are not recommended. A buffer layer with OA 4370 is recommended. Fire gratings, gravel washing equipment, clinker crushers, screw conveyors, sintering lines, mixer blades etc.
OA 68Nb	MF 10-70-G	67-69 HRc	C ~4,0 Nb ~13,0 Cr ~19,0 Mo ~0,30 V ~0,4	High C-, Cr-, Mo, Nb-, V-, alloyed flux-cored wire electrode which forms extremely hard carbides for extremely hard deposits on parts subject to excessively heavy abrasive wear. Weldable without protective gas. More than 1, maximum 2 layers should not be deposited. A buffer layer with OA 4370, OA MnCr or ER 100 is recommended. Sintering plants, gravel washing equipment, clinker crushers, stone recycling, mixer blades etc.
OA WC2Ni	MF 21-55-CGTZ	58 HRc carbides 2800 HV	CrNiBSi + WC2 Special Alloy	Tubular wire on Tungsten-Carbide basis with a corrosion-resistant matrix weldable without protective gas. Extremely abrasion-resistant. Ground drills, trench diggers, mixer blades, fertiliser injectors etc.
Alloy C-G	MF 23-GF-200-CKT	200-500 HB carbides 2800 HV	C ~0.06 Mo ~16 Ni ~56 Fe ~6 Cr ~15.5 W ~4	Tubular wire weldable with protective gas corresponding to the wellknown alloy Hasteloy C. This wire is corrosion-resistant under oxidising and reducing conditions. The overlays are tough and become compact at high temperatures and by impact strength up to 400 HB without deforming the weld metal. Wearings on forging dies, warm shearing blades, warm plug etc.
AA CrCoMo-50	MF 3-50-CKTZ	49-51 HRc		High-alloyed tubular wire on a C-Cr-Co basis for wear protection in several applications where metal to metal wear at high temperatures is needed. Weldable with shielding gas according EN 439: M11, M12 and M21. Hot working tools such as: Dies and continuous casting rollers.

FOR CAST IRON

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
AA FeNi	MF NiFe-2	200 HB	Ferro / Nickel	New flux-cored wire for welding cast iron, for very strong joints between grey cast iron, spherical cast iron and alloyed steels as well as between steel and cast iron. Available from 1.2 mm.
OA GGG		200 HB	C ~ 1 Si ~ 0.5 V ~ 8-9 Mn ~ 1-2	A tubular wire free of nickel, based on a special alloy for machinable hardfacing on cast iron with globular graphite like GGG 40, GGG 50, GGG 60 and cast iron with lamellar graphite like GG 10, GG 20, GG 25, GG 30, GG 40 as well as malleable cast iron GTS 70. The cast iron should be preheated to approx 359°C and kept at this temperature during welding. Joint weldings and repairs of GGG en GGL when equal corrosion properties are desired. Especially suited for invisible repairs of casting moulds.
AA GGG	MSG Fe-2		C ~ 0,06 Si ~ 0,4 Cr ~ 0,6 V ~ 6	Medium-alloy high-basicity flux-cored wire with slag for hardfacing using Ar-Co2 mix. Build-up of cast iron and alloyed grey-cast iron, well suited for warm and in special applications for cold welding. Used to fill-in voids and pores, build-up of worn-down parts. Joint weldings and repairs of GGG en GGL when equal corrosion properties are desired. Especially suited for invisible repairs of casting moulds.

OA = Self shielding wire

SOLID WIRES MIG/TIG
FOR STEEL

TYPE	CLASSIFICATION	APPLICATION / PROPERTIES
SG 1	DIN 8559: SG1	Welding wire with a reduced silicon and manganese percentage used for applications that are galvanised afterwards and sheet steel. Protection: Mix-gas.
SG 2	DIN 8559: SG2	Welding wire used to join unalloyed and fine grain steels up to 420 N/mm ² . Used for welding of tanks, machinery, vehicles and ship building. Smooth advancement in long sheaths.
SG TITAN + Ti-Zr-Al	Strongly improved welding wire for joining of diluted or galvanised steel plate with extremely good welding properties and a bronzed surface!
SG 3	DIN 8559: SG3	Universally applicable welding wire with increased tensile strength up to 620 N/mm ² .
SG Mo	DIN 8575: SG Mo	Low-alloyed welding wire for creep-resistant and fine-grain steels. 17 Mn4, 19 Mn5, 15 Mo3, St E 255, St E 420. Working temperatures up to 500°C.
SG CrMo1	DIN 8575: SG CrMo1	Welding wire for creep and hydrogen-resistant steels, for working temperatures up to 550°C.
SG CrMo2	DIN 8575: SG CrMo2	Welding wire for creep and hydrogen-resistant steels, for working temperatures up to 600°C.
SG CrMo5	DIN 8575: SG CrMo5	Welding wire for creep and hydrogen-resistant steels, for working temperatures up to 550°C.
SG CrMo9	DIN 8575: SG CrMo9	Welding wire for creep and hydrogen-resistant steels, yet for similar applications an even higher chrome percentage than CrMo1, 2 and 5.
G CrMo9 B9	AWS: ER 90S-B9	Vacume melted high quality welding wire for creep-resistant high tensile steels with additions off Niobium, Vanadium en Nitrogen. Main application: Grade ~91 materials.
SG Corten	AWS/SFA 5.28:ER 80 SG	Welding wire for weather-resistant steels such as Corten, Patinax etc.
SG NiMo1	AWS/SFA 5.28:ER 80S-Ni1	Welding wire for refined fine grain steels. Yield 550 > N/mm ² .
SG Ni 1	AWS/SFA 5.28:ER 80S-Ni1	Welding wire for fine grain steels in cold tough applications down to -60°C.
SG Ni 2,5	AWS/SFA 5.28:ER 80S-Ni2	Welding wire for fine grain steels and cold-tough steels. 14 NiMn6, 10 Ni14, 12 Ni14, 13 MnNi63, TTSt E 355, TTSt E 460. For working temperatures up to -60°C.
ER 100 S-1	AWS/SFA 5.28:ER 100 S-1	Low-alloy welding wire for high tensile strength, refined fine grain steels. The weld deposit is highly crack-resistant and is easily reformed. Maximum yield strength of 690 N/mm ² . Commonly used for NAXTRA 70, Hardox, T 1 steel etc.
ER 110 S-1	AWS/SFA 5.28:ER 110 S-1	Low-alloy welding wire for high tensile strength, water refined fine grain steels. Commonly used for e.g. XABO 90.
ER 120 S-1	AWS/SFA 5.28:ER 120 S-1	Low-alloy welding wire for high tensile strength, refined fine grain steels as described above, only with higher Ni-percentages.

