

PRODUCT CATALOGUE

WELDING CONSUMABLES

2023

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WELDING CONSUMABLES

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TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

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Consumable TÜV Certificates:

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STICK ELECTRODES FOR MILD STEEL

Product name	Type	Chemical composition (typical values) in %											AWS	EM/ISO				
		C	Mn	Si	S	P	Cr	Ni	Mo	V								
FLEXAL 60	CELLULOSIC	0.1	0.6	0.2	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6010	EN ISO 2560-A	E 383 C 21
CTORAPID		0.06	0.7	0.2	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6020	EN ISO 2560-A	E 382 RA 13
CTIOFIX		0.09	0.5	0.4	≤0.03	≤0.03	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 A R 11
FINCORD M		0.06	0.4	0.4	0.01	0.02	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 R 12
OVERCORD E		0.08	0.5	0.4	≤0.02	≤0.03	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 R 12
SUPERCORD		0.05-0.11	0.4-0.7	0.2-0.4	≤0.02	≤0.03	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 R 12
SUPERCORD 45		0.08	0.6	0.40	0.010	0.025	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 R 12
FINCORD DB		0.08	0.5	0.35	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 RR 12
CTOREX	RUTILE	0.07	0.6	0.2	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 2 RB 12
OVERCORD		0.08	0.5	0.3	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 0 RC 11
OVERCORD R 12		0.07	0.6	0.4	≤0.03	≤0.03	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 0 RC 11
OVERCORD R 92		0.07	0.55	0.4	≤0.03	≤0.03	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 35 0 RC 11
OVERCORD Z		0.08	0.5	0.3	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 38 0 RC 11
CTOCORD		0.08	0.6	0.4	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 RC 11
FINCORD		0.08	0.6	0.45	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E6013	EN ISO 2560-A	E 42 0 RR 12
FERROMATIC 160		0.1	0.9	0.45	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E7024	EN ISO 2560-A	E 42 Z RR 7 3
FERROMATIC 180	RUTILE, HIGH RECOVERY	0.1	0.9	0.4	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E7024	EN ISO 2560-A	E 42 0 RR 7 3
FERROMATIC 200		≤0.1	0.6-1.2	0.5	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E7024	EN ISO 2560-A	E 42 0 RR 7 3
SPEZIAL	DOUBLE COATED	0.06	0.9	0.7	≤0.015	≤0.020	-	-	-	-	-	-	-	-	AWS A5.1	E7016-H8	EN ISO 2560-A	E 38 3 B 12 H10
EXTRA	PIPELINE APPLICATION	0.08	1.3	0.45	≤0.015	≤0.025	-	-	-	-	-	-	-	-	AWS A5.1	E7016-H8	EN ISO 2560-A	E 42 4 B 32 H10
TENAX 565		0.06	1.2	0.5	≤0.02	≤0.02	-	-	-	-	-	-	-	-	AWS A5.1	E7016-1 H4	EN ISO 2560-A	E 42 5 B 12 H5
SUPERCITO		0.05-0.08	1.0-1.5	≤0.55	≤0.020	≤0.020	-	-	-	-	-	-	-	-	AWS A5.1	E7018-1 H4	EN ISO 2560-A	E 42 5 B 42 H5
SUPERCITO A		0.05-0.9	0.80-1.20	0.25-0.65	≤0.015	≤0.025	-	-	-	-	-	-	-	-	AWS A5.1	E7018 H4	EN ISO 2560-A	E 42 4 B 42 H5
SUPERCITO 7018S		0.05	1.2	0.4	≤0.015	≤0.020	-	-	-	-	-	-	-	-	AWS A5.1	E7018-1 H4	EN ISO 2560-A	E 42 5 B 32 H5
TENAGITOR		0.06	1.45	0.3	≤0.012	≤0.012	-	-	-	-	-	-	-	-	AWS A5.5	E7018-1 H4	EN ISO 2560-A	E 42 6 B 42 H5
TENAX 355		0.075	1.35	0.35	≤0.015	≤0.02	-	-	-	-	-	-	-	-	AWS A5.1	E7018-1 H4	EN ISO 2560-A	E 42 5 B 32 H5
TENAX 585	BASIC	0.06-0.1	0.8-1.5	≤0.5	≤0.02	≤0.02	-	-	-	-	-	-	-	-	AWS A5.1	E7018-1 H4	EN ISO 2560-A	E 42 5 B 32 H5
TENAX 355 R		0.075	1.35	0.35	≤0.015	≤0.02	-	-	-	-	-	-	-	-	AWS A5.1	E7018-1 H4R	EN ISO 2560-A	E 42 5 B 32 H5
TENAX 77		0.06	1.3	0.35	≤0.03	≤0.03	≤0.08	≤0.08	≤0.06	≤0.06	-	-	-	-	AWS A5.1	E7018-1 H4R	EN ISO 2560-A	E 42 5 B 32 H5
TENAX 565T		0.06	1.7	0.5	≤0.025	≤0.025	-	-	-	-	-	-	-	-	AWS A5.5	E8018-G H4	EN ISO 2560-A	E 46 4 B 32 H5
BORSP6		0.05	1.7	0.5	0.01	0.011	-	-	-	-	-	-	-	-	-	-	EN ISO 2560-A	E 46 6 B 34 H10

STICK ELECTRODES FOR LOW ALLOY STEEL

Product name	Type	Chemical composition (typical values) in %											AWS	EN/ISO						
		C	Mn	Si	S	P	Cr	Ni	Mo	Nb	V	N			Other					
FLEXAL 70	CELLULOSE	0.1	0.7	0.2	-	-	-	-	-	-	-	-	-	-	-	AWS A5.1	E7010-P1	EN ISO 2560-A	E42 3 Mo C 21	
FLEXAL 80		0.1	0.8	0.2	-	-	-	-	-	-	-	-	-	-	-	-	AWS	E8010-G	EN ISO 2560-A	E46 3 MnMo C 21
TENAX 118D2	HIGH STRENGTH	0.08	1.8	0.3	0.02	0.025	-	0.8	0.35	-	0.8	0.35	-	-	-	AWS A5.5	E10018-D2 H4	EN ISO 18275-A	E62 4 Mn1NiMo B T 32 H5	
TENACTO 80		0.06	1.65	0.35	0.010	0.010	0.4	2.3	0.4	-	-	-	-	-	-	AWS A5.5	E11018-G H4	EN ISO 18275-A	E69 6 Mn2NiCrMo B 42 H5	
TENACTO 80CL		0.08	1.75	0.4	0.005	0.01	0.15	2.5	0.4	-	-	-	-	-	-	AWS A5.5	E11018-G H4	EN ISO 18275-A	E69 6 Z B 32 H5	
TENACTO 100		0.07	1.7	0.4	<0.012	0.015	0.45	1.9	0.4	-	-	-	-	-	-	AWS A5.5	E12018-G H4	EN ISO 18275-A	E99 4 Mn2NiCrMo B 42 H5	
TENAX 128M		0.08	1.6	0.35	<0.015	0.015	0.45	1.9	0.4	-	-	-	-	-	-	AWS A5.5	E12018-M H4	EN ISO 18275-A	E79 5 Mn2NiCrMo B 32 H5	
TENACTO 65R		0.05	1.6	0.3	<0.012	<0.012	-	0.9	0.35	-	-	-	-	-	-	AWS A5.5	E9018-G H4	EN ISO 18275-A	E55 6 Mn1NiMo B T 42 H5	
TENAX 70		0.06	1.2	0.5	<0.015	<0.020	-	1	-	-	-	-	-	-	-	AWS A5.5	E8018-G H4	EN ISO 2560-A	E50 6 Mn1Ni B 42 H5	
TENAX 88S		0.06	1.7	0.4	<0.02	<0.02	-	0.8	-	-	-	-	-	-	-	AWS A5.5	E8016-G H4	EN ISO 2560-A	E50 6 Mn1Ni B 12 H5	
TENAX 98M		0.07	1.2	0.4	<0.02	<0.02	-	1.6	0.3	-	-	-	-	-	-	AWS A5.5	E9018M H4	EN ISO 18275-A	E55 2 Z B 32 H5	
TENAX 140		0.08	1.3	0.3	<0.012	<0.012	0.7	3.7	1.1	-	-	-	-	-	-	-	-	EN ISO 18275-A	EN ISO 18275-A	E89 4 Z (Mn3Ni)(Cr1Mo) B 32 H5
MOLYCORD KV2HR	HIGH TEMPERATURE	0.08	0.8	0.45	<0.015	<0.015	-	-	0.53	-	-	-	-	-	-	AWS A5.5	E7018-A1 H4R	EN ISO 3580-A	E30 Mo B 32 H5	
MOLYCORD KV2L		0.05	0.70	0.35	<0.015	<0.015	-	-	0.5	-	-	-	-	-	-	-	AWS A5.5	E7015-A1 H4	EN ISO 3580-A	E Mo B 22 H5
CROMCORD KV5HR		0.08	0.75	0.25	<0.01	<0.01	1.25	-	0.5	-	-	-	-	-	-	-	AWS A5.5	E8018-B2 H4R	EN ISO 3580-A	E(CrMo1) B 32 H5
CROMCORD KV5L		0.04	0.7	0.27	<0.015	<0.015	1.25	-	0.5	-	-	-	-	-	-	-	AWS A5.5	E7015-B2L H4	EN ISO 3580-A	E(CrMo1) B 22 H5
CROMCORD W125		0.12	0.9	0.4	<0.015	<0.020	1.4	-	1.0	-	0.25	-	-	-	-	-	AWS A5.5	E9015-G H4	EN ISO 3580-A	EZ (CrMo1) B 42 H5
CROMO E225		0.1	0.7	0.25	<0.010	<0.010	2.3	-	1.1	-	-	-	-	-	-	-	AWS A5.5	E9015-B3 H4	EN ISO 3580-A	E CrMo2 B 22 H5
CROMCORD KV3HR		0.1	0.75	0.3	<0.01	<0.01	2.25	-	1	-	-	-	-	-	-	-	AWS A5.5	E9018-B3 H4R	EN ISO 3580-A	E CrMo2 B 32 H5
CROMCORD KV3L		0.04	0.75	0.35	<0.015	<0.02	2.25	-	1	-	-	-	-	-	-	-	AWS A5.5	E8015-B3L H4	EN ISO 3580-A	E(CrMo2) B 22 H5
CROMO E225V		0.09	0.6	0.2	<0.010	<0.010	2.3	-	1	0.020	0.25	-	-	-	-	-	AWS A5.5	E9015-G H4	EN ISO 3580-B	E6215-2Cr1Mo1 H5
CROMCORD 5		0.07	0.8	0.5	<0.010	<0.012	5	-	0.5	-	-	-	-	-	-	-	AWS A5.5	E8015-B6 H4	EN ISO 3580-A	E CrMo5 B 22 H5
CROMCORD 5L		0.04	0.75	0.4	<0.015	<0.015	5	-	0.5	-	-	-	-	-	-	-	AWS A5.5	E8015-B6L H4	EN ISO 3580-A	E CrMo5 B 22 H5
CROMCORD 9		0.08	0.7	0.4	<0.015	<0.015	9	0.06	1	-	-	-	-	-	-	-	AWS A5.5	E8015-B8 H4	EN ISO 3580-A	EZ (CrMo9) B 22 H5
CROMCORD 10M	0.11	0.8	0.25	0.008	0.010	9.5	0.5	1	0.05	0.22	0.05	Al 0.01 W 1.0	-	-	-	AWS A5.5	E9018-G H4	EN ISO 3580-A	EZ (CrMoW10) B 42 H5	
CROMO E91	HIGH TEMPERATURE	0.11	0.8	<0.3	<0.010	<0.010	8.5	0.4	0.050	-	0.2	0.050	-	-	-	AWS A5.5	E9015-B91 H4	EN ISO 3580-A	E(CrMo91) B 2 2 H5	
CROMCORD 91		0.1	0.6	0.25	0.008	0.01	9	0.5	1	0.05	0.20	0.05	-	-	-	AWS A5.5	E9018-B91 H4	EN ISO 3580-A	E(CrMo91) B 42 H5	
CROMCORD 9M		0.09	0.95	0.25	<0.010	0.01	9	-	1	0.07	0.20	0.04	-	-	-	AWS A5.5	E9018-B91 H4	EN ISO 3580-A	EZ (CrMo9) B 4 2 H5	
CROMO E92		0.11	0.6	0.25	0.01	0.01	9	0.5	0.45	0.05	0.2	0.05	Al <0.01 Cu <0.05 B 0.003	-	-	AWS A5.5	E 9015-B92 H4	EN ISO 3580-B	EZ (CrMoW9) B 42 H5	
CROMCORD 92	0.095	1.1	0.2	<0.012	<0.012	9	-	0.5	0.05	0.20	0.04	W 1.7 Co 1.0	-	-	AWS A5.5	E 9018-G H4	EN ISO 3580-A	EZ (CrMoWCo) B 99,0,5 2 1) B 42 H5		
TENACTO 38R	LOW TEMPERATURE WEATHERING STEELS	0.06	1.3	0.4	<0.015	<0.012	-	0.95	-	-	-	-	-	-	-	AWS A5.5	E7018-G H4	EN ISO 2560-A	E46 6 Mn1 B 42 H5	
TENACTO 70B		0.06	1.1	0.3	<0.012	<0.012	-	2.4	-	-	-	-	-	-	-	AWS A5.5	E8018-C1 H4	EN ISO 2560-A	E46 6 2M B 42 H5	
TENCORD 85 Kb		0.06	1.3	0.4	<0.02	<0.02	0.5	0.45	-	-	-	-	-	-	-	AWS A5.5	E8018-G H4	EN ISO 18275-A	E50 4 Z B 32 H5	

STICK ELECTRODES FOR STAINLESS STEEL

Product name	Type	Chemical composition (typical values) in %											AWS	EN/ISO			
		C	Mn	Si	S	P	Cr	Ni	Mo	Nb	N						
BASINOX 307	AUSTENITIC	0.08	5.5	0.3	≤0.025	≤0.035	19	8.5	-	-	-	-	-	AWS A5.4	E307-15*	EN ISO 3581-A	E 18 8 Mn B 22 E Fe10
SUPRANOX RS 307		0.12	5	1	-	-	18	9	-	-	-	-	-	AWS A5.4	E307-16*	EN ISO 3581-A	E 18 8 Mn R 12 E Fe10
BASINOX 308L		≤0.03	1.5	0.3	≤0.025	≤0.025	19	10	-	-	-	-	-	AWS A5.4	E308L-15	EN ISO 3581-A	E 19 9 L B 22
SUPRANOX RS 308L		0.025	0.9	0.8	≤0.025	≤0.030	19.8	9.5	-	-	-	-	-	AWS A5.4	E308L-16	EN ISO 3581-A	E 19 9 L R 12
SUPRANOX 308L		0.025	0.9	0.8	≤0.025	≤0.030	19.8	9.5	-	-	-	-	-	AWS A5.4	E308L-17	EN ISO 3581-A	E 19 9 L R 12
CLEARINOX E 308L		0.03	0.8	1.0	0.01	≤0.025	19.5	10	-	-	-	-	-	AWS A5.4	E308L-17	EN ISO 3581-A	E 19 9 L R 22
BASINOX 309L		0.025	1.4	0.35	≤0.025	≤0.03	22.5	13	-	-	-	-	-	AWS A5.4	E309L-15	EN ISO 3581-A	E 23 12 L B 22
SUPRANOX RS 309L		≤0.040	0.9	0.9	≤0.025	≤0.025	23.5	12.2	-	-	-	-	-	AWS A5.4	E309L-16	EN ISO 3581-A	E 23 12 L R 12
SUPRANOX 309L		≤0.040	0.9	0.9	≤0.025	≤0.025	23.5	12.2	-	-	-	-	-	AWS A5.4	E309L-17	EN ISO 3581-A	E 23 12 L R 12
CLEARINOX E 309L		0.03	0.9	0.8	0.01	0.025	24	13	-	-	-	-	-	AWS A5.4	E309L-17	EN ISO 3581-A	E 23 12 L R 22
BASINOX 316L		≤0.025	1	0.3	≤0.020	≤0.025	18.5	11.5	2.7	-	-	-	-	AWS A5.4	E316L-15	EN ISO 3581-A	E 19 12 3 L B 22
SUPRANOX RS 316L		0.035	0.9	0.8	≤0.025	≤0.025	19.0	12.0	2.6	-	-	-	-	AWS A5.4	E316L-16	EN ISO 3581-A	E 19 12 3 L R 12
SUPRANOX 316L		0.035	0.9	0.8	≤0.025	≤0.025	19.0	12.0	2.6	-	-	-	-	AWS A5.4	E316L-17	EN ISO 3581-A	E 19 12 3 L R 12
CLEARINOX E 316L		0.03	0.8	1.0	0.01	0.025	19.5	11.5	2.7	-	-	-	-	AWS A5.4	E316L-17	EN ISO 3581-A	E 19 12 3 L R 22
BASINOX 310		0.09	2.0	0.7	≤0.02	≤0.03	26	21	-	-	-	-	-	AWS A5.4	E310-15	EN ISO 3581-A	E 25 20 B 22
SUPRANOX RS 310		0.1	1.7	0.6	-	-	27	21	-	-	-	-	-	AWS A5.4	E310-16	EN ISO 3581-A	E 25 20 R 12
SUPRANOX RS 317L	0.025	0.9	0.8	≤0.03	≤0.03	20	13	3.4	-	-	-	-	AWS A5.4	E317L-16	EN ISO 3581-A	EZ (19 13 4 N) L R 12	
SUPRANOX RS 318	≤0.03	0.8	0.9	-	-	19	11.5	2.7	0.4	-	-	-	AWS A5.4	E318-16	EN ISO 3581-A	E 19 12 3 Nb R 12	
BASINOX 347	0.05	1.6	0.45	≤0.025	≤0.030	19	9.5	-	0.5	-	-	-	AWS A5.4	E347-15	-	-	
SUPRANOX RSL 347	≤0.05	0.5-2.0	0.5-0.9	≤0.025	≤0.03	18-21	9-11	≤0.75	0.4	-	-	-	AWS A5.4	E347-16	EN ISO 3581-A	E 19 9 Nb R 12	
BASINOX 22 9 3 N	≤0.04	1.20	0.4	≤0.020	≤0.020	23.40	9	2.80	-	0.15	-	-	AWS A5.4	E2209-15	EN ISO 3581-A	E 22 9 3 N L B 42	
SUPRANOX RS 22.9.3N	0.025	0.9	0.9	≤0.03	≤0.03	22.5	9.5	2.8	-	0.14	-	-	AWS A5.4	E2209-16	EN ISO 3581-A	E 22 9 3 N L R 12	
BASINOX 25 10 4 N	0.03	1.3	0.5	≤0.025	≤0.03	25	9.5	4	-	0.25	-	-	AWS A5.4	E2594-15	EN ISO 3581-A	E 25 9 4 N L B 42	
BASINOX 308H	0.05	1.5	0.4	≤0.025	≤0.025	19	10	-	-	-	-	-	AWS A5.4	E308H-15	EN ISO 3581-A	E 19 9 HB 22	
SUPRANOX RS 308H	0.05	0.75	0.85	-	-	18.50	9.50	-	-	-	-	-	AWS A5.4	E308H-16	EN ISO 3581-A	E 19 9 HR 12	
SUPRANOX RS 347	0.05	0.8	0.6	≤0.02	≤0.03	19.5	10	-	0.4	-	-	-	AWS A5.4	E347-16	EN ISO 3581-A	E 19 9 Mb R 12	
SUPRANOX RS 309LMo	0.03	0.9	0.9	≤0.02	≤0.02	22.7	12.5	2.3	-	-	-	-	AWS A5.4	E309LMo-16	EN ISO 3581-A	E 23 12 L R 12	
SUPRANOX RS 312	0.08	1	1.2	-	-	28	12	-	-	-	-	-	AWS A5.4	E312-16*	EN ISO 3581-A	E Z (29 9) R 12	
BASINOX 4-10	0.05	0.4	0.3	≤0.025	0	12	1.50	-	-	-	-	-	AWS A5.4	E4-10-15*	EN ISO 3581-A	E Z 13 1 B 42	
BASINOX 4-10 NiMo	0.06	0.8	0.5	0.006	0.017	12	4.5	0.5	-	-	-	-	AWS A5.4	E4-10NiMo-15	EN ISO 3581-A	E 13 4 B 4 2	
BASINOX 309NB	≤0.04	1.6	0.45	≤0.025	≤0.03	23.5	12.5	-	0.9	-	-	-	AWS A5.4	E309NB-15	EN ISO 3581-A	E 23 12 Nb B 22	

* Nearest classification.

STICK ELECTRODES FOR HARDFACING APPLICATIONS

Product name	Type	Chemical composition (typical values) in %										AWS	EN/ISO	
		C	Mn	Si	Cr	Ni	Mo	Fe	V					
SUPRADUR V1000	ABRASION	3.5	1	1	33	-	-	-	-	-	rem.	-	-	-
SUPRADUR 400B	WEAR HB400	0.2	0.4	0.7	2.7	-	-	-	-	-	rem.	-	-	-
SUPRADUR 600B	ABRASION+IMPACT	0.5	0.3	0.4	8	-	0.5	rem.	0.5	-	-	-	-	-
SUPRADUR 600RB	ABRASION+IMPACT	0.5	0.5	0.8	7	-	0.5	rem.	0.7	-	-	-	-	-
SUPRAMANGAN	WEAR BY IMPACT (14%MM)	0.60	15	-	4.50	4.80	-	-	-	-	rem.	-	-	-
SUPRAMANGAN CR	WEAR BY IMPACT (14%MM)	0.65	16	-	12.8	-	-	-	-	-	rem.	-	-	-
CTORAIL	WEAR HB300	0.09	0.8	0.9	2.4	-	-	-	-	-	rem.	-	-	-

STICK ELECTRODES FOR NICKEL ALLOYS

Product name	Type	Chemical composition (typical values) in %										AWS	EN/ISO									
		C	Mn	Si	S	P	Cr	Ni	Mo	Nb	Fe			Al	Cu	Ti						
SUPRANEL 182	NICKEL 182 TYPE ALLOY	0.025	5.5	0.4	0.01	-	16	rem.	-	2.0	6.5	-	-	-	-	-	-	-	AWS A5.11	ENICrFe-3	EN ISO 14172-A	E Ni 6182
SUPRANEL 625	NICKEL 625 TYPE ALLOY	0.03	0.5	0.35	-	-	22	rem.	9	3.4	0.9	-	-	-	-	-	-	-	AWS A5.11	ENICrMo-3	EN ISO 14172-A	E Ni 6625
SUPRANEL NiCu7	NICKEL BASED NON-FERREOUS ALLOYS	0.08	3.5	1.2	0.005	0.01	-	63	-	-	1	0.03	30	0.9	-	-	-	-	AWS A5.11	ENICu-7	EN ISO 14172-A	E Ni 4060
SUPERFONTE Ni	NI CAST IRON	0.7	-	-	-	-	-	rem.	-	-	2	-	-	-	-	-	-	-	AWS A5.15	ENi-CI	EN ISO 1071	E C Ni-CI 1
SUPERFONTE NiFe	NiFe CAST IRON	0.6	-	-	-	-	-	rem.	-	-	40	-	-	-	-	-	-	-	AWS A5.15	ENiFe-CI	EN ISO 1071	E C NiFe-CI 1

MIG WIRES FOR MILD STEEL

Product name	Chemical composition (typical values) in %					AWS	EN/ISO
	C	Mn	Si	P	S		
ULTRAFIL 1	0.08	1.4	0.9	≤0.025	≤0.025	AWS A5.18	EN ISO 14341-A
ULTRAFIL 1A	0.08	1.7	0.9	≤0.025	≤0.025	ER70S-6	G 42 3 C1 3511 / G 42 4 M21 3511
CARBOFIL	0.08	1.1	0.6	≤0.025	≤0.025	ER70S-6	EN ISO 14341-A
CARBOFIL 1	0.08	1.4	0.9	≤0.025	≤0.025	ER70S-3	G 46 3 C1 4511 / G 46 4 M21 4511
CARBOFIL 1 GOLD	0.08	1.4	0.9	≤0.025	≤0.025	ER70S-6	G 38 3 C1 251 / G 42 3 M21 251
CARBOFIL 1A	0.08	1.7	0.9	≤0.025	≤0.025	ER70S-6	G 42 3 C1 3511 / G 42 4 M21 3511
CARBOFIL 1A GOLD	0.08	1.7	0.9	≤0.025	≤0.025	ER70S-6	G 42 3 C1 3511 / G 42 4 M21 3511
CARBOFIL 1A GOLD	0.08	1.7	0.9	≤0.025	≤0.025	ER70S-6	G 46 3 C1 4511 / G 46 4 M21 4511
CARBOFIL 1A GOLD	0.08	1.7	0.9	≤0.025	≤0.025	ER70S-6	G 46 3 C1 4511 / G 46 4 M21 4511

MIG WIRES FOR LOW ALLOY STEEL

Product name	Chemical composition (typical values) in %											AWS	EN/ISO		
	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Nb	V				
CARBOFIL CRMO1	0.08	1.2	0.6	≤0.020	≤0.020	1.2	-	0.6	-	-	-	AWS A5.28	ER80S-G	EN ISO 21952-A	G CrMo1Si
CARBOFIL CRMO2	0.09	1.2	0.7	≤0.020	≤0.020	2.5	-	1.0	-	-	-	AWS A5.28	ER90S-G	EN ISO 21952-A	G CrMo2Si
CARBOFIL CRMO5	0.07	0.5	0.5	≤0.020	≤0.020	5.70	-	0.6	-	-	-	AWS A5.28	ER80S-B6	EN ISO 21952-A	G CrMo5Si
CARBOFIL CRMO91	0.11	0.5	0.40	-	-	9.25	0.45	0.95	-	0.06	0.22	AWS A5.28	ER90S-B91	EN ISO 21952-A	G CrMo91
CARBOFIL KV3	0.075	0.55	0.57	0.005	0.005	2.5	0.1	1.0	0.1	-	-	AWS A5.28	ER90S-B3	EN ISO 21952-B	G 62M 2C1M
CARBOFIL KV5	0.09	0.55	0.55	0.005	0.005	1.3	0.05	0.5	0.12	-	-	AWS A5.28	ER80S-B2	EN ISO 21952-B	G 55 M 1CM
CARBOFIL MNM10	0.09	1.80	0.60	0.014	0.010	-	-	0.40	-	-	-	AWS A5.28	ER80S-D2	EN ISO 14341-A	G 50.4 M2 1.4M0
CARBOFIL MNM10CR	0.09	1.65	0.75	0.010	0.010	0.55	0.55	0.25	-	-	-	AWS A5.28	ER100S-G	EN ISO 16834-A	G 62.4 M21 Mn3NiCrMo
CARBOFIL MO	0.1	1.1	0.6	≤0.020	≤0.020	-	-	0.5	-	-	-	AWS A5.28	ER70S-A1	EN ISO 14341-A	G 46.3 M21 2M0
CARBOFIL Ni2	0.08	1.1	0.5	≤0.020	≤0.020	-	2.3	-	-	-	-	AWS A5.28	ER80S-Ni2	EN ISO 21952-A	G MoSi
CARBOFIL NiCu	0.09	1.4	0.8	≤0.025	≤0.025	-	0.8	-	0.4	-	-	AWS A5.28	ER80S-G	EN ISO 14341-A	G 42.3 C1 Z / G 42.4 M21 Z
CARBOFIL NiMo1	0.08	1.5	0.7	0.010	0.010	-	1.1	0.4	-	-	-	AWS A5.28	ER100S-G	EN ISO 16834-A	G 62.4 M21 Mn3Ni1Mo
CARBOFIL NiMoCR	0.08	1.6	0.5	≤0.015	≤0.015	0.25	1.5	0.25	-	-	-	AWS A5.28	ER110S-G	EN ISO 16834-A	G 69.4 M21 Mn3Ni1CrMo
CARBOFIL 2NiMoCR	0.08	1.7	0.7	≤0.015	≤0.018	0.4	2.2	0.6	-	-	-	AWS A5.28	ER120S-G	EN ISO 16834-A	G 89.4 M21 Mn4Ni2CrMo
CARBOFIL 3NiMoCR	0.11	1.9	0.8	≤0.015	≤0.018	0.55	2.4	0.55	-	-	-	AWS A5.28	ER 120S-G	EN ISO 16834-A	G 89.5 M2.1 Mn4Ni2.5CrMo

MIG WIRES FOR STAINLESS STEEL

Product name	Chemical composition (typical values) in %											AWS	EN/ISO		
	C	Mn	Si	P	S	Cr	Ni	Mo	Nb	N					
INERTFIL 307	0.10	7	0.8	≤0.030	≤0.025	19	9	-	-	-	-	AWS A5.9	ER307*	EN ISO 14343-A	G 18.8 Mn
INERTFIL 308L	0.020	1.8	0.45	≤0.025	≤0.020	20	10	-	-	-	-	AWS A5.9	ER308L	EN ISO 14343-A	G 19.9 L
INERTFIL 308LSI	0.020	1.8	0.85	≤0.025	≤0.020	20	10	-	-	-	-	AWS A5.9	ER308LSI	EN ISO 14343-A	G 19.9 L Si
INERTFIL 309L	0.020	1.8	0.45	≤0.025	≤0.020	24	13	-	-	-	-	AWS A5.9	ER309L	EN ISO 14343-A	G 23.12 L
INERTFIL 309LMO	0.012	1.44	0.35	0.019	0.002	21.5	14.5	2.6	-	-	-	AWS A5.9	ER309LMO	EN ISO 14343-A	G 23.12 2 L
INERTFIL 309LSI	0.020	1.8	0.85	≤0.025	≤0.020	24	13	-	-	-	-	AWS A5.9	ER309LSI	EN ISO 14343-A	G 23.12 L Si
INERTFIL 310	0.12	1.8	0.6	≤0.020	≤0.020	26	21	-	-	-	-	AWS A5.9	ER310	EN ISO 14343-A	G 25.20
INERTFIL 316L	0.020	1.4	0.45	≤0.025	≤0.020	19	12.5	2.6	-	-	-	AWS A5.9	ER316L	EN ISO 14343-A	G 19.12 3L
INERTFIL 316LSI	0.020	1.8	0.85	≤0.025	≤0.020	19	12.5	2.6	-	-	-	AWS A5.9	ER316LSI	EN ISO 14343-A	G 19.12 3 L Si
INERTFIL 318SI	0.04	1.4	0.85	≤0.025	≤0.020	19	12	2.7	0.5	-	-	AWS A5.9	ER318*	EN ISO 14343-A	G 19.12 3 Nb Si
INERTFIL 347	0.040	1.6	0.45	≤0.025	≤0.020	19.5	10	-	0.5	-	-	AWS A5.9	ER347	EN ISO 14343-A	G 19.9 Nb
INERTFIL 347SI	0.040	1.6	0.8	≤0.025	≤0.020	19.5	10	-	0.5	-	-	AWS A5.9	ER347SI	EN ISO 14343-A	G 19.9 Nb Si
INERTFIL 22.9.3	0.020	1.7	0.5	≤0.025	≤0.020	23	9	3	-	0.15	-	AWS A5.9	ER2209	EN ISO 14343-A	G 22.9 3 N L
INERTFIL 4.10NiMo	0.04	0.5	0.4	≤0.030	≤0.020	12	4	0.5	-	-	-	AWS A5.9	ER4.10NiMo*	EN ISO 14343-A	G 13.4

* Nearest classification

MIG WIRES FOR COPPER ALLOYS

Product name	Chemical composition (typical values) in %							AWS	EN/ISO
	Mn	Si	Ni	Cu	Fe	Al	Al		
COPPERFIL CUALB	0.2	0.1	0.7	Rest	0.4	8.0	AWS A5.7	ER CuAl-A1	EN ISO 24373-A S Cu 6100 (CuAl7)
COPPERFIL CUSB	1.1	3.4	-	Rest	0.2	0.01	AWS A5.7	ER CuSi+A	EN ISO 24373-A S Cu 6560 (CuSi3Mn1)

MIG WIRES FOR ALUMINIUM ALLOYS

Product name	Chemical composition (typical values) in %										AWS	EN/ISO		
	Mn	Si	Cr	Cu	Fe	Al	Ti	Mg	Be	Zn				
ALUFILALMG3	0.29	0.07	0.06	0.01	0.13	bal.	0.05	3.0	0.0004		AWS A5.10	ER5754	EN ISO 18273-A	S Al 5754 (AlMg3)
ALUFILALMG5	0.12	0.05	0.08	0.03	0.09	bal.	0.15	4.90	0.0002	<0.01	AWS A5.10	ER5356	EN ISO 18273-A	S Al 5356 (AlMg5Cr(A))
ALUFILALSJ5	0.01	5.26		0.01	0.15	bal.	0.01	0.03	<0.0002	0.001	AWS A5.10	ER4043	EN ISO 18273-A	S Al 4043 (AlSi)
ALUFILALMG4,5MN	0.8	0.3	0.1	0.1	Rem	0.1	Rem	4.5			AWS A5.10	ER5183	EN ISO 18273-A	S Al 5183 (AlMg4.5Mn0.7Al)

MIG WIRES FOR NICKEL ALLOYS

Product name	Chemical composition (typical values) in %											AWS	EN/ISO						
	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Fe	Al			Ti	Nb				
CARBONCAST NIFE	0.9	0.8	0.7	-	-	-	55	-	1.0	42	0.5	-	-	-	-	AWS	EN ISO 1071-A	S NiFe1	
NIFIL 600	0.050	3	0.3	≤0.020	≤0.015	20	Rest	-	2	-	0.5	2.5	2.5	2.5	2.5	AWS A5.14	ERNiCr-3	EN ISO 18274-A	S Ni 6082 (NiCr20Mn3Nb)
NIFIL 625	0.025	0.4	0.3	≤0.020	≤0.015	21	Rest	9	-	0.3	-	0.3	3.5	3.5	3.5	AWS A5.14	ERNiCrMo-3	EN ISO 18274-A	S Ni 6625 (NiCr22Mo9Nb)

MIG WIRES FOR HARDFACING APPLICATIONS

Product name	Chemical composition (typical values) in %				AWS	EN/ISO
	C	Mn	Si	Cr		
CARBONFIL A.600	0.5	0.4	3	9.5	-	-