AGAINST SHOCKS AND ABRASION FOR HARDFACING

TYPE	W.NR.	HARDNESS	APPLICATION / PROPERTIES
MA 250	-	220/280 HB	Welding wire for overlays of wear- and shock-resistant overlays.
MA 350	-	320/380 HB	Welding wire for overlays of wear- and shock-resistant overlays.
MA 500	1.8425	47/52 HRc	Welding wire for overlays of very wear- and shock-resistant overlays.
MA 600	1.4718	57/62 HRc	Widely applicable welding wire, shock-, wear- and abrasion-resistant. Applications: jaw crushers, cold cutting tools, car shredders, sand pumps etc.
MA 650	1.2606	57/64 HRc	Welding wire like MA 600, only with addition of Molybdenum, Tungsten and Vanadium.
MA HSS	1.3348	57/62 HRc	Welding wire specifically designed for repairs to HSS or welding cutting edges to soft steels. The alloy is used for wood shredders, cold cutting tools, drilling chisels and many other applications.

FOR LOW ALLOYED STEELS

TYPE	DIN 8557/8575	AWS 5.17/5.23	BASE METAL	APPLICATION / PROPERTIES
S1	S1	EL 8 / EL 8K	1.0351	Sub arc wire for common steels subject to low stress levels used in shipbuilding, structures and equipment with tensile strength up to 510 N/mm. St. 33.2 . 46.2 , H1 , H11 , 35.8 . 45.8 , A . D , fine grain steel up to St. E 355 .
S2	S2	EM 12	1.0494	General use sub arc wire for construction steels, boilers, shipbuilding. St. 42.2 . 52.2 , H1 , H111 , 19Mn5 , 45.8 , A . E , fine grain steel up to St. E 380 .
S3 / S3 Si	S3	-	1.0496	Used for the construction of boilers, tanks, ship building and fine grain steel with tensile strength up to 700 N/mm. S3S i is particularly suitable for pipe welding. Due to the increased amount of Si the sensitivity to dilution had been reduced considerably. Combined with FL 160 F excellent impact resistance values at low temperatures can be obtained. St. 42.2 . 52.2 , H11 , H111 , 19Mn5 , 45.8 , A . E , fine grain steel up to St. E 420 .
S4	S4	EH 14	1.5086	Sub arc wire used for construction steels and boilers with high tensile strength and C content up to 2.5% as well as fine grain steels. Also used for boilers, heavy steel structures, shipbuilding, pipe production, machinery etc. St. 42.2 . 52.2 . 60 , H111 , 19Mn5 , 55.4 , A . E , fine grain steel up to St. E 460 .
S2 Mo	S2 Mo	EA 2	1.5425	Sub arc wire for heat-resistant and fine grain steel for working temperatures up to 500°C. St. 52-3 , 60 , H111 , 19Mn5 , 55.4 , 15Mo3 , E 315 , E 420 , WSt E 315 . WSt E 420 .
S3 Mo	S3 Mo	EA 4	1.5426	Sub arc wire for heat-resistant and fine grain steel for working temperatures up to 500°C. St. 50 , 52-3 , 60 , H111 , 19Mn5 , 55.4 , 15Mo3 , E 355 , E 460 , WstE 355 , WstE460 .
S4 Mo	S4 Mo	EA 3	1.5427	Sub arc wire for heat-resistant and fine grain steel for working temperatures up to 500°C. St. 52-3 , 60 , 19Mn5 , 55.4 , 15Mo3 , E 355 , E 500 , WstE 355 , WstE 500 .
CrMo1	S2 CrMo1	EB 2	1.7346	Sub arc wire for CrMo steels in the production of barrels, tanks and pipe lines, creep-resistant up to 600°C. Optimum crack and creep resistance due by low acid concentrations. 13CrMo44 , 16CrMo4 , 21CrMo3 , 24CrMo5 , 24CrMo54 , 25CrMo4 .
Corten	S2NiCu1			Sub arc wire for weather-resistant steels such as Corten, Patinax, Resco, Itacor etc. Excellent results when combined with flux FL180F. WTSt 37 . WTSt 52 , Corten A,B,C, Patinax 37.
NiMoCr	-	EM 2		Sub arc wire for low alloy steels with high mechanical properties and crack resistance as for instance in cold applications, T1, NAXTRA and similar materials. Tensile strength up to 750 N/mm.

SUB ARC FLUXES (POWDERS)

TYPE	DIN	AWS A5.17	APPLICATION / PROPERTIES
FL 160F	BFB 155AC10MHV P5 EN 760: SAFB 1 55 AC H5	F7AP8-EH12K F7AP6-EH14 F7AP6-EA3-A3	Agglomerated neutral basic flux for single and multipass welding of carbon and low alloy steel requiring high impact values at low temperatures. Excellent bead aspect, even in fillet welding. Good slag removal even in hot welding conditions. To be used with: S3Si, S4, S4Mo.
FL 180F	BAR188AC10KM EN 760: SA AR 1 88 AC	F6A2-EL12 F7A3-EM12K	Agglomerated rutile flux additive in Mn and Si, suitable for carbon steel welding with two or three layers. Excellent slag removal in fillet and root passes. It can be used with single or multiwires at high speed with excellent bead aspect. S4 wire is suitable only for fillet welding in single pass. To be used with: S1, S2, S2Si, S4, SH2.
FL 188F	BFB 165AC12MHP5 EN 756-95: (TR) S 4T 2 FB S2Mo (MR)S 42 2 FB S2Mo	F7A4-EH14 F7A0-EA2-A2	Agglomerated semi-basic flux suitable for carbon and low alloy steel weldings, in single or multipass technique and in single or multiwire applications. The weld metal, produced in combination with corresponding wire electrodes, meets excellent mechanical properties and in particular high toughness at low temperatures. Good slag removal even in root passes and at high temperatures. To be used with: S1, S2, S2Si, S2Mo, SH2.
FL 915	B FB 1 65 DC EN 760: SA FB 1 65 DC	F7 A6-EM 12 (K) F8 A6-EH 12 K F8 P4-EA2-A2 F7P8-ENi1-Ni1 F9P4-EF3-F3 F9A4-EA3-A3 F8P0-EB2-B2	Agglomerated semi-basic flux suitable for low alloyed steel and 13% Chromium alloys in single or multipass technique and in single or multiwire applications with very high welding speed. The weld metal, produced in combination with corresponding wire electrodes, meets excellent mechanical properties and in particular high toughness at low temperatures. Excellent slag removal even in root passes.
FL 801	EN 760: SA Z 2 DC		FL 801 is an agglomerated, slightly basic flux designed for submerged arc strip cladding. with all types of austenitic stainless steel strip such as: AISI 308L, 347, 316L, 309L and 309LNb. It offers excellent welding properties and easy slag removal. The flux has a composition that gives a weld metal with a ferrite level exceeding 4 FN (acc. to DeLong) when welding the first layer with strip AISI 309L.
FL 805	EN 760: SA AF2Cr DC		Agglomerated chrome compensated universal basic flux, especially designed for welding high alloyed steels such as Inconel 625, 1.4539, RVS 316, 309 Mo, Duplex and similar materials. The FL 805 is especially recommended where high impact values are desired. FL 805 has an excellent bead aspect, excellent welding properties and remarkably easy slag removal.
FL 8111	EN 760: A FB 1 65 AC H5		Special designed flux for subarc welding stainless steel solid wires and fluxcored wires. Amazing results are obtained with 13% chromium wires cladding steel mill rollers and similar applications. Slag releases completely it selves and offers a perfect bead aspect. Excellent resistance against moisture pick up!
FL 122 ES	BFB6 63155DC+40B-2-12 EN 760: (E) SA FB2		FL 122 ES is a highly basic agglomerated flux designed for ES strip cladding with stainless steel sintered and solid strip as well. It offers excellent bead aspect and self detaching slag removal even in extreme hot condition. The flux has a neutral action on chemical composition and can be used for single and multi layers.
FL 423 ES	EN 760: (E) SA FB 3 Mo		FL 122 ES is a highly basic agglomerated flux designed for ES strip cladding with 13% chromium sintered and solid strip as well. It offers excellent bead aspect and good slag removal even in extreme hot condition. The flux is adding Molybdenum to the weld pool to improve corrosion and wear resistance at higher temperatures and can be used for single and multi layers.
FL 830 ESH	EN 760: SA FB 2 DC		FL 830 ESH is a highly basic agglomerated flux designed for ES high speed strip cladding with stainless steel alloys in the 300 and 400 series. It offers excellent bead aspect and self detaching slag removal even in extreme hot conditions without any residues. The flux has a neutral action on chemical composition and can be used for single and multi layers.
FL 860 ESH	BF B 7 6544 DC+ 40 B-2 EN 760: SA FB 2		FL 860 ESH is a highly basic agglomerated flux designed for ES high speed strip cladding with Nickel based alloys. It offers excellent bead aspect and self detaching slag removal even in extreme hot conditions without any residues. The flux has a neutral action on chemical composition and can be used for single and multi layers.