TIG RODS FOR MILD STEEL

Product name	Chemical composition (typical values) in %											EN/ISO		
	C	Mn	Si	P	S	Ti	Al	Zr	AWS					
CARBOROD	0.07	1	0.65	≤0.025	≤0.025	-	-	-	AWS A5.18			ER70S-3	EN ISO 636-A	W 42 4 25i
CARBOROD 1	0.08	1.5	0.9	≤0.025	≤0.025	-	-	-	AWS A5.18			ER70S-6	EN ISO 636-A	W 42 4 35i1
CARBOROD 1A	0.08	1.7	0.9	≤0.020	≤0.020	-	-	-	AWS A5.18			ER70S-6	EN ISO 636-A	W 46 4 45i1
CARBOROD GALVA	0.06	1.30	0.65	≤0.025	≤0.025	0.13	0.10	0.11	AWS A5.18			ER70S-2*	EN ISO 636-A	W2Ti

TIG RODS FOR LOW ALLOY STEEL

Product name	Chemical composition (typical values) in %														EN/ISO		
	C	Mn	Si	P	S	Cr	Ni	Mo	Nb	V	AWS						
CARBOROD MO	0.10	1.0	0.6	≤0.020	≤0.020	-	-	0.5	-	-	AWS A5.28				ER 70S-A1	EN ISO 21952-A	W MoSi
CARBOROD MNMO	0.09	1.9	0.6	≤0.02	≤0.02	-	0.15	0.5	-	-	AWS A5.28				ER 80S-D2	EN ISO 636-A	W 2Mo
CARBOROD NIMO1	0.08	1.8	0.6	≤0.015	≤0.018	-	1.0	0.4	-	-	AWS A5.28				ER 100S-G	EN ISO 21952-B	W 3M3*
CARBOROD NI2	0.08	1.1	0.5	≤0.015	≤0.015	-	2.3	-	-	-	AWS A5.28				ER 80S-NI2	EN ISO 16834-A	W Mn3Ni1Mo
CARBOROD NI1	0.08	1.1	0.6	≤0.020	≤0.020	-	0.9	-	-	-	AWS A5.28				ER 80S-NI1	EN ISO 636-A	W 46 9 2Ni2
CARBOROD NI3	0.08	0.8	0.5	≤0.010	≤0.010	-	3.5	-	-	-	AWS A5.28				ER 80S-NI3	EN ISO 636-A	W 46 6 3Ni1
CARBOROD CRMO1	0.08	1.2	0.6	≤0.020	≤0.020	1.2	-	0.6	-	-	AWS A5.28				ER 80S-G	EN ISO 21952-A	W 55A 10 N71
CARBOROD CRMO2	0.09	1.1	0.7	≤0.020	≤0.020	2.5	-	1.0	-	-	AWS A5.28				ER 90S-G	EN ISO 21952-A	W CrMo1 Si
CARBOROD CRMO5	0.07	0.5	0.5	≤0.020	≤0.020	5.7	-	0.6	-	-	AWS A5.28				ER 80S-B6	EN ISO 21952-A	W CrMo2 Si
CARBOROD CRMO9	0.06	0.7	0.5	≤0.025	≤0.025	9.0	0.06	1.0	-	-	AWS A5.28				ER 80S-B8	EN ISO 21952-A	W CrMo5 Si
CARBOROD CRMO91	0.10	0.5	0.30	-	-	9.1	0.65	1.0	0.06	0.22	AWS A5.28				ER 90S-B91	EN ISO 21952-A	W CrMo9
CARBOROD KV3	0.08	0.60	0.55	≤0.020	≤0.020	2.40	-	1	-	-	AWS A5.28				ER 90S-B3	EN ISO 21952-B	W 62M 2Cr1M
CARBOROD KV5	0.08	0.56	0.50	≤0.020	≤0.020	1.25	-	≤0.50	-	-	AWS A5.28				ER 80S-B2	EN ISO 21952-B	W 55M 1CM
CARBOROD W 225V	≤0.13	≤1	≤0.2	-	-	2.5	-	1	0.02	0.25	AWS A5.28				ER 90S-G	-	-

* Nearest classification

TIG RODS FOR NICKEL ALLOYS

Product name	Chemical composition (typical values) in %											AWS	EN/ISO		
	C	Mn	Si	P	S	Cr	Ni	Mo	Ti	Fe	Nb				
NIROD 600	0.050	3	0.3	≤0.020	≤0.015	20	Rest	-	0.5	2	2.5	AWS A5.14		ER NiCr-3	EN ISO 18274-A 5 Ni 6082 (NiCr20Mn3Nb)
NIROD 625	0.025	0.4	0.3	≤0.020	≤0.015	21	Rest	9	0.3	0.3	3.5	AWS A5.14		Er NiCrMo-3	EN ISO 18274-A 5 Ni 6625 (NiCr22Mo9Nb)

TIG RODS FOR STAINLESS STEEL

Product name	Chemical composition (typical values) in %													EM/ISO	
	C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Nb	N	AWS			
INERTROD 307	0.1	7	0.8	≤0.030	≤0.025	19	9	-	-	-	-	AWS A5.9	ER307*	EN ISO 14343-A	W 18 8 Mn
INERTROD 308L	0.020	1.8	0.45	≤0.025	≤0.020	20	10	-	-	-	-	AWS A5.9	ER308L	EN ISO 14343-A	W 19 9 L
INERTROD 308LSI	0.020	1.8	0.85	≤0.025	≤0.020	20	10	-	-	-	-	AWS A5.9	ER308LSI	EN ISO 14343-A	W 19 9 L Si
INERTROD 309L	0.02	1.8	0.45	≤0.025	≤0.020	24	13	-	-	-	-	AWS A5.9	ER309L	EN ISO 14343-A	W 23 12 L
INERTROD 309LSI	0.02	1.8	0.85	0.025	0.020	24	13	-	-	-	-	AWS A5.9	ER309LSI	EN ISO 14343-A	W 23 12 L Si
INERTROD 316L	0.020	1.4	0.45	≤0.025	≤0.020	19	12.5	2.6	-	-	-	AWS A5.9	ER316L	EN ISO 14343-A	W 19 12 3 L
INERTROD 316LSI	0.02	1.4	0.85	≤0.025	≤0.020	19	12.5	2.6	-	-	-	AWS A5.9	ER316LSI	EN ISO 14343-A	W 19 12 3 L Si
INERTROD 308H	0.060	1.9	0.5	≤0.020	≤0.020	20	10	-	-	-	-	AWS A5.9	ER308H	EN ISO 14343-A	W 19 9 H
INERTROD 309LMO	0.020	1.6	0.45	≤0.025	≤0.020	22	15	2.7	-	-	-	AWS A5.9	ER309LMO*	EN ISO 14343-A	W 23 12 2 L
INERTROD 310	0.12	1.8	0.6	≤0.020	≤0.020	26	21	-	-	-	-	AWS A5.9	ER310	EN ISO 14343-A	W 25 20
INERTROD 318SI	0.04	1.4	0.85	≤0.025	≤0.020	19	12	2.7	-	0.5	-	AWS A5.9	ER318*	EN ISO 14343-A	W 19 12 3 Nb Si
INERTROD 347	0.04	1.6	0.45	≤0.025	≤0.020	19.5	10	-	-	0.5	-	AWS A5.9	ER347	EN ISO 14343-A	W 19 9 Nb
INERTROD 347SI	0.04	1.6	0.85	≤0.025	≤0.020	19.5	10	-	-	0.5	-	AWS A5.9	ER347SI	EN ISO 14343-A	W 19 9 Nb Si
INERTROD 904L	0.020	1.9	0.4	≤0.020	≤0.020	20	25	4.5	1.5	-	-	AWS A5.9	ER385	EN ISO 14343-A	W 20 25 5 Cu L
INERTROD 410NIMO	0.04	0.5	0.4	≤0.030	≤0.020	12.5	4	0.5	-	-	-	AWS A5.9	ER410NIMO*	EN ISO 14343-A	W 13 4
INERTROD 22 9 3	0.020	1.7	0.5	≤0.025	≤0.020	23	9	3	-	-	0.15	AWS A5.9	ER2209	EN ISO 14343-A	W 22 9 3 N L
INERTROD 25 10 4	0.03	1	0.5	≤0.020	≤0.020	25	9.5	4	-	-	0.25	AWS A5.9	ER2594	EN ISO 14343-A	W 25 9 4 N L

* Nearest classification

TIG RODS FOR ALUMINIUM ALLOYS

Product name	Chemical composition (typical values) in %											EM/ISO			
	Mn	Si	Cr	Ti	Fe	Al	Cu	Mg	Be	Zn	Zr		AWS		
ALUROD AL5F	0.009	5.01	-	0.007	0.13	bal.	0.008	0.03	0.0002	0.002	-	AWS A5.10	R4043	EN ISO 18273-A	S Al 4043 (AlSi5)
ALUROD ALMG3	0.29	0.07	0.06	0.05	0.13	bal.	0.01	3.0	0.0004	-	-	AWS A5.10	R5754	EN ISO 18273-A	S Al 5754 (AlMg3)
ALUROD ALMG4.5MN	0.65	0.03	0.10	0.07	0.13	bal.	0.001	4.99	0.0002	0.02	-	AWS A5.10	R5183	EN ISO 18273-A	S Al 5183 (AlMg4.5Mn0.7Al)
ALUROD ALMG4.5MNMZR	0.7	0.06	0.07	0.01	0.13	bal.	-	4.9	0.0002	-	0.12	AWS A5.10	R5087	EN ISO 18273-A	S Al 5087 (AlMg4.5MnZr)
ALUROD ALMG5	0.12	0.06	0.12	0.09	0.09	bal.	0.02	4.84	0.0002	0.001	-	AWS A5.10	R5356	EN ISO 18273-A	S Al 5356 (AlMg5CrAl)

TIG RODS FOR COPPER ALLOYS

Product name	Chemical composition (typical values) in %											EM/ISO			
	Mn	Si	P	Ni	Ti	Fe	Al	Cu	Pb	Sn	AWS				
CUROD	0.3	0.3	≤0.15	-	-	-	≥980	-	≤0.01	≤0.02	0.75	AWS A5.7	ER Cu	EN ISO 24373-A	S Cu 1898 (CuSn1)
CUROD 70/30	0.9	0.2	-	30	0.3	0.5	-	Rest	-	-	-	AWS A5.7	ER CuNi	EN ISO 24373-A	S Cu 7158 (CuNi30Mn1Fe1)

FLUX-CORED WIRES FOR MILD STEEL

Product name	Type	Chemical composition (typical values) in %					AWS	EN/ISO
		C	Mn	Si	P	S		
FLUXOFIL M 8	Seamless MCAW	0.07	1.3	0.7	0.010	0.010	AWS A5.18	EN ISO 17632-A EN ISO 17632-B
FLUXOFIL M10		0.08	1.5	0.4	0.010	0.010	AWS A5.18	T 46 4 M M 1 H5 T 494 T15-1MA-UH5
FLUXOFIL M10S		0.07	1.6	0.4	0.010	0.010	AWS A5.18	T 42 6 M M 1 H5 T 496 T15-1MA-UH5
FLUXOFIL MC466M	Seamless FCAW	0.06	1.40	0.55	≤0.010	≤0.010	AWS A5.18	T 46 6 M M 1 H5
FLUXOFIL 14HD		0.05	1.4	0.5	≤0.010	≤0.010	AWS A5.20	T 46 3 P M 1 H5 / T 46 2 P C 1 T 492 T1-1CA-UH5 / T 493 T1-1MA-UH5
FLUXOFIL 71		0.05	1.4	0.5	≤0.010	≤0.010	AWS A5.20	T 46 2 P C 1 H5 / T 46 2 P M 1 H5 T 492 T1-1CA-UH5 / T 493 T1-1MA-UH5
FLUXOFIL 19HD	Seamless FCAW	0.05	1.3	0.5	≤0.010	≤0.010	AWS A5.20	T 46 3 P C T H5 T 493 T1-1CA-UH5
FLUXOFIL 31		0.05	1.2	0.3	≤0.010	≤0.010	AWS A5.20	T 42 4 B M 2 H5 / T 42 4 B C 2 H5 T 494 T5-1CA-UH5 / T 494 T5-1MA-UH5
FLUXOFIL 31S		0.05	1.2	0.3	≤0.010	≤0.010	AWS A5.20	T 42 4 B M 2 H5 / T 42 4 B C 2 H5 T 494 T5-1CA-UH5 / T 494 T5-1MA-UH5
CITOFILUX M00	Folded MCAW	0.04	1.5	0.4	≤0.012	≤0.02	AWS A5.18	T 46 5 M M 1 H5 T 555 T15-1MA-UH5
CRISTAL F 206		0.05	1.35	0.6	≤0.015	≤0.023	AWS A5.18	T 42 3 M M 1 H5 T 493 T15-1MA-UH5
CITOFILUX M60 A		0.05	1.35	0.6	≤0.015	≤0.023	AWS A5.18	T 42 2 M M 1 H5 T 492 T15-1MA-UH5
CITOFILUX M60	Folded FCAW	0.04	1.5	0.4	≤0.012	≤0.02	AWS A5.18	T 46 4 M M 1 H5 T 494 T1-1MA-UH5
CITOFILUX R00		0.05	1.47	0.5	≤0.015	≤0.015	AWS A5.20	T 42 3 P M 1 H5 / T 42 2 P C1 H5 T 492 T1-1CA-UH5 / T 493 T1-1MA-UH5
CITOFILUX R00C		0.05	1.3	0.4	≤0.015	≤0.015	AWS A5.20	T 42 3 P C 1 H5
CITOFILUX R71	Folded FCAW	0.05	1.3	0.40	≤0.015	≤0.015	AWS A5.20	T 42 2 P C 1 H10 T 46 2 P M 1 H10
CITOFILUX GALVA		0.4	1.2	0.3	-	-	AWS A5.18	-
CITOFILUX B13-O	FCAW-SS	0.3	0.6	0.15	≤0.025	≤0.025	AWS A5.20	EN ISO 17632-A

FLUX-CORED WIRES FOR LOW ALLOY STEEL

CHEMICAL COMPOSITION AND CLASSIFICATION

Product name	Type	Chemical composition (typical values) in %											AWS	EN/ISO				
		C	Mn	Si	P	S	Ni	Cr	Mo	Cu	V							
FLUXOFIL M 41	Seamless MCAW	0.06	1.7	0.6	0.015	0.015	0.6	-	0.3	-	-	-	-	-	AWS A5.28	E90C-GM H4	EN ISO 18276-A	T 625T15-1MA-3M2-UH5
FLUXOFIL M 42		0.05	1.5	0.5	0.01	0.01	2	0.4	0.4	-	-	-	-	-	AWS A5.29	E110C-GM H4	EN ISO 18276-A	T 69 4 Mm2NiCrMo M M 1 H5
FLUXOFIL M 48		0.05	1.1	0.4	≤0.020	≤0.020	0.5	0.6	-	0.5	-	-	-	-	AWS A5.28	E80C-GM H4	EN ISO 17632-A	T 46 3 Z M M 1 H5
FLUXOFIL 20HD		0.06	1.3	0.4	≤0.010	≤0.010	≤1.0	-	-	-	-	-	-	-	AWS A5.29	E81T1-NiM-JH4	EN ISO 17632-A	T 46 4 1Ni P M 1 H5
FLUXOFIL 40	Seamless FCAW	0.06	1.3	0.4	≤0.010	≤0.010	1.0	-	-	-	-	-	-	-	AWS A5.29	E80T5-GM-H4	EN ISO 17632-B	T 554T1-1MA-N2-UH5
FLUXOFIL 41		0.07	1.3	0.4	0.01	0.01	1.1	-	0.4	-	-	-	-	-	AWS A5.29	E90T5-GC-H4	EN ISO 18276-A	T 46 6 1Ni B M 2 H5
FLUXOFIL 42		0.06	1.5	0.3	0.01	0.01	2.3	0.4	0.4	-	-	-	-	-	AWS A5.29	E110T5-K4M-H4	EN ISO 18276-A	T 55 4 1NiMo B M 2 H5
FLUXOFIL 29HD		0.06	1.4	0.4	≤0.010	≤0.010	2.9	-	0.35	-	-	-	-	-	AWS A5.29	E111T1-GM-H4	EN ISO 18276-B	T 55 4 1NiMo B C 2 H5
FLUXOFIL 45		0.09	2	0.5	0.01	0.01	1.8	1	0.4	-	-	-	-	-	AWS A5.29	E120T5-GM-H4	EN ISO 18276-A	T 69 6 Mm2NiCrMo B M 2 H5
FLUXOFIL 18HD		0.04	1.1	0.5	-	-	0.6	0.6	-	0.7	-	-	-	-	AWS A5.29	E81T1-GM-H4	EN ISO 18276-A	T 69 4 Z P M 1 H5
FLUXOFIL 48		0.05	1.1	0.25	0.010	0.010	1.2	-	-	0.5	-	-	-	-	AWS A5.29	E80T5-GM-H4	EN ISO 17632-A	T 50 3 Z P M 1 H5
FLUXOFIL 25		0.05	1.1	0.4	0.01	0.01	-	-	0.5	-	-	-	-	-	AWS A5.29	E81T1-A1M-H4	EN ISO 17634-A	T 46 6 Z B M 2 H5
FLUXOFIL 35		0.05	1.1	0.3	0.010	0.010	-	-	0.5	-	-	-	-	-	AWS A5.29	E80T5-GC-H4	EN ISO 17634-A	T Mol B C 2 H5
FLUXOFIL 36		0.08	0.8	0.3	0.010	0.010	-	1.2	0.4	-	-	-	-	-	AWS A5.29	E80T5-GM-H4	EN ISO 17634-A	T Mol B C 2 H5
FLUXOFIL 37		0.1	0.8	0.4	0.010	0.010	-	2.4	1.1	-	-	-	-	-	AWS A5.29	E80T5-B2M-H4	EN ISO 17634-A	T CrMo1 B M 2 H5
FLUXOFIL 38C		0.1	0.7	0.3	0.010	0.010	0.3	1.3	0.9	-	0.25	-	-	-	AWS A5.36	E70T5-GM-JH4	EN ISO 17634-A	T CrMo2 B C 2 H5
CITOFILUX M20	Folded MCAW	0.05	1.45	0.9	≤0.010	≤0.010	0.8	-	-	-	-	-	-	AWS A5.18	E70T5-GC-JH4	EN ISO 17632-A	T Z B M 3 H5	
CITOFILUX R00Ni		0.06	1.2	0.4	≤0.015	≤0.015	0.7	-	-	-	-	-	-	-	AWS A5.18	E70C-GM H4	EN ISO 17632-B	T 46 6 Mm1NiM M 1 H5
CITOFILUX R00NiC	Folded FCAW	0.06	1.2	0.4	≤0.015	≤0.015	0.4	-	-	-	-	-	-	AWS A5.29	E81T1-GM-H4	EN ISO 17632-B	T 556T15-1MA-N1-UH5	
CITOFILUX R111		0.04	0.8	0.4	-	-	0.8	-	-	-	-	-	-	-	AWS A5.20	E71T-1C-JH4	EN ISO 17632-B	T 46 4 1Ni P C 1 H5
CITOFILUX R550		0.07	1.3	0.4	≤0.015	≤0.015	1.5	-	-	-	-	-	-	-	AWS A5.29	E91T1-G M H4	EN ISO 18276-A	T 554T1-1M21A-N1-UH5
CITOFILUX R82		0.05	1.3	0.4	≤0.010	≤0.010	0.85	-	-	-	-	-	-	-	AWS A5.29	E81T1-NiM-H4	EN ISO 17632-A	T 46 4 P C 1 H5
CITOFILUX R82 SR		0.05	1.4	0.2	≤0.015	≤0.015	0.95	-	-	-	-	-	-	-	AWS A5.29	E81T1-NiM-H4	EN ISO 17632-A	T 42 2 1Ni R C 3 H5
CITOFILUX R83		0.04	1.4	0.2	≤0.014	≤0.014	1.4	-	-	-	-	-	-	-	AWS A5.29	E81T1-Ni1	EN ISO 17632-A	T 55 5 Mm1.5Ni P M 1 H5
CITOFILUX R83 C		0.05	1.2	0.4	≤0.014	≤0.014	0.85	-	-	-	-	-	-	-	AWS A5.29	E81T1-M21G-Ni1-H4	EN ISO 17732-A	T 50 6 1.5Ni P M 1 H5

FLUX-CORED WIRES FOR STAINLESS STEEL

Product name	Chemical composition (typical values) in %											AWS	EM/ISO	
	C	Mn	Si	P	S	Ni	Cr	Mo	Nb					
FLUXINOX 307	0.04	6.5	0.7	-	-	9	19	-	-	-	-	-	EN ISO 17633-A	T 18.8 Mn RC 3
FLUXINOX 308L	≤0.04	1.7	0.6	-	-	10	20	-	-	AWS A5.22	E308LT0-1	EN ISO 17633-A EN ISO 17633-B	T 19.9 L R C 3 T S308L-FB0	
FLUXINOX 308L PF	≤0.04	1.4	0.6	-	-	10	20	-	-	AWS A5.22	E308LT1-1	EN ISO 17633-A EN ISO 17633-B	T 19.9 L P C 1 T S308L-FB1	
FLUXINOX 316L	≤0.04	1.7	0.6	-	-	12	19	2.8	-	AWS A5.22	E316LT0-1	EN ISO 17633-A EN ISO 17633-B	T 19.12.3 L R C 3 T S316L-FB0	
FLUXINOX 316L PF	≤0.04	1.5	0.6	-	-	12	19	2.8	-	AWS A5.22	E316LT1-1 E316LT1-4	EN ISO 17633-A EN ISO 17633-B	T 19.12.3 L P C 1 / T 19.12.3 L P M 1 T S316L-FB1	
FLUXINOX 309L	≤0.04	1.5	0.6	≤0.03	≤0.03	13	24	-	-	AWS A5.22	E309LT0-1	EN ISO 17633-A EN ISO 17633-B	T 23.12 L R C 3 T S309L-FB0	
FLUXINOX 309L PF	≤0.04	0.7	0.6	-	-	13	24	-	-	AWS A5.22	E309LT1-4	EN ISO 17633-A EN ISO 17633-B	T 23.12 L P C 1 T S309L-FB1	
FLUXINOX 309MoL	≤0.04	1.2	0.7	-	-	13	24	2.5	-	AWS A5.22	E309LMoT0-1	EN ISO 17633-A EN ISO 17633-B	T 23.12.2 L R C 3 T S309LMo-FB0	
FLUXINOX 347	≤0.04	1.8	0.4	-	-	10	20	-	0.4	AWS A5.22	E347T0-1	EN ISO 17633-A EN ISO 17633-B	T 19.9 Nb R C 3 T S347L-FB0	
CLEARINOX F 308L PF	0.03	1.3	0.7	-	-	10	19.5	-	-	AWS A 5.22	E308LT1-1	EN ISO 17633-A EN ISO 17633-B	T 19.9 L P C 1 T S308L-FB1	
CLEARINOX F 309L PF	≤0.04	0.7	0.6	-	-	13	24	-	-	AWS A 5.22	E309LT1-1 E309LT1-4	EN ISO 17633-A EN ISO 17633-B	T 23.12 L P M 1 T S309L-FB1	
CLEARINOX F 316L PF	≤0.04	1.4	0.6	-	-	12	19	2.8	-	AWS A 5.22	E316LT1-1	EN ISO 17633-A EN ISO 17633-B	T 19.12.3 L P C 1 T S316L-FB1	

FLUX-CORED WIRES FOR HARFACING

Product name	Type	Chemical composition (typical values) in %											AWS	EM/ISO
		C	Mn	Si	Ni	Cr	Mo	Nb	W					
FLUXOFIL M 58	Seamless MCAW	0.6	1.9	0.7	-	5.4	0.7	-	-	-	-	-	-	-
FLUXOFIL 50		0.2	1.6	0.5	-	0.7	-	-	-	-	-	-	-	-
FLUXOFIL 51		0.2	1.6	0.6	-	1.4	-	-	-	-	-	-	-	-
FLUXOFIL 52		0.25	1.5	0.4	-	1.8	-	-	-	-	-	-	-	-
FLUXOFIL 54		0.07	1.6	0.3	-	6	0.9	-	-	-	-	-	-	-
FLUXOFIL 56	Seamless FCAW	0.4	1.7	0.6	-	6	0.7	-	-	-	-	-	-	-
FLUXOFIL 58		0.5	1.5	0.6	-	5.5	0.6	-	-	-	-	-	-	-
FLUXOFIL 66		1.4	0.9	0.9	0.8	6.3	0.2	9	0.25	-	-	-	-	-
FLUXOFIL 70		0.08	1.1	0.4	2.2	1	1	-	-	AWS A5.36	E120T5-GM-H4	EN ISO 18276-A	T 69 A Z B M 3 H 5	
CITOFILUX H06	Folded FCAW	0.42	0.55	2.6	-	9.5	-	-	-	-	-	-	-	-

SAW WIRES FOR MILD STEEL

Product name	Chemical composition (typical values) in %						AWS	EM/ISO
	C	Mn	Si	P	S			
OE-S1	0.1	0.5	0.06	≤0.02	≤0.02		AWS A5.17	EN ISO 14171-A S1
OE-S2	0.1	1	0.12	≤0.025	≤0.025		AWS A5.17	EN ISO 14171-A S2
OE-SD2	0.1	1	0.25	≤0.025	≤0.025		AWS A5.17	EN ISO 14171-A S2S1
OE-SD3	0.1	1.7	0.3	≤0.015	≤0.015		AWS A5.17	EN ISO 14171-A S3S1
OE-S4	0.13	1.9	0.1	≤0.02	≤0.02		AWS A5.17	EN ISO 14171-A S4

SAW WIRES FOR LOW ALLOY STEEL

Product name	Chemical composition (typical values) in %														AWS	EN/ISO			
	C	Mn	Si	P	S	Ni	Mo	Cr	Nb	Ti	B	V	N	Cu			W		
OE-S2Mo	0.1	1	0.15	≤0.02	≤0.02	-	0.5	-	-	-	-	-	-	-	-	-	AWS A5.23	EA2	EN ISO 14171-A S2Mo
OE-TiBOR 25	0.08	1.55	0.3	≤0.015	≤0.015	-	-	-	-	0.15	0.015	-	-	-	-	-	AWS A5.23	EG	EN ISO 14171-A SZ
OE-TiBOR 33	0.06	1.1	0.25	≤0.015	≤0.015	-	0.5	-	-	0.13	0.013	-	-	-	-	-	AWS A5.23	EA2TiB	EN ISO 14171-A S2MoTiB
OE-S2NiCu	0.1	1	0.25	≤0.02	≤0.02	0.8	<0.4	-	-	-	-	-	-	0.5	-	-	AWS A5.23	EG	EN ISO 14171-A S2NiCu
OE-S2Ni1	0.1	1	0.15	-	-	0.9	-	-	-	-	-	-	-	-	-	-	AWS A5.23	EN1	EN ISO 14171-A S2Ni1
OE-S2Ni2	0.1	1	0.15	≤0.015	≤0.015	2.2	-	-	-	-	-	-	-	-	-	-	AWS A5.23	EN2	EN ISO 14171-A S2Ni2
OE-S2Ni3	0.08	1	0.2	≤0.015	≤0.015	3.2	-	-	-	-	-	-	-	-	-	-	AWS A5.23	EN3	EN ISO 14171-A S2Ni3
OE-SD3 1Ni 1/4Mo	0.1	1.5	0.20	<0.015	<0.015	0.95	0.25	-	-	-	-	-	-	-	-	-	AWS A5.23	EN5	EN ISO 14171-A S3Ni1Mo0.2
OE-SD3 1Ni 1/2Mo	0.12	1.7	0.2	≤0.015	≤0.015	0.95	0.5	-	-	-	-	-	-	-	-	-	AWS A5.23	EF3	EN ISO 26304-A S3Ni1Mo
OE-SD2 1NiCrMo	0.1	1	0.25	-	-	1	0.5	1.1	-	-	-	-	-	-	-	-	AWS A5.23	EG	EN ISO 26304-A SZ
OE-SD3 2NiCrMo	0.12	1.5	0.2	-	-	2.4	0.5	0.6	-	-	-	-	-	-	-	-	AWS A5.23	EG	EN ISO 26304-A S3Ni2.5CrMo
OE-S2 CrMo1	0.12	0.8	0.1	≤0.01	≤0.01	-	0.5	1.2	-	-	-	-	-	-	-	-	AWS A5.23	EB2R	EN ISO 24598-A S Cr Mo1
OE-S1 CrMo2	0.12	0.5	0.12	≤0.15	≤0.15	-	1	2.5	-	-	-	-	-	-	-	-	AWS A5.23	EB3R	EN ISO 24598-A S Cr Mo2
OE-CROMO S225	0.12	0.6	0.12	≤0.01	≤0.01	-	1	2.5	-	-	-	-	-	-	-	-	AWS A5.23	EB3R	EN ISO 24598-A S Cr Mo2
OE-CROMO S225V	≤0.13	≤1	≤0.2	-	-	1	2.5	0.02	-	-	-	0.25	-	-	-	-	AWS A5.23	EG	EN ISO 24598-A SZ
OE-S1 CrMo5	0.1	0.5	0.3	-	-	0.6	5.5	-	-	-	-	-	-	-	-	-	AWS A5.23	EB6	EN ISO 24598-A S CrMo5
OE-S1 CrMo91	0.1	0.5	0.2	-	-	0.4	0.9	9	0.05	-	-	0.2	0.04	-	-	-	AWS A5.23	EB91	EN ISO 24598-A S CrMo91
OE-S1 CrMo92	0.1	0.5	0.2	-	-	0.5	0.5	9	0.05	-	-	0.2	0.05	-	1.7	-	AWS A5.23	EG	EN ISO 24598-A SZ

SAW WIRES FOR STAINLESS STEEL

Product name	Chemical composition (typical values) in %											AWS			EN/ISO		
	C	Mn	Si	P	S	Ni	Mo	Cr	Nb	N							
OE-308L	0.02	1.8	0.4	≤0.02	≤0.02	10	-	20	-	-				AWS A5.9	ER308L	EN ISO 14343-A	S 199 L
OE-309L	0.02	1.8	0.4	≤0.03	≤0.03	13	-	24	-	-				AWS A5.9	ER309L	EN ISO 14343-A	S 23 12 L
OE-309LMb	0.02	1.5	0.4	≤0.02	≤0.02	14.5	2.6	21.5	-	-				AWS A5.9	EG	EN ISO 14343-A	S 23 12 2 L
OE-316L	0.02	1.7	0.4	≤0.02	≤0.02	12	2.75	18.5	-	-				AWS A5.9	ER316L	EN ISO 14343-A	S 19 12 3 L
OE-318	<0.05	1.3	0.4	-	-	12.5	2.7	19	-	-				AWS A5.9	ER318	EN ISO 14343-A	S 19 12 3 Nb
OE-347	0.04	1.6	0.4	≤0.02	≤0.02	9.7	-	19.5	0.6	-				AWS A5.9	ER347	EN ISO 14343-A	S 19 9 Nb
OE-522 09	0.015	1.6	0.5	≤0.02	≤0.003	8.6	3.1	23	-	0.16				AWS A5.9	ER2209	EN ISO 14343-A	S 22 9 3 N L
OE-525 10	0.02	2	0.4	≤0.02	≤0.02	10	4	26	-	0.25				AWS A5.9	ER2594	EN ISO 14343-A	S 25 9 4 N L
OE-430	≤0.1	≤0.6	≤0.5	-	-	-	-	16.5	-	-				AWS A5.9	ER4-30	EN ISO 14343-A	S 17

FLUX-CORED SAW WIRES FOR MILD AND LOW ALLOY STEEL

Product name	Related to	Chemical composition (typical values) in %													AWS		EN/ISO	
		C	Mn	Si	P	S	Ni	Mo	Cr	Nb	Ti	B						
FLUXOCORD 31	OP 121TT	0.05	1.6	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLUXOCORD 35 25	OP 121TT	0.04	1.4	0.30	≤0.025	≤0.020	-	-	-	-	0.020	0.003	-	-	-	-	-	-
FLUXOCORD 35 25	OP 122	0.04	1.5	0.25	≤0.025	≤0.020	-	-	-	-	0.020	0.003	-	-	-	-	-	-
FLUXOCORD 40	OP 121TT	0.05	1.3	0.2	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-
FLUXOCORD 40C	OP 121TT	0.1	1.3	0.2	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-
FLUXOCORD 41	OP 121TT	0.05	1.5	0.3	-	-	1.5	0.4	-	-	-	-	-	-	-	-	-	-
FLUXOCORD 42	OP 121TTW	0.07	1.4	0.25	-	-	2.5	0.4	0.5	-	-	-	-	-	-	-	-	-
FLUXOCORD 43.1	OP 121TT	0.05	1.40	0.10	-	-	1.90	0.35	-	-	-	-	-	-	-	-	-	-
FLUXOCORD 44-TN	OP 121TTW	0.05	0.8	0.3	-	-	3	0.3	-	-	-	-	-	-	-	-	-	-

EN ISO 3580-A

Classification of covered electrodes for Manual Metal Arc Welding of creep resistant steels

E Mo B 3 2 H5

MOLYCORD KV2HR

Welding positions: H5 = max.5, H10 = max.10

Current type and recovery: 105

Type of covering: RR

Chemical composition: Mo, B, Cr, Ni, Mn, Si, P, S, Cu, N, Nb, Ti, Al, Ca, Mg, Zr, V, W, Co, Ni, Nb, Ti, Al, Ca, Mg, Zr, V, W, Co

Covered electrode

- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

Symbol	Recovery	Current type
1	≤ 105	AC + DC
2		DC
3	>105 ≤ 125	AC + DC
4		DC

A	RA	Rutlo-cellulosic
C	RB	Rutlo-acid
R	RB	Rutlo-basic
RR	B	Basic

Symbol	Cr	Mo	V	Others
Mo	-	0.40-0.70	-	-
MoV	0.30-0.60	0.8-1.20	0.25-0.60	-
CrMo0.5	0.40-0.65	0.40-0.65	-	-
CrMo1	0.9-1.40	0.45-0.70	-	-
CrMo1L	0.9-1.40	0.45-0.70	-	C<0.05
CrMoV1	0.9-1.30	0.90-1.30	0.10-0.35	-
CrMo2	2.0-2.6	0.90-1.30	-	-
CrMo2L	2.0-2.6	0.90-1.30	-	C<0.05
CrMo5	4.0-6.0	0.40-0.70	-	-
CrMo9	8.0-10.0	0.90-1.20	0.15	Ni ≤ 1.0
CrMo9L	8.0-10.5	0.90-1.20	0.15-0.30	Ni 0.40-1.0
				Nb 0.03-0.10
				W 0.02-0.07
CrMoW12	10.0-12.0	0.80-1.20	0.20-0.40	Ni ≤ 0.8
				W 0.40-0.60
Z		Other		