SOLID STAINLESS STEEL WIRES AND STRIPS

TYPE	AWS/SFA 5.9	W.NR.	APPLICATION / PROPERTIES
307Si	ER 307	1.4370	Suitable for welding dissimilar and self hardening steels such as armoured and manganese steel. The weld metal has high stress resistance and is heat-resistant up to approx 850°C.
308 LSi	ER 308 LSi	1.4316	Suitable for welding 18/8 steels with low carbon content. Perfect arc stability and better flowing because of the higher Si content. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
347 Si	ER 347 Si	1.4551	Welding wire for Nb or Ti stabilised 18/8 and similar CrNi steels. For working temperatures up to approx 400°C. High resistance to intercrystalline corrosion and oxidising environments.
309 LSi	ER 309 LSi	1.4332	Suitable for welding corrosion and heat-resistant Cr/Ni steel and Cr/Ni steel to unalloyed and low alloy steels. Heat-resistant up to approx 1100°C. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
309 L Mo	ER 309 L Mo	1.4459	Welding wire with high corrosion resistance, often used for buffer layers when cladding with an AISI 316 quality and for dissimilar joints with C, Mn and low alloy steels. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
309 H	ER 309	1.4829	Welding wire like AISI 309 with higher carbon percentage for better heat and wear resistance.
310	ER 310	1.4842	Welding wire for similar heat-resistant 25/20 CrNi steels for working temperatures up to 1200°C. Also suitable for welding ferritic stainless steel.
312	ER 312	1.4337	Welding wire for welding difficult to weld steel and self-hardening steels such as armouring steel, austenitic Mn steel, spring steel and high carbon steels. Very suitable for repair welding.
316 LSi	ER 316 LSi	1.4430	Low carbon welding wire for austenitic CrNiMo steels for working temperatures up to 350°C. Very high resistance to intercrystalline corrosion. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
318 Si	ER 318 Si	1.4576	Welding wire for Nb or Ti stabilised CrNiMo steels with a working temperature up to 400°C. High resistance to intercrystalline corrosion and corrosive environments.
22-09 Duplex	ER 2209	1.4462	Welding wire for stainless steel Duplex steels, high resistance to general corrosion, pitting and stress corrosion. Maximum working temperature 280°C. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
Super Duplex (25-07)	ER 25 5 3	1.4410	Welding wire used for Stainless steel, Super Duplex, Zeron 100 etc.
904 L	ER 385	1.4539	Welding wire for extremely corrosion-resistant CrNiMoCu steels. Usable between temperatures from -196°C to 350°C. 1.4500, 1.4505, 1.4506, 1.4531, 1.4536, 1.4539, 1.4573, 1.4585, 1.4586. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
327	-	1.4820	Low nickel special wire suitable in sulphurous environments at very high temperatures as in combustion gasses. Very hard, good machinable deposit.
409 Cb	ER 409 Cb		Stabilised welding wire for welding similar alloys as found in the exhaust pipe industry.
420 B or C	ER 420	1.4034	Stainless steel 13% Cr alloy with high hardness suitable for many overlay applications. The type 420 C has a higher percentage carbon than 420 B. 420°C. Also available in strip diameters of 60 x 0.5 mm and 30 x 0.5 mm.
430 LNb	ER 430 LNb	1.4511	Ferritic welding wire with very high tensile strength and good corrosion resistance. Typically used in the car industry.
1.4115		1.4115	17% chrome alloy welding wire with meltdown hardness of approx 45 HRc. For corrosion-resistant layers with a working temperature up to 550°C.
410 NiMo	ER 410 NiMo		Martensitic thermoshock-resistant alloy for wear and impact-resistant layers at changing temperatures.

SINTERED STRIP FOR STAINLESS STEEL

TYPE	C	Cr	Ni	Mo	Mn	Si	Nb	N
SAS 308L	0.010	20	10.5	<0.2	1.8	0.4	-	+
SAS 309L	0.010	23	12	0.2	1.8	0.4	-	+
SAS 309LMo	0.015	22	14.0	2.9	1.8	0.3	-	+
SAS 309LNb	0.015	24	12.0	-	1.8	0.6	0.6	0.03
SAS X 15 CrNiMn 32 27 8	0.140	32	27.0	-	7.5	0.3	-	+

SINTERED STRIP AGAINST WEAR

TYPE	C	Cr	Ni	Mo	Mn	Si	V	W	Nb
SAS 307	0.06	18.0	8	-	6.0	0.5	-	-	-
SAS 4351L	0.10	15.0	4.3	0.90	0.9	0.34	-	-	-
SAS 581	0.35	6.0	-	3.00	2.0	0.3	0.3	-	-
SAS 601	0.31	7.0	0.3	1.60	3.0	-	0.2	1.9	-
SAS 410NiMo	0.06	14.0	4.5	0.90	0.8	-	0.2	-	0.2
SAS 410MoV	0.15	12.4	-	2.00	1.2	-	0.2	-	-
SAS 420	0.38	13.6	0.4	0.15	1.0	0.2	-	-	-
SAS 430L	0.06	13.0	0.4	0.15	1.0	0.2	-	-	-

SINTERED STRIP NICKEL BASED

TYPE	C	Cr	Ni	Mo	Mn	Nb	Fe	W	Ti
SAS 625	0.01	23.0	Rest	9.0	0.2	3.5	<5.0	-	-
SAS 825L	0.01	32.0	Rest	8.0	2.3	0.2	4.5	-	-
SAS 276	0.01	15.8	Rest	16.6	0.5	0.1	4.5	3.7	-
SAS 82	0.01	19.9	Rest	-	3.2	2.3	0.7	-	0.4

SINTERED STRIP COBALT BASED

TYPE	C	Cr	Co	W	Mo	Si	Mn	Fe	HARDNESS
SAS DUR 6	1.10	28	Rest	4.5	-	1.0	0.6	<2.5	40-43
SAS DUR 6LC	0.80	28	Rest	4.5	-	1.0	0.6	<2.5	36-39
SAS DUR 21	0.25	27	Rest	-	5.5	0.8	0.3	<2.5	30-35