EN ISO 3581-A

Classification of covered electrodes for Manual Metal Arc Welding of stainless and heat-resisting steels

E 19 9 L R 1 2

SUPRANOX RS 308L

Welding positions: 1, 2

Current type and recovery: 105

Type of covering: R

Chemical composition: C, Mn, Cr, Ni, Mo, Other

Covered electrode

- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

Symbol	Recovery	Current type
1	≤ 105	AC + DC
2		DC
3	>105 ≤ 125	AC + DC
4		DC
5	>125 ≤ 160	AC + DC
6		DC

R	RB
R	Rutlo-basic
RB	Rutlo-cellulosic

	C	Mn	Cr	Ni	Mo	Other
Martensitic/ferritic						
13	0.12	1.5	11-14	-	-	-
13.4	0.06	1.5	11-14	3-5	0.4-1	-
17	0.12	1.5	16-18	-	-	-
Austenitic						
19.9	0.08	2.0	18-21	9-11	-	-
19.9 L	0.04	2.0	18-21	9-11	-	-
19.9 Nb	0.08	2.0	18-21	9-11	-	Nb
19.12.2	0.08	2.0	17-20	10-13	2-3	-
19.12.3 L	0.04	2.0	17-20	10-13	2-3	-
19.12.3 Nb	0.08	2.0	17-20	10-13	2-3	Nb
19.13.4 N L	0.04	1-5	17-20	12-15	3-4	0.20N
Austenitic/Ferritic, high corrosion resistance						
22.9.3 N L	0.04	2.5	21-24	7-10	2-4	0.15
25.7.2 N L	0.04	2.0	24-28	6-8	1-3	0.20N
25.9.3 Cu N L	0.04	2.5	24-27	7-10	2-4	0.15
25.9.4 N L	0.04	2.5	24-27	8-10	2-4	0.15
Fully austenitic, high corrosion resistance						
18.15.3 L	0.04	1-4	16-19	14-17	2-3	0.15
18.16.5 N L	0.04	1-4	17-20	15-19	3-5	0.20N
Fully austenitic, high corrosion resistance (cont.)						
20.25.5 Cu N L	0.04	1-4	19-22	24-27	4-7	0.15
20.16.3 Mn N L	0.04	5-8	18-21	15-18	2-3	0.20N
25.22.2 N L	0.04	1-5	24-27	20-23	2-3	0.20N
7.31.4 Cu L	0.04	2-5	26-29	30-33	3-4	0.15
Special						
18.8 Mn	0.20	45-75	17-20	7-10	-	-
18.9 MnMo	0.04-1.4	3-5	18-21	9-11	0.5-1	0.15
20.10.3	0.10	2.5	18-21	9-12	1-3	0.15
23.12 L	0.04	2.5	22-25	11-14	-	-
23.12 Nb	0.10	2.5	22-25	11-14	-	Nb
23.12 L	0.04	2.5	22-25	11-14	2-3	-
29.9	0.15	2.5	27-31	8-12	-	-
Heat resisting						
16.8.2	0.08	2.5	14-16	7-9	1-2	0.15
19.9 H	0.04-0.08	2.0	18-21	9-11	-	-
25.4	0.15	2.5	24-27	4-6	-	-
22.12	0.06-0.20	1-5	20-23	10-13	-	-
25.20	0.06-0.20	1-5	23-27	18-22	-	-
25.20 H	0.35-0.45	2.5	23-27	18-22	-	-
18.36	0.25	2.5	14-18	33-37	-	-

¹⁾ Nb

²⁾ 0.10 - 0.25N

³⁾ 0.10 - 0.20N, 1.5Cu, 1.0W

⁴⁾ 0.20-0.30N, 1.5Cu, 1.0W

⁵⁾ 1.2Cu

⁶⁾ 0.7-1.5Cu

EN ISO 2560-A

Classification of covered electrodes for Manual Metal Arc Welding of non alloyed and fine grain steels

TENAX 88S

E 50 6 Mn1Ni B 1 2 H₅ H_{DM}(ml/100g)

Z = no requirem.
A = +20°C
0 = 0°C
2 = -20°C
3 = -30°C
4 = -40°C
5 = -50°C
6 = -60°C

H₅ = max.5
H₁₀ = max.10
H₁₅ = max.15

Welding positions

Current type and recovery

Type of covering

Chemical composition

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Covered electrode

- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

Symbol	Recovery	Current type
1		AC + DC
2	≤ 105	DC
3		AC + DC
4	>105 ≤ 125	DC
5		AC + DC
6	> 160	DC

A	RC	Rutlo-cellulosic
C	RA	Rutlo-acid
R	RB	Rutlo-basic
RR	B	Basic

Symbol	Yield	Tensile	A ₅
35	≥ 355	440-570	≥ 22%
38	≥ 380	470-600	≥ 20%
42	≥ 420	500-640	≥ 20%
46	≥ 460	530-680	≥ 20%
50	≥ 500	560-720	≥ 18%

Symbol	Mn	Ni	Mo
Mo	2,0	-	-
MnMo	1,4	-	0,3-0,6
1Ni	1,4	0,6-0,12	-
2Ni	1,4	1,8-2,6	-
3Ni	1,4	2,6-3,8	-
Mn1Ni	>1,4-2,0	0,6-0,12	-
1NiMo	1,4	0,6-0,12	0,3-0,6
Z		Other	

EN-ISO 18275-A

Classification of covered electrodes for Manual Metal Arc Welding of high strength steels

TENACITO 80CL

E 55 6 Mn2NiCr B 4 2 H₅ T

Stress relieved 1h / 560-600°C

Z = no requirem.
A = +20°C
0 = 0°C
2 = -20°C
3 = -30°C
4 = -40°C
5 = -50°C
6 = -60°C
7 = -70°C
8 = -80°C

H_{DM} (ml/100g)
H₅ = max.5
H₁₀ = max.10

Welding positions

Current type and recovery

Type of covering

Chemical composition

Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Covered electrode

- All positions
- All positions except vertical down
- Flat and horizontal-vertical butt / fillet weld
- Flat butt and fillet weld
- Vertical down and according to symbol 3

Symbol	Recovery	Current type
1		AC + DC
2	≤ 105	DC
3		AC + DC
4	>105 ≤ 125	DC
5		AC + DC
6	> 160	DC

A	RC	Rutlo-cellulosic
C	RA	Rutlo-acid
R	RB	Rutlo-basic
RR	B	Basic

Symbol	Yield	Tensile	A ₅
55	≥ 550	610-780	≥ 18%
62	≥ 620	690-890	≥ 18%
69	≥ 690	760-960	≥ 17%
79	≥ 790	880-1080	≥ 16%
89	≥ 890	980-1180	≥ 15%

Symbol	Mn	Ni	Cr	Mo
MnMo	1,4-2,0	-	-	0,3-0,6
Mn1Ni	1,4-2,0	0,6-1,2	-	-
1NiMo	<1,4	0,6-1,2	-	0,3-0,6
1,5NiMo	<1,4	1,2-1,8	-	0,3-0,6
2NiMo	<1,4	1,8-2,6	-	0,3-0,6
Mn1NiMo	1,4-2,0	0,6-1,2	-	0,3-0,6
Mn2NiMo	1,4-2,0	1,8-2,6	-	0,3-0,6
Mn2NiCrMo	1,4-2,0	1,8-2,6	-	0,3-0,6
Mn2NiCrMo	1,4-2,0	1,8-2,6	0,3-0,6	0,3-0,6
Mn2Ni1CrMo	1,4-2,0	1,8-2,6	0,6-1,0	0,3-0,6
Z		Other		

EN ISO 14341-A

Classification of solid wires and deposits for MIG/MAG Welding of non alloy and fine grain steels

G 42 3 M 3Si

CARBOFIL 1

Z = no requirement.
 A = +20°C
 0 = 0°C
 2 = -20°C
 3 = -30°C
 4 = -40°C
 5 = -50°C
 6 = -60°C

Chemical composition

Symbol	Si	Mn	Ni	Mo
0				
2Si	0,50-0,80	0,90-1,30	0,15	0,15
3Si1	0,70-1,00	1,30-1,60	0,15	0,15
4Si1	0,80-1,20	1,60-1,90	0,15	0,15
3Si2	1,00-1,30	1,30-1,60	0,15	0,15
			Al	Ti + Zr
2Ti	0,40-0,80	0,90-1,40	0,05-0,20	0,05-0,25
3Ni1	0,50-0,90	1,00-1,60	0,80-1,50	0,15
2Ni2	0,40-0,80	0,80-1,40	2,10-2,70	0,15
2Mo	0,30-0,70	0,90-1,30	0,15	0,40-0,60
4Mo	0,50-0,80	1,70-2,10	0,15	0,40-0,60
				Al
2Al	0,30-0,50	0,90-1,30	0,15	0,35-0,75

Type of shielding gas

M = M2 mixed shielding gas (without helium)
 C = 100 CO2

Minimum impact of avg. 47 Joule at

Symbol	Yield	Tensile	A ₅
35	≥ 355	440-570	≥ 22%
38	≥ 380	470-600	≥ 20%
42	≥ 420	500-640	≥ 20%
46	≥ 460	530-680	≥ 20%
50	≥ 500	560-720	≥ 18%

Min. yield strength (N/mm²)

Solid wire for GMAW-process

EN ISO 636-A

Classification of rods, wires and deposits for Tungsten Inert Gas Welding of non alloy and fine grain steels

W 42 4 3Si1

CARBOROD 1

Chemical composition

Symbol	Si	Mn	Ni	Mo
0				
2Si	0,50-0,80	0,90-1,3		
3Si1	0,70-1,00	1,30-1,60		
4Si1	0,80-1,20	1,60-1,90		
			Al	Ti + Zr
2Ti	0,40-0,80	0,90-1,40	0,05-0,20	0,05-0,25
3Ni1	0,50-0,90	1,00-1,60	0,80-1,50	
2Ni2	0,40-0,80	0,80-1,40	2,10-2,70	
2Mo	0,30-0,70	0,90-1,30		0,40-0,60

Minimum impact of avg. 47 Joule at

Z = no requirement.
 A = +20°C
 0 = 0°C
 2 = -20°C
 3 = -30°C
 4 = -40°C
 5 = -50°C
 6 = -60°C

Min. yield strength (N/mm²)

Symbol	Yield	Tensile	A ₅
35	≥ 355	440-570	≥ 22%
38	≥ 380	470-600	≥ 20%
42	≥ 420	500-640	≥ 20%
46	≥ 460	530-680	≥ 20%
50	≥ 500	560-720	≥ 18%

GTAW-process, wire and weld metal

EN ISO 14343-A

Classification of wire electrodes, wires and rods for arc welding stainless and heat-resisting steels

G 19 12 3 L Si

INERTFIL 316 LSi

G = GMAW
W = GTAW
P = PAW
S = SAW

Chemical composition

Classification
Si = 0,65 - 1,2%

¹⁾ Nb
²⁾ 0,10 - 0,25N
³⁾ 0,10 - 0,20N, 1,5-2,5Cu
⁴⁾ 0,20-0,30N, 1,5Cu, 1,0W
⁵⁾ 1,2Cu
⁶⁾ 0,7-1,5Cu

	C	Mn	Cr	Ni	Mo	Other
Martensitic/ferritic						
13	0,12	1,5	11-14	-	-	-
13 4	0,06	1,5	11-14	3-5	0,4-1	-
17	0,12	1,5	16-18	-	-	-
Austenitic						
19 9	0,08	2,0	18-21	9-11	-	-
19 9 L	0,04	2,0	18-21	9-11	-	-
19 9 Nb	0,08	2,0	18-21	9-11	-	Nb
19 12 2	0,08	2,0	17-20	10-13	2-3	-
19 12 3 L	0,04	2,0	17-20	10-13	2-3	-
19 12 3 Nb	0,08	2,0	17-20	10-13	2-3	Nb
19 13 4 N L	0,04	1-5	17-20	12-15	3-4	0,20N
Austenitic/Ferritic, high corrosion resistance						
22 9 3 N L	0,04	2,5	21-24	7-10	2-4	¹⁾ Si
25 7 2 N L	0,04	2,0	24-28	6-8	1-3	0,20N ¹⁾ Si
25 9 3 Cu N L	0,04	2,5	24-27	7-10	2-4	¹⁾ Si
25 9 4 N L	0,04	2,5	24-27	8-10	2-4	¹⁾ Si
Fully austenitic, high corrosion resistance						
18 15 3 L	0,04	1-4	16-19	14-17	2-3	¹⁾ Si
18 16 5 N L	0,04	1-4	17-20	15-19	3-5	0,20N ¹⁾ Si
Fully austenitic, high corrosion resistance (cont.)						
20 25 5 Cu N L	0,04	1-4	19-22	24-27	4-7	⁴⁾ Si
20 16 3 Mn N L	0,04	5-8	18-21	15-18	2-3	0,20N ¹⁾ Si
25 22 2 N L	0,04	1-5	24-27	20-23	2-3	0,20N ¹⁾ Si
7 31 4 Cu L	0,04	2-5	26-29	30-33	3-4	¹⁾ Si
Special						
18 8 Mn	0,20	45-75	17-20	7-10	-	-
18 9 MnMo	0,04-1,4	3-5	18-21	9-11	0,5-1	¹⁾ Si
20 10 3	0,10	2,5	18-21	9-12	1-3	-
23 12 L	0,04	2,5	22-25	11-14	-	-
23 12 Nb	0,10	2,5	22-25	11-14	-	Nb
23 12 2 L	0,04	2,5	22-25	11-14	2-3	-
29 9	0,15	2,5	27-31	8-12	-	-
Heat resisting						
16 8 Z	0,08	2,5	14-16	7-9	1-2	¹⁾ Si
19 9 H	0,04-0,08	2,0	18-21	9-11	-	-
25 4	0,15	2,5	24-27	4-6	-	-
22 12	0,06-0,20	1-5	20-23	10-13	-	-
25 20	0,06-0,20	1-5	23-27	18-22	-	-
25 20 H	0,35-0,45	2,5	23-27	18-22	-	-
18 36	0,25	2,5	14-18	33-37	-	-

Solid wire for :

EN ISO 17632-A

Classification of tubular electrodes for metal arc welding with or without a gas shield of non alloy and fine grain steels

T 46 6 1Ni PC 1 H5

CITOFILUX R83 C

Z = no requirement.
A = +20°C
O = 0°C
2 = -20°C
3 = -30°C
4 = -40°C
5 = -50°C
6 = -60°C

H_{DM} (ml/100g)
H5 = max.5
H10 = max.10
H15 = max.15

1. All positions
2. All positions except vertical down
3. Flat and horizontal-vertical butt / fillet weld
4. Flat butt and fillet weld
5. Vertical down and according to symbol 3

M = M2 mixed shielding gas (without helium)
C = 100 CO₂

Symbol Characteristics

With shielding gas (C and M2)
R Rutile, slow freezing slag
P Rutile, fast freezing slag
B Basic
M Metal powder
Without shielding gas
V Rutile or basic / fluoride
W Basic/fluoride, slow freezing slag
Y Basic/fluoride, fast freezing slag
S Other types

Symbol	Yield	Tensile	A ₅
35	≥ 355	440-570	≥ 22%
38	≥ 380	470-600	≥ 20%
42	≥ 420	500-640	≥ 20%
46	≥ 460	530-680	≥ 20%
50	≥ 500	560-720	≥ 18%

Symbol	Mn	Ni	Mo
-	2,0	-	-
Mo	1,4	-	0,3-0,6
MnMo	>1,4-2,0	-	0,3-0,6
1Ni	1,4	0,6-0,12	-
2Ni	1,4	1,8-2,6	-
3Ni	1,4	>2,6-3,8	-
Mn1Ni	>1,4-2,0	0,6-0,12	-
1NiMo	1,4	0,6-0,12	0,3-0,6
z	-	Other	-

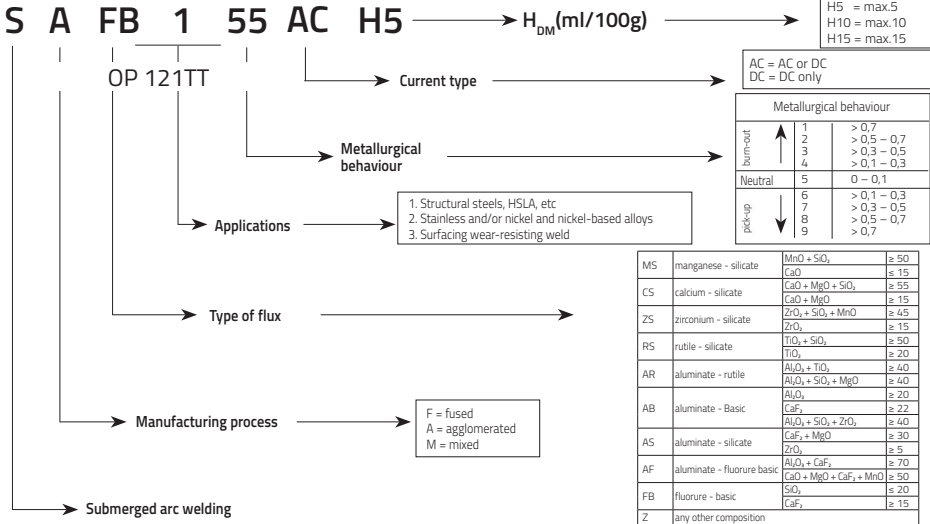
Minimum impact of avg. 47 Joule at

Min. yield strength (N/mm²)

Flux-cored wire

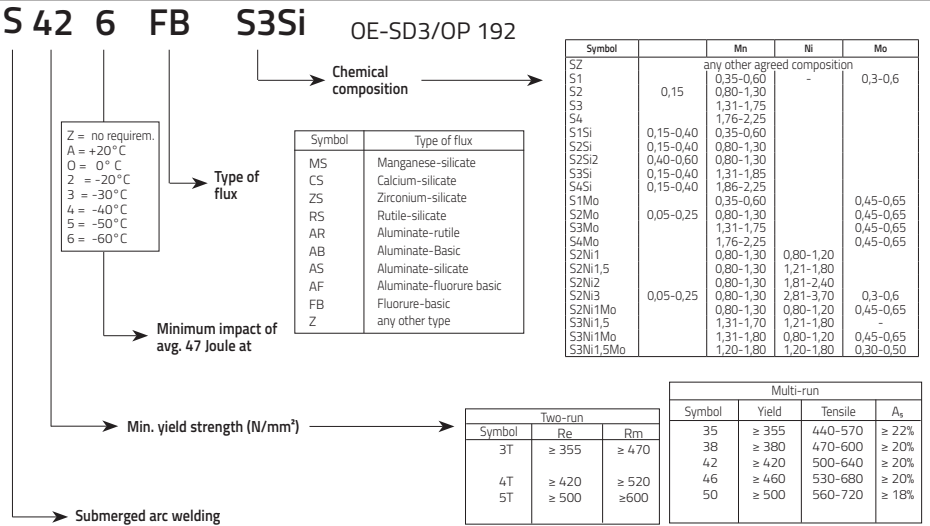
EN ISO 14174

Classification of flux for submerged arc welding



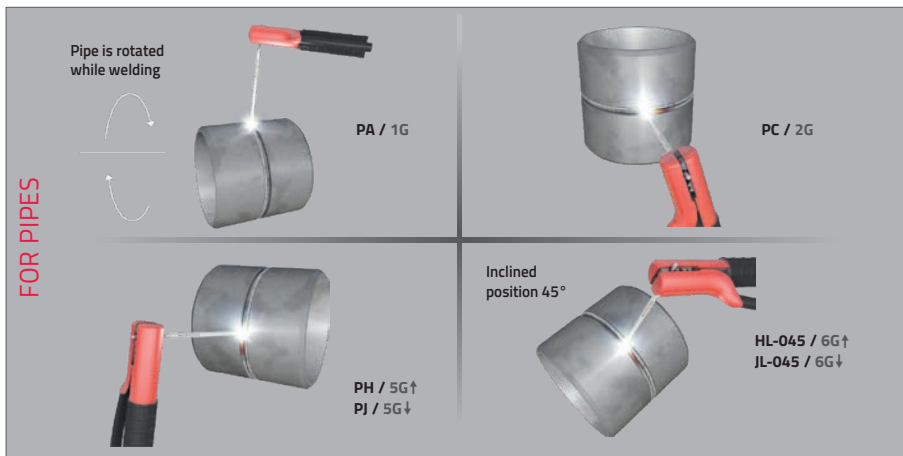
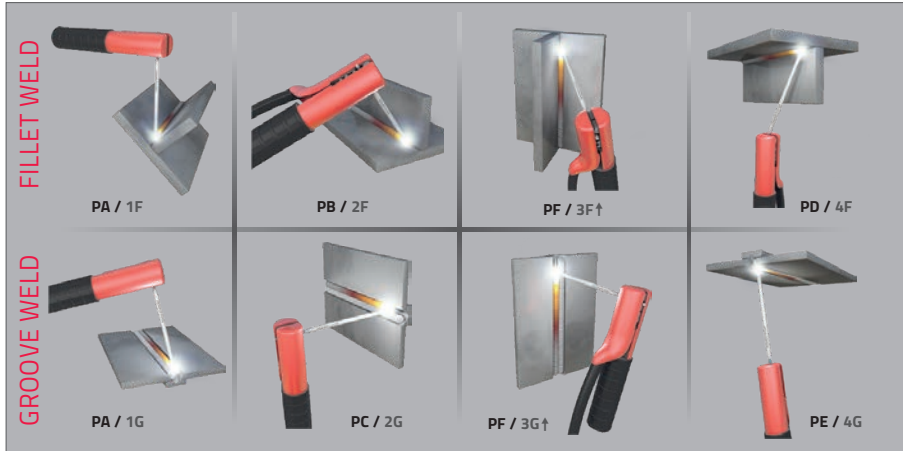
EN ISO 14171-A

Classification of wire and wire/flux combinations for submerged arc welding of non alloy and fine grain steels



Some welding engineers prefer to use the standard AWS/ASME terminology for welding positions – some use a general description – some use a mixture of both!
 It is useful in describing welding procedures if we all understand each other. This chart shows the basic AWS/ASME (and BS EN) welding positions, together with the outline descriptions. The AWS/ASME positions are described in ASME IX and the European terminology is used in BS EN 287-1 and defined in ISO 6947.

ASME (BS EN) POSITIONS



Weld metal volume per meter

Fillet size "a" (mm)	Theoretical content (cm ³)	Formula: (a ² x L) "a"(mm)
3	9	
3.5	12.3	
4	16	
4.5	20.3	
5	25	
5.5	30.3	
6	36	
8	64	
10	100	

Thickness "t" (mm)	Theoretical content (cm ³)			Formula: V50° : d (0.466d + v) L V60° : d (0.577d + v) L V70° : d (0.700d + v) L
	V50°	V60°	V70°	
6	35	39	43	
8	54	61	69	
10	77	88	100	
12	103	119	137	
14	133	155	179	
16	167	196	227	
18	205	241	281	
20	246	291	340	

Thickness "t" (mm)	Theoretical content (cm ³)			Formula: X50° : d (0.233d + v) L X60° : d (0.228d + v) L X70° : d (0.350d + v) L
	V50°	V60°	V70°	
14	88	98	111	
16	108	122	138	
18	129	147	167	
20	153	175	200	
25	220	255	294	
30	300	349	405	
35	390	458	534	
40	493	581	680	

Thickness "t" (mm)	Theoretical content (cm ³)	Formula: ((d-10) ² x 0,27 + 12d - 73)
20	194	
25	288	
30	395	
35	516	
40	650	

DETERMINATION OF WELDING COSTS

weld content deposit per electrode	=	number of electrodes
price per electrode x number	=	costs of electrodes
number of electrodes x arc time	=	total arc time
total arc time x100 percentage duty cycle	=	total work time
total work time x hourly wage	=	wage costs
costs of electrodes + wage costs	=	total costs

Ferrite Number

To facilitate international communication (specifications, certifications), the internationally accepted term Ferrite Number (FN) has been introduced to indicate a delta-ferrite content in stainless steel weld metal.

The Ferrite Number is often used as an indicator of resistance to weld metal hot cracking. This aspect and other engineering properties have been correlated with the FN value of the weld metal. For various service conditions the following typical levels reflect good experiences:

- fully austenitic weld metal:
 - high corrosion resistance in severe oxidising and reducing acidic and chloride containing media: FN < 0.5
 - fully austenitic CrNiMoN weld metal, non-magnetic: FN < 0.5
 - low ferrite CrNiN and CrNiMoN weld metal, cryogenic applications: FN 3-6 or < 0.5
- general purpose stainless steel weld metal with corrosion resistance and high resistance to hot cracking and microfissures: FN 6-15
- buffer layer of austenitic/ferritic weld deposits for dissimilar joints and buffer layers in clad steel: FN 15-35
- austenitic/ferritic weld metal with high stress and pitting corrosion resistance as well as a balanced structure for toughness and corrosion: FN 30-70

Control of welding of constructions often requires the determination of the Ferrite Number (FN)

Ferrite Measurement

An internationally accepted standardised method to determine the ferrite content is based upon an arbitrarily defined relationship between a magnetic force and weld ferrite content. This is necessary because an absolute and correct determination of the ferrite content is not available as a result of inherent inaccuracy of metallographic examination and the nonexistence of a calibration method for the absolute ferrite content in stainless steel. The attracting force between a defined permanent magnet and weld metal, containing delta-ferrite is measured by means of a torsion balance. The values are in fact compared with the values obtained in measurements using the same magnet, attracting a carbon steel base plate with a non magnetic copper coating of a specified thickness. A calibration method provides the necessary linear relation. The principles are accepted as the international standard ISO 8249 and AWS A4.2-91. The European Standardization will adopt the ISO standard.

The range in the revised standards has been extended to 100FN (originally 0-28FN).

Coated thickness standards are available from the "U.S. National Institute of Standards and Technology" (NIST). A precision torsion balance or the commercially available "Magne Gage" (fig.3) are suitable for the determination of the Ferrite Number under laboratory conditions (horizontal position). A permanent magnet of defined dimensions and magnetic strength, according ISO 8249, shall be used.

Secondary standards for the checking and calibration of field equipment in the range 0-100FN are available from NIST.

Calculation of ferrite content

The ferrite content is estimated on the basis of calculation, using the as deposited weld metal chemical composition.

The Cr- and Ni-equivalent is plotted in diagrams, based on the metallographic studies, such as:

- the Schaeffler Diagram¹⁾, published in 1949, is considered as most suitable for a general picture of weld metal structures for a wide range of compositions, but not accurate for ferrite containing austenitic weld metals;
- the DeLong Diagram (1973)²⁾, widely used up to 1985, for a limited range of CrNi (Mo, N)-stainless steel weld metal grades;
- the WRC 1992 Constitution Diagram (1992), published by Kotecki and Siewert (1992)³⁾ has been based upon the WRC 1988 Constitution Diagram, earlier published by Siewert, McCowan and Olson⁴⁾ as a result of a review and of more than 950 weld metal sample analyses and FN determinations (including data from Lincoln Electric). For this diagram, a better accuracy has been reported due to the accurate determination of the effect of Mn, Si, C, N and Nb.
- Also reference is made to the ESPY Diagram⁵⁾ for the calculation of the ferrite content.

¹⁾⁻⁵⁾ See References, p. 29

Application of Ferrite Diagrams

The various ferrite diagrams are suitable to estimate the Ferrite Number in weld metal. Ongoing verifications indicate that the new WRC 1992 Constitution Diagram provides the best estimate. The old Schaeffler diagram still provide useful information in a wide range of weld metal compositions. It provides guidelines for dissimilar joints and welding clad steel, calculation of composition and position of the diluted weld metal.

The following pages contain a reprint of a combination of the Schaeffler and the WRC 1992 Constitution Diagram (fig. 1) and the standard WRC 1992 Constitution Diagram on full scale (fig. 2). In using these diagrams for the estimation of weld metal structure, one should always take into account the effects of different welding conditions (temperature/time-cycles, welding parameters, surface effects) which usually influence FN values, compared with measurements on all weld metal deposit samples.

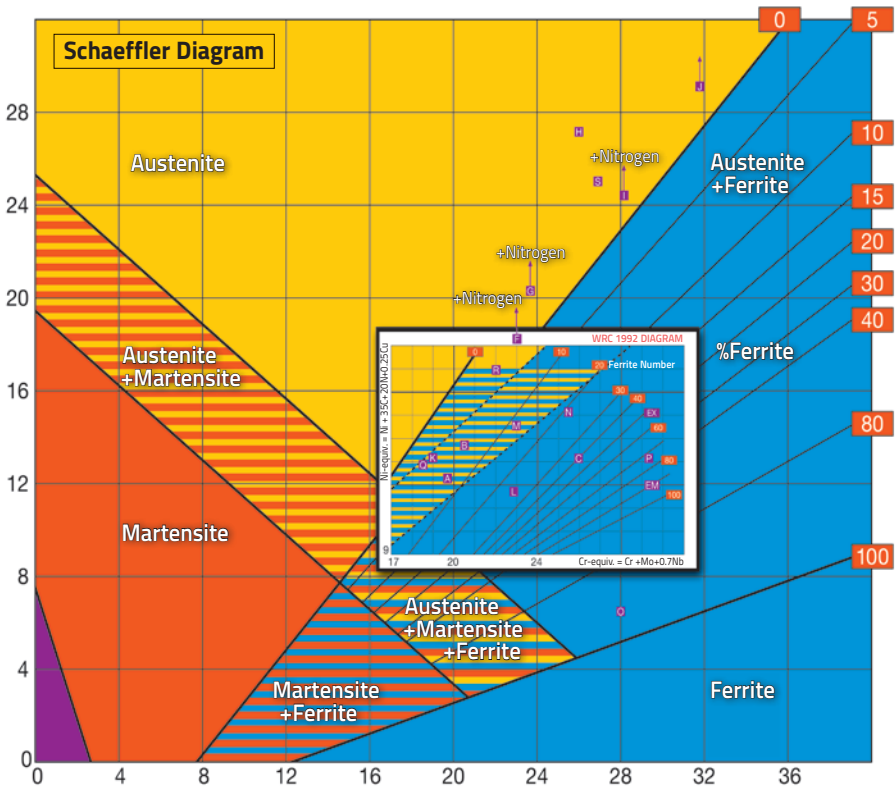


Fig. 1 Combined Schaeffler / WRC 1992 Constitution Diagram

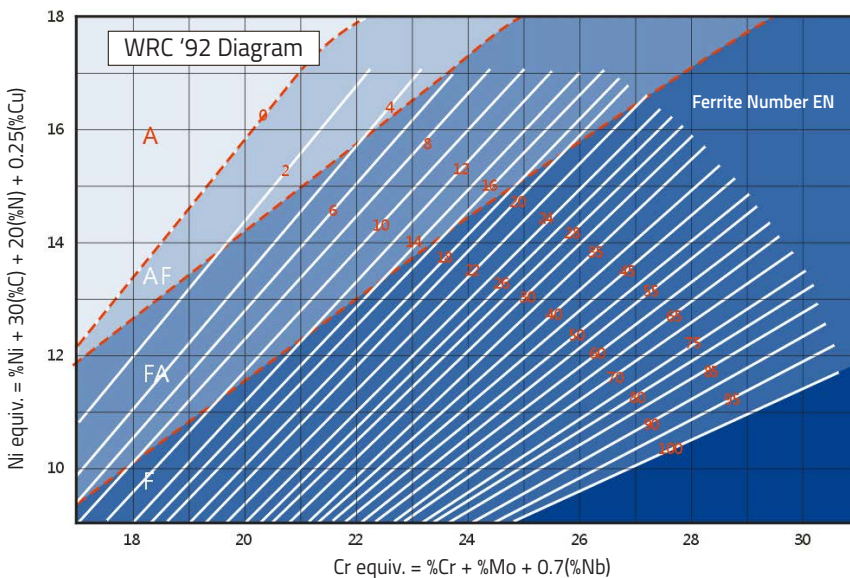


Fig. 2 WRC 1992 Constitution Diagram

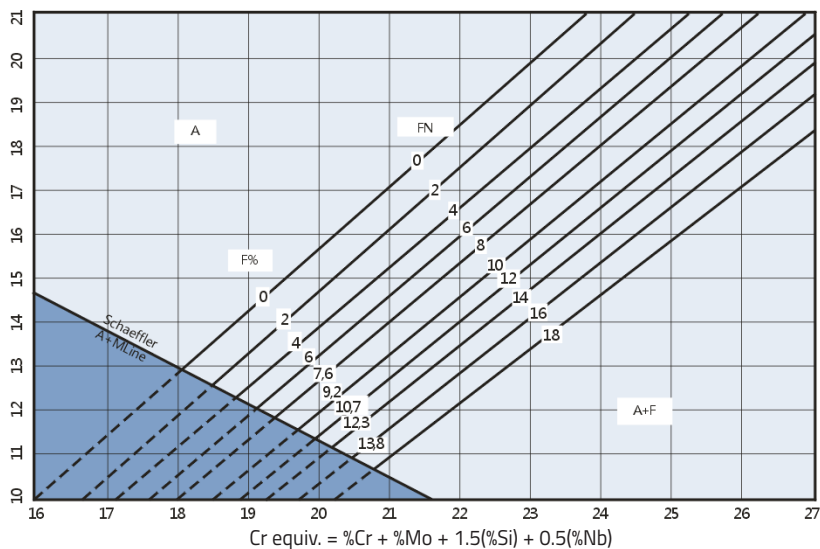


Fig. 3 W.T. DeLong, Welding Journal, July 1973, page. 273-286

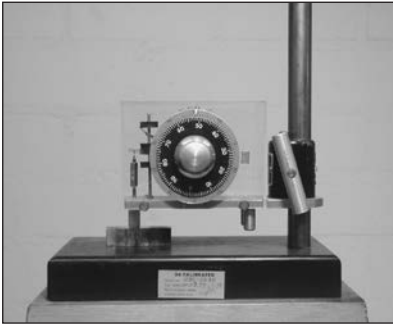


Fig. 4 Magne Gage

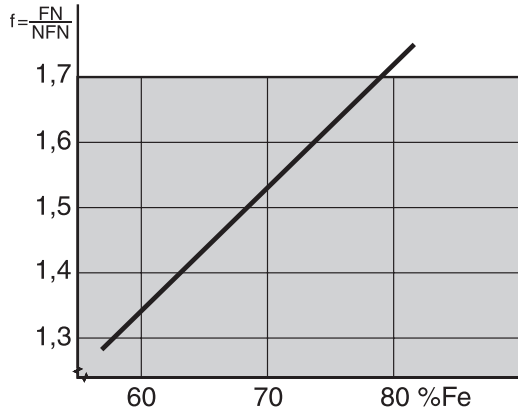


Fig. 5 Iron content versus factor f

Ferrite Number versus Ferrite Content

The Ferrite Number is not equal to the volumetric ferrite content (%). Although an absolute ferrite content can not be measured accurately, a reasonable estimate of the ferrite content can be made by dividing the Ferrite Number by the factor f (% ferrite = FN / f) which is dependant of the iron content in the weld metal as shown in figure 5.