FOR ALUMINIUM AND ALUMINIUM ALLOYS

TYPE	DIN 1732	AWS/SFA 5.10	APPLICATION / PROPERTIES
Al 99,8	SG-AL 99,8	ER 1100	Aluminium wire for welding mostly pure aluminium with max. 0.2% alloying elements. The material can also be used when high corrosion resistance is required.
Al 99,5	SG-AL 99,5	ER 1100	Aluminium wire for welding mostly pure aluminium with max. 0.5% alloying elements. The material can also be used when high corrosion resistance is required.
AlMg3	SG-ALMg 3	ER 5154	Aluminium alloy used for welding aluminium alloys with a maximum of 3% Mg. Where high mechanical properties of the joint is required. Very good weldability and welding properties.
AlMg4,5Mn	SG-ALMg4.5Mn	ER 5183	Aluminium alloys used for welding aluminium magnesium based alloys such as ALMg/ALMg 4.5 Mn. alloys. Cosmetically good welding result. Relatively high tensile strength. Mainly used in seawater-resistant applications.
AlMg5	SG-ALMg5	ER 5356	Aluminium alloy for welding aluminium magnesium based alloys with a maximum of 5% Mg. This type is also suitable for welding different Aluminium alloys with each other. Excellent weldability and welding result, relatively high tensile strength.
AlSi5	SG-ALSi5	ER 4043	Aluminium alloy for welding aluminium with a maximum of 2% alloying elements and for castings containing up to 7% Si. Excellent flow characteristics and penetration. Recommended if a good looking result is preferred over good mechanical properties and corrosion resistance. Welding ALMg alloys with more than 3% Mg is not recommended because of the risk of cracking. [DC+]. Suitable for wall thickness from 2 mm and up.
AlSi12	SG-ALSi12	ER 4047	Aluminium alloy for cast alloys with more than 7% Si. In special circumstances the so-called moulded alloys can be welded also. [DC+]. Suitable for wall thickness from 2 mm and up.

Do not use AlSi welding materials if the weld will be anodised afterwards. The weld will then discolour. Alternatively use an ALMg alloyed welding wire.

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TITANIUM WELDING WIRE MIG/TIG

GRADE	AWS A5.16	AMS	ASTM
Grade 1 (Commercially Pure (PC))	ERTi 1	AMS 4951	B 348, Gr 1 (Chem)
Grade2	ERTi 2	AMS 4951	B 348, Gr 2 (Chem)
Grade3	ERTi 3	AMS 4951	B 348, Gr 3 (Chem)
Grade4	ERTi 4	AMS 4951	B 348, Gr 4 (Chem)
Grade5 (6Al-4V)	ERTi 5	AMS 4954	B 348, Gr 5 (Chem)
6Al-4V Eli WW	ERTi 5 Eli	AMS 4956	-
15V-3Cr-3Sn-3Al	-	AMS 4914 (Chem)	-
6Al-2Sn-4Zr-2Mo	-	AMS 4952	-
Grade 12 (0.3 Mo-0.8 Ni)	ERTi 12	-	B 348, Gr 12 (Chem)
Grade 7 (Ti + Pd)	ERTi 0.2 Pd	-	B 348, Gr 7 (Chem)
Grade 9 (3Al-2.5V)	ERTi 9	-	B 348, Gr 9 (Chem)

FOR COPPER AND COPPER ALLOYS (MIG/TIG)

DIN 1733T.1	AWS	BS	W.NR	APPLICATION
SF-Cu	-	-	2.0091 2.0090	Special copper wire for welding copper, joining copper to steel, grey cast iron and Ni alloys of 3 mm wall thickness or more. Particularly suitable for large work pieces.
SG-CuAg	-	C1	2.1211	Copper alloy, silver alloyed with a slightly higher percentage of phosphor, suitable for TIG/MIG welding, easy to handle, high plasticity of the weld metal.
SG-CuSn	ERCu	C7	2.1006	Copper filler metal, tin alloyed with good flow properties. Suitable for joining Cu and copper alloyed metals subject to strain. Very well workable. Welding seams without pores.
SG-Cu-Si3	ERCuSi-A	C9	2.1461	For MIG/TIG welding on feebly alloyed CuMn, CuSiMn and CuZn materials. Also recommended for cladding of ferritic-pearlitic steel. High temperature and corrosion resistance. Mainly used in automobile industry and for sculpturing and sculpture restoration.
SG-CuSn6	ERCuSn-A	C11	2.1022	Tin bronze alloy of minimally 6% tin for virtually all welding procedures. Very good deoxidisation. Surfacing and joining of CuSn alloys. Widely used in oven soldering.
SG-CuSn12	-	C27	2.1056	Copper-tin alloy of high tin percentage suitable for multiple welding jobs. The welded material attains high hardness similar to cast bronzes, therefore to be used for specially wear-resistant surfacing, joining and repair welding of bronzes.
SG-CuAl5Ni2	-	-	-	Low alloyed aluminum bronze, particularly suitable for joining on ferritic and austenitic steels. Good flowing properties with good cover groove, also suitable for joining on steels and copper. For multilayer welding on steels, pulsed arc welding is recommended. Amazing results on stainless steel sheet metal due to less heat input, higher travel speed and less cleaning hours.
SG-CuAl8	ERCuAl-A1	C12	2.0921	Joining of copper-aluminium alloyed metals. Surfacing of ferritic-pearlitic steel. Very high corrosion and wear resistance as required for welding brass ship propellers.
SG-CuAl9Fe	ERCuAl-A2	C13	2.0937	Joining of copper-aluminium alloyed metals. Surfacing of ferritic-pearlitic steel. Very high corrosion and wear resistance as required for welding brass ship propellers. Improved wear-resistance and hardness compared to CuAl8.
SG-Cu-Al8Ni2	-	-	2.0922	Copper-aluminium based filler metal. Alloy of several metal elements. Suitable for CuAlNi alloyed metals, surfacing of steel. High resistance to wear and abrasion. Very good corrosion- and seawater-resistance.
SG-CuAl8Ni6	ERCuNiAl	C20 C26	2.0923	Nickel-Aluminium-Bronzes. High corrosion- and wear-resistance. For welding CuAlNi-parts in offshore technology, seawater desalting, shipbuilding and repair (propeller) as well as power plants and chemical industry like reaction plants, pumps and tube systems.
SG-CuMn13Al7	ERCuMnNiAl	C22	2.1367	Highest grade of the Al-Bronze-types. Seawater-resistant copper-aluminium alloy without Zn of high toughness and hardness. Joining- and wear-resistant surfacing of copper alloys, of unalloyed and low-alloy steels and grey cast iron. Applications include: ship propellers, pulling tools and sliding surfaces.
SG-CuAl14NiFe	-	-	-	New super copper alloy with extreme hardness (400 HB). Especially designed for applications whereby high hardness is required. The weld deposit is seawater- and wear-resistant. Homogenous and spark free. Applications include: axes, crankshafts, pliers, dredger axes etc.
SG-CuNi30Fe (Monel 67)	ERCuNi	C18	2.0837	Copper-Nickel alloy for construction and chemical equipment, seawater desalting and offshore technology.