Limitations

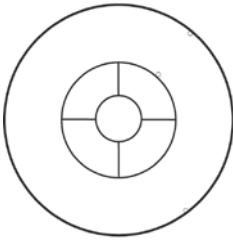
With the practice of measuring the Ferrite Number or ferrite content, welding conditions deviating from the standardised conditions have always to be taken into account. Furthermore, comparison tests showed that the accuracy between measurements in various laboratories may show differences up to +/- 10%.

Lincoln Electric laboratories

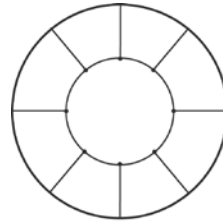
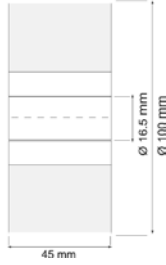
Since 1966 the Lincoln Electric R&D departments have always been involved in the international development of ferrite determinations. The laboratories are equipped with calibrated Magne Gages and on site measurement equipment. Primary coating thickness standards and secondary standards are available for contract calibration work.

References

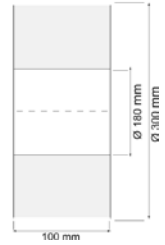
- 1) Schaeffler A.E., Metal Progress 56 (1949) p680-680s
- 2) DeLong W.T., Welding Journal 53 (1974) p273s-286s
- 3) Kotecki D.J., Siewert T.A., Welding Journal (1992) p171s-178s
- 4) Siewert T.A., McCowan C.N., Olson D.L., Welding Journal (1988) p289s-298s
- 5) Espy R.H., Welding Journal 61 (1982) p149s-156s



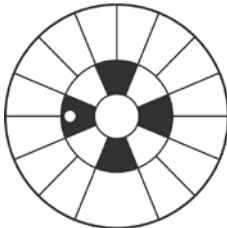
S100 (plastic)



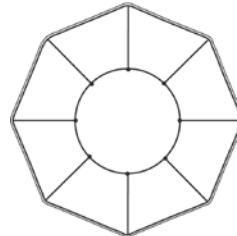
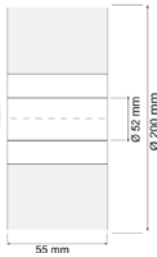
B300 (metal)



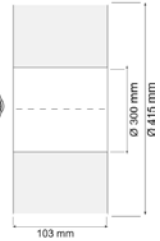
Adaptor : K10158
K10158-1 (plastic)



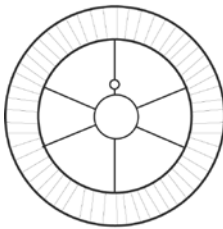
S200 (plastic)



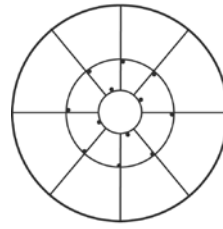
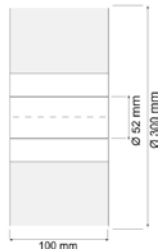
B415 (metal)



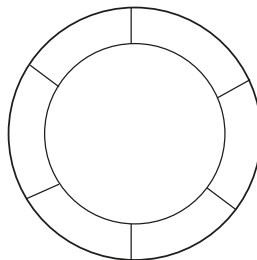
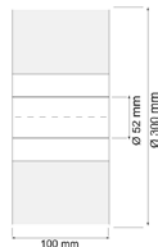
Adaptor : K299 (axis 25mm)
K1504-1 (axis 50mm)



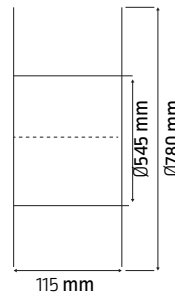
S300 (plastic)



B5300 (metal)



B785 (100 kg SAW spool)



Adaptor : K10410

ACCUTRAK® DRUMS



FEATURES (250/300/500 kg)

- Drum structure done in resistant fiber carton
- Specifically designed retaining for easy pay off
- Approved Integrated Lifting Belts
- No hood needed
- Recyclable

FEATURES (600+ kg)

- Drum structure done in resistant fiber carton with metallic part to fix the cover
- Approved Integrated Lifting Belts
- Internal Cylinder
- Plastic Hood needed





350 & 400 kg
SPEED FEED DRUMS



600 kg
SPEED FEED DRUMS



300/600/1000 kg
ACCUTRAK® DRUMS

DRUMS	350 kg Speed Feed	400 kg Speed Feed	600 kg Speed Feed	300 kg Accutrak	600 kg Accutrak	1000 kg Accutrak
Wire Diameter (mm)	1.6 – 4.8			2.0	1.6 – 2.4	1.6 – 4.8
Wire grade	All including mild steel and low alloy					
Pallet load (kg)	1400	800	600	600	600	1000
Pallet dimension (mm) LxWxH	1160 x 1160 x 1030	1200 x 800 x 1030	720 x 720 x 1051	1200 x 800 x 1030	720 x 720 x 1051	1000 x 1000 x 1000
Drum dimension (mm) Diameter x H	580 x 890		720 x 720 x 1051	580 x 890	720 x 720 x 1051	1000 x 1000 x 1000
Nb of pallets/container	14	N/A	35	N/A	35	20
Nb of drums/pallets	4	2	1	2	1	1
Turntable	AD1329-13		USE21000558	-	-	-
Overseas transportation	yes	N/A	yes	N/A	yes	yes



300/350 kg
METAL REEL



1000/1200 kg
LIFTABLE COIL

COILS	300/350 kg	1000/1200 kg
Wire Diameter (mm)	1.6 – 4.8	1.6 – 4.8
Wire grade	All including mild steel and low alloy	
Dimensions (mm)	760x280	800x800x1125
Pallet load (kg)	900/1050	1000/1200
Pallet dimension (mm) - LxWxH	1200x800x1000	800x800
Nb of pallets/container	10	12
Nb of units/pallets	3	1
Adaptor/turntable	-	21000558
Overseas transportation	yes	yes

1. Scope

Covered arc welding electrodes, manufactured by Lincoln Electric Europe, delivered in their original packaging.

The packaging consists of either:

- A cardboard boxes in outer carton;
- B foil protected cardboard boxes in outer carton;
- C plastic (PE) boxes with sealed cap, suitable for reclosing;
- D hermetically sealed metal tin (LINC CAN™) in outer carton;
- E hermetically vacuum sealed aluminium foil packs Sahara ReadyPack® (SRP) in outer carton.;
- F hermetically vacuum sealed foil packs (Protech®, VPMD- Vacuum Pack Medium, VPMD- Vacuum pack Micro) in outer carton.

Electrode grades	Packaging type					
	A	B	C	D	E	F
Mild steel	X	X	X	X		X
Low alloy high strength steel		X		X		X
Low temperature fine grain steel		X		X	X	X
Creep resistant steel		X				X
Stainless steel		X	X	X	X	X
Duplex and Superduplex stainless steel		X				X
Nickel base electrodes			X			X
Hardfacing-; maintenance and repair electrodes			X			

2. Storage

2a. Storage of electrodes in cardboard boxes requires humidity and temperature controlled storage areas.

General recommended storage conditions include:

- temperature 17-27°C, relative humidity ≤60%
- temperature 27-37°C, relative humidity ≤50%.
- electrode boxes may be stored in layers to a maximum of 7.

2b. Plastic boxes require storage conditions suitable to cardboard boxes

2c. No temperature and humidity requirements are applicable for electrodes in Linc-Can Mini-Pack and Sahara ReadyPacks, providing that (vacuum) seal is present in undamaged packs.

General recommended storage conditions include:

- Sahara ReadyPacks & Mini-Pack in outer cartons may be stored in layers to a maximum of 7;
- Linc Can in outer boxes may be stored in layers to a maximum of 5;
- Prevent damage and heating above 60°C for Linc-Can and Sahara ReadyPacks;
- Prevent damage and heating above 40°C for Mini-Pack.

3. Handling

3a. Re-drying and subsequential holding, as recommended in table 1, is required for products in the following conditions

- rutile electrodes, being humidified for any reason;
- basic low hydrogen electrodes in cardboard boxes;
- basic low hydrogen electrodes, returned from shop floor or damaged Sahara ReadyPacks, Mini-Pack or Linc Can;
- stainless steel and Ni-base electrodes after long and unknown storage conditions (deviating from recommendations);
- Wearshield electrodes in plastic (PE) boxes, stored for more than 1 year under conditions as described under section 2a. or earlier when the condition deviates from those recommended.

3b. Electrodes in Sahara ReadyPack and Linc-Can can be used without re-drying, providing that vacuum or seal is present in the undamaged packaging. The electrodes can be consumed in the as received condition, direct from the packaging within a period of 8 hours after opening under the conditions of ≤35°C and ≤90% RH, with the electrodes remaining in the opened packaging and protected against excessive conditions as condensation, rain, etc. This time can be extended to 12 hours under the conditions of ≤27°C and ≤70% RH. Once opened Linc-Cans should be closed during welding operations using the plastic lid that is supplied with the tin. If vacuum or seal is not present, the electrodes shall follow the re-dry and holding procedure as recommended in table 1 for the EMR-Sahara® Range. Electrodes in Mini-Pack can be used without re-drying, provided that the vacuum is present in the undamaged packaging. The electrodes can be consumed in the as received condition, direct from the packaging within a period of 4 hours after opening under the conditions of ≤35°C and ≤90% RH, with the electrodes remaining in the opened packaging and protected against excessive conditions as condensation, rain, etc.

REDRYING AND HOLDING RECOMMENDATIONS

The re-drying time / temperature listed in Table 1, is a general guideline. Specific individual re-drying instructions on the product label may differ.

Table 1. Covered electrode re-dry times and temperatures

Electrode product groups	Re-drying time (h)*	Temp. (°C)	Holding
Mild steel: - rutile E6013 - rutile E6012, E7024	0.5-1h 1-2h	70-80 100-120	Cabinet 10-20°C above ambient temperature
- basic, low hydrogen (HDM <8 ml/100g) - basic, very low hydrogen*	2-6h 2-6h	250-375 325-375	a. Holding oven max. one year at 120-180°C b. Quiver max. 10h at RT-125°C (see illustration fig. 1) c. Plastic (PE) box max. 2 weeks workshop conditions
Low alloy: - basic, very low hydrogen**	2-6h	325-375	
Hardfacing-; maintenance & repair electrodes			
Stainless steel: - non EMR-SAHARA electrodes - EMR-SAHARA range	1-6h 1-6h	200-300 125-300	Holding oven unlimited time at 75-125°C quiver max. 10h at RT-125°C
Ni-base	1-6h	200-300	

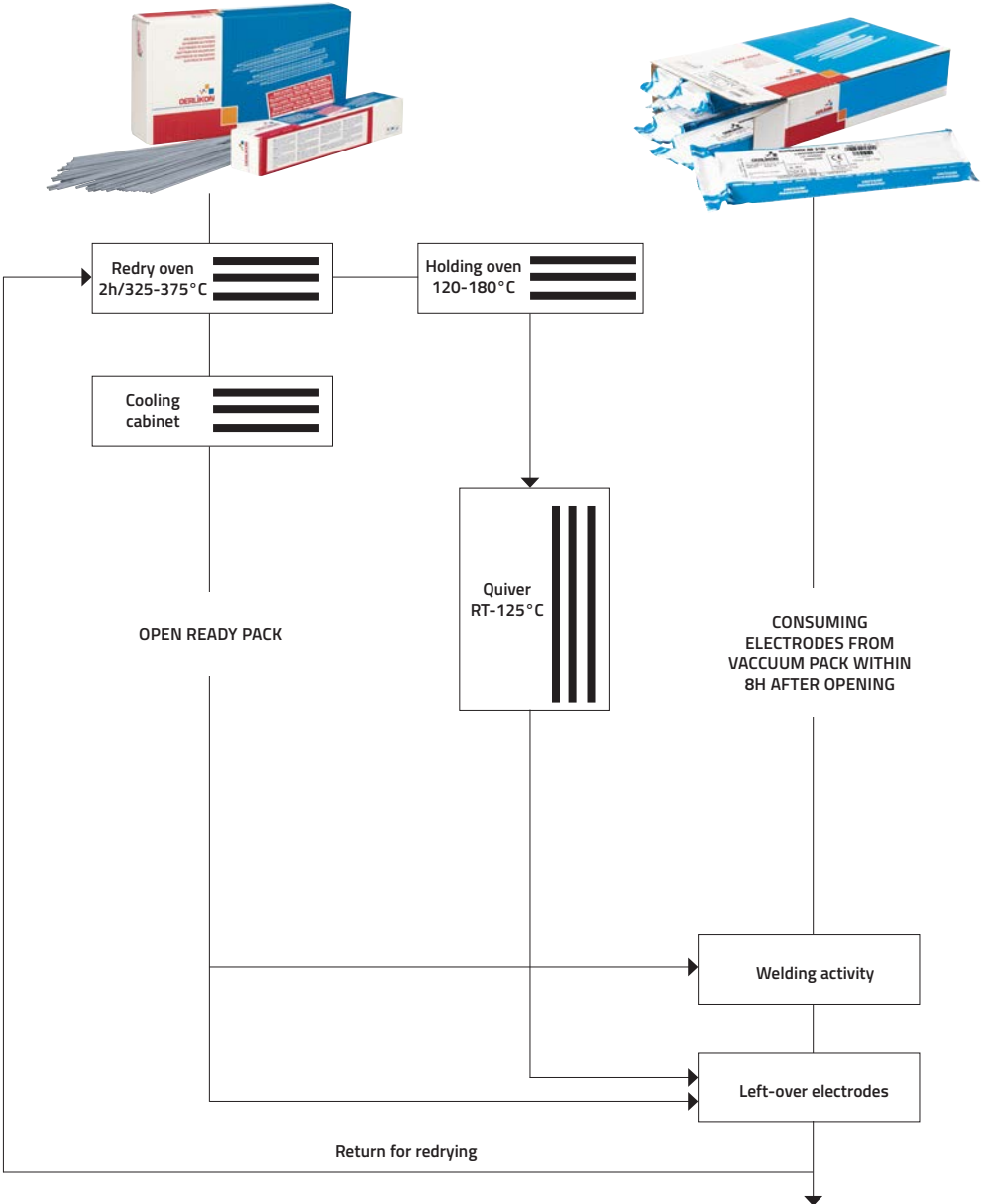
* Re-drying can be repeated twice within the indicated max. time of 6h. Re-drying of electrodes should be carried out by taking them out of the packaging and place the electrodes in approx. 3 cm thick layers in a temperature controlled air-circulation oven.

** If these EMR-SAHARA, vacuum packing electrodes are re--dried a maximum content HDM of ≤5ml/100g is valid.

4. Deteriorated product

Covered electrodes that have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded.

Figure 1:
Recommended handling procedure of stick electrodes



FLUX-CORED WIRES

1. Scope

Tubular cored wires with the following trade names are supplied in various spooling and packaging

Product family	Packaging
Gas shielded mild steel and low alloyed flux and metal cored wires.	<ul style="list-style-type: none"> - spool in plastic bag in cardboard box - spool in Al/PE vacuum packaging in cardboard outer box - spool in plastic protection on pallet - Accutrak® drums - spool in cardboard box or plastic bucket or hermetically sealed cans - spool in plastic bag in cardboard box

2. Storage

Exposure to a humid environment with only a relative thin plastic foil shall be prevented.

Tubular wire, packed in the original foil and cardboard box or drum require controlled warehouse conditions such as:

- temperature 17-27°C, relative humidity: ≤60%;

- temperature 27-37°C, relative humidity: ≤50%.

INNERSHIELD wires in plastic buckets or in hermetically sealed cans and OUTERSHIELD as well as COR-A-ROSTA in Al/PE bags under vacuum, if applicable, do not require measures against moisture pick-up. Damage of the packaging shall be prevented.

3. Handling

3a. OUTERSHIELD, INNERSHIELD xxx-H types and COR-A-ROSTA

Spools outside the protective packaging allow exposure to normal workshop conditions during ≤72 hours.

Drums fitted with the original lid or recommended drum hood allow exposure to normal workshop conditions during 2 weeks

3b. INNERSHIELD, non xxx-H types:

Spools outside the protective packaging allow 2 weeks exposure to normal workshop conditions.

In all cases the products require protection against contamination with moisture, dirt and oil products. During interruption of the production process for more than 8 hours, wire spools shall be stored in their plastic bag in the above-mentioned storage conditions.

4. Deteriorated product

Cored electrode products that are rusty, have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded.

MIG WIRES & TIG RODS

1. Scope

Solid wires and rods can be supplied in various packaging units in tubes, spools and drums.

2. Storage

Exposure to a humid environment shall be prevented.

The following storage conditions are recommended.

Solid wire in the original packaging require controlled warehouse conditions such as:

- temperature 17-27°C, relative humidity ≤60%

- temperature 27-37°C, relative humidity ≤50%

3. Handling

Rods and spools outside the protective packaging allow 2 weeks of exposure to normal workshop conditions.

In all cases, the products require protection against contamination with moisture, dirt and oil products.

During interruption of the production process for more than 8 hours, wire spools shall be stored in their plastic bag in the above mentioned storage conditions. Damage of packaging should be avoided

4. Deteriorated product

Products that are oxidized, have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods, cannot be restored in their original condition and should be discarded.

FLUX

1. Scope

Welding fluxes are supplied in plastic bags, bulk bags, Sahara ReadyBags, Drybags, Bigbag Dry and metal drums

2. Storage

The following storage conditions are recommended:

Welding fluxes, packed in plastic bags, require controlled warehouse conditions such as:

- temperature 17-27 °C, relative humidity: ≤60%
- temperature 27-37 °C, relative humidity: ≤50%

Product in metal drums, Sahara ReadyBags, Drybags and Bigbag Dry does not require special storage conditions but rust and damage of the packaging shall be prevented.

3. Handling

Product characteristics as specified for the original condition, are retained if the product is treated in accordance with the following recommendations:

Packaging	Storage conditions	
	0-6 months, temperature ≤37 °C or rel. humidity <50%	>6 months or temperature >37 °C or relative humidity 50-90%*
Plastic bags	use as is**	redry 1-2h / 300-375 °C
Sahara ReadyBag / Drybag / Bigbag Dry	use as is	use as is
Metal drums	use as is	use as is

* if storage conditions include a relative humidity over 90% the flux may have been deteriorated so that re-drying becomes ineffective.

** if a severe application is considered (HAZ or weld metal hardness HV10 >350, heavy restraint, etc.) re-drying 1-2h / 300-375 °C is recommended.

For MIL800-H, MIL800-HPNi and 842-H fluxes Follow all previous procedures, with the following changes:

- Set temperature between 120°-205°C.
- For ovens in which heating rods are inserted into the flux, do not let the temperature of flux adjacent to the rods exceed 205°C. Re-drying is carried out with the product removed from the original packaging and treated in an oven with an even temperature. It is recommended to have either an oven atmosphere circulation over a maximum flux height of 3 cm or to have the flux moving. The re-drying operation can be repeated to a maximum of 4 times. Re-dried flux and flux handled in the welding operation, shall be kept dry, preferably at a temperature of 50-120 °C above ambient temperature, time unlimited.

4. Deteriorated product

Welding fluxes that have suffered from serious water and moisture contamination, or have been exposed to the atmosphere over long periods of time cannot be restored in their original condition and should be discarded

5. Recycling

Non consumed flux collected from the weld shall be cleaned from slag, metal and/or other contamination. Damage of the flux by heavy impingement in the transport system shall be prevented. Prevent separation of the different grain fraction in cyclones or in "dead" corners. Add new flux in the hopper in a circulation system before a level of 25% of the full hopper is reached.

SHELF LIFE FOR ALL CONSUMABLES

Shelf life indicates how long our goods can be stocked at customer's premises and is not an integration to warranty.

Shelf life for all consumables is 3 years, with two exceptions described below, provided storage and handling conditions are met,

- for consumables with vacuum packing, shelf life can be extended to 5 years
- for Al (alloy) consumables, the shelf life is limited to 1 year.

Individual products might have a longer shelf life, but as standards or formulas might change, we do not extend shelf life.

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STICK ELECTRODES

FLEXAL 60

TOP FEATURES

- Also used for root passes on higher-strength pipe steels, up to X 80.
- Excellent weldability in all position
- Shall be used in DC+ or DC- current.

CLASSIFICATION

AWS A5.1 E6010
EN ISO 2560-A E 38 3 C 21

CURRENT TYPE

DC-, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	DNV	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.1	0.6	0.2

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20 °C	-30 °C
AWS A5.1	AW	≥330	≥430	≥22	not specified	≥27
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified	≥47
Typical values	AW	490	520	28	80	64

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	40-80
3.2 x 350	60-110
4.0 x 350	90-140
5.0 x 350	110-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	MCAN	555	9.0	W000287257
3.2 x 350	MCAN	355	9.5	W000287258
4.0 x 350	MCAN	237	9.5	W000287259
5.0 x 350	MCAN	158	9.5	W000287260

CITORAPID

TOP FEATURES

- Particularly suited for piece-work applications.
- Suitable for welding primer painted and slightly rusted parts
- Due to the low Si-content, welded components are suitable for subsequent galvanising, enamelling and rubber cladding.

CLASSIFICATION

AWS A5.1 E6020
EN ISO 2560-A E 38 2 RA 13

CURRENT TYPE

AC, DC-

WELDING POSITIONS

Flat/Horizontal

APPROVALS

ABS	LR	BV	DNV	TÜV	DB	CE
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.06	0.7	0.2

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
AWS A5.1	AW	≥330	≥430	≥22	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified
Typical values	AW	440	515	27	76

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	90-160
4.0 x 450	130-220
5.0 x 450	180-300

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2x450	CBOX	130	5.5	W000258274
4.0x450	CBOX	85	5.4	W000258275
5.0x450	CBOX	50	5.0	W000258276

CITOFIX

TOP FEATURES

- Suitable for welding on thin sheets.
- Smooth welds, self-releasing slag and good gap-bridging
- Very good weldability on AC and DC+ current.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 A R 11

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All positions

APPROVALS

LR	BV	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.09	0.5	0.4	≤0.03	≤0.03

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified
Typical values	AW	470	560	22	65

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	50-70
2.5 x 300	60-85
3.2 x 350	100-125
3.2 x 450	85-135
4.0 x 350	130-170
4.0 x 450	115-180
5.0 x 350	160-230

CITOFIX

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0x300	CBOX	325	3.6	W000258079
2.5x350	CBOH	130	2.4	W000386142
	CBOX	250	4.6	W000258080
3.2x350	CBOH	78	2.3	W000386143
	CBOX	170	5.0	W000258081
3.2x450	CBOX	145	5.8	W000258082
4.0x350	CBOH	58	2.5	W000386144
	CBOX	105	4.5	W000258083
4.0x450	CBOX	100	6.0	W000258084
5.0x450	CBOX	65	6.0	W000380847

FINCORD M

TOP FEATURES

- Smooth metal transfer, low spatter and self-releasing slag.
- Smooth weld bead appearance
- Operates on low circuit voltage, good welding properties on AC, DC- and DC+.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 R 12

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	BV	DNV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	0.4	0.4	0.02	0.01

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20 °C	0 °C
AWS A5.1	AW	≥330	≥430	≥17	not specified	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified	≥47
Typical values	AW	460	525	24	≥60	55

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-85
2.5 x 350	55-90
3.2 x 350	80-130
4.0 x 450	120-180
5.0 x 450	160-240
6.0 x 450	220-290

FINCORD M

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOX	240	3.5	W000287215
2.5 x 350	CBOH	120	2.0	W000380856
	CBOX	240	4.1	W000287216
3.2 x 350	CBOH	70	2.1	W000380860
	CBOX	140	4.3	W000287217
4.0 x 450	CBOX	85	5.1	W000287219
5.0 x 450	CBOX	50	5.1	W000287220
6.0 x 450	CBOX	35	5.1	W000287221

OVERCORD E

TOP FEATURES

- Stable arc and very spattering loss
- The slag is self-releasing.
- Very good weldability on AC and DC- current.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 R 12

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.08	0.5	0.4	≤0.03	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	not specified	≥47
Typical values	AW	430	550	24	75	55

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
1.6 x 250	35-50
2.0 x 300	50-70
2.5 x 300	60-90
2.5 x 350	60-90
3.2 x 350	110-135
3.2 x 450	110-135
4.0 x 350	160-180
4.0 x 450	160-180
5.0 x 450	180-210

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
1.6 x 250	CBOH	250	1.5	W000380863
2.0 x 300	CBOH	161	1.9	W000380865
2.5 x 300	CBOX	237	3.8	W000380867
2.5 x 350	CBOX	230	4.5	W000287158
3.2 x 350	CBOX	141	4.5	W000287159
3.2 x 450	CBOX	139	5.8	W000287160
4.0 x 350	CBOX	93	4.5	W000287161
4.0 x 450	CBOX	90	5.8	W000287162
5.0 x 450	CBOX	62	6.0	W000287163

SUPERCORD

TOP FEATURES

- Suitable for vertical down welding of thin plates.
- Operates on low open circuit voltage, recommended for tack welding.
- Good slag detachability and excellent bead appearance.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 R 12

WELDING POSITIONS

All positions

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05-0.11	0.4-0.7	0.2-0.4	≤0.03	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	470	540	25	≥47

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	65 - 90
3.2x350	100 - 140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	220	4.4	W000287168
3.2 x 350	CBOX	140	4.5	W000287176

SUPERCORD 45

TOP FEATURES

- Good slag detachability and excellent bead appearance.
- Efficiency 100%.
- Operates on low open circuit voltage, recommended for tack welding or continuous welding.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 R 12

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.08	0.6	0.40	0.025	0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified
Typical values	AW	460	525	24	55

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	50-70
2.5 x 300	60-90
3.2 x 350	80-130
3.2 x 450	90-130

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	CBOH	161	1.9	W000380873
2.5 x 300	CBOX	215	3.8	W000287189
3.2 x 350	CBOX	140	4.3	W000380876
3.2 x 450	CBOX	130	5.7	W000287190

FINCORD DB

TOP FEATURES

- Easy weldability, easy striking and restriking and used extensively for tack-welding.
- Mostly self-releasing slag.
- Smooth weld bead surface.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 RR 12

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.08	0.5	0.35

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	485	565	30	50

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	60-100
3.2 x 350	95-140
4.0 x 450	130-190
5.0 x 450	170-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	225	4.4	W000258265
3.2 x 350	CBOX	140	4.4	W000258266
4.0 x 450	CBOX	90	5.8	W000258267
5.0 x 450	CBOX	55	5.6	W000258268

CITOREX

TOP FEATURES

- The welding current can be decreased to low values while maintaining a stable arc, good for gap-bridging.
- The excellent positional welding characteristics have established CITOREX as a first choice for welder training.
- Due to the low silicon content of the weld deposit, CITOREX is used to weld components for subsequent galvanising or enamelling.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 2 RB 12

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.07	0.6	0.2

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	≥47
Typical values	AW	430	500	28	49

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 250	40-60
2.5 x 300	50-90
3.2 x 350	100-150
4.0 x 350	140-190
4.0 x 450	140-190
5.0 x 450	220-260

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0x250	CBOH	150	1.4	W000287226
2.5x350	CBOX	210	4.1	W000258269
3.2x350	CBOX	130	4.3	W000258270
4.0x350	CBOX	90	4.5	W000258271
4.0x450	CBOX	90	5.7	W000258272
5.0x450	CBOX	55	5.4	W000258273

OVERCORD

TOP FEATURES

- Excellent all positional operating characteristics, especially vertically-down
- Welding in the vertical-down position produces flat, slightly concave weld beads.
- Good gap bridging and easy striking and restriking
- Used on mains transformers

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.08	0.5	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	not specified	≥47
Typical values	AW	457	520	26	85	64

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 250	50-60
2.5 x 350	60-85
3.2 x 350	90-130
4.0 x 350	140-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 250	CBOH	205	1.6	W000287109
2.5 x 350	CBOX	275	4.5	W000287110
3.2 x 350	CBOX	160	4.5	W000287111
4.0 x 350	CBOX	105	4.5	W000287112

OVERCORD R 10

TOP FEATURES

- Good appearance of weld beads.
- Very smooth arc.
- Easy slag removal.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	BV
+	+	+

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					0°C	-20°C
AWS A5.1	AW	≥330	≥430	≥17	not specified	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	≥47	not specified
Typical values	AW	465	540	27	59	31

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-90
3.2 x 350	85-130
4.0 x 350	120-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	240	4.4	W000258239
3.2 x 350	CBOX	170	4.7	W000258240
4.0 x 350	CBOX	115	5.0	W000258242

OVERCORD R 12

TOP FEATURES

- Easy to use even for fillet weld in vertical down position
- Flat or slightly convex beads.
- Easy slag removal

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 11

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.07	0.6	0.4	≤0.03	≤0.03

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥380	470-600	≥20	≥47
Typical values	AW	465	540	25	58

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 350	45-65
2.5 x 350	60-95
3.2 x 350	85-125
4.0 x 350	120-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 350	CBOH	160	1.9	W000384854
2.5 x 350	CBOX	260	4.5	W000258223
3.2 x 350	CBOX	160	4.4	W000258224
4.0 x 350	CBOX	105	4.5	W000258226

OVERCORD R 92

TOP FEATURES

- Excellent weldability, fusion and good bead aspect on vertical-up, vertical-down and overhead positions.
- Used with all types of welding equipment even with low OCV
- Efficiency 100%.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 35 0 RC 11

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

BV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.07	0.55	0.4	≤0.03	≤0.03

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥355	440-570	≥22	≥47
Typical values	AW	470	550	25	51

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
1.6 x 300	35-50
2.5 x 350	70-90
3.2 x 350	90-125
4.0 x 350	135-185

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
1.6 x 300	CBOH	240	1.6	W000384785
2.5 x 350	CBOX	240	4.4	W000258232
3.2 x 350	CBOX	170	4.9	W000258233
4.0 x 350	CBOX	115	4.9	W000258235

OVERCORD Z

TOP FEATURES

- Good gap bridging, easy striking and restriking.
- The slag is generally self-releasing, the weld beads are smooth and slightly concave, blending into the base plate without undercut
- Used for welding galvanised steels, there is a tolerance to impurities in the welding zone.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 38 0 RC 1 1

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.08	0.5	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥355	440-570	≥22	≥47
Typical values	AW	440	505	25	62

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	60-85
3.2 x 350	85-130
4.0 x 350	125-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOH	120	2.1	W000258806
	CBOX	260	4.6	W000258218
3.2 x 350	CBOH	65	1.9	W000258807
	CBOX	160	4.7	W000258219
	CBOX	170	5.0	W000403243
4.0 x 350	CBOX	105	4.7	W000258220

CITOCORD

TOP FEATURES

- Suitable for pipes and plates welding vertically-down without restrictions.
- Ideal for tack welding and short beads with a generally self-releasing slag.
- Applications include equipment with low circuit voltage.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 RC 1 1

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.08	0.6	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					0°C	-20°C
AWS A5.1	AW	≥330	≥430	≥17	not specified	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47	not specified
Typical values	AW	460	530	25	75	52

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-95
3.2 x 350	100-135

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x350	CBOX	240	4.3	W000258250
3.2x350	CBOX	155	4.8	W000258251

FINCORD

TOP FEATURES

- Easy striking and restriking and used for touch-welding
- The arc is stable with very low spatter and the slag is generally self-releasing.
- The weld beads are finely-rippled and clean, blending into the base plate without undercut.
- Suitable for use with mains transformers.

CLASSIFICATION

AWS A5.1 E6013
EN ISO 2560-A E 42 0 RR 12

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.08	0.6	0.45

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥330	≥430	≥17	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	470	530	26	64

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
1.6 x 250	30-60
2.0 x 250	50-70
2.0 x 350	50-75
2.5 x 250	65-90
2.5 x 350	65-90
3.2 x 350	100-140
3.2 x 450	100-140
4.0 x 350	140-210
4.0 x 450	150-195
5.0 x 450	170-240
6.0 x 450	240-320

FINCORD

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
1.6 x 250	CBOH	220	1.3	W000287198
2.0 x 250	CBOH	170	1.5	W000287199
2.0 x 350	CBOH	170	2.2	W000380798
2.5 x 350	CBOX	210	4.2	W000287201
3.2 x 350	CBOX	125	4.3	W000287202
3.2 x 450	CBOX	118	5.7	W000287203
4.0 x 350	CBOX	78	4.3	W000287204
4.0 x 450	CBOX	78	5.6	W000287205
5.0 x 450	CBOX	50	5.2	W000287206
6.0 x 450	CBOX	33	5.0	W000287207

MMA

FERROMATIC 160

TOP FEATURES

- Easy striking and restriking, low spatter loss and self-releasing slag.
- The weld bead is smooth with well blended toes, without undercut into the base plate.
- Can be welded in "touch" technique.

CLASSIFICATION

AWS A5.1 E7024
EN ISO 2560-A E 42 Z RR 7 3

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

LR	DNV	RINA	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.1	0.9	0.45

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	475	560	26	59

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	105-140
4.0 x 450	160-220
5.0 x 450	240-320

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2x450	CBOX	76	5.4	W000287242
4.0x450	CBOX	51	5.5	W000287243
5.0x450	CBOX	39	5.8	W000287244

FERROMATIC 180

TOP FEATURES

- Easy striking and restriking, low spatter loss and self-releasing slag.
- The weld bead is smooth with well blended toes, without undercut into the base plate.
- Can be welded in "touch" technique.

CLASSIFICATION

AWS A5.1 E7024
EN ISO 2560-A E 42 0 RR 7 3

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

LR	DNV	RMRS	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
0.1	0.9	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	490	585	24	54

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	110-150
4.0 x 450	160-220
5.0 x 450	225-310

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 450	CBOX	79	5.6	W000287245
4.0 x 450	CBOX	51	5.4	W000287246
5.0 x 450	CBOX	33	5.2	W000287247

FERROMATIC 200

TOP FEATURES

- Easy striking and restriking, low spatter loss and self-releasing slag.
- The weld bead is smooth with well blended toes, without undercut into the base plate.
- Can be welded in "touch" technique.

CLASSIFICATION

AWS A5.1 E7024
EN ISO 2560-A E 42 0 RR 7 3

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

LR	BV	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si
≤0.1	0.6-1.2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 0°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	510	575	25	58

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
5.0 x 450	210-270

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
5.0 x 450	CBOX	33	5.5	W000287253

SPEZIAL

TOP FEATURES

- ISO-V toughness at -30°C.
- Deposit free from porosity and good of X-ray quality
- Optimum AC weldability requires an OCV > 65V.
- Very good gap bridging and ideally suited for root passes and positional welding. The glassy slag is easily removed from the finely-rippled.

CLASSIFICATION

AWS A5.1 E7016-H8
EN ISO 2560-A E 38 3 B 12 H10

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	BV	DNV	RMRS	TÜV	DB
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	0.9	0.7	≤0.020	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥380	470-600	≥20	≥47
Typical values	AW	450	540	28	82

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 350	55-65
2.5 x 350	55-95
3.2 x 350	80-150
3.2 x 450	95-150
4.0 x 450	120-190
5.0 x 450	190-250

SPEZIAL

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 350	VPMD	160	2.0	W000287407
	CBOX	330	4.2	W000287401
2.5 x 350	VPMD	100	2.0	W000287408
	CBOX	200	3.9	W000287402
3.2 x 350	VPMD	22	0.7	W000385798
	VPMD	55	1.8	W000287409, W000402672
	CBOX	125	4.1	W000287403
3.2 x 450	VPMD	55	2.3	W000287410
	CBOX	125	5.3	W000287404
4.0 x 450	VPMD	40	2.6	W000287411
	CBOX	80	5.2	W000287405
5.0 x 450	CBOX	50	5.0	W000287406

MMA

EXTRA

TOP FEATURES

- Excellent for root pass and positional welding.
- ISO-V toughness at -40°C.
- Deposit free from porosity and good of X-ray quality.
- The double coating confers a stable and concentrated arc with good gap bridging characteristics.

TYPICAL APPLICATIONS

- Metal construction, workshop and maintenance welding

CLASSIFICATION

AWS A5.1 E7016-H8
EN ISO 2560-A E 42 4 B 32 H10

CURRENT TYPE

AC; DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.08	1.3	0.45	≤0.025	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	510	595	28	63

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	60-90
3.2x350	90-140
4.0x450	135-190

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x350	CBOX	200	3.9	W000287365
3.2x350	CBOX	125	4.1	W000287366
4.0x450	CBOX	80	5.1	W000287367

TENAX 56S

TOP FEATURES

- Excellent impact at - 50°C.
- Excellent penetration and stable arc.
- Efficiency 100%.

CLASSIFICATION

AWS A5.1 E7016-1 H4
EN ISO 2560-A E 42 5 B 12 H5

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All positions

APPROVALS

LR	RINA	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	1.2	0.5	≤0.02	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	490	590	28	180
	PWHT 620°C/1h	420	620	22	110

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	60-90
3.2x350	80-130
3.2x450	80-120
4.0x350	125-170
4.0x450	125-170
5.0x450	170-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	110	2.1	W000372210
3.2 x 350	VPMD	65	2.0	W000372209
3.2 x 450	VPMD	65	2.6	W000287512
4.0 x 350	VPMD	45	2.1	W000287513

SUPERCITO

TOP FEATURES

- Very low diffusible hydrogen content, high impact toughness down to - 50°C and CTOD tested.
- Easy slag removal.
- Efficiency 120%.
- DC- and AC welding current.

CLASSIFICATION

AWS A5.1 E7018-1 H4
EN ISO 2560-A E 42 5 B 42 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	DNV	RMRS	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05-0.08	1.0-1.5	≤0.55	≤0.020	≤0.020

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	490	545	26	140

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-90
3.2 x 350	100-140
3.2 x 450	100-140
4.0 x 450	140-190
5.0 x 450	190-250

SUPERCITO

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	90	2.0	W000279901, W000387681
	CBOX	185	4.1	W000279896, W000287295, W000375647
3.2 x 350	VPMD	55	1.9	W000279902
	CBOX	120	4.2	W000287296
3.2 x 450	VPMD	55	2.5	W000387682
	CBOX	120	5.5	W000279898, W000287297, W000375648, W000404200
4.0 x 450	VPMD	40	2.7	W000279904, W000387683
	CBOX	85	5.8	W000279899, W000287298, W000375649, W000404201
5.0 x 450	CBOX	55	5.5	W000287299, W000375650, W000404197

MMA

SUPERCITO A

TOP FEATURES

- Hydrogen < 5ml H₂/100g deposited weld metal.
- Weld metal recovery: ~120%.
- DC and AC welding current.

CLASSIFICATION

AWS A5.1 E7018 H4
EN ISO 2560-A E 42 4 B 42 H5

CURRENT TYPE

DC-,DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05-0.9	0.80-1.20	0.25-0.65	≤0.025	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	490	565	27	135

*AW: As-welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-90
3.2 x 350	120-140
3.2 x 450	120-140
4.0 x 450	160-190

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	180	4.0	W000287280
3.2 x 350	CBOX	112	4.0	W000287281
3.2 x 450	CBOX	117	5.5	W000287282
4.0 x 450	CBOX	81	5.5	W000287283

SUPERCITO 7018S

TOP FEATURES

- Good welding characteristics, suitable for root passes and positional welding, welds are of X-ray quality.
- Very low diffusible hydrogen content, high impact toughness down to - 50°C.
- Efficiency 120%.
- DC- and AC welding current.

CLASSIFICATION

AWS A5.1 E7018-1 H4
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	BV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.2	0.4	≤0.020	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	485	560	28	150

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	100-135
3.2 x 450	85-135
4.0 x 450	110-210
5.0 x 450	170-240

SUPERCITO 7018S

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	90	1.9	W000258282
	CBOX	195	4.2	W000258277
3.2 x 350	VPMD	55	1.9	W000258283
	CBOX	120	4.2	W000258278
3.2 x 450	VPMD	55	2.4	W000258284
	CBOX	120	5.3	W000258279
4.0 x 450	VPMD	40	2.7	W000258285
	CBOX	85	5.7	W000258280
5.0 x 450	VPMD	25	2.6	W000258286
	CBOX	55	5.7	W000258281

MMA

TENACITO R

TOP FEATURES

- The weld metal is of extremely high metallurgical purity, is ageing-resistant, retaining ISO-V toughness to -60°C and CTOD tested.
- Welds are of X-ray quality.
- Due to the double coating of the 2.5 mm and 3.2 mm sizes, the arc is both stable and concentrated, even at lower welding currents when positional welding, with good gap bridging characteristics.

CLASSIFICATION

AWS A5.5 E7018-1 H4
EN ISO 2560-A E 42 6 B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	1.45	0.3	≤0.012	≤0.012

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.1	AW	≥400	≥490	≥22	not specified
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	440	580	25	90
	PWHT 580°C/15h	420	550	25	90

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	65-95
3.2x350	90-140
3.2x450	90-140
4.0x450	140-185
5.0x450	160-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	110	2.1	W000287418
3.2 x 350	VPMD	60	2.1	W000287419,
				W000404202
3.2 x 450	VPMD	60	2.8	W000287420,
				W000403915
4.0 x 450	VPMD	35	2.3	W000403916
		35	2.4	W000258297
5.0 x 450	VPMD	20	2.2	W000258298,
				W000403917

TENAX 35S

TOP FEATURES

- Excellent X-ray soundness
- Efficiency 120%.
- Excellent mechanical properties.

CLASSIFICATION

AWS A5.1 E7018-1 H4
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	RINA	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.075	1.35	0.35	≤0.02	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	465	540	29	150
	PWHT 620°C/1h	450	530	30	120

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0x300	25-50
2.5x300	60-95
2.5x350	60-95
3.2x350	90-130
3.2x450	85-135
4.0x450	110-195
5.0x450	175-220
6.0x450	210-280

TENAX 35S

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	CBOX	275	3.6	W000380285
2.5 x 300	VPMD	90	1.8	W000380314
	CBOX	180	3.7	W000380286
2.5 x 350	VPMD	90	2.2	W000287341
	CBOX	180	4.3	W000380289
3.2 x 350	VPMD	55	2.1	W000287342
3.2 x 450	VPMD	55	2.8	W000287343
	CBOX	115	5.8	W000380291
4.0 x 450	VPMD	40	2.9	W000287344, W000403910
	CBOX	80	5.8	W000380293
5.0 x 450	VPMD	25	2.7	W000287345
	CBOX	55	5.9	W000380295
6.0 x 450	CBOX	40	6.0	W000380312

MMA

TENAX 58S

TOP FEATURES

- Good Mechanical Properties
- Deposit free from porosity, excellent slag detachability in position.
- Hydrogen < 5ml H₂/100g deposited weld metal.

CLASSIFICATION

AWS A5.1 E7018-1 H4
EN ISO 2560-A E 42 5 B 42 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DNV	RINA	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06-0.1	0.8-1.5	≤0.5	≤0.02	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	450	550	24	80
	PWHT 620°C/1h	420	500	23	70

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	65-90
2.5x350	65-90
3.2x450	100-140
4.0x450	140-190
5.0x450	190-250

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOX	185	3.5	OD10522012
2.5 x 350	CBOX	185	4.1	OD10522212
3.2 x 450	CBOX	120	5.5	OD10522015
4.0 x 450	CBOX	85	5.8	OD10522016
5.0 x 450	CBOX	55	5.5	OD10522018

TENAX 35S R

TOP FEATURES

- Self releasing slag
- Efficiency 120%.
- Good X-ray soundness

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	DNV	RINA	TÜV
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.075	1.35	0.35	≤0.02	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	460	560	29	120
	PWHT 620°C/1h	420	520	24	100

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	60-95
2.5x300	60-95
2.5x350	60-95
3.2x450	90-130
4.0x450	110-170
5.0x450	175-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	90	1.8	W000380325
2.5x350	CBOX	180	4.3	W000380320
3.2x450	VPMD	55	2.7	W000380327
	CBOX	115	5.7	W000380322
4.0x450	VPMD	40	2.8	W000380328
	CBOX	80	5.7	W000380323
5.0x450	CBOX	55	5.9	W000380324

TENAX 77

TOP FEATURES

- Very low diffusible hydrogen content (< 4 ml/100g)
- High impact toughness down to - 50°C.
- Low moisture reabsorption.

CLASSIFICATION

AWS A5.1 E7018-1 H4R
EN ISO 2560-A E 42 5 B 32 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	BV	DNV	RINA
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	V
0.06	1.3	0.35	≤0.03	≤0.03	≤0.08	≤0.08	≤0.06	≤0.06

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -47/-50°C
AWS A5.1	AW	≥400	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	460	530	30	70
	PWHT 620°C/1h	420	510	26	52

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	70-100
3.2x450	90-145
4.0x450	110-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.8	W000380330
3.2 x 450	VPMD	55	2.6	W000380331
4.0 x 450	VPMD	40	2.7	W000380332

TENAX 56ST

TOP FEATURES

- Excellent impact at - 50°C.
- Excellent penetration and stable arc.
- Efficiency 100%.

CLASSIFICATION

AWS A5.5 E8018-G H4
EN ISO 2560-A E 46 4 B 32 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	1.7	0.5	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
AWS A5.5	AW	470-550	≥550	≥24	not specified
EN ISO 2560-A	AW	≥460	530-680	≥20	≥47
Typical values	AW	500	600	26	70
	PWHT 580°C/15h	420	530	25	47

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	70-100
3.2x450	90-130
4.0x450	110-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	80	1.6	OETNX56ST25300VPMD
3.2 x 450	VPMD	54	2.7	OETNX56ST32450VPMD
4.0 x 450	VPMD	38	2.7	OETNX56ST40450VPMD

BOR SP6

TOP FEATURES

- Continuous welding of the rail joint is possible without intermediate slag removal. For these special applications, BOR SP6 is only available in 550 mm length.
- Designed welding of rails using a copper backing. Material to be welded S(P)460: X60-X65.
- Basic double coated electrodes. 550 mm length

CLASSIFICATION

EN ISO 2560-A E 46 6 B 34 H10

CURRENT TYPE

AC, DC+

WELDING POSITIONS

Flat/Horizontal

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.7	0.5	0.011	0.01

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20° C	-60° C
EN ISO 2560-A	AW	≥460	530-680	≥20	not specified	≥47
Typical values	AW	495	565	26	≥160	99

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
4.0 x 550	160-210
5.0 x 550	180-220
6.0 x 550	210-260

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
4.0x550	VPMD	40	3.4	W000287393
5.0x550	VPMD	25	3.3	W000287394
6.0x550	VPMD	18	3.3	W000287395

CITOCUT

TOP FEATURES

- Applications include the removal of defects in castings, risers and gates, gouging out defective welds, back-gouging root runs and removing rivets.
- Shall be used in DC- or AC current.

CURRENT TYPE

AC, DC-

WELDING POSITIONS

Flat/Horizontal/Cornice

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	130-150
4.0 x 350	200-230

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2x350	CBOX	95	3.4	W000287396
4.0x350	CBOX	60	3.4	W000287397

MMA

SUPERCUT

TOP FEATURES

- Typical applications are the removal of defects from castings and the repair of defective welds.
- Shall be used in DC- or AC current.

CLASSIFICATION

AWS Not applicable

CURRENT TYPE

AC, DC-

WELDING POSITIONS

Flat/Horizontal

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	130-170
4.0 x 450	200-260

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 450	CBOX	70	3.9	W000258293
4.0 x 450	CBOX	55	4.1	W000258294

MMA

FLEXAL 70

TOP FEATURES

- Excellent weldability in all position
- Used for root and hot passes as well as filling and capping up to X60 grades
- Shall be welded in DC+/- mode.
- When root pass welding, negative polarity is recommended

TYPICAL APPLICATIONS

- Pipeline

CLASSIFICATION

AWS A5.1 E7010-P1
EN ISO 2560-A E 42 3 Mo C 21

CURRENT TYPE

DC-, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	DNV	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Mo
0.1	0.7	0.2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition		Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
AWS A5.5	AW	≥415	≥490	≥22	≥27
EN ISO 2560-A	AW	≥420	500-640	≥20	≥47
Typical values	AW	475	520	23	66

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	40-80
3.2x350	60-110
4.0x350	90-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	MCAN	555	9.0	W000287261
3.2 x 350	MCAN	355	9.5	W000287262
4.0 x 350	MCAN	237	9.5	W000287263

FLEXAL 80

TOP FEATURES

- Excellent weldability in all position
- Used for root and hot passes as well as filling and capping up to X70 grades
- Clearly visible weld puddle for improved control and weldability
- Shall be used in DC+ or DC- current.

TYPICAL APPLICATIONS

- Pipeline

CLASSIFICATION

AWS E8010-G
EN ISO 2560-A E 46 3 1NiMo C 21

CURRENT TYPE

DC-/+

WELDING POSITIONS

All positions

APPROVALS

ABS	LR	DNV	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Ni	Mo
0.1	0.8	0.2	0.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20°C	-20°C	-30°C
AWS A5.5 AW or PWHT	≥460	≥550	≥19	not specified	not specified	not specified
EN ISO 2560-A AW	≥460	530-680	≥20	not specified	not specified	≥47
Typical values AW	530	610	23	≥60	77	68

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2x350	60-110
4.0x350	90-140
5.0x350	110-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	MCAN	355	9.5	W000287266
4.0 x 350	MCAN	238	9.5	W000287267
5.0 x 350	MCAN	156	9.5	W000287268

TENAX 118D2

TOP FEATURES

- Used for applications with a higher yield strength up to 600 Mpa and down to -40°C.
- Easy striking.
- 120% Efficiency.

CLASSIFICATION

AWS A5.5 E 10018-D2 H4
EN ISO 18275-A E 62 4 Mn1NiMo B T 32 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.08	1.8	0.3	0.025	0.02	0.8	0.35

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
AWS A5.5	AW	≥600	≥690	≥16	≥27
EN ISO 18275-A	AW	≥620	760-960	≥18	not specified
Typical values	AW	700	780	24	100
	PWHT 620°C/1h	620	760	24	80

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	65-90
3.2x350	95-130
4.0x450	130-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	TBD	0.0	W100258333
3.2 x 350	VPMD	55	1.9	W000258334
4.0 x 450	VPMD	35	2.4	W000258335

TENACITO 80

TOP FEATURES

- Low-alloyed basic coated MMA electrode with a very low hydrogen content.
- The TENACITO 80 is used for HYSS, applications with a higher yield strength up to 700 Mpa and down to -60°C.
- The double coating in dia 2,5 and 3,2mm confers a stable and concentrated arc, even at low currents, making it very convenient for root passes and positional welding.
- Good gap bridging characteristics.
- Good X-ray soundness

CLASSIFICATION

AWS A5.5 E 11018-G H4
EN ISO 18275-A E 69 6 Mn2NiCrMo B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DNV	TÜV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.06	1.65	0.35	0.010	0.010	0.4	2.3	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-40°C	-60°C
AWS A5.5	AW	680-760	760	15	not specified	not specified
EN ISO 18275-A	AW	≥690	760-960	≥17	not specified	≥47
Typical values	AW	740	820	18	75	55

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	65-95
3.2x350	90-135
4.0x450	140-185
5.0x450	180-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	VPMD	55	2.0	W100287476
4.0 x 450	VPMD	40	2.8	W100258329
5.0 x 450	VPMD	20	2.1	W000258330

TENACITO 80CL

TOP FEATURES

- The weld metal is of a extremely high metallurgical purity, retaining good CVN toughness up to -60°C. For optimal conditions a good balanced t8/5: (heat input, interpass temperature, plate thickness) is recommended.
- The TENACITO 80CL is used for HYSS, applications with a higher yield strength up to 700 Mpa and down to -60°C.
- The welds are of X-ray quality.

CLASSIFICATION

AWS A5.5 E 11018-G H4
EN ISO 18275-A E 69 6 Z B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	DNV	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	1.75	0.4	0.01	0.005	0.15	2.5	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.5	AW	≥670	≥760	≥15	not specified
EN ISO 18275-A	AW	≥690	760-960	≥17	≥47
Typical values	AW	760	840	18	80
	PWHT 580°C/2h	750	830	17	47

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	65-95
3.2x350	80-130
4.0x450	110-180
5.0x450	160-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	110	2.2	W100287467
3.2 x 350	VPMD	TBD	2.1	W100287468
4.0 x 450	VPMD	TBD	2.7	W100258325
5.0 x 450	VPMD	TBD	2.1	W100258326

TENACITO 100

TOP FEATURES

- Good gap bridging characteristics.
- The double coating in dia 2,5 and 3,2mm confers a stable and concentrated arc, even at low currents, making it very convenient for root passes and positional welding.
- Good X-ray soundness

CLASSIFICATION

AWS A5.5 E 12018-G H4
EN ISO 18275-A E 89 4 Mn2Ni1CrMo B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.07	1.7	0.4	≤0.012	≤0.012	0.8	2.45	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C	
AWS A5.5	AW	≥740	≥830	≥18	not specified
ISO 18275-A	AW	≥890	980-1080	≥17	≥47
Typical values	AW	980	1000	17	55

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	90-135
4.0 x 450	140-185

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	TBD	0.0	W100287479
	VPMD	105	2.1	W000287479
3.2 x 350	VPMD	TBD	0.0	W100287480
	VPMD	60	2.0	W000287480
4.0 x 450	VPMD	TBD	0.0	W100258331
	VPMD	35	2.3	W000258331

TENAX 128M

TOP FEATURES

- Used for main and especially military applications with a higher yield strength up to 850 Mpa and down to -50°C.
- Easy striking.
- 110-120% Efficiency.

CLASSIFICATION

AWS A5.5 E 12018-M H4
EN ISO 18275-A E 79 5 Mn2NiCrMo B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	1.6	0.35	≤0.015	≤0.015	0.45	1.9	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -51°C
AWS A5.5	AW	≥740	≥830	≥18	not specified
EN ISO 18275-A	AW	≥790	880-1080	≥18	≥47
Typical values	AW	830	950	19	60

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2x350	90-140
4.0x350	110-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	VPMD	55	1.9	W000287551
4.0 x 350	VPMD	40	2.1	W000287552

TENACITO 65R

TOP FEATURES

- Very convenient for root passes and positional welding.
- Good gap bridging characteristics.
- Good X-ray soundness

CLASSIFICATION

AWS A5.5 E9018-G H4
EN ISO 18275-A E 55 6 Mn1NiMo B T 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	TÜV	DB
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.05	1.6	0.3	≤0.012	≤0.012	0.9	0.35

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.5	AW	≥530	≥620	≥17	not specified
EN ISO 2560-A	AW	≥550	610-780	≥18	≥47
Typical values	AW	615	690	24	90

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	90-140
4.0 x 450	140-185
5.0 x 450	180-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	109	2.2	W000287435
3.2 x 350	VPMD	60	2.1	W000287436
	CBOX	125	4.3	W000384014
4.0 x 450	VPMD	34	2.3	W000258305
	CBOX	77	5.3	W000384016
5.0 x 450	VPMD	20	2.2	W000258306

TENAX 70

TOP FEATURES

- 100% efficiency.
- Excellent operability.

CLASSIFICATION

AWS A5.5 E8018-G H4
EN ISO 2560-A E 50 6 Mn1Ni B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.2	0.5	≤0.020	≤0.015	1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.5	AW	≥460	≥550	≥19	not specified
EN ISO 2560-A	AW	≥500	560-720	≥18	≥47
Typical values	AW	520	650	22	60
	PWHT 620°C/1h	460	570	22	65

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-90
3.2 x 350	130-150
4.0 x 450	160-190

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	87	2.0	W000403802
3.2 x 350	VPMD	54	2.0	W000403803
4.0 x 450	VPMD	37	2.5	W000403804
	CBOX	81	5.5	W000258309

TENAX 88S

TOP FEATURES

- Yield strength < 450MPa. BS 4360-55 e/f and e 450 EMZ. With a high impact energy (down to -60°C) and fracture (CTOD) toughness in the as welded and stress relieved conditions.
- Excellent operability in all welding positions.
- 100% efficiency.

CLASSIFICATION

AWS A5.5 E8016-G H4
EN ISO 2560-A E 50 6 Mn1Ni B 12 H5

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	LR	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.7	0.4	≤0.02	≤0.02	0.8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.5 AW	≥460	≥550	≥19	not specified
EN ISO 2560-A AW	≥500	560-720	≥18	≥47
Typical values AW	550	640	26	90
PWHT 620°C/1h	460	560	26	100

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	55-85
3.2x350	80-140
4.0x450	110-180
5.0x450	180-230

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	100	2.0	W000287539
3.2 x 350	VPMD	65	2.0	W000287540
4.0 x 450	VPMD	45	2.7	W000287542
5.0 x 450	VPMD	30	2.8	W000287543

TENAX 98M

TOP FEATURES

- Especially used for main and especially military applications with a higher yield strength up to 550 Mpa and down to -60°C.
- Good striking.
- 110-120% Efficiency.

CLASSIFICATION

AWS A5.5 E9018M H4
EN ISO 18275-A E 55 5 Z B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.07	1.2	0.4	≤0.02	≤0.02	1.6	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -50°C
AWS A5.5	AW	540-620	≥620	≥24	≥27
EN ISO 18275_A	AW	≥550	610-780	≥18	≥47
Typical values	AW	570	650	27	50

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2x350	90-140
4.0x350	110-180
5.0x450	170-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	88	1.7	W100287520
3.2 x 350	VPMD	53	2.0	W100287521
4.0 x 350	VPMD	38	2.0	W100287522

TENAX 140

TOP FEATURES

- The TENAX 140 is used for HYSS, applications with fine grain steels with a yield strength >900Mpa and down to -40°C. Example S960QL.
- The weld metal is of extremely high metallurgic purity
- Good ISO-V toughness up to -40°C

CLASSIFICATION

EN ISO 18275-A E 89 4 Z (Mn3Ni1Cr1Mo) B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	1.3	0.3	≤0.012	≤0.012	0.7	3.7	1.1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
ISO 18275-A	AW	≥890	980-1080	≥17	≥47
Typical values	AW	960	1050	18	52

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2x350	90-135

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	VPMD	60	2.0	W000287484

MOLYCORD KV2HR

TOP FEATURES

- Approved up to +530°C. Very low diffusible hydrogen (HD<4ml/100g).
- Excellent bead shape, low spatter and excellent operability in all position welding except vertical down
- Preheat min 90°C, interpass max 120°C

CLASSIFICATION

AWS A5.5 E7018-A1 H4R
EN ISO 3580-A E (Mo) B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Mo
0.08	0.8	0.45	≤0.015	≤0.015	0.53

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	-20°C
AWS A5.5	PWHT	≥390	≥490	≥22	not specified	not specified
EN ISO 3580-A	PWHT	≥390	≥490	≥22	not specified	not specified
Typical values	620°C x 1h	550	610	25	140	50

* PWHT: Postweld Heat Treatment 605-645°C / min 1h

Preheat and interpass temperature: 160-190°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165
5.0 x 450	170-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	80	1.6	W100287612
3.2 x 350	VPMD	55	2.1	W100287613
4.0 x 350	VPMD	40	2.1	W100287614
5.0 x 450	VPMD	20	2.2	W100287615

MOLYCORD KV2L

TOP FEATURES

- The low carbon reduces the risk of cracking and promotes a lower tensile strength and hardness in the all weld metal deposit.
- Low diffusible hydrogen (HD<5ml/100g).
- Suitable for use with DC positive.

CLASSIFICATION

AWS A5.5 E7015-A1 H4
EN ISO 3580-A E Mo B 22 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Mo
0.05	0.70	0.35	≤0.015	≤0.015	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20°C	-20°C	
AWS A5.5	PWHT	≥390	≥520	≥19	not specified	not specified
EN ISO 3580-A	PWHT	≥355	≥510	≥20	≥47	not specified
Typical values	620°C x 1h	420	610	24	60	47

* PWHT: Postweld Heat Treatment 570-620°C / min 1h

Preheat and interpass temperature: <200°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOH	TBD	0.0	W1013007012
3.2 x 350	CBOX	TBD	0.0	W1013007015
4.0 x 350	CBOX	TBD	0.0	W1013007016

CROMOCORD KV5HR

TOP FEATURES

- Excellent tensile strength at high temperature, approved up to +570°C.
- Very low diffusible hydrogen (HD<4ml/100g).
- Excellent operability in all position welding except vertical down.

CLASSIFICATION

AWS A5.5	E8018-B2 H4R
EN ISO 3580-A	E (CrMo1) B 32 H5
EN ISO 3580-B	E (55XX-1CM) B 32 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.08	0.75	0.25	≤0.01	≤0.01	1.25	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
AWS A5.5	PWHT	≥460	≥550	≥19	not specified
EN ISO 3580-A	PWHT	≥460	≥550	≥17	not specified
Typical values	690°C x 1h	525	610	25	100
	690°C x 5h	515	610	29	160
	690°C x 1h + STC	490	595	29	140

* PWHT: Postweld Heat Treatment 675-705°C / min 1h

STC = Step cooling

Preheat and interpass temperature: 160-190°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165
4.0 x 450	125-165
5.0 x 450	170-220

CROMOCORD KV5HR

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	80	1.6	W100287628
	CBOX	165	3.3	W100287624
3.2x350	VPMD	55	2.0	W100287629
	CBOX	115	4.2	W100287625
4.0x350	VPMD	40	2.1	W100287630
	CBOX	80	4.2	W100287626
4.0x450	VPMD	40	2.7	W100380266
5.0x450	VPMD	20	2.2	W100287631
	CBOX	50	5.4	W100287627

MMA

CROMOCORD KV5L

TOP FEATURES

- Approved up to +570°C.
- Low diffusible hydrogen (HD<5ml/100g).
- Excellent operability in all position welding except vertical down.
- Stable arc with excellent bead shape.
- Preheat min 160°C, Interpass max 250°C.
- Efficiency about 105%.

CLASSIFICATION

AWS A5.5	E7015-B2L H4
EN ISO 3580-A	E (CrMo1L) B 22 H5
EN ISO 3580-B	E (52XX-1CML) B 22 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

RINA	TÜV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.04	0.7	0.27	≤0.015	≤0.015	1.25	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
AWS A5.5	PWHT	≥390	≥520	≥19	not specified
EN ISO 3580-A	PWHT	≥390	≥520	≥17	not specified
Typical values	690°C x 1h	420	550	23	47

* PWHT: Postweld Heat Treatment 675-705°C / min 1h

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOH	180	3.6	W100287632
3.2 x 350	CBOX	120	4.4	W100287633
4.0 x 350	CBOX	85	4.4	W100287634

CROMOCORD N125

TOP FEATURES

- Operating temperature <600°C.
- Very low diffusible hydrogen (HD<4ml/100g).
- Excellent radiographic and weldability in all position welding (except vertical down).

CLASSIFICATION

AWS A5.5 E9015-G H4
EN ISO 3580-A E Z (CrMoV1) B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo	V
0.12	0.9	0.4	≤0.020	≤0.015	1.4	1.0	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	AW or PWHT	≥530	≥620	≥17	not specified
EN ISO 3580-B	PWHT	≥530	≥620	≥15	not specified
Typical values	690°C x 8h / air	730	780	18	80

* PWHT: Postweld Heat Treatment 725-755°C / min 1h

AW: As-welded (preheat and interpass temperature: 160-190°C)

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 450	90-130
4.0 x 450	125-165
5.0 x 450	170-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x350	CBOX	TBD	0.0	W100258370
3.2x450	CBOX	TBD	0.0	W100258371
4.0x450	CBOX	TBD	0.0	W100258372
5.0x450	CBOX	TBD	0.0	W100258373

CROMO E225

TOP FEATURES

- Stable arc with excellent bead shape.
- Preheat min 160°C, Interpass max 250°C.
- Suitable for use with either DC positive and with AC.

CLASSIFICATION

AWS A5.5 E9015-B3 H4
EN ISO 3580-A E CrMo2 B 22 H5

CURRENT TYPE

DC+/AC

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.1	0.7	0.25	≤0.010	≤0.010	2.3	1.1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-20°C	-40°C
AWS A5.5	PWHT	≥530	≥620	≥17	not specified	not specified
EN ISO 3580-A	PWHT	≥400	≥500	≥18	not specified	not specified
Typical values	690°C x 1h	610	720	22	120	80
	690°C x 8h	500	620	22	180	140

*PWHT: Postweld Heat Treatment 690-750°C/min. 1h

Preheat and interpass temperature: 200-300°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	85-130
4.0 x 450	130-170
5.0 x 450	150-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	CBOX	120	4.0	W100287666
	VPMD	60	2.0	W100402346
4.0 x 450	VPMD	40	2.5	W100402347
	CBOX	86	5.5	W100287667
5.0 x 450	CBOX	55	5.3	W100287668

CROMOCORD KV3HR

TOP FEATURES

- The weld metal chemistry is low in impurity elements which allows to guarantee X-Factor <15ppm and J-Factor <150ppm
- Excellent tensile strength at high temperature, approved up to +600°C.
- Very low diffusible hydrogen (HD<4ml/100g).

CLASSIFICATION

AWS A5.5	E9018-B3 H4R
EN ISO 3580-A	E CrMo2 B 32 H5
EN ISO 3580-B	E 6218-2C1M H5

CURRENT TYPE

DC+/AC

WELDING POSITIONS

All position, except vertical down

APPROVALS

RINA	TÜV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo	X-Factor
0.1	0.75	0.3	≤0.01	≤0.01	2.25	1	<12ppm

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
AWS A5.5	≥530	≥620	≥17	not specified
EN ISO 3580-A	≥530	≥620	≥15	not specified
Typical values	560	660	27	140
	550	650	25	110
	570	670	22	80

* PWHT: Postweld Heat Treatment as agreed between purchaser and supplier

STC = Step cooling

Preheat and interpass temperature as agreed between purchaser and supplier

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	90-130
4.0 x 350	125-165
4.0 x 450	125-165
5.0 x 450	170-220

CROMOCORD KV3HR

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	80	1.9	W100380268
	CBOX	165	4.0	W100380267
3.2 x 350	VPMD	55	2.0	W100287654
	CBOX	115	4.2	W100287650
4.0 x 350	VPMD	40	2.1	W100287655
	CBOX	80	4.3	W100287651
4.0 x 450	VPMD	20	2.2	W100287656
	VPMD	40	2.8	W100380269
5.0 x 450	CBOX	50	5.4	W100287652

CROMOCORD KV3L

TOP FEATURES

- Stable arc with excellent bead shape.
- Preheat min. 160°C, interpass up to 250°C.
- Efficiency about 105%.
- Suitable for use with DC positive.

CLASSIFICATION

AWS A5.5 E8015-B3L H4
EN ISO 3580-A E (CrMo2L) B 22 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

RINA	TÜV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.04	0.75	0.35	≤0.02	≤0.015	2.25	1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
AWS A5.5	PWHT	≥460	≥550	≥19	not specified
EN ISO 3580-A	PWHT	≥460	≥550	≥15	not specified
Typical values	700°C x 1h	540	630	20	90

* PWHT: Postweld Heat Treatment 675-705°C / min 1h

Preheat and interpass temperature: 160-190°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOH	180	3.6	W100287641
3.2 x 350	CBOX	120	4.4	W100287642
4.0 x 350	CBOX	85	4.4	W100287643

CROMO E225V

TOP FEATURES

- Stable arc with excellent bead shape.
- Suitable for use with either DC positive and with AC.
- Very low diffusible hydrogen (HD<4ml/100g).

CLASSIFICATION

AWS A5.5 E9015-G H4
EN ISO 3580-B E 6215-2C1MV H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo	Nb	V
0.09	0.6	0.2	≤0.010	≤0.010	2.3	1	0.020	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
AWS A5.5	AW or PWHT	≥530	≥620	≥17	not specified
EN ISO 3580-B	AW or PWHT	≥530	≥620	≥15	not specified
Typical values	710°C x 8h	590	700	18	130

PWHT: Postweld Heat Treatment 725-755°C / min 2h

AW: As-welded (preheat and interpass temperature: 180-250°C)

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	85-130
4.0 x 450	130-170
5.0 x 450	150-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2x350	CBOX	120	4.0	W000287673, W100287673
4.0x450	CBOX	90	5.5	W100287674
5.0x450	CBOX	55	5.3	W100287675

CROMOCORD 5

TOP FEATURES

- Excellent tensile strength at high temperature, approved up to +600°C.
- Low diffusible hydrogen (HD<4ml/100g).
- Offers excellent operability in all position welding except vertical down

CLASSIFICATION

AWS A5.5	E8015-B6 H4
EN ISO 3580-A	E CrMo5 B 22 H5
EN ISO 3580-B	E 5515-5CM H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.07	0.8	0.5	≤0.012	≤0.010	5	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	PWHT	≥460	≥550	≥19	not specified
EN ISO 3580-A	PWHT	≥400	≥590	≥17	≥47
Typical values	740°C x 1h	500	610	22	81

PWHT: Postweld Heat Treatment 730-760°C / min 1h

Preheat and interpass temperature: 200-300°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 450	125-165
5.0 x 450	170-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	88	1.8	W100287701
3.2x350	VPMD	54	2.0	W100287702
4.0x450	VPMD	40	2.1	W100287703
5.0x450	VPMD	24	2.5	W100287704

CROMOCORD 5L

TOP FEATURES

- Excellent tensile strength at high temperature, approved up to +650°C.
- The low carbon reduces the risk of cracking and promotes a lower tensile strength and hardness in the all weld metal deposit.
- Low diffusible hydrogen (HD<5ml/100g).