FOR NICKEL BASED ALLOYS (INCONEL, MONEL, ETC.)

TYPE	DIN 1736 UNS	AWS	W.NR.	APPLICATION
Nicro 600	SG-NiCr20Nb N06082	ERNiCrFe3	2.4806	Solid wire for welding of Ni and NiCr alloys (Inconel, Hasteloy, Nimonic etc.) and stainless steel with each other or with mild steel. Resistant to corrosion and high temperatures. Temperatures from -196 to +600°C. Also suitable for metal refining. The welding material has thermoshock-resistant properties. Also available as Mig, Tig and S.A. wire and strip.
Nicro 625	SG-NiCr21Mo9Nb N06625	ERNiCrMo-3	2.4831	Solid wire for welding of Inconel 625, 825 and alloy 25-6Mo and nickel alloys or different metals with each other. NiCrMo alloys and joining with low and high alloyed steels; austenitic steels with high corrosion resistance for temperatures above 300°C. Also available as Mig, Tig and S.A. wire and strip.
Nicro 718	SG-NiCr19MoTi N07718	ERNiFeCr-2	2.4667	Solid wire for welding Inconel, 718, 706 and X-750. The weld metal is hardenable and has mechanical properties comparable to those of the base metals.
NiTi 3	SG-NiTi4 N02061	ERNi-1	2.4155	Special solid wire for welding of pure nickel and nickelclad steel sheet and joining of pure copper and band copper alloys with unalloyed or stainless steel. Especially suitable for joining nickel and steel. Brazing cracks will not occur. Also available as Mig, Tig and S.A. wire and strip.
NiCu30Mn	SG-NiCu30MnTi N04060	ENiCu-7	2.4377	Solid wire for welding NiCu30Fe, CuNi alloys and joining these alloys with steels such as Monel 400, R-405 and K-500. Also available as Mig, Tig and S.A. wire and strip.
NiCrCo 617	SG-NiCr22Co12Mo N06617	ERNiCrCoMo-1	2.4627	Solid wire for welding Inconel 617. The weld metal has high mechanical properties and is extremely resistant to corrosion at very high temperatures. Applicable to Inconel 600 and 601, alloy 800HT and 802 and cast alloys such as HK-40, HP, HP-45 modified. Also available as Mig, Tig and S.A. wire.
NiCrMo 686	N06686	ERNiCrMo-14		Special alloy for joining Duplex, Superduplex and super-austenitic stainless steel as well as nickel alloys such as N06059, N06022, Hasteloy C-276 and Inconel 622, 625 and 686. This alloy offers a wide range of applications in the chemical and petrochemical industries. Also available as Mig, Tig and S.A. wire and strip.
NiCrMo 622	N06022	ERNiCrMo-10	2.4813	Solid wire for joining Inconel 622 en 625, alloy 25-6Mo and Incoloy 825. Excellently suitable for joining different metals including: Inconel 625 and Hasteloy C-276. The weld metal offers good corrosion resistance when used with molybdenum-containing stainless steels. Also available as Mig, Tig and S.A. wire.
Alloy C 276	EL-NiMo16Cr16W N10276	ERNiCrMo-4	2.4886	Solid wire for the welding of Hasteloy C-276 and similar NiCrMo alloys. Typically used for surfacing on steel. The weld deposit has excellent corrosion resistance in aggressive media and is especially resistant to pitting and crevice corrosion. This alloy is useful for various dissimilar joints involving nickel alloys, stainless steels and low alloy steels.
Alloy HX	N06002	ERNiCrMo-2		Solid wire used for welding Hasteloy X and similar NiCrMo alloy. Also used for surfacing steel and joining of Hasteloy X, nickel alloys, stainless steel, carbon steel and low alloy steels. The weld deposit is very strong and has excellent oxidation resistance at high temperatures up to 1200°C.