CLASSIFICATION

AWS A5.5 E8015-B6L H4
EN ISO 3580-A E CrMo5 B 22 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.04	0.75	0.4	≤0.015	≤0.015	5	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	PWHT	≥460	≥550	≥19	not specified
EN ISO 3580-A	PWHT	≥400	≥590	≥17	≥47
Typical values	740°C x 2h	480	610	23	70

* PWHT: Postweld Heat Treatment 730-760°C / min 1h

Preheat and interpass temperature: 200-300°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	125-165

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	88	1.8	W100287697
3.2 x 350	VPMD	54	2.0	W100287698
4.0 x 350	VPMD	40	2.1	W100287699

CROMOCORD 9

TOP FEATURES

- Excellent tensile strength at high temperature, approved up to +600°C.
- Low diffusible hydrogen (HD<4ml/100g).
- Stable arc with excellent bead shape and excellent operability in all position welding except vertical down

CLASSIFICATION

AWS A5.5	E8015-B8 H4
EN ISO 3580-A	E Z (CrMo9) B 22 H5
EN ISO 3580-B	E 5515-9C1M H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	0.7	0.4	≤0.015	≤0.015	9	0.06	1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	PWHT	≥460	≥550	≥19	not specified
EN ISO 3580-B	PWHT	≥460	≥550	≥17	not specified
Typical values	750°C x 2h	500	650	22	50

* PWHT: Postweld Heat Treatment 725-755°C / min 1h

Preheat and interpass temperature: 205-260°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	90-130
4.0 x 350	135-165

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.8	W100287721
3.2 x 350	VPMD	54	2.0	W100287722
4.0 x 350	VPMD	40	2.1	W100287723

CROMOCORD 10M

TOP FEATURES

- The weld metal chemistry is low in impurity elements (P,S).
- Excellent tensile strength at high temperature.
- Particularly suited for surfacing and joining application thick-walled steel casting.
- Very low diffusible hydrogen (HD<4ml/100g).
- Specialized coated electrode for welding cast turbine casing.
- Offers excellent operability in all position welding except vertical down

CLASSIFICATION

AWS A5.5 E9018-G H4
 EN ISO 3580-A E Z (CrMoWV10) B 42 H5

* Nearest classification

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	V	W	N	Al
0.11	0.8	0.25	0.010	0.008	9.5	0.5	1	0.05	0.22	1	0.05	0.01

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	AW or PWHT ≥530	≥620	≥17	not specified
EN ISO 3580-A	AW or PWHT not specified	not specified	not specified	not specified
Typical values	730°C x 12h 620	760	≥17	≥60

* PWHT: Postweld Heat Treatment as agreed between purchaser and supplier

AW: As-welded (preheat and interpass temperature as agreed between purchaser and supplier)

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	80-130
4.0 x 450	140-180
5.0 x 450	180-230

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2x350	VPMD	51	1.9	W100258367
4.0x450	VPMD	32	2.4	W100258368
5.0x450	VPMD	18	2.1	W100258369

CROMO E91

TOP FEATURES

- Excellent tensile strength in creep regime.
- Good impact toughness down to -20°C.
- Low diffusible hydrogen (HD<4ml/100g).

CLASSIFICATION

AWS A5.5 E9015-B91 H4
EN ISO 3580-A E (CrMo91) B 2 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	V	N	X-Factor
0.11	0.8	≤0.3	≤0.010	≤0.010	8.5	0.4	0.050	0.2	0.050	<15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20°C	0°C	
AWS A5.5	PWHT	≥530	≥620	≥17	not specified	not specified
EN ISO 3580-A	PWHT	≥530	≥620	≥15	≥47	not specified
Typical values	760°C x 2h	610	730	20	85	27

PWHT: Postweld Heat Treatment 745-755°C / min 2h (heating rate in the furnace shell be 85°C/h to 275°C/h)

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-85
3.2 x 350	95-110
4.0 x 350	125-155

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x350	CBOX	190	3.9	W100386546
3.2x350	CBOX	119	3.9	W100386547
4.0x350	CBOX	85	4.1	W100386548

CROMOCORD 91

TOP FEATURES

- Long term use approved up to +650°C.
- The fine tuning of the weld metal chemistry allows to guarantee very low impurities. Ni+Mn restriction increases Ac1 to avoid harmful microstructure transformation during PWHT.
- The CROMOCORD 91 offers excellent operability in all position welding except vertical down.
- Stable arc with low spatter, excellent slag removal and bead shape.
- Preheat min. 200°C, Interpass max. 280°C.
- Efficiency about 120%.

CLASSIFICATION

AWS A5.5	E9018-B91 H4
EN ISO 3580-A	E (CrMo91) B 42 H5
EN ISO 3580-B	E (62XX-9C1MV) B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	V	N
0.1	0.6	0.25	0.01	0.008	9	0.5	1	0.05	0.20	0.05

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	PWHT	≥530	≥620	≥17	not specified
EN ISO 3580-B	PWHT	≥530	≥620	≥15	not specified
Typical values	760°C x 2h	640	770	22	65

* PWHT: Postweld Heat Treatment 745-755°C / min 1h

Preheat and interpass temperature: 215-315°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-95
3.2 x 350	90-120
4.0 x 350	135-165
5.0 x 450	170-220

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	100	2.1	W100287717
3.2 x 350	VPMD	55	1.9	W100287718
4.0 x 350	VPMD	35	1.9	W100287719
5.0 x 450	VPMD	20	2.1	W100287720

CROMOCORD 9M

TOP FEATURES

- Approved for operating temperature up to +625°C.
- The Nickel free weld metal improves the tensile strength at high temperature.
- Very low diffusible hydrogen (HD<4ml/100g).
- Excellent radiographic examination results
- Offers excellent operability in all position welding except vertical down
- Stable arc with low spatter, easy slag removal and excellent bead profile.

CLASSIFICATION

AWS A5.5 E9018-B91 H4
EN ISO 3580-A E Z (CrMo9) B 4 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo	Nb	V	N
0.09	0.95	0.25	0.01	≤0.010	9	1	0.07	0.20	0.04

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	PWHT	≥530	≥620	≥17	not specified
EN ISO 3580-A	PWHT	≥460	≥550	≥17	not specified
Typical values	760°C x 2h	550	640	18	60

* PWHT: Postweld Heat Treatment 725-755°C / min 1h

Preheat and interpass temperature: 205-260°C

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	60-90
3.2 x 350	85-130
4.0 x 450	130-160
5.0 x 450	180-230

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	CBOX	195	3.7	W100258353
3.2x350	CBOX	110	4.1	W100258354
4.0x450	CBOX	70	5.2	W100258355
5.0x450	CBOX	45	5.2	W100258356

CROMO E92

TOP FEATURES

- Basic coated MMA electrode made on matching core wire.
- Excellent tensile strength in creep regime.
- Good impact toughness down to 0°C.
- Low diffusible hydrogen (HD<4ml/100g).

CLASSIFICATION

AWS A5.5 E 9015-B92 H4
EN ISO 3580-B E Z (CrMoWVNb9) B 42 H5

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	V	N	B	Al	Cu
0.11	0.6	0.25	0.01	0.01	9	0.5	0.45	0.05	0.2	0.05	0.003	<0.01	<0.05

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	AW or PWHT	≥530	≥17	not specified
EN ISO 3580-A	AW or PWHT	not specified	not specified	not specified
Typical values	PWHT 760°C/2h	630	19	60

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	70-85
3.2x350	90-120
4.0x350	125-155

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	CBOX	208	4.3	W100386549
3.2 x 350	CBOX	120	4.2	W100386550
4.0 x 350	CBOX	80	4.0	W100386551

CROMOCORD 92

TOP FEATURES

- The weld metal chemistry is low in impurity elements.
- Suitable for long term use, up to +650°C.
- Excellent operability in all position welding except vertical down.
- Stable arc with excellent bead shape and low spatter.
- Efficiency about 120%.
- Suitable for use with DC positive.

CLASSIFICATION

AWS A5.5	E 9018-G H4
EN ISO 3580-A	E Z (CrMoWCoVNb9 0,5 2 1) B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo	Nb	Co	V	W	N
0.095	1.1	0.2	≤0.012	≤0.012	9	0.5	0.05	1.0	0.20	1.7	0.04

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.5	AW or PWHT	≥530	≥620	≥17	not specified
EN ISO 3580-A	AW or PWHT	not specified	not specified	not specified	not specified
Typical values	PWHT 760°C/4h	560	640	19	65

AW: As-welded (preheat and interpass temperature as agreed between purchaser and supplier)

PWHT: Postweld Heat Treatment as agreed between purchaser and supplier

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	85-135
4.0 x 350	140-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	195	4.2	W100258361
3.2 x 350	CBOX	110	4.2	W100258362
4.0 x 350	CBOX	70	4.0	W000258363
	CBOX	70	4.1	W100258363

TENACITO 38R

TOP FEATURES

- Weld metal is of very low hydrogen content
- Excellent mechanical properties
- Weld metal is of very low hydrogen content

CLASSIFICATION

AWS A5.5 E7018-G H4
EN ISO 2560-A E 46 6 1Ni B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.3	0.4	≤0.012	≤0.015	0.95

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
AWS A5.5	AW	≥390	≥480	≥22	not specified
EN ISO 2560-A	AW	≥460	530-680	≥20	≥47
Typical values	AW	500	580	28	100

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	90-140
4.0 x 450	140-185

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	110	2.1	W100287427
3.2 x 350	VPMD	60	2.1	W100287428
4.0 x 450	VPMD	35	2.4	W100258301

TENACITO 70B

TOP FEATURES

- Very stable and concentrated arc
- Easy slag removal and mechanical properties in both the as welded and stress relieved conditions.

CLASSIFICATION

AWS A5.5 E8018-C1 H4
EN ISO 2560-A E 46 6 2Ni B 42 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.1	0.3	≤0.012	≤0.012	2.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60 °C
AWS A5.5	AW	470-550	≥550	≥24	not specified
EN ISO 2560-A	AW	≥460	530-680	≥20	≥47
Typical values	AW	510	610	24	100

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-95
3.2 x 350	90-130
4.0 x 450	140-185
5.0 x 450	180-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	VPMD	110	2.1	W000287451
3.2 x 350	VPMD	60	2.0	W000287452
4.0 x 450	VPMD	35	2.4	W000258317
5.0 x 450	VPMD	20	2.2	W000258318

TENCORD 85 Kb

TOP FEATURES

- The weld deposit has a very similar appearance to Cor-Ten A steel.
- Suitable for positional welding and welding with an inverter power source.
- Very low diffusible hydrogen content.

CLASSIFICATION

AWS A5.5 E8018-G H4
EN ISO 18275-A E 50 4 Z B 32 H5

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

RINA	TÜV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Cu
0.06	1.3	0.4	≤0.02	≤0.02	0.5	0.45	0.45

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
AWS A5.5	540-620	≥620	≥24	≥27
EN ISO 18275_A	≥500	560-720	≥18	≥47
Typical values	650	700	24	90
PWHT 620°C/1h	460	650	23	60

* AW = As welded, PWHT = Post Weld Heat Treatment

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	60-90
3.2x450	80-140
4.0x450	110-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	88	1.8	W100287584
3.2 x 450	VPMD	53	2.1	W100287585
4.0 x 450	VPMD	39	2.8	W100287586

BASINOX 307

TOP FEATURES

- Excellent mechanical properties
- High crack resistance with maximum service temperature up to 850°C
- Easy striking and restriking and smooth arc

CLASSIFICATION

AWS A5.4 E307-15*
EN ISO 3581-A E 18 8 Mn B 22 E Fe10

* Nearest classification

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.08	5.5	0.3	≤0.035	≤0.025	19	8.5	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	
AWS A5.4	AW	not specified	≥590	≥30	not specified
EN ISO 3581-A	AW	≥350	≥500	≥25	not specified
Typical values	AW	500	650	35	100

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	60-75
3.2 x 350	85-110
4.0 x 350	95-145
5.0 x 350	130-160

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	95	1.8	W000380922
3.2x350	VPMD	60	2.1	W000380558
4.0x350	VPMD	40	2.1	W000380559
5.0x350	VPMD	25	2.1	W000380561

SUPRANOX RS 307

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E307-16 *
 EN ISO 3581-A E 18 8 Mn R 12 E Fe10
 EN 14700 E Fe10

* Nearest classification

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni
0.12	5	1	18	9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	Hardness	
						Hrc	HB
AWS A5.4	AW	not specified	≥590	≥30	not specified	not specified	not specified
EN ISO 3581-A	AW	≥350	≥500	≥25	not specified	not specified	not specified
EN 14700	AW	not specified	not specified	not specified	not specified	180-200	38-42
Typical values	AW	450	650	35	110	not specified	not specified

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 300	80-130
4.0 x 350	120-160

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	110	1.7	W000258459
3.2 x 300	VPMD	60	1.6	W000258460
4.0 x 350	VPMD	40	2.0	W000258461

BASINOX 308L

TOP FEATURES

- Slag solidifies quickly, covers the weld uniformly
- Well-suited for positional welding.
- Structural works with 304L stainless steels in all positions except vertical down.

CLASSIFICATION

AWS A5.4 E308L-15
EN ISO 3581-A E 19 9 L B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
≤0.03	1.5	0.3	≤0.025	≤0.025	19	10	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	-120°C
AWS A5.4	AW	not specified	≥520	≥30	not specified	not specified
EN ISO 3581-A	AW	≥320	≥510	≥30	not specified	not specified
Typical values	AW	400	600	40	80	40

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-70
3.2 x 350	65-120
4.0 x 350	100-140
5.0 x 350	130-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	100	1.7	W100287951
3.2 x 350	VPMD	65	2.1	W100287952
4.0 x 350	VPMD	40	2.0	W100287953
4.0 x 450	VPMD	40	2.5	W100387510
5.0 x 350	VPMD	25	1.8	W100287954
5.0 x 450	VPMD	25	2.3	W100402293

SUPRANOX RS 308L

TOP FEATURES

- The weld deposit has a carbon content <0,04%.
- This electrode offers excellent operability and is particularly suitable for downhand butt and fillet welding applications, the 2.5mm and 3.2mm diameter electrodes can be used for positional welding.
- Easy arc striking and restriking.

CLASSIFICATION

AWS A5.4 E308L-16
EN ISO 3581-A E 199 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.025	0.9	0.8	≤0.030	≤0.025	19.8	9.5	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥30	not specified
Typical values	AW	445	600	47	73

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	30-60
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140
5.0 x 350	145-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	VPMD	150	1.7	W000375864
2.5 x 300	VPMD	90	1.7	W000375866
3.2 x 350	VPMD	55	1.9	W000375867
4.0 x 350	VPMD	40	2.1	W000375869
5.0 x 350	VPMD	20	1.6	W000375871

SUPRANOX 308L

TOP FEATURES

- Easy arc striking and restriking.
- Efficiency 100%.
- Excellent operability. Particularly suitable for downhand butt and fillet welding applications.

CLASSIFICATION

AWS A5.4 E308L-17
EN ISO 3581-A E 19 9 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.025	0.9	0.8	≤0.030	≤0.025	19.8	9.5	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥30	not specified
Typical values	AW	445	600	47	73

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	30-60
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	CBOX	340	3.8	W000375882
2.5 x 300	VPMD	90	1.7	W000375875
	CBOX	190	3.6	W000375886
3.2 x 350	CBOX	120	4.2	W000375888
4.0 x 350	CBOX	80	4.2	W000375891

CLEARINOX E 308L

TOP FEATURES

- Very good operability
- Lower porosity
- Excellent slag removal
- Reduced CrVI concentration up to -60%

CLASSIFICATION

AWS A5.4 E308L-17
EN ISO 3581-A E 199 L R 2 2

CURRENT TYPE

DC+

WELDING POSITIONS

Flat and horizontal

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.03	0.8	1.0	≤0.025	0.01	19.5	10	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥30	not specified
Typical values	AW	470	615	42	≥50

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	75-80
3.2 x 350	110-115
4.0 x 350	150-160

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	90	1.7	W000387142
3.2x350	VPMD	55	1.9	W000387152
4.0x350	VPMD	40	2.1	W000387153

BASINOX 309L

TOP FEATURES

- Weld deposit carbon content is 0.04% max
- Excellent weldability with a spatter free arc
- Self-releasing slag

CLASSIFICATION

AWS A5.4 E309L-15
EN ISO 3581-A E 23 12 L B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.025	1.4	0.35	≤0.03	≤0.025	22.5	13	5-15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	470	570	40	30

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-70
3.2 x 350	65-120
4.0 x 350	115-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	105	1.8	W000287981
3.2 x 350	VPMD	60	2.1	W000287982
4.0 x 350	VPMD	40	2.0	W000287983

SUPRANOX RS 309L

TOP FEATURES

- Easy arc striking and restriking.
- Suitable for use with either AC [minimum OCV 50V] or DC positive.
- Efficiency 100%.

CLASSIFICATION

AWS A5.4 E309L-16
EN ISO 3581-A E 23 12 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All positions

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
≤0.040	0.9	0.9	≤0.025	≤0.025	23.5	12.2	5-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	470	590	40	65

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140
5.0 x 350	145-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.8	W000277022
3.2 x 350	VPMD	55	2.0	W000277023
4.0 x 350	VPMD	40	2.2	W000277024
5.0 x 350	VPMD	20	1.7	W000277025

SUPRANOX 309L

TOP FEATURES

- Easy arc striking and restriking.
- Suitable for use with either AC [minimum OCV 50V] or DC positive.
- Efficiency 100%.

CLASSIFICATION

AWS A5.4 E309L-17
EN ISO 3581-A E 23 12 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
≤0.040	0.9	0.9	≤0.025	≤0.025	23.5	12.2	5-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	470	590	40	65

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140
5.0 x 350	145-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.8	W000375900
	CBOX	190	3.7	W000375906
3.2 x 350	VPMD	55	2.0	W000375902
	CBOX	120	4.3	W000375907
4.0 x 350	CBOX	80	4.3	W000375909
5.0 x 350	CBOX	50	4.3	W000375912

CLEARINOX E 309L

TOP FEATURES

- Suitable for root pass
- Lower porosity, good striking and restriking
- Excellent slag removal

CLASSIFICATION

AWS A5.4 E309L-17
EN ISO 3581-A E 23 12 L R 2 2

CURRENT TYPE

DC+

WELDING POSITIONS

Flat and horizontal

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.03	0.9	0.8	0.025	0.01	24	13	8-15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥520	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	465	565	41	57

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-90
3.2 x 350	100-120
4.0 x 350	150-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	90	1.8	W000387155
3.2x350	VPMD	55	2.0	W000387156
4.0x350	VPMD	40	2.2	W000387157

BASINOX 316L

TOP FEATURES

- Easy slag release
- Well-suited for positional welding.
- Applications include wet-corrosive conditions for operating temperatures up to 350 °C.

CLASSIFICATION

AWS A5.4 E316L-15
EN ISO 3581-A E 19 12 3 L B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
≤ 0.025	1	0.3	≤ 0.025	≤ 0.020	18.5	11.5	2.7	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20 °C	-60 °C
AWS A5.4	AW	not specified	≥490	≥30	not specified	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified	not specified
Typical values	AW	430	580	40	70	32

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-70
3.2 x 350	65-120

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	108	1.9	W100287964
3.2x350	VPMD	60	2.0	W100287965
4.0x350	VPMD	42	2.1	W100287966

SUPRANOX RS 316L

TOP FEATURES

- Easy arc striking and restriking.
- Suitable for use with either AC [minimum OCV 50V] or DC positive.
- Efficiency 100%.

CLASSIFICATION

AWS A5.4 E316L-16
EN ISO 3581-A E 19 12 3 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

LR	DNV	RINA	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
0.035	0.9	0.8	≤0.025	≤0.025	19.0	12.0	2.6	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥480	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	460	580	43	68

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	30-60
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140
5.0 x 350	145-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	VPMD	150	1.7	W000277026
2.5 x 300	VPMD	90	1.7	W000277027
3.2 x 350	VPMD	55	2.0	W000277028
4.0 x 350	VPMD	40	2.1	W000277029
5.0 x 350	VPMD	20	1.7	W000277030

SUPRANOX 316L

TOP FEATURES

- Easy arc striking and restriking.
- Suitable for use with either AC [minimum OCV 50V] or DC positive.
- Efficiency 100%.

CLASSIFICATION

AWS A5.4 E316L-17
EN ISO 3581-A E 19 12 3 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All positions

APPROVALS

ABS	BV	DNV	RINA	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
0.035	0.9	0.8	≤0.025	≤0.025	19.0	12.0	2.6	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	AW	not specified	≥490	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	460	580	43	68

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
1.6 x 300	20-40
2.0 x 300	30-60
2.5 x 300	55-80
3.2 x 350	70-110
4.0 x 350	120-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
1.6 x 300	VPMD	250	1.8	W000375922
2.0 x 300	CBOX	310	3.6	W000375872
2.5 x 300	SMPA	30	0.6	W000375945
	VPMD	90	1.7	W000375924
	CBOX	190	3.5	W000375873
3.2 x 350	VPMD	55	2.0	W000375925
	CBOX	120	4.3	W000375876
4.0 x 350	VPMD	40	2.1	W000375865
	CBOX	80	4.2	W000375878

CLEARINOX E 316L

TOP FEATURES

- Suitable for root pass
- Lower porosity, good striking and restriking
- Excellent slag removal

CLASSIFICATION

AWS A5.4 E316L-17
EN ISO 3581-A E 19 12 3 LR 2 2

CURRENT TYPE

DC+

WELDING POSITIONS

Flat and horizontal

APPROVALS

ABS	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.03	0.8	1.0	0.025	0.01	19.5	11.5	2.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥490	≥30	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified
Typical values	AW	490	615	42	≥50

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-90
3.2 x 350	100-120
4.0 x 350	150-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	90	1.7	W000387159
3.2x350	VPMD	55	2.0	W000387160
4.0x350	VPMD	40	2.1	W000387161

BASINOX 310

TOP FEATURES

- The electrode deposits fully austenitic weld metal containing 25%Cr and 20%Ni.
- Slag solidifies quickly, covers the weld uniformly
- Well-suited for positional welding.

CLASSIFICATION

AWS A5.4 E310-15
EN ISO 3581-A E 25 20 B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni
0.09	2.0	0.7	≤0.03	≤0.02	26	21

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	AW	not specified	≥550	≥30	not specified
EN ISO 3581-A	AW	≥350	≥550	≥20	not specified
Typical values	AW	420	580	35	60

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 350	70-110

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	95	1.8	W000380564
3.2x350	VPMD	60	2.1	W000380565
4.0x350	VPMD	40	2.1	W000380566

SUPRANOX RS 310

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E 310-16
EN ISO 3581-A E 25 20 R 12

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni
0.1	1.7	0.6	27	21

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	AW	not specified	≥550	≥30	not specified
EN ISO 3581-A	AW	≥350	≥550	≥20	not specified
Typical values	AW	440	600	30	80

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-90
3.2 x 350	80-110
4.0 x 350	100-130

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	100	2.1	W100258439
3.2 x 350	VPMD	60	2.0	W100258440
4.0 x 350	VPMD	40	2.0	W100258441

SUPRANOX RS 312

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E312-16*
EN ISO 3581-A E Z (29 9) R 12

* Nearest classification

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
0.08	1	1.2	28	12	25-50

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C	Hardness (HB)
AWS A5.4 AW	not specified	≥660	≥22	not specified	not specified
EN ISO 3581-A AW	≥450	≥650	≥15	not specified	not specified
Typical values AW	700	800	20	50	220

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	55-75
3.2 x 350	75-115
4.0 x 350	90-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	SMPA	28	0.5	W000287909
	VPMD	95	1.7	W000258455
2.5 x 350	VPMD	90	1.9	W100258455
	VPMD	55	2.0	W000258456
3.2 x 350	VPMD	58	2.0	W100258456
	VPMD	35	1.8	W000258457
4.0 x 350	VPMD	40	1.9	W100258457

SUPRANOX RS 317L

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E317L-16
EN ISO 3581-A E Z (19 13 4 N L) R 12

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
0.025	0.9	0.8	≤0.03	≤0.03	20	13	3.4	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)		Impact ISO-V (J) 20°C
				4d	5d	
AWS A5.4	AW	not specified	≥520	≥30	not specified	not specified
EN ISO 3581-A	AW	≥350	≥550	not specified	≥25	not specified
Typical values	AW	450	600	33	≥30	45

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 350	60-120
4.0 x 350	100-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	TBD	0.0	W100287838
	VPMD	90	1.7	W000287838
3.2 x 350	VPMD	TBD	0.0	W100287839
4.0 x 350	VPMD	TBD	0.0	W100287840

SUPRANOX RS 318

TOP FEATURES

- Good striking and restriking.
- The weld metal transfer is in fine droplets, nearly spatter free with a generally self-releasing slag
- Finely rippled concave fillet welds with an outstanding weld bead aspect.

CLASSIFICATION

AWS A5.4 E318-16
EN ISO 3581-A E 19 12 3 Nb R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Nb	Ferrite
≤0.03	0.8	0.9	19	11.5	2.7	0.4	5-15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥550	≥25	not specified
EN ISO 3581-A	AW	≥350	≥550	≥25	not specified
Typical values	AW	400	600	30	50

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	40-55
3.2 x 350	75-105
4.0 x 350	100-130

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	95	1.8	W100258422
3.2 x 350	VPMD	56	2.0	W100258423
4.0 x 350	VPMD	40	2.2	W100258424

BASINOX 347

TOP FEATURES

- Easy slag release
- Well-suited for positional welding.
- Applications include wet-corrosive conditions for operating temperatures up to 350 °C, non-scaling up to 800 °C.

CLASSIFICATION

AWS A5.4 E347-15

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Nb	Ferrite
0.05	1.6	0.45	≤0.030	≤0.025	19	9.5	0.5	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20 °C	-60 °C
AWS A5.4	AW	not specified	≥520	≥25	not specified	not specified
EN ISO 3581-A	AW	≥320	≥510	≥25	not specified	not specified
Typical values	AW	420	600	35	70	40

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-70
3.2 x 350	65-120
4.0 x 350	115-140
4.0 x 450	115-140
5.0 x 350	130-170
5.0 x 450	130-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	110	1.9	W100287977
3.2x350	VPMD	65	2.2	W100287978
4.0x350	VPMD	45	2.2	W100287979
4.0x450	VPMD	45	2.8	W100380283
5.0x350	VPMD	31	2.3	W100287980
5.0x450	VPMD	31	2.9	W100380284

SUPRANOX RS 347

TOP FEATURES

- Good striking and restriking.
- Under wet corrosive conditions, suitable for operating temperatures <400°C, non-scaling <800°C.
- The weld metal transfer is in fine droplets producing finely rippled concave fillet welds with an outstanding weld bead aspect.

CLASSIFICATION

AWS A5.4 E347-16
EN ISO 3581-A E 19 9 Nb R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Nb	Ferrite
0.05	0.8	0.6	≤0.03	≤0.02	19.5	10	0.4	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20°C
AWS A5.4	AW	not specified	≥550	≥25	not specified
EN ISO 3581-A	AW	≥350	≥550	≥25	not specified
Typical values	AW	450	610	40	53

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 350	60-120
4.0 x 350	100-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.7	W000380162
3.2 x 350	VPMD	55	2.0	W000380170
4.0 x 350	VPMD	40	2.1	W000380264

SUPRANOX RSL 347

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E347-16
EN ISO 3581-A E 19 9 Nb R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	Ferrite
≤0.05	0.5-2.0	0.5-0.9	≤0.03	≤0.025	18.0-21.0	9.0-11.0	≤0.75	0.4	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20° C
AWS A5.4	AW	not specified	≥550	≥25	not specified
EN ISO 3581-A	AW	≥350	≥550	≥25	not specified
Typical values	AW	450	610	30	50

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.0 x 300	30-60
2.5 x 300	50-80

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.0 x 300	VPMD	160	1.8	W000380831
2.5 x 300	VPMD	95	1.8	W000380833

BASINOX 22 9 3 N

TOP FEATURES

- Good weldability with a spatter free arc
- Self-releasing slag combined with a very smooth bead appearance and high level of fracture toughness at -50°C
- Excellent resistance to intergranular corrosion.

CLASSIFICATION

AWS A5.4 E2209-15
EN ISO 3581-A E 22 9 3 N L B 42

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	N	Ferrite
≤0.04	1.20	0.4	≤0.020	≤0.020	23.40	9	2.80	0.15	35-50

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20°C	-50°C	
AWS A5.4	AW	not specified	≥690	≥20	not specified	not specified
EN ISO 3581-A	AW	≥450	≥550	≥20	not specified	not specified
Typical values	AW	550	750	28	80	45

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-90
3.2 x 350	95-120
4.0 x 350	130-160

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	105	1.8	W100288019
3.2x350	VPMD	62	2.0	W100288020
4.0x350	VPMD	40	2.0	W100288021

SUPRANOX RS 22.9.3N

TOP FEATURES

- Good weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E2209-16
EN ISO 3581-A E 22 9 3 N L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

BV	DNV	RINA
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	N	Ferrite
0.025	0.9	0.9	≤0.03	≤0.03	22.5	9.5	2.8	0.14	30-55

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20 °C	-20 °C	-40 °C
AWS A5.4	AW	not specified	≥690	≥20	not specified	not specified	not specified
EN ISO 3581-A	AW	≥450	≥550	≥20	not specified	not specified	not specified
Typical values	AW	630	780	27	65	50	40

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	60-120
4.0 x 350	90-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	VPMD	55	1.9	W100287893
4.0 x 350	VPMD	40	2.1	W100287894

BASINOX 25 10 4 N

TOP FEATURES

- The deposited weld metal has high strength, toughness and very good resistance to pitting and stress corrosion cracking.
- Well-suited for positional welding.
- Easy slag release.

CLASSIFICATION

AWS A5.4 E2594-15
EN ISO 3581-A E 25 9 4 N L B 42

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	N	Ferrite
0.03	1.3	0.5	≤0.03	≤0.025	25	9.5	4	0.25	35-70

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20 °C	-50 °C	
AWS A5.4	AW	not specified	≥760	≥15	not specified	not specified
EN ISO 3581-A	AW	≥550	≥620	≥18	not specified	not specified
Typical values	AW	710	880	18	47	32

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	80-110
3.2 x 350	100-140
4.0 x 350	130-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	105	1.8	W100288034
3.2x350	VPMD	55	1.9	W100288035
4.0x350	VPMD	40	2.0	W100288036

BASINOX 308H

TOP FEATURES

- Carbon content in the range of 0.04-0.08 provides higher tensile and creep strengths at elevated temperatures.
- Slag solidifies quickly, covers the weld uniformly
- Well-suited for positional welding.

CLASSIFICATION

AWS A5.4 E308H-15
EN ISO 3581-A E 19 9 H B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.05	1.5	0.4	≤0.025	≤0.025	19	10	3-8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
				+20 °C	-20 °C	
AWS A5.4	AW	not specified	≥550	≥30	not specified	not specified
EN ISO 3581-A	AW	≥350	≥550	≥30	not specified	not specified
Typical values	AW	450	600	44	85	50

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 350	70-120
4.0 x 350	110-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	105	1.8	W000287961
3.2x350	VPMD	65	2.1	W000287962
4.0x350	VPMD	45	2.2	W000287963

SUPRANOX RS 308H

TOP FEATURES

- Specially developed for high temperature applications (up to 730°C) - e.g. AISI 304H or Mat. Nr 1.4948
- Weldable on AC and DC
- Very smooth bead appearance.

TYPICAL APPLICATIONS

- Chemical and petrochemical industry

CLASSIFICATION

AWS A5.4 E308H-16
EN ISO 3581-A E 19 9 H R 12

CURRENT TYPE

AC/DC(+/-)

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
0.05	0.75	0.85	18.50	9.50	3-7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4 AW	not specified	≥550	≥35	not specified
EN ISO 3581-A AW	≥350	≥550	≥30	not specified
Typical values AW	400	600	38	65

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-80
3.2 x 350	60-120
4.0 x 350	100-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	100	1.7	W100287866
3.2 x 350	VPMD	65	2.1	W100287867
4.0 x 350	VPMD	40	2.1	W100287868

SUPRANOX RS 309LMo

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance.

CLASSIFICATION

AWS A5.4 E309LMo-16
EN ISO 3581-A E 23 12 2 L R 12

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	BV	RINA
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	Ferrite
0.03	0.9	0.9	≤0.02	≤0.02	22.7	12.5	2.3	10-25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20°C
AWS A5.4	AW	not specified	≥550	≥35	not specified
EN ISO 3581-A	AW	≥350	≥550	≥30	not specified
Typical values	AW	450	600	37	45

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-70
3.2 x 350	70-105
4.0 x 350	105-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	90	1.8	W100380839
3.2 x 350	VPMD	55	2.1	W100380158
4.0 x 350	VPMD	40	2.2	W100380159

BASINOX 309Nb

TOP FEATURES

- Excellent weldability with a spatter free arc
- Self-releasing slag
- Very smooth bead appearance

CLASSIFICATION

AWS A5.4 E309Nb-15
EN ISO 3581-A E 23 12 Nb B 22

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Nb	Ferrite
≤0.04	1.6	0.45	≤0.03	≤0.025	23.5	12.5	0.9	5-15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
AWS A5.4	AW	not specified	≥550	≥30	not specified
EN ISO 3581-A	AW	≥350	≥550	≥25	not specified
Typical values	AW	520	660	33	80

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	65-120
4.0 x 350	115-140

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
4.0 x 350	VPMD	40	2.0	W000287991

BASINOX 410

TOP FEATURES

- BASINOX 410 is also used for stainless wear resistant surfacing on unalloyed or low-alloy steels for the sealing surfaces of water, gas or steam fittings.
- Most common application of these electrodes is for welding alloys of similar compositions. They are also used for surfacing of carbon steels to resist corrosion, erosion, or abrasion.
- Easy slag release
- Well-suited for positional welding.

CLASSIFICATION

AWS A5.4 E410-15*
 EN ISO 3581-A E Z 13 1 B 42
 EN ISO 14700-A E Fe10*

* Nearest classification

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni
0.05	0.4	0.3	0	≤0.025	12	1.50

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	Hardness (HB)
AWS A5.4	PWHT	not specified	≥520	≥20	not specified	not specified
EN ISO 3581-A	PWHT	not specified	≥520	≥15	not specified	not specified
Typical values	680°C x 8h	550	720	22	55	200

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	85-140
4.0 x 350	120-190

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	100	1.8	W000288022
3.2x350	VPMD	50	1.9	W000288023
4.0x350	VPMD	40	2.2	W000288024

BASINOX 410 NiMo

TOP FEATURES

- Basic coated MMA electrode for welding martensitic 13% chromium-nickel ASTM CA6NM (CA-6NM) castings or similar materials, as well as light-gauge Type 410, 410S, and 405 base metals.
- The weld metal has excellent toughness despite the high strength,
- Preheat-interpass range of 100-200°C is recommended to allow martensite transformation during welding.
- Easy slag release
- Well-suited for positional welding.

CLASSIFICATION

AWS A5.4 E410NiMo-15
EN ISO 3581-A E 13 4 B 4 2

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.06	0.8	0.5	0.017	0.006	12	4.5	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
AWS A5.4	PWHT	not specified	≥760	≥15	not specified
EN ISO 3581-A	PWHT	not specified	≥760	≥10	not specified
Typical values	600°C x 1h/air	740	880	20	50

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	65-95
3.2 x 350	85-140
4.0 x 350	120-190
5.0 x 350	190-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5x300	VPMD	100	1.9	W000288026
3.2x350	VPMD	55	2.1	W000288027
4.0x350	VPMD	40	2.3	W000288028
5.0x350	VPMD	25	2.1	W000288029

SUPRADUR V1000

TOP FEATURES

- The deposit is only machinable by grinding.
- Flat welding position only.
- Shall be used in DC+ or AC current.

CLASSIFICATION

EN 14700 E Z (Fe14)

CURRENT TYPE

AC, DC+

WELDING POSITIONS

Flat

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Fe
3.5	1	1	33	Rem.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HRc)
EN 14700	AW	40-60
Typical values	AW	60

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	120-150

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 450	CBOX	75	5.3	W000258545

SUPRADUR 400B

TOP FEATURES

- Weld metal hardness~ 375-450HB can only be machined by using sintered hard metal tools.
- Excellent weldability in all position except Vertical Down and Overhead positions.
- Shall be used in DC+ or AC current.

CLASSIFICATION

EN 14700 E Fe1

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Fe
0.2	0.4	0.7	2.7	Rem

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HB)
EN 14700	AW	150-450
Typical values	AW, Nph/It <100°C	375-450
	AW, Ph/It 200 ±25°C	330

* AW = As welded

Nph = No pre-heating

Ph = Pre-heating

It = Interpass temperature

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 350	105-135
4.0 x 450	120-180
5.0 x 450	170-240

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 350	CBOX	135	4.7	W000258528
4.0 x 450	CBOX	85	5.8	W000258529
5.0 x 450	CBOX	50	5.6	W000258530

SUPRADUR 600B

TOP FEATURES

- Weld metal hardness ~550-650HV which can be ground. Very good resistance to moderate impacts.
- Excellent weldability in all positions except vertical down.
- Shall be used in DC+ or AC current.

CLASSIFICATION

EN 14700 E Z (Fe2)

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo	Fe	V
0.5	0.3	0.4	8	0.5	Rem	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HRc)
EN 14700	AW	30-58
Typical values	AW	60

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	70-90
3.2 x 450	100-135
4.0 x 450	140-180

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	220	4.8	W000258537
3.2 x 450	CBOX	130	5.7	W000258538
4.0 x 450	CBOX	85	5.8	W000258539

SUPRADUR 600RB

TOP FEATURES

- Weld metal hardness~57-62HRC, the deposit can only be machined by grinding.
- Excellent weldability in all position except Vertical Down and Overhead positions.
- Shall be used in DC+ or AC current.

CLASSIFICATION

EN 14700 E Z (Fe2)

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo	Fe	V
0.5	0.5	0.8	7	0.5	Rem	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HRc)
EN 14700	AW	30-58
Typical values	AW	59

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 350	65-90
3.2 x 350	100-130
4.0 x 350	140-160
5.0 x 450	160-210

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 350	CBOX	270	5.0	W000258541
3.2 x 350	CBOX	160	5.4	W000258542
4.0 x 350	CBOX	105	5.0	W000258543
5.0 x 450	CBOX	60	6.0	W000258544

SUPRAMANGAN

TOP FEATURES

- When building up several layers, it is recommended that a buffer layer is deposited with 307 type MMA electrode.
- Flat welding position only.
- Shall be used in DC+ welding current.

CLASSIFICATION

EN 14700 E Z (Fe9)

CURRENT TYPE

AC, DC+

WELDING POSITIONS

Flat/Horizontal

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Cr	Ni	Fe
0.60	15	4.50	4.80	Rem.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		Hardness (HB)
Typical values	AW	180

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
3.2 x 450	110-135
4.0 x 450	140-175

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
3.2 x 450	CBOX	135	6.5	W000258522
4.0 x 450	CBOX	95	6.5	W000258523

SUPRAMANGAN CR

TOP FEATURES

- Basic coated austenitic manganese steel MMA electrode for wear resisting hard facing deposits and for joining.
- Used for hardfacing or buttering on carbon steels and high Mn steels, the deposit is only machinable by grinding.
- The weld metal will increase in hardness by cold-working, from ~ 200-250 HB to ~400-500 HB, therefore it is particularly suitable for components which are subjected mainly to wear, caused by heavy impact and shock.
- When building up several layers, it is recommended that a buffer layer is deposited with 307 type MMA electrode.
- Flat welding position only.
- Shall be used in DC+ current.

CLASSIFICATION

EN 14700 E Z (Fe9)

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

TYPICAL APPLICATIONS

- Hardfacing/ reconditioning of wear resisting components such as crusher jaw plates, crusher cones, pulverising hammers and beating arms

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Cr
0.65	16	12.8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HRc)
Typical values	As welded	23
	After hammer-harden	52

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
4.0 x 450	180-200
5.0 x 450	220-260

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
4.0 x 450	CBOX	64	5.6	W000380866
5.0 x 450	CBOX	41	5.6	W000380869

CITORAIL

TOP FEATURES

- Weld Metal hardness ~275-325HB can be machined by chip-forming.
- Good weldability when positional welding
- Preferred to be used with DC+

CLASSIFICATION

EN 14700 E Fe1

CURRENT TYPE

AC, DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

DB

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Fe
0.09	0.8	0.9	2.4	bal

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HB)
EN 14700	AW	150-450
Typical values	AW	275-325

AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
4.0 x 450	140-180
5.0 x 450	190-240
6.0 x 450	210-280

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
4.0x450	CBOX	85	5.7	W000258525
5.0x450	CBOX	50	5.2	W000258526
6.0x450	CBOX	35	5.2	W000258527

SUPRANEL 182

TOP FEATURES

- Excellent weldability.
- Smooth and stable arc with good slag removal.
- Very good slag removal.

CLASSIFICATION

AWS A5.11 ENiCrFe-3
EN ISO 14172-A E Ni 6182

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Nb	S	Fe
0.025	5.5	0.4	16	Rem.	2.0	0.01	6.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*		0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -196°C
AWS A5.11	AW	not specified	≥550	≥30	not specified
ISO 14172	AW	≥360	≥550	≥27	not specified
Typical values	AW	400	630	40	125

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	50-70
3.2x300	75-95
4.0x350	100-130
5.0x350	140-170

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	100	1.8	W100380270
3.2 x 300	VPMD	65	1.9	W100380271
4.0 x 350	VPMD	45	2.2	W100380272
5.0 x 350	VPMD	30	3.0	W100380273

SUPRANEL 625

TOP FEATURES

- Excellent weldability.
- Smooth and stable arc.
- Good slag removal.

CLASSIFICATION

AWS A5.11 ENiCrMo-3
EN ISO 14172-A E Ni 6625

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

APPROVALS

ABS	BV	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Nb	Fe
0.03	0.5	0.35	22	Rem	9	3.4	0.9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -196°C
AWS A5.11 AW	not specified	≥760	≥30	not specified
EN ISO 14172-A AW	≥420	760	≥27	not specified
Typical values AW	510	770	44	92

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	45-70
3.2 x 300	70-100
4.0 x 350	100-130

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	110	1.9	W100258497
3.2 x 300	VPMD	68	1.8	W100258498
4.0 x 350	VPMD	51	2.3	W100258499

SUPRANEL NiCu7

TOP FEATURES

- Typical specifications for the nickel-copper base metal are ASTM B127, B163, B164, B165, all of which have UNS Number N04400.
- The weld metal has a high corrosion resistance in saline solution and seawater.
- Suitable for joining and for surfacing of unalloyed or low-alloy steels and cast iron.

CLASSIFICATION

AWS A5.11 ENiCu-7
EN ISO 14172-A E Ni 4060

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Cu	Fe	Ti	Al
0.08	3.5	1.2	0.01	0.005	63	30	1	0.9	0.03

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	0.2% Proof strength (MPa)	Tensile strength (MPa)	Elongation (%)		Impact ISO-V (J) -30°C
				4d	5d	
Typical values	AW	not specified	≥480	≥30		not specified
	AW	≥200	≥410	not specified	≥27	not specified
	AW	320	520	40	35	110

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5 x 300	50-70
3.2 x 350	75-100
4.0 x 350	90-130

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	118	2.0	W100288087
3.2 x 350	VPMD	68	2.1	W100288088
4.0 x 350	VPMD	45	2.2	W000288089

SUPERFONTE Ni

TOP FEATURES

- Easy arc striking, stable arc, finely-rippled bead surface, the weld metal is machinable.
- Weld using a low heat input and weld with short beads, ~10 to 30 mm and in order to reduce weld residual stresses, hammer-peen welds immediately after welding and before cooling.

CLASSIFICATION

AWS A5.15 ENi-CI
EN ISO 1071 E C Ni-CI 1

CURRENT TYPE

AC, DC-

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Fe	Ni
0.7	2	Rem

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Hardness (HB)
AWS A5.15	AW	262-414	276-448	3-6	135-218
EN ISO 1071-A	AW	≥200	≥250	≥3	not specified
Typical values	AW	270	445	8	175

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x350	60-80
3.2x350	75-120

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	125	2.1	W100258507
3.2 x 350	VPMD	83	2.6	W100258508

SUPERFONTE NiFe

TOP FEATURES

- Higher weld metal strength than SUPERFONTE Ni.
- Easy striking, stable arc, finely-rippled bead surface.
- Weld at low heat input with short beads, ~10 to 30 mm, and hammer peen. Weld metal can be machined.

CLASSIFICATION

AWS A5.15 ENiFe-CI
EN ISO 1071 E C NiFe-CI 1

CURRENT TYPE

AC, DC-, DC+

WELDING POSITIONS

All position, except vertical down

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Fe	Ni
0.6	40	Rem.

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Hardness (HB)
AWS A5.15	AW	296-434	400-579	6-18	165-218
EN ISO 1071-A	AW	≥250	≥350	≥6	not specified
Typical values	AW	300	460	10	175

* AW = As welded

OUTPUT RANGE

Diameter x Length (mm)	Current range (A)
2.5x300	50-70
3.2x300	70-90
4.0x350	100-120

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Electrodes/pack	Net weight/pack (kg)	Item number
2.5 x 300	VPMD	130	2.1	W100258513
3.2 x 300	VPMD	80	2.1	W100258514
4.0 x 350	VPMD	49	2.4	W100258515

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GMAW
CONSUMABLES
MIG/MAG WIRES

ULTRAFIL 1

TOP FEATURES

- Good performances in terms of feedability and weldability
- Stable arc and low spatter
- High productivity

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 42 3 C1 3Si1
	G 42 4 M21 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + 0,5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.4	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-30°C	-40°C
Typical values	M21	AW	≥420	500-640	≥24	≥90	≥70	≥47
	C1	AW	≥420	500-640	≥22	≥70	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	E08K016P6E11
	SPOOL (BS300)	16.0	E08L016P6E11
1.0	SPOOL (B300)	16.0	E10K016P6E11
	SPOOL (BS300)	16.0	E10L016P6E11
1.2	SPOOL (B300)	16.0	E12K016P6E11
	SPOOL (BS300)	16.0	E12L016P6E11

ULTRAFIL 1A

TOP FEATURES

- Good performances in terms of feedability and weldability
- Stable arc and low spatter
- High productivity

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 46 3 C1 4S11
	G 46 4 M21 4S11

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + 0,5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.7	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-30°C	-40°C
Typical values	M21	AW	≥460	530-680	≥24	≥100	≥80	≥70
	C1	AW	≥460	530-680	≥24	≥80	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	E10K016P3E11
	SPOOL (B300)	16.0	E12K016P3E11
1.2	SPOOL (B5300)	16.0	E12L016P3E11

CARBOFIL

TOP FEATURES

- Used mainly for single pass welding and for steels that have a rusty or dirty surfaces.
- Stable arc and excellent feedability
- Excellent mechanical properties

TYPICAL APPLICATIONS

- General fabrication
- Construction
- Automotive

CLASSIFICATION

AWS A5.18	ER70S-3
EN ISO 14341-A	G 38 3 C1 2Si
	G 42 3 M21 2Si

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

DB	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.1	0.6	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-30 °C
Typical values	M21	AW	≥420	480-550	≥22	≥90	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	C08K016P1E11
1.0	SPOOL (B300)	16.0	C10K016P1E11
1.2	SPOOL (B300)	16.0	C12K016P1E11

CARBOFIL 1

TOP FEATURES

- Very consistent welding performance
- Optimal bead profile appearance and minimal spatters
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive
- Structural fabrication
- Robotics

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 42 3 C1 3Si1
	G 42 4 M21 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + >0,5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	DNV	TÜV	DB	CE
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.4	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20 °C	-30 °C	-40 °C
Typical values	M21	AW	≥420	500-640	≥24	≥90	≥70	≥47
	C1	AW	≥420	500-640	≥22	≥70	≥47	

* AW = As welded

CARBOFIL 1

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)
0.6	SPOOL (S200)	5.0
	SPOOL (S300)	15.0
0.8	SPOOL (S200)	5.0
	SPOOL (S300)	15.0
	SPOOL (B300)	16.0
	SPOOL (BS300)	16.0
	DRUM	300.0
0.9	SPOOL (B300)	16.0
1.0	SPOOL (S200)	5.0
	SPOOL (S300)	15.0
	SPOOL (B300)	16.0
	SPOOL (BS300)	16.0
	DRUM	300.0, 500.0, 600.0
1.2	SPOOL (S200)	5.0
	SPOOL (S300)	15.0
	SPOOL (B300)	16.0
	SPOOL (BS300)	16.0
	DRUM	300.0, 600.0
1.6	SPOOL (B300)	16.0
	DRUM	250.0

MIG/MAG

CARBOFIL 1 GOLD

TOP FEATURES

- Exceptional arc stability, minimal spatters and smooth bead profile
- Low presence of silicates
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive
- Structural fabrication
- Robotics

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 42 3 C1 3Si1
	G 42 4 M21 3Si1

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + >0,5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	DNV	TÜV	DB	CE
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.4	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-20°C	-40°C
Typical values	M21	AW	≥420	500-640	≥24	≥90	≥70	≥47
	C1	AW	≥420	500-640	≥22	≥70	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	G08K016P6E11
	DRUM	300.0	G08D300E6E11
1.0	SPOOL (S300)	15.0	G10P015P6E11
	SPOOL (B300)	16.0	G10K016P6E11
	SPOOL (B5300)	16.0	G10L016P6E11, G10L016P5E11
	DRUM	300.0	G10D300E6E11
	SPOOL (S300)	15.0	G12P015P6E11
1.2	SPOOL (B300)	16.0	G12K016P6E11
	SPOOL (B5300)	16.0	G12L016P6E11
	DRUM	300.0	G12D300E6E11
	DRUM	600.0	G12D600E6Z11
	SPOOL (S300)	15.0	G12P015P6E11
1.32	SPOOL (B5300)	16.0	G13L016P5E11
	DRUM	300.0	G13D300E5E11
1.6	SPOOL (B300)	16.0	G16K016P6E11

CARBOFIL 1A

TOP FEATURES

- Very consistent welding performance
- Optimal bead profile appearance and minimal spatters
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive
- Structural fabrication
- Robotics

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 46 3 C1 4Si1
	G 46 4 M21 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + 0.5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	DNV	TÜV	DB	CE
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.7	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-30°C	-40°C
Typical values	M21	AW	≥460	530-680	≥24	≥100	≥80	≥70
	C1	AW	≥460	530-680	≥24	≥80	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)
0.8	SPOOL (B300)	16.0
	DRUM	300.0
1.0	SPOOL (S300)	15.0
	SPOOL (B300)	16.0
	SPOOL (BS300)	16.0
	DRUM	300.0, 600.0
	SPOOL (S300)	15.0
1.2	SPOOL (B300)	16.0
	SPOOL (BS300)	16.0
	DRUM	300.0, 500.0, 600.0
	SPOOL (B300)	16.0
1.6	SPOOL (B300)	16.0

CARBOFIL 1A GOLD

TOP FEATURES

- Exceptional arc stability, minimal spatters and smooth bead profile
- Low presence of silicates
- Available in all packagings from spools to drums

TYPICAL APPLICATIONS

- General fabrication
- Heavy Fabrication
- Automotive
- Structural fabrication
- Robotics

CLASSIFICATION

AWS A5.18	ER70S-6
EN ISO 14341-A	G 46 3 C1 4S11
	G 46 4 M21 4S11

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M14	Mixed gas Ar+ 0.5-5% CO ₂ + >0,5-3% O ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	DNV	TÜV	DB	CE
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.7	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-30°C	-40°C
Typical values	M21	AW	≥460	530-680	≥24	≥100	≥80	≥70
	C1	AW	≥460	530-680	≥24	≥80	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	G08K016P3E11
	SPOOL (B300)	16.0	G10K016P3E11
1.0	SPOOL (B5300)	16.0	G10L016P3E11
	DRUM	300.0	G10D300E3E11
1.2	SPOOL (B300)	16.0	G12K016P3E11
	SPOOL (B5300)	16.0	G12L016P3E11
	DRUM	300.0	G12D300E3E11
	DRUM	500.0	G12D500ETV11
	DRUM	600.0	G12D600E3Z11
1.32	SPOOL (B5300)	16.0	G13L016PTE11
1.6	DRUM	500.0	G16D500ETV11

CARBOFIL CRMO1

TOP FEATURES

- Excellent mechanical characteristics.
- Can also be used to weld 0.9% Cr and 0.5% Mo steels.
- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28	ER80S-G
EN ISO 21952-A	G CrMo1Si

SHIELDING GASES (ACC. EN ISO 14175)

M20	Mixed gas Ar+ >5-15% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂
M24	Mixed gas Ar+ >5-15% CO ₂ + >0,5-3% O ₂
M26	Mixed gas Ar+ >15-25% CO ₂ + >0,5-3%O ₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.08	1.2	0.6	≤0.020	≤0.020	1.2	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	
Typical values	M21	PWHT 690°C/1h	≥355	≥550	≥20	≥80

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000282958
1.2	SPOOL (B300)	16.0	W000282960

CARBOFIL CRMO2

TOP FEATURES

- Deposit insensitive to cracking.
- Good radiographic quality.
- Also suitable for the welding of 2.25Cr 1Mo steels where improved resistance to hydrogen attack or corrosion by sulphur is required.

TYPICAL APPLICATIONS

- Oil & Gas
- Thermal Power
- Pressure vessels
- Chemical
- Boilers, plates, tubes steels

CLASSIFICATION

AWS A5.28 ER90S-G
EN ISO 21952-A G CrMo2Si

SHIELDING GASES (ACC. EN ISO 14175)

M20 Mixed gas Ar+ >5-15% CO₂
M21 Mixed gas Ar+ >15-25% CO₂
M24 Mixed gas Ar+ >5-15% CO₂+
>0,5-3% O₂
M26 Mixed gas Ar+ >15-25% CO₂+
>0,5-3%O₂

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.09	1.2	0.7	≤0.020	≤0.020	2,5	1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	
Typical values	M21	PWHT 690°C/1h	≥400	≥620	≥18	≥47

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000282963

CARBOFIL CRM05

TOP FEATURES

- Used in the chemical industry and in ammonia synthesis processes.
- Ideal for elevated temperature creep resisting steels
- Suitable for low temperature applications.

TYPICAL APPLICATIONS

- Power Generation
- Petrochemical

CLASSIFICATION

AWS A5.28 ER80S-B6
EN ISO 21952-A G CrMo5Si

SHIELDING GASES (ACC. EN ISO 14175)

M20 Mixed gas Ar+ >5-15% CO₂
M21 Mixed gas Ar+ >15-25% CO₂
M24 Mixed gas Ar+ >5-15% CO₂+ >0,5-3% O₂
M26 Mixed gas Ar+ >15-25% CO₂+ >0,5-3% O₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.07	0.5	0.5	≤0.020	≤0.020	5.70	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	
Typical values	M21	PWHT 760°C/1h	≥470	≥590	≥17	≥47

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000282968

CARBOFIL CRM091

TOP FEATURES

- Ideal for welding of creep resisting steels.
- This product is suitable for applications in long-term service at temperatures up to 650°C.

TYPICAL APPLICATIONS

- Power Generation
- Petrochemical

CLASSIFICATION

AWS A5.28 ER90S-B91
EN ISO 21952-A G CrMo91

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo	Nb	V
0.11	0.5	0.40	9.25	0.45	0.95	0.06	0.22

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values M12	PWHT 760°C/2h	≥620	≥720	≥19	≥50

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	15.0	W000386460

CARBOFIL KV3

TOP FEATURES

- Very clean welding wire with guaranteed X<15 ppm Bruscato factor, and with controlled As, Sb, Sn content against temper embrittlement.
- Ideal for the welding of creep resistant steels
- Also suitable for the welding of 1½Cr 1Mo steels where improved resistance to hydrogen attack or corrosion by sulphur is required. Main applications are welding of boilers, plates and tubes as well as oil refineries e.g. in crack plants produced from mainly 10CrMo9-10 (ASTM A335 Gr. P/T22).

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation

CLASSIFICATION

AWS A5.28 ER90S-B3
EN ISO 21952-B G 62M 2C1M

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Cu
0.075	0.55	0.57	0.005	0.005	2.5	0.1	1.0	0.1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20° C
Typical values M21	PWHT 620°C/1h	≥540	≥620	≥20	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000283639

CARBOFIL KV5

TOP FEATURES

- Very clean welding wire with guaranteed X<15 ppm Bruscato factor, and with controlled As, Sb, Sn content against temper embrittlement.
- Ideal for the welding of creep resistant steels
- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required.

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation

CLASSIFICATION

AWS A5.28 ER80S-B2
EN ISO 21952-B G 55 M 1CM

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Cu
0.09	0.55	0.55	0.005	0.005	1.3	0.05	0.5	0.12

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20° C	
Typical values	M21	PWHT 620°C/1h	≥470	≥550	≥20	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (S300)	15.0	W000283634
1.2	SPOOL (S300)	15.0	W000283636

CARBOFIL MNMO

TOP FEATURES

- Suitable for applications in petrochemical process plant where some resistance to hot hydrogen attack is necessary
- Increased deposit strength thanks to Mn content
- For welding 0.5% Mo low-alloy steels and for high strength steels.

TYPICAL APPLICATIONS

- Nuclear Power generation
- Petrochemical
- Pipelaying
- Cranes

CLASSIFICATION

AWS A5.28 ER80S-D2
EN ISO 14341-A G 50 4 M21 4Mo

SHIELDING GASES (ACC. EN ISO 14175)

M20 Mixed gas Ar+ >5-15% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL WIRE

C	Mn	Si	P	S	Mo
0.09	1.80	0.60	0.014	0.010	0.40

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥600	≥690	≥20	≥58

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	S10K016PDE11
1.2	SPOOL (B300)	16.0	S12K016PDE11

CARBOFIL MNNIMOCR

TOP FEATURES

- Used for welding in low temperature applications >-40°C.
- For welding high yield strength steels.
- The weld metal contains less than 1% Ni conforming to NACE requirement.

TYPICAL APPLICATIONS

- Infrastructures
- Pipelaying
- Cranes

CLASSIFICATION

AWS A5.28 ER100S-G
EN ISO 16834-A G 62 4 M21 Mn3NiCrMo

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.09	1.65	0.75	0.010	0.010	0.55	0.55	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C	
Typical values	M21	AW	≥690	≥790	≥21	≥95

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	S10K016PZE11
1.2	SPOOL (B300)	16.0	S12K016PZE11

CARBOFIL MO

TOP FEATURES

- Used for welding low alloy creep resistant ferritic steels and fine grained steels
- Ideal for low temperature applications in the as welded condition with service temperatures in range -30°C to +500°C
- Recommended for welding 0.5% Mo low-alloy steels and for high strength steels.

TYPICAL APPLICATIONS

- Chemical plant construction
- Petrochemical
- Oil & Gas
- Thermal Power

CLASSIFICATION

AWS A5.28 ER70S-A1
 EN ISO 14341-A G 46 3 M21 2Mo
 EN ISO 21952-A G MoSi

SHIELDING GASES (ACC. EN ISO 14175)

M20 Mixed gas Ar+ >5-15% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Mo
0.1	1.1	0.6	≤0.020	≤0.020	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-20°C
Typical values	M21	AW*	≥480	515-620	≥22	≥100	≥47
	M21	PWHT 580°C/15h**	≥380	480-560	≥19	≥100	≥47

* AW = As welded

** PWHT = Post welding heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	W000282948
1.0	SPOOL (B300)	16.0	W000282950
1.2	SPOOL (B300)	16.0	W000282952

CARBOFIL NI2

TOP FEATURES

- Excellent mechanical characteristic both when welded and after stress relieving.
- High impact value at low temperature (-60°C as welded and -90°C after stress relieving 15h/580°C)
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- LNG
- Cryogenic Applications

CLASSIFICATION

AWS A5.28 ER80S-Ni2
EN ISO 14341-A G 46 7 M21 2Ni2

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.08	1.1	0.5	≤0.020	≤0.020	2.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-70°C	-90°C
Typical values	M21	AW	≥460	550-680	≥22	>120	≥47	
	M21	PWHT 580°C/15h	≥460	550-680	≥22	≥130	≥70	≥47

* AW = As welded, PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000282982

CARBOFIL NICU

TOP FEATURES

- The addition of Ni and Cu to the weld metal provides increased resistance to atmospheric corrosion compared to conventional C-Mn steels
- Copper percentage help preventing further oxidation of the weld bead
- Excellent mechanical characteristics and resistance to corrosion.

TYPICAL APPLICATIONS

- Infrastructures
- Transmission towers, barriers, ducting, chimneys
- Exhaust Systems

CLASSIFICATION

AWS A5.28 ER80S-G
 EN ISO 14341-A G 42 3 C1 Z
 G 42 4 M21 Z

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Cu
0.09	1.4	0.8	≤0.025	≤0.025	0.8	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
						+20°C	-30°C	-40°C
Typical values	M21	AW	≥420	500-640	≥22	≥120	≥90	>80
	C1	AW	>420	500-640	≥22	≥100	≥47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B300)	16.0	508K016PCE11
1.0	SPOOL (B300)	16.0	510K016PCE11
1.2	SPOOL (B300)	16.0	512K016PCE11

CARBOFIL NIMO1

TOP FEATURES

- The weld metal has good impact toughness values down to -40°C .
- Low heat inputs are recommended to obtain optimum joint mechanical properties.

TYPICAL APPLICATIONS

- Cranes
- Pipelaying

CLASSIFICATION

AWS A5.28 ER100S-G
EN ISO 16834-A G 62 4 M21 Mn3Ni1Mo

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO_2
M21 Mixed gas Ar+ >15-25% CO_2

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Mo
0.08	1.5	0.7	0.010	0.010	1.1	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	M21	AW	≥ 620	700-890	≥ 18	≥ 100	≥ 60
	C1	AW	> 550	640-820	≥ 18	≥ 100	≥ 47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000282914
1.2	SPOOL (B300)	16.0	W000282916

CARBOFIL NIMOCR

TOP FEATURES

- Excellent mechanical properties.
- For low temperature applications down to -40°C .
- Low heat inputs are recommended to obtain optimum joint mechanical properties.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes
- Structural Steels

CLASSIFICATION

AWS A5.28	ER110S-G
EN ISO 16834-A	G 69 4 M21 Mn3Ni1CrMo

SHIELDING GASES (ACC. EN ISO 14175)

M20	Mixed gas Ar+ >5-15% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂
M24	Mixed gas Ar+ >5-15% CO ₂ + >0,5-3% O ₂
M26	Mixed gas Ar+ >15-25% CO ₂ + >0,5-3% O ₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	1.6	0.5	≤0.015	≤0.015	0.25	1.5	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥700	≥790	≥20	≥64

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (S300)	15.0	S10P015PVE11
	SPOOL (B300)	16.0	S10K016PVE11
	DRUM	300.0	S10D300EVE11
1.2	SPOOL (B300)	16.0	S12K016PVE11
	DRUM	300.0	S12D300EVE11
1.6	SPOOL (B300)	16.0	S16K016PVE11

CARBOFIL 2NIMOCR

TOP FEATURES

- Excellent mechanical properties.
- Up to 890 MPa yield strength steels
- Can be used for low temperature applications up to -40°C.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes
- Structural Steels

CLASSIFICATION

AWS A5.28	ER1205-G
EN ISO 16834-A	G 89 4 M21 Mn4Ni2CrMo

SHIELDING GASES (ACC. EN ISO 14175)

M20	Mixed gas Ar+ >5-15% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂
M24	Mixed gas Ar+ >5-15% CO ₂ + >0,5-3% O ₂
M26	Mixed gas Ar+ >15-25% CO ₂ + >0,5-3% O ₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.08	1.7	0.7	≤0.015	≤0.018	0.4	2.2	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	M21	AW	≥890	≥940	≥15	≥80	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000289173
1.2	SPOOL (B300)	16.0	W000289176
	DRUM	300.0	W000289177

CARBOFIL 3NIMOCR

TOP FEATURES

- Excellent mechanical properties.
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Infrastructures
- Earthmoving
- Cranes

CLASSIFICATION

AWS A5.28	ER 120S-G
EN ISO 16834-A	G 89 5 M21 Mn4Ni2.5CrMo

SHIELDING GASES (ACC. EN ISO 14175)

M20	Mixed gas Ar+ >5-15% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂
M24	Mixed gas Ar+ >5-15% CO ₂ + >0,5-3% O ₂
M26	Mixed gas Ar+ >15-25% CO ₂ + >0,5-3% O ₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.11	1.9	0.8	≤0.015	≤0.018	0.55	2.4	0.55

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-50 °C
Typical values	M21	AW	≥930	≥980	≥14	≥70	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000377715

INERTFIL 307

TOP FEATURES

- The increased silicon content promotes weld pool fluidity resulting in a smoother weld deposit.
- Useful in case of difficult weldability.
- Often used as a buffer layer for hardfacing applications

TYPICAL APPLICATIONS

- Exhaust Systems
- Dissimilar joints
- Hardfacing
- Quenched and tempered steels

CLASSIFICATION

AWS A5.9 ER307*
EN ISO 14343-A G 18 8 Mn

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.10	7	0.8	≤0.030	≤0.025	19	9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	M12	AW	≥420	≥590	≥40	≥100	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (BS300)	15.0	W000283109
1.0	SPOOL (BS300)	15.0	W000283110
1.2	SPOOL (BS300)	15.0	W000283111
	DRUM	250.0	W000378431

INERTFIL 308L

TOP FEATURES

- The low carbon content reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The weld metal provides good corrosion resistance properties to intergranular attack from a range of liquid media at service temperatures up to 300°C.
- Better weldability and appearance

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation
- Cladding

CLASSIFICATION

AWS A5.9 ER308L
EN ISO 14343-A G 19 9 L

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.45	≤0.025	≤0.020	20	10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	M13	AW	≥350	≥520	≥35	≥140	≥40

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000282986
1.2	SPOOL (BS300)	15.0	W000282988

INERTFIL 308LSI

TOP FEATURES

- The low carbon content reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Better weldability and appearance

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Vessel construction
- Cladding

CLASSIFICATION

AWS A5.9 ER308LSi
EN ISO 14343-A G 19 9 L Si

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.85	≤0.025	≤0.020	20	10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-120 °C
Typical values	M13	AW	≥350	≥520	≥35	≥80	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (S200)	5.0	W000283000
	SPOOL (BS300)	15.0	W000283002
1.0	SPOOL (S200)	5.0	W000283005
	SPOOL (BS300)	15.0	W000283007
1.2	SPOOL (BS300)	15.0	W000283013
1.6	SPOOL (BS300)	15.0	W000283018

INERTFIL 309L

TOP FEATURES

- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- Also used for the welding of clad steels where service temperatures are below 300 °C.
- 300 °C maximum operating temperature.

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation
- Dissimilar joints
- Cladding

CLASSIFICATION

AWS A5.9 ER309L
EN ISO 14343-A G 23 12 L

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.45	≤0.025	≤0.020	24	13

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-80 °C
Typical values	M13	AW	≥350	≥520	≥30	≥55	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (BS300)	15.0	W000283090
1.0	SPOOL (BS300)	15.0	W000283091
1.2	SPOOL (BS300)	15.0	W000283092

INERTFIL 309LMO

TOP FEATURES

- The weld metal has a delta-ferrite content of ~15% resulting in a high resistance to hot cracking.
- Also used for buffer layers prior to surfacing, where the Mo is a required alloying element.
- Used for dissimilar joints such as carbon and duplex.