STELLITE (COBALT BASED ALLOYS)

TYPE	AWS	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur 1	ER Co Cr-C	53-55 HRc	C ~ 2.5 Cr ~ 30 Co ~ 52 W ~ 15	Stellite alloy with high resistance to abrasion, oxidation and erosion. Especially resistant to seizing on case of friction of metal to metal. Even up to red hot this alloy retains high hardness properties. Completely tempering-resistant.
Dur 6	ER Co Cr-A	43-45 HRc	C ~ 1.1 Cr ~ 28 Co ~ 65 W ~ 5	Tough and high tensile Stellite alloy for overlays in case of wear as well as temperature shocks, impact loads or corrosion. Dur 6 is the most used type in the range.
Dur 12	ER Co Cr-B	46-48 HRc	C ~ 1.3 Cr ~ 28 Co ~ 59 W ~ 10	In hardness and toughness this Stellite alloy lies between Dur 1 and 6. As compared to 6 it is somewhat more resistant to wear and as compared to 1 it is more resistant to temperature shocks and impact loads.

BRAZING RODS

TYPE	DIN	ANALYSIS	MECHANICAL PROPERTIES	APPLICATION / BASE METAL
CuZn39Sn	L-CuZn39Sn 2.0533	Cu ~ 58 Si ~ 0.15 Sn ~ 0.5 Mn ~ 0.7	T ~ 450 AT ~ 880°C	Brass alloy for many applications including: bicycle industry, ship propeller, furniture industry etc. Suitable for welding brass and brazing of steel, cast iron, iron, copper, nickel etc.
CuZn40 CuZn40 F	L-Cu Zn 40 2.0367 RB Cu Zn-A	Cu ~ 60 Zn ~ 40	T ~ 450 H ~ 110 HB AT ~ 900°C	Brass alloy for many applications including: bicycle industry, ship propeller, furniture industry etc. CuZn40 F is flux coated.
CuNi10Zn42 CuNi10ZnF	L-CuNi10Zn42 2.0711 RB Cu Zn-D	Cu ~ 50 Zn ~ 40 Ni ~ 10	T = 500-800 H ~ 180 HB AT : 900°C	Special alloy with very high strength for joint welding of steel, cast iron, nickel and nickel alloys. Excellently suited for surfacing cog on cogwheels. CuNi10ZnF is flux coated.

HARDFACING WITH TUNGSTEN CARBIDES

TYPE	DIN 8555	HARDNESS	ANALYSIS	APPLICATION / PROPERTIES
Dur R	G 21-GF-65	ca. 65 HRc	Steel tube filled with Tungsten carbide WSC approx 60% Fe - rest	High wear-resistant tungsten-carbide based hardfacing alloy. Suitable for rotary drilling and for mining. The alloy can be applied with little preheat of the surface and welding with a slight excess acetylene flame.
Dur R (Ni)	G-21-GS-350 GR	Matrix - 56 HRc	NiCrBSi = matrix WSC approx = 60% WSC - 500-1600 um WSC - 2800 HV	Same as Dur R, but with corrosion-resistant matrix for application with acids and other corrosive media. Due to the low melting point of the matrix this alloy has good bonding properties and it can be applied on almost every surface. Applications: wear in chemical and/or food industries, stabilisers, deep drilling, mixers, scratchers, bentonit mixers etc.
Dur CS			CuZnNi matrix + Tungsten lumps approx 65%	The gas weldable Dur CS contains broken massive lumps of hard metal which are fixed in a matrix of CuZnNi with a melting point of approx 900°C. This alloy is used in deep drilling technique (hardfacing of drill point), stone mills, paper or pulp shredders, scratchers etc. Available grain sizes: 2-4 mm, 4-6 mm, 6-8 mm, 10-12 mm in lengths of 450 mm.

FLUXES FOR BRAZING

TYPE	DIN 8511	AWS	APPLICATION / PROPERTIES
Super-flux	F-SH1	BF3-C	Flux for brazing of silver alloys with a working range from 450 to 850°C. Universal flux for copper, brass, steel and stainless steel.
Uten-flux	F-SH1	FB4-D	Flux for brazing of silver alloys with a longer life than Superflux e.g. for larger workpieces and somewhat higher melting temperatures such as molybdenum and tungsten types.
Universal-flux	F-SH 2		Flux for brazing of copper, copper alloys, brass, steel and galvanised steel. Working range from 750 to 1100°C.
Gas-flux	F-SH 2		Flux for large-scale use (gas transported, comes along with the flame) for brazing copper, brass, bronze, steel and galvanised steel. Ideal when a clean product is desired or if used with a soldering machine. Working range from 750 to 1100°C.
Alu-flux	F-LH 1		Flux for welding or brazing aluminium and aluminium alloys with a working range from 450 to 620°C.

SILVER BRAZING ALLOYS

ALLOY DIN: 8513	Ag	Cu	Zn	Ni	Sn	P	Cd	MELTING POINT °C	TENSILE STRENGTH (N/mm ²)	APPLICATION	
L-CuP 6		94					6	730	250	Copper to copper (without flux). Brass, copper and copper-tin alloys (with flux). Do not use in a sulphurous environment. For working temperatures up to 200°C.	
L-Ag 2P	2	91					6	710	250		
L-Ag 5P	5	89					6	710	250		
L-Ag 15P	15	80					5	710	250		
L-Ag 20Cd	20	40	25					15	750	Steel, stainless steel, copper, copper alloys. Nickel, nickel alloys. For working temperatures up to 200°C.	
L-Ag 25Cd	25	30	27					18	710		420
L-Ag 30Cd	30	28	21					21	680		420
L-Ag 34Cd	34	22	24					20	640		430
L-Ag 40Cd	40	19	21					20	610		450
L-Ag 45Cd	45	16	17					22	620		450
L-Ag 50Cd	50	15	17					18	640		350
L-Ag50CdNi	50	15	16	3				16	660		300
L-Ag 25Sn	25	40	33		2				750	430	Steel, copper, copper alloys, nickel, nickel alloys and grey cast iron. For working temperatures up to 200°C.
L-Ag 30Sn	30	36	32		2				740	430	
L-Ag 34Sn	34	36	27		3				710	430	
L-Ag 40Sn	40	30	28		2				690	400	
L-Ag 45Sn	45	27	25		3				670	400	
L-Ag 55Sn	55	22	18		5				650	400	
L-Ag 27	27	39	20	5					840	300	Tungsten tool tips to steel, tungsten and molybdenum.
L-Ag 49	49	17	22	5					690	300	

The alloys above are available in uncoated and coated rods, rings and strips and on spools D-300 in various diameters.

WIRES FOR THERMAL SPRAY

TYPE	ANALYSIS	APPLICATION / PROPERTIES
SP 80/20	Ni ~ 80 Al ~ 20	Spray wire with excellent bonding strength. Sprayed layers of this material are resistant to variation in high temperatures and are used as a buffer layer for all other spraying alloys. Hardness, coating macro: approx HRc 22. Maximum working temperature: approx 800°C. Layer thickness: approx 0.1-0.15 mm.
SP 80/20 NiCr	Ni = 80 Cr = 20	Solid drawn spray wire with good bonding properties and high corrosion-resistance for applications in chemical industries and as a buffer layer for ceramic layers. 80/20 NiCr coatings are resistant to oxidising and corroding gasses at working temperatures up to 900°C. Coating hardness macro: approx HRb 90.
SP NiTi4	Ni = Basis Ti = 3	Solid drawn spray wire with good bonding properties for applications such as ceramics or steel spray layers. High corrosion-resistance even in acid solutions.
SP 1.3505	C = 1.0 Si = 0.25 Cr = 1.5	Solid drawn spray wire for extremely wear-resistant layers where corrosion-resistance is not important or of minor importance. Hardness approx 50 Hrc.
SP 420	C = 0.35 Cr = 13	Solid spray wire with 13% Cr, a combination of good wear-resistance and a fairly good corrosion-resistance for applications in repairs and new work. The coating has high tensile strength and low shrinkage and therefore can be applied in larger layers thicknesses without any risk of cracking. Maximum working temperature: approx 540°C. Hardness macro: HRc. Machineable by grinding. Available in three hardnesses: A, B and C.
SP 1.4370	Cr = 18 Ni = 8 Mn = 6	Solid spray wire of type 18/8/6 with low shrink factor and therefore very suitable for thick coatings and coatings in internal diameters. The addition of Mn gives the coating work-hardening and wear-resistant properties. Coating hardness macro: HRb 90, after work-hardening 450 HB. For working temperatures up to 850°C.
SP 1.4302	Cr = 19 Ni = 9	Solid spray wire to achieve a stainless steel coating consistent to quality 18/8. Applications include: pump parts, scal rings and gland sealings. Hardness macro: approx HRb 80.
SP 1.4403	Cr = 19 Ni = 12 Mo = 3	Solid spray wire for spraying on parts that must meet a higher quality than 18/8, corrosion and acid resistance. Maximum working temperature: approx 450°C. Hardness macro: HRb 74.
SP 1.4115	C = 0.2 Cr = 17.5 Mo = 1.1	Solid spray wire that combines high toughness with very good corrosion resistance, shiny coating and better machineability than the SP 420 C coating. Hardness approx 40/45 HRc. The weld deposit can be machined.
SP 1.4122	C = 0.35 Cr = 17.5 Mo = 1.1	Solid spray wire that combines high toughness with very good corrosion resistance, shiny coating with a little higher hardness than SP 1.4115. The weld deposit cannot be machined with normal cutting tools, grinding is possible. Hardness approx 50 HRc.
SP AlBz8	Cu = 92 Al = 8	Spray wire for thermal spraying of wear and seawater-resistant layers, that can be returned to a very smooth and tight finish. The high pressure resistance and strength of these layers make it especially suitable for heavy loads on bearings en treads. Suitable for layer thicknesses up to 5 mm. Hardness macro: HRb 80.
SP CuSN6	Cu = 94 Sn = 6	Spray wire made out of copper and tin for wear-resistant layers where good sliding characteristics are desired.
SP NiCu	Ni = 64 Cu = Rest	Alloy like Monel with very good resistance to seawater and excellent sliding characteristics.
SP CuZn36	Cu = 64 Zn = Rest	Brass spray wire with high spray capacity for general bronze applications. Hardness macro: HRb 30.
SP CU99,9	Cu = 99.9	Pure copper spray wire. Thermally sprayed copper layers can easily be machined into a smooth surface.
SP AL 99,5	Al = 99,5	Spray wire with excellent corrosion resistance, typically used in the food industry.
SP ZnAl	Zn = 85 Al = 15	Spray wire for so-called scouping where high corrosion resistance is required.
SP Babbitts	SnSb7Cu4	Tin alloy, commonly used for its good sliding characteristics e.g. for bearing scales.
SP Mo	Mo = 99.95	Solid molybdenum spray wire with very good bonding properties on aluminium and copper. Excellent results are obtained during high-speed wire and flame spraying with very high hardnesses (600 to 1400 HV).