TYPICAL APPLICATIONS

- Dissimilar joints
- Cladding

CLASSIFICATION

AWS A5.9	ER309LMO
EN ISO 14343-A	G 23 12 2 L

SHIELDING GASES (ACC. EN ISO 14175)

M12	Mixed gas Ar+ 0.5-5% CO ₂
M13	Mixed gas Ar+ 0.5-3% O ₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.012	1.44	0.35	0.019	0.002	21.5	14.5	2.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	M13	AW	≥350	≥550	≥30	≥55

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000283100
1.2	SPOOL (BS300)	15.0	W000283101

INERTFIL 309LSI

TOP FEATURES

- Also used for the welding of clad steels where service temperatures are below 300 °C.
- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- General fabrication
- Transport
- Process Industries

CLASSIFICATION

AWS A5.9 ER309LSi
EN ISO 14343-A G 23 12 L Si

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.85	≤0.025	≤0.020	24	13

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-120 °C
Typical values	M12	AW	≥350	≥520	≥30	≥100	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B5300)	15.0	W000283093
1.0	SPOOL (B5300)	15.0	W000283094
1.2	SPOOL (B5300)	15.0	W000283095

INERTFIL 310

TOP FEATURES

- High temperature ductility and excellent resistance to oxidation at working temperatures <1000°C.
- The weld deposit is fully austenitic
- Excellent corrosion resistance even when hot.

TYPICAL APPLICATIONS

- Petrochemical
- Heat Exchangers
- Hot water boilers
- Fabrication of furnaces

CLASSIFICATION

AWS A5.9 ER310
EN ISO 14343-A G 25 20

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.12	1.8	0.6	≤0.020	≤0.020	26	21

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	M13	AW	≥350	≥550	≥30	≥70

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000283115
1.2	SPOOL (BS300)	15.0	W000283116

INERTFIL 316L

TOP FEATURES

- The weld metal has a high resistance to crevice corrosion by oxidising acids.
- Excellent mechanical and chemical characteristics.
- Suitable for welding or hard-facing stainless steels with the same chemical composition

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation
- Cladding

CLASSIFICATION

AWS A5.9 ER316L
EN ISO 14343-A G 19 12 3L

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.020	1.4	0.45	≤0.025	≤0.020	19	12.5	2.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-196 °C
Typical values	M13	AW	≥350	≥510	≥30	≥130	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000283045
1.2	SPOOL (BS300)	15.0	W000283047

INERTFIL 316LSI

TOP FEATURES

- The higher Si level results in a smooth weld bead shape and even appearance with excellent toe blending particularly in fillet welds.
- The weld metal has a high resistance to pitting and crevice corrosion by non-oxidising acids.
- Used for applications with service temperatures <400°C.

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding
- Cladding

CLASSIFICATION

AWS A5.9 ER316LSi
EN ISO 14343-A G 19 12 3 L Si

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.020	1.8	0.85	≤0.025	≤0.020	19	12.5	2.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	M13	AW	≥350	≥510	≥30	≥80	>32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (S200)	5.0	W000283058
	SPOOL (BS300)	15.0	W000283060
1.0	SPOOL (S200)	5.0	W000283063
	SPOOL (BS300)	15.0	W000283065
1.2	SPOOL (BS300)	15.0	W000283070
1.6	SPOOL (BS300)	15.0	W000283075

INERTFIL 318SI

TOP FEATURES

- High resistance to intergranular corrosion and general corrosion conditions
- The increased silicon results in increased weld pool fluidity to give a smooth deposit appearance.
- The presence of the stabilizer improves resistance to precipitation of chromium carbides.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER318*
EN ISO 14343-A G 19 12 3 Nb Si

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Nb
0.04	1.4	0.85	≤0.025	≤0.020	19	12	2.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-110°C
Typical values	M13	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B5300)	15.0	W000378425
1.0	SPOOL (B5300)	15.0	W000283088
1.2	SPOOL (B300)	15.0	W000283089

INERTFIL 347

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the possibility of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER347
EN ISO 14343-A G 19 9 Nb

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb
0.040	1.6	0.45	≤0.025	≤0.020	19.5	10	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	M13	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000283036

INERTFIL 347Si

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the possibility of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- Process Industries
- Pharmaceutical Equipment
- High Temperature Stainless Applications

CLASSIFICATION

AWS A5.9 ER347Si
EN ISO 14343-A G 19 9 Nb Si

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb
0.040	1.6	0.8	≤0.025	≤0.020	19.5	10	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	M13	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	15.0	W000283041
1.2	SPOOL (BS300)	15.0	W000283042

INERTFIL 22 9 3

TOP FEATURES

- Used for the welding of duplex stainless steels in a range of applications
- The weld metal has a PREN value >35 giving a high resistance to pitting and stress corrosion cracking especially in high chloride media.
- Excellent corrosion resistance and mechanical characteristics of the deposit

TYPICAL APPLICATIONS

- Pipelaying
- Shipbuilding
- Petrochemical

CLASSIFICATION

AWS A5.9 ER2209
EN ISO 14343-A G 22 9 3 N L

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	N
0.020	1.7	0.5	≤0.025	≤0.020	23	9	3	0.15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	-40°C
Typical values	AW	≥480	≥690	≥22	≥50	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000283138
1.2	SPOOL (BS300)	15.0	W000283139

INERTFIL 410NiMo

TOP FEATURES

- It contains less chromium and more nickel to eliminate ferrite in the microstructure as it has a deleterious effect on mechanical properties.
- AISI 410NiMo steels are self-hardening steels and usually require pre-heating and stress relieving treatments in order to obtain adequate ductility.
- Good corrosion resistance especially after hardening and tempering.

TYPICAL APPLICATIONS

- Hydro turbines construction

CLASSIFICATION

AWS A5.9 ER410NiMo*
EN ISO 14343-A G 13 4

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

M12 Mixed gas Ar+ 0.5-5% CO₂
M13 Mixed gas Ar+ 0.5-3% O₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.04	0.5	0.4	≤0.030	≤0.020	12	4	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	
Typical values	M13	PWHT 600°C/8h	≥500	≥760	≥15	≥50

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000283130

COPPERFIL CUAL8

TOP FEATURES

- Used for welding galvanized steel sheets and components in the automobile industry.
- It is an iron-free aluminum bronze, which composition offers a very high resistance to sea water-corrosion and to the most commonly used acids in any concentrations and at a wide range of operating temperatures.
- High erosion resistance.

TYPICAL APPLICATIONS

- Automotive components
- Galvanized Steels

CLASSIFICATION

AWS A5.7 ER CuAl-A1
EN ISO 24373-A S Cu 6100 (CuAl7)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Mn	Si	Ni	Cu	Fe	Al
0.2	0.1	0.7	Rest	0.4	8.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C	Hardness (HB)
Typical values	I1	AW	390-450	≥45	>80	80-100

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000283249
1.2	SPOOL (BS300)	15.0	W000283253

COPPERFIL CUSI3

TOP FEATURES

- This wire is frequently used for joining in artistic foundries, for welding galvanized sheets and even as a steel cladding.
- It is also suitable for surfaces subject to corrosion.
- Used also for MIG brazing where a very small active component is suggested in the shielding gas.

TYPICAL APPLICATIONS

- Cladding
- Brazing
- Automotive

CLASSIFICATION

AWS A5.7 ER CuSi-A
EN ISO 24373-A S Cu 6560 (CuSi3Mn1)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Mn	Si	Cu	Fe	Al
1.1	3.4	Rest	0.2	0.01

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	Hardness (HB)
Typical values	I1	AW	>100	>345	≥40	>50	80-90

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	DRUM	200.0	W000283276

ALUFIL ALS15

TOP FEATURES

- Designed for welding heat-treatable base alloys and more specifically the 6XXX series alloys
- Low sensitivity to weld cracking with the 6XXX series base alloys
- Lower melting point and more fluidity than the 5XXX series filler alloys

TYPICAL APPLICATIONS

- Bicycle frames
- Automotive components such as frame and drive shafts

CLASSIFICATION

AWS A5.10	ER4043
EN ISO 18273-A	S Al 4043 (AlSi5)

SHIELDING GASES (ACC. EN ISO 14175)

I1	Inert gas Ar (100%)
I3	Inert gas Ar+ 0.5-95% He

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL WIRE

Al	Si	Fe	Cu	Mn	Mg	Zn	Ti	Be
bal.	5.26	0.15	0.01	0.01	0.03	0.001	0.01	<0.0002

Note: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	20-40	120-165	3-18

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	7.0	W000283183
1.2	SPOOL (BS300)	7.0	W000283184
1.6	SPOOL (BS300)	7.0	W000283185

ALUFIL ALMG3

TOP FEATURES

- Magnesium alloyed aluminium for welding of alloys with a maximum of 3.5%
- Good corrosion resistance and excellent colour match after anodizing
- Higher strength comparing with Si-alloyed Al welding wires.

TYPICAL APPLICATIONS

- General Constructions
- Structural Industry

CLASSIFICATION

AWS A5.10 ER5754
EN ISO 18273-A S Al 5754 (AlMg3)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

APPROVALS

CE

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Cr	Ti	Be
bal.	0.07	0.13	0.01	0.29	3.0	0.06	0.05	0.0004

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	70-80	180-200	15-20

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	7.0	W000283193

ALUFIL ALMG5

TOP FEATURES

- General purpose filler alloy for 5XXX and 6XXX series alloys
- The most widely used welding alloy
- High strength filler metal

TYPICAL APPLICATIONS

- Shipbuilding
- Railway Industry
- Automotive
- Storage tanks
- Power Industry

CLASSIFICATION

AWS A5.10	ER5356
EN ISO 18273-A	S Al 5356 (AlMg5Cr(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1	Inert gas Ar (100%)
I3	Inert gas Ar+ 0.5-95% He

APPROVALS

LR	BV	DNV	RINA	TÜV	DB	CE
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Be
bal.	0.05	0.09	0.03	0.12	4.90	0.08	<0.01	0.15	0.0002

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	110-120	240-296	17-26

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
0.8	SPOOL (B5300)	7.0	W000283218
	SPOOL (S200)	2.0	W000283219
1.0	SPOOL (B5300)	7.0	W000283221
	SPOOL (B5300)	7.0	W000283225
1.2	SPOOL (B5300)	7.0	W000283225
	SPOOL (S300)	7.0	W000283224
1.6	SPOOL (B5300)	7.0	W000283229

ALUFIL ALMG4.5MN

TOP FEATURES

- Designed for welding heat-treatable base alloys and more specifically the 6XXX series alloys
- Low sensitivity to weld cracking with the 6XXX series base alloys
- Lower melting point and more fluidity than the 5XXX series filler alloys

TYPICAL APPLICATIONS

- Shipbuilding
- Marine
- Cryogenic Industries
- High strength structural aluminum fabrication

CLASSIFICATION

AWS A5.10	ER5183
EN ISO 18273-A	S Al 5183 (AlMg4.5Mn0.7(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1	Inert gas Ar (100%)
I3	Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Mn	Mg	Cr	Ti	Cu	Fe
Rem	0.3	0.8	4.5	0.1	0.1	0.1	0.1

Note: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I3	AW	≥125	≥275	≥17

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	7.0	W000283200
1.2	SPOOL (BS300)	7.0	W000283203
	SPOOL (S300)	7.0	W000283202

CARBOCAST NIFE

TOP FEATURES

- Suitable for cast irons with globular graphite (GJS), black-heart cast iron (GJMB), white-heart cast iron (GJMW), austenitic cast iron and dissimilar joints to steel.
- Weld at low heat input with short beads, ~10 to 30mm, and hammer peen.
- Weld metal can be machined.

TYPICAL APPLICATIONS

- Cast Iron
- Maintenance
- Repair

CLASSIFICATION

EN ISO 1071-A S NiFe1

SHIELDING GASES (ACC. EN ISO 14175)

I1	Inert gas Ar (100%)
M12	Mixed gas Ar+ 0.5-5% CO ₂
M13	Mixed gas Ar+ 0.5-3% O ₂

APPROVALS

DB	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Ni	Cu	Fe	Al
0.9	0.8	0.7	55	1.0	42	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C	Hardness (HB)
Typical values	M12	AW	≥290	≥400	≥20	≥80	150-200

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000283707
	DRUM	250.0	W000400785

NIFIL 600

TOP FEATURES

- Used for 3%, 5% and 9% nickel steels to give good strength and toughness in LPG and LNG processing or storage plant.
- In sulphurous atmosphere the weld metal can be used <500°C.
- Used for joining ferritic to austenitic steels (dissimilar) with operating temperatures or postweld heat treatment higher than 300°C.

TYPICAL APPLICATIONS

- Cryogenic Applications
- Cladding
- Nuclear Power generation
- Petrochemical

CLASSIFICATION

AWS A5.14 ERNiCr-3
EN ISO 18274-A S Ni 6082 (NiCr20Mn3Nb)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb	Fe	Ti
0.050	3	0.3	≤0.020	≤0.015	20	Rest	2.5	2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	I3	AW	≥380	≥620	≥35	≥100	≥55

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000378508
	DRUM	250.0	W000404403
1.2	SPOOL (BS300)	15.0	W000378509

NIFIL 625

TOP FEATURES

- In sulphur-free atmospheres the weld metal is non-scaling <1200 °C, in sulphurous atmospheres the weld metal can be used <500 °C.
- Used for joining ferritic to austenitic steels (dissimilar) with operating temperatures or postweld heat treatment >300 °C.
- Very resistant to stress corrosion cracking and pitting corrosion in a range of media including phosphoric acid, organic acids, sea water and polluting environments

TYPICAL APPLICATIONS

- Cryogenic Applications
- Cladding
- Petrochemical
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.14 ERNiCrMo-3
EN ISO 18274-A S Ni 6625 (NiCr22Mo9Nb)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	Fe	Ti
0.025	0.4	0.3	≤0.020	≤0.015	21	Rest	9	3.5	0.3	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-196 °C
Typical values	I3	AW	≥460	≥720	≥30	≥100	≥40

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000378519
1.2	SPOOL (BS300)	15.0	W000283171

CARBOFIL A 600

TOP FEATURES

- High resistance against corrosion, abrasion and impact deformation. Hardness approximately 55-60HRc
- Weld deposits can be used at service temperatures <450°C with a minimal loss of abrasion resistance. The as deposited weld metal can be shaped or profiled by grinding.
- Ferritic and martensitic structure

TYPICAL APPLICATIONS

- Hardfacing
- Repair
- Earthmoving

CLASSIFICATION

EN 14700 S Fe 8

SHIELDING GASES (ACC. EN ISO 14175)

M20 Mixed gas Ar+ >5-15% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂
 M24 Mixed gas Ar+ >5-15% CO₂+ >0,5-3% O₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr
0.5	0.4	3	9.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Hardness (HRc)
Typical values	AW	57-62

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (BS300)	15.0	W000378757
1.2	SPOOL (BS300)	15.0	W000283294

GTAW CONSUMABLES

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GTAW
CONSUMABLES
TIG RODS

CARBOROD

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -40°C.
- Stable Arc

TYPICAL APPLICATIONS

- General fabrication
- Construction

CLASSIFICATION

AWS A5.18 ER70S-3
EN ISO 636-A W 42 4 2Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.07	1	0.65	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	I1	AW	≥420	500-640	≥22	≥90	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	T16T005R1S11
2.0	PE Tube	5.0	T20T005R1S11
2.4	PE Tube	5.0	T24T005R1S11
3.2	PE Tube	5.0	T32T005R1S11

CARBOROD 1

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -40°C.
- Smooth bead appearance

TYPICAL APPLICATIONS

- General fabrication
- Construction

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 636-A W 42 4 3S11

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL WIRE

C	Mn	Si	P	S
0.08	1.5	0.9	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	I1	AW	≥420	500-640	≥24	≥90	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.2	PE Tube	5.0	W000283321
1.6	PE Tube	5.0	T16T005R6S11
2.0	PE Tube	5.0	T20T005R6S11
2.4	PE Tube	5.0	T24T005R6S11
3.2	PE Tube	5.0	T32T005R6S11

CARBOROD 1A

TOP FEATURES

- Excellent mechanical and toughness properties for low temperature applications, down to -40°C.
- Smooth bead appearance

TYPICAL APPLICATIONS

- General fabrication
- Construction

CLASSIFICATION

AWS A5.18 ER70S-6
EN ISO 636-A W 46 4 4Si1

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.08	1.7	0.9	≤0.020	≤0.020

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	I1	AW	≥460	550-680	≥24	≥120	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	T16T005R3S11
2.0	PE Tube	5.0	T20T005R3S11
2.4	PE Tube	5.0	T24T005R3S11
3.2	PE Tube	5.0	T32T005R3S11

TIG

CARBOROD GALVA

TOP FEATURES

- Better fusion characteristics compared to standard unalloyed rods
- Spatter free welding with a good bead appearance

TYPICAL APPLICATIONS

- Galvanized Steels

CLASSIFICATION

AWS A5.18 ER70S-2*
EN ISO 636-A W2Ti

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ti	Al	Zr
0.06	1.30	0.65	≤0.025	≤0.025	0.13	0.10	0.11

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	-20°C
Typical values	I1	≥420	500-640	≥24	≥100	≥50

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283341
2.4	PE Tube	5.0	W000283343

CARBOROD MO

TOP FEATURES

- Used for welding low alloy creep resistant ferritic steels and fine grained steels
- Ideal for low temperature applications in the as welded condition with service temperatures in range -20°C to +500°C

TYPICAL APPLICATIONS

- Chemical plant construction
- Petrochemical
- Oil & Gas
- Thermal Power
- Nuclear

CLASSIFICATION

AWS A5.28 ER 70S-A1
 EN ISO 21952-A W MoSi
 EN ISO 636-A W 2Mo

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Mo
0.10	1.0	0.6	≤0.020	≤0.020	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-20°C
Typical values	I1	AW	≥480	≥550	≥29	≥120	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.2	PE Tube	5.0	W000283352
1.6	PE Tube	5.0	W000283353
2.0	PE Tube	5.0	W000283354
2.4	PE Tube	5.0	W000283355
3.2	PE Tube	5.0	W000283356

CARBOROD MNMO

TOP FEATURES

- Molybdenum content increases deposit strength
- High level of deoxidizers (Mn/Si) control porosity
- Used in as welded and post weld heat treated conditions

TYPICAL APPLICATIONS

- Nuclear Power generation
- Petrochemical
- Pipelaying
- Cranes

CLASSIFICATION

AWS A5.28 ER 80S-D2
EN ISO 21952-B W 3M3*

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Mo
0.09	1.9	0.6	≤0.02	≤0.02	0.15	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	I1	PWHT 620°C/1h	≥470	≥550	≥22	≥47

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283361
2.0	PE Tube	5.0	W000283362
2.4	PE Tube	5.0	W000283363

CARBOROD NIMO1

TOP FEATURES

- The weld metal has good impact toughness values down to -40°C.
- Low heat inputs are recommended to obtain optimum joint mechanical properties.

TYPICAL APPLICATIONS

- Cranes
- Pipelaying

CLASSIFICATION

AWS A5.28 ER 1005-G
EN ISO 16834-A W Mn3Ni1Mo

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Mo
0.08	1.8	0.6	≤0.015	≤0.018	1.0	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	I1	AW	≥620	700-890	≥20	≥120	≥80

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283349

CARBOROD Ni2

TOP FEATURES

- Excellent mechanical characteristic both when welded and after stress relieving.
- High impact value at low temperature (-60°C as welded and -90°C after stress relieving 15h/580°C)
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Offshore
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.28 ER 80S-Ni2
EN ISO 636-A W 46 9 2Ni2

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.08	1.1	0.5	≤0.015	≤0.015	2.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20°C	-70°C	-90°C
Typical values I1	AW	≥460	550-680	≥24	≥150	≥60	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283401

CARBOROD NI1

TOP FEATURES

- The weld metal contains less than 1% Ni conforming to NACE requirements
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Offshore
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.28 ER 80S-Ni1
EN ISO 636-A W 46 6 3Ni1

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.08	1.1	0.6	≤0.020	≤0.020	0.9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-60°C
Typical values	I1	AW	≥460	550-680	≥24	≥120	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283392
2.0	PE Tube	5.0	W000283393
2.4	PE Tube	5.0	W000283394
3.2	PE Tube	5.0	W000283395

CARBOROD NI3

TOP FEATURES

- Excellent mechanical characteristic both when welded and after stress relieving.
- Ideal for low temperature applications.

TYPICAL APPLICATIONS

- Offshore
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.28 ER 80S-Ni3
EN ISO 636-B W 55A 10 N71

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.08	0.8	0.5	≤0.010	≤0.010	3.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-80°C	-101°C
Typical values	I1	AW	≥460	≥550	≥24	≥130	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283405
3.2	PE Tube	5.0	W000400287

CARBOROD CRM01

TOP FEATURES

- Excellent mechanical characteristics.
- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required

TYPICAL APPLICATIONS

- Power Generation
- Chemical Plant Applications
- Boilers, plates, tube steels
- Quenched and tempered steels
- Petrochemical

CLASSIFICATION

AWS A5.28 ER 80S-G
EN ISO 21952-A W CrMo1 Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.08	1.2	0.6	≤0.020	≤0.020	1.2	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20°C	-30°C	
Typical values	I1	PWHT 690°C/1h	≥355	≥550	≥22	≥100	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283365
2.4	PE Tube	5.0	W000283367

CARBOROD CRMO2

TOP FEATURES

- Also suitable for the welding of 2.25Cr 1.25Mo steels where improved resistance to hydrogen attack or corrosion by sulphur is required.

TYPICAL APPLICATIONS

- Crack plants
- Oil Refineries
- Boilers, plates, tube steels
- Petrochemical

CLASSIFICATION

AWS A5.28 ER 90S-G
EN ISO 21952-A W CrMo2 Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.09	1.1	0.7	≤0.020	≤0.020	2.5	1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20 °C	-30 °C	
Typical values	I1	PWHT 690 °C/1h	≥400	≥620	≥22	≥120	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283371
2.4	PE Tube	5.0	W000283373

CARBOROD CRM05

TOP FEATURES

- Ideal for elevated temperature creep resisting steels
- Used in the chemical industry and in ammonia synthesis processes.

TYPICAL APPLICATIONS

- Power Generation
- Petrochemical

CLASSIFICATION

AWS A5.28 ER 805-B6
EN ISO 21952-A W CrMo5 Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.07	0.5	0.5	≤0.020	≤0.020	5.7	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Typical values	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-30 °C
	I1	PWHT 690 °C/1h	≥470	≥590	≥20	≥100	≥60

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283379

CARBOROD CRM09

TOP FEATURES

- Ideal for welding of creep resisting steels.

TYPICAL APPLICATIONS

- Power Generation
- Petrochemical

CLASSIFICATION

AWS A5.28 ER 805-B8
EN ISO 21952-A W CrMo9

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.06	0.7	0.5	≤0.025	≤0.025	9.0	0.06	1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	I1	PWHT 760°C/2h	≥470	≥590	≥18	≥34

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283656

CARBOROD CRM091

TOP FEATURES

- Ideal for welding of creep resisting steels.
- This product is suitable for applications in long-term service at temperatures up to 650°C.

TYPICAL APPLICATIONS

- Power Generation
- Petrochemical

CLASSIFICATION

AWS A5.28 ER 90S-B91
EN ISO 21952-A W CrMo91

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo	Nb	V
0.10	0.5	0.30	9.1	0.65	1.0	0.06	0.22

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	I1	PWHT 760°C/2h	≥620	≥720	≥19	≥50

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000402219
2.4	PE Tube	5.0	W000377655

CARBOROD KV3

TOP FEATURES

- Very clean welding wire with guaranteed X<15ppm Bruscato factor, and with controlled As, Sb, Sn content against temper embrittlement.
- Also suitable for the welding of 2½Cr 1Mo steels where improved resistance to hydrogen attack or corrosion by sulphur is required.

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation
- Boilers, plates, tubes
- Oil Refineries

CLASSIFICATION

AWS A5.28 ER 90S-B3
EN ISO 21952-B W 62M 2C1M

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.08	0.60	0.55	≤0.020	≤0.020	2.40	1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -29°C
Typical values	I1 PWHT 620°C/1h	≥540	≥620	≥18	≥47
	I1 PWHT 690°C/1h	≥400	≥620	≥18	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283652
2.4	PE Tube	5.0	W000283653
3.2	PE Tube	5.0	W000387307

CARBOROD KV5

TOP FEATURES

- Very clean welding wire with guaranteed X<15ppm Bruscato factor, and with controlled As, Sb, Sn content against temper embrittlement.
- Also suitable where some resistance to hydrogen attack by sulphur bearing crude oil is required.

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation
- Boilers, plates, tubes
- Quenched and tempered steels

CLASSIFICATION

AWS A5.28 ER 80S-B2
EN ISO 21952-B W 55M 1CM

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.08	0.56	0.50	≤0.020	≤0.020	1.25	≤0.50

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -29°C
Typical values	I1	PWHT 620°C/1h	≥470	≥550	≥20	≥47
	I1	PWHT 690°C/1h	≥355	≥550	≥20	≥70

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000402711
2.0	PE Tube	5.0	W000283649
2.4	PE Tube	5.0	W000283650

CARBOROD W 225V

TOP FEATURES

- It has a very low impurity deposit
- Used in the petrochemical industry for hydrocrackers and heavy wall pressure vessels for hydrogen service.

TYPICAL APPLICATIONS

- Petrochemical
- Pressure vessels
- Oil & Gas
- Heat Exchangers

CLASSIFICATION

AWS A5.28 ER 90S-G

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Mo	Nb	V
≤0.13	≤1	≤0.2	2.5	1	0.02	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -29°C
Typical values	I1	PWHT 710°C/8h	≥500	≥680	≥18	≥100

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000289159

INERTROD 307

TOP FEATURES

- The increased silicon content promotes weld pool fluidity resulting in a smoother weld deposit.
- Useful in case of difficult weldability.
- Often used as a buffer layer for hardfacing applications

TYPICAL APPLICATIONS

- Hardenable steels
- Exhaust Systems
- Dissimilar joints
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER307*
EN ISO 14343-A W 18 8 Mn

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.1	7	0.8	≤0.030	≤0.025	19	9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-120 °C
Typical values	I1	AW	≥420	≥590	≥40	≥100	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000275411
2.0	PE Tube	5.0	W000283489
2.4	PE Tube	5.0	W000283490
3.2	PE Tube	5.0	W000378461

INERTROD 308L

TOP FEATURES

- The low carbon content reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The weld metal provides good corrosion resistance properties to intergranular attack from a range of liquid media at service temperatures up to 300°C.
- Excellent mechanical strength and corrosion resistance.

TYPICAL APPLICATIONS

- Pipework
- Petrochemical
- Nuclear Power generation
- LNG

CLASSIFICATION

AWS A5.9 ER308L
EN ISO 14343-A W 19 9 L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.45	≤0.025	≤0.020	20	10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	I1	AW	≥350	≥520	≥35	≥80	≥40

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000283413
1.2	PE Tube	5.0	W000283414
1.6	PE Tube	5.0	W000283415
2.0	PE Tube	5.0	W000283416
2.4	PE Tube	5.0	W000283417
3.2	PE Tube	5.0	W000283418

INERTROD 308LSI

TOP FEATURES

- The low carbon reduces the propensity to intergranular carbide precipitation, which increases the resistance to intergranular corrosion without the use of stabilizers.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Better weldability and appearance

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER308LSi
EN ISO 14343-A W 19 9 L Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.020	1.8	0.85	≤0.025	≤0.020	20	10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	I1	AW	≥350	≥520	≥35	≥80	≥40

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000370408
1.2	PE Tube	5.0	W000275412
1.6	PE Tube	5.0	W000283424
2.0	PE Tube	5.0	W000283425
2.4	PE Tube	5.0	W000283426
3.2	PE Tube	5.0	W000275413

INERTROD 309L

TOP FEATURES

- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- Also used for the welding of clad steels where service temperatures are below 300°C.
- 300°C maximum operating temperature.

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER309L
EN ISO 14343-A W 23 12L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.02	1.8	0.45	≤0.025	≤0.020	24	13

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-80°C
Typical values	I1	AW	≥350	≥520	≥30	≥47	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283477
2.0	PE Tube	5.0	W000283478
2.4	PE Tube	5.0	W000283479
3.2	PE Tube	5.0	W000272191

INERTROD 309LSI

TOP FEATURES

- The weld metal has a delta-ferrite content of ~12% resulting in a high resistance to hot cracking.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.
- Also used for the welding of clad steels where service temperatures are below 300°C.

TYPICAL APPLICATIONS

- General fabrication
- Cladding

CLASSIFICATION

AWS A5.9 ER309LSi
EN ISO 14343-A W 23 12 L Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	CE
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Ferrite
0.02	1.8	0.85	0.025	0.020	24	13	10-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-80°C
Typical values	I1	AW	≥350	≥520	≥30	≥60	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283484
2.4	PE Tube	5.0	W000283485

INERTROD 316L

TOP FEATURES

- The weld metal has a high resistance to crevice corrosion by oxidising acids.
- Excellent mechanical and chemical characteristics.
- Suitable for welding or hard-facing stainless steels with the same chemical composition

TYPICAL APPLICATIONS

- Petrochemical
- Nuclear Power generation
- Pipework

CLASSIFICATION

AWS A5.9 ER316L
EN ISO 14343-A W 19 12 3L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.020	1.4	0.45	≤0.025	≤0.020	19	12.5	2.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	I1	AW	≥350	≥510	≥30	≥130	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000283449
1.2	PE Tube	5.0	W000283450
1.6	PE Tube	5.0	W000283451
2.0	PE Tube	5.0	W000283452
2.4	PE Tube	5.0	W000283453
3.2	PE Tube	5.0	W000283454

INERTROD 316LSI

TOP FEATURES

- The higher Si level results in a smooth weld bead shape and even appearance with excellent toe blending particularly in fillet welds.
- The weld metal has a high resistance to pitting and crevice corrosion by non-oxidising acids.
- Used for applications with service temperatures <400°C.

TYPICAL APPLICATIONS

- Pipework
- Plates fabrication
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER316LSi
EN ISO 14343-A W 19 12 3 L Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.02	1.4	0.85	≤0.025	≤0.020	19	12.5	2.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						20°C	-120°C
Typical values	I1	AW	≥350	≥510	≥30	≥80	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000370407
1.2	PE Tube	5.0	W000275416
1.6	PE Tube	5.0	W000283460
2.0	PE Tube	5.0	W000283461
2.4	PE Tube	5.0	W000283462
3.2	PE Tube	5.0	W000275417

INERTROD 308H

TOP FEATURES

- The higher carbon content results in higher strength at elevated temperatures.
- Excellent mechanical strength.
- It is used mainly in petrochemical industry, including the fabrication of pipe and vessel.

TYPICAL APPLICATIONS

- Petrochemical
- Pipes and vessels fabrication

CLASSIFICATION

AWS A5.9 ER308H
EN ISO 14343-A W 19 9 H

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.060	1.9	0.5	≤0.020	≤0.020	20	10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-10°C
Typical values	I1	AW	≥350	≥550	≥35	≥70	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283427
2.0	PE Tube	5.0	W000283428
2.4	PE Tube	5.0	W000283429

INERTROD 309LMO

TOP FEATURES

- The weld metal has a delta-ferrite content of ~15% resulting in a high resistance to hot cracking.
- Also used for buffer layers prior to surfacing, where the Mo is a required alloying element.
- Used for dissimilar joints such as carbon and duplex.

TYPICAL APPLICATIONS

- Dissimilar joints
- Shipbuilding

CLASSIFICATION

AWS A5.9 ER309LMO*
EN ISO 14343-A W 23 12 2 L

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.020	1.6	0.45	≤0.025	≤0.020	22	15	2.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	I1	AW	≥350	≥550	≥30	≥55

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283486
2.0	PE Tube	5.0	W000283487
2.4	PE Tube	5.0	W000283488

INERTROD 310

TOP FEATURES

- High temperature ductility and excellent resistance to oxidation at working temperatures <1000°C.
- The weld deposit is fully austenitic
- Excellent corrosion resistance even when hot.

TYPICAL APPLICATIONS

- Heat Exchangers
- Hot water boilers
- Fabrication of furnaces

CLASSIFICATION

AWS A5.9 ER310
EN ISO 14343-A W 25 20

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.12	1.8	0.6	≤0.020	≤0.020	26	21

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	I1	AW	≥350	≥550	≥30	≥70

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283491
2.0	PE Tube	5.0	W000283492
2.4	PE Tube	5.0	W000283493

INERTROD 318SI

TOP FEATURES

- High resistance to intergranular corrosion and general corrosion conditions
- The increased silicon results in increased weld pool fluidity to give a smooth deposit appearance.
- The presence of the stabilizer improves resistance to precipitation of chromium carbides.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER318*
EN ISO 14343-A W 19 12 3 Nb Si

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Nb
0.04	1.4	0.85	≤0.025	≤0.020	19	12	2.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						20°C	-110°C
Typical values	I1	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000378446
1.6	PE Tube	5.0	W000283473
2.0	PE Tube	5.0	W000283474
2.4	PE Tube	5.0	W000283475
3.2	PE Tube	5.0	W000275410

INERTROD 347

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the possibility of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER347
EN ISO 14343-A W 19 9Nb

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb
0.04	1.6	0.45	≤0.025	≤0.020	19.5	10	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	I1	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.0	PE Tube	5.0	W000283433
1.6	PE Tube	5.0	W000283435
2.0	PE Tube	5.0	W000283436
2.4	PE Tube	5.0	W000283437

INERTROD 347SI

TOP FEATURES

- The weld metal has a high resistance to corrosive media at service temperatures <400°C.
- The presence of niobium reduces the propensity of intergranular chromium carbide precipitation and thus reduces the susceptibility to intergranular corrosion.
- The increased silicon content results in increased weld pool fluidity to give a smooth deposit appearance.

TYPICAL APPLICATIONS

- Fabrication of pipes, plates, vessels

CLASSIFICATION

AWS A5.9 ER347Si
EN ISO 14343-A W 19 9 Nb Si

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb
0.04	1.6	0.85	≤0.025	≤0.020	19.5	10	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-120°C
Typical values	I1	AW	≥400	≥550	≥30	≥65	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000275414
2.0	PE Tube	5.0	W000283441
2.4	PE Tube	5.0	W000283442
3.2	PE Tube	5.0	W000275415

INERTROD 904L

TOP FEATURES

- Very good corrosion resistance to general, pitting and crevice corrosion as well as stress corrosion cracking.
- The impact toughness at low temperatures is excellent.
- Excellent inter-granular corrosion resistance.

TYPICAL APPLICATIONS

- Cryogenic Applications
- Non-magnetic applications

CLASSIFICATION

AWS A5.9 ER385
EN ISO 14343-A W 20 25 5 Cu L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)
I3 Inert gas Ar+ 0.5-95% He

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Cu
0.020	1.9	0.4	≤0.020	≤0.020	20	25	4.5	1.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	I1	AW	≥410	≥560	≥35	≥80	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283505
2.4	PE Tube	5.0	W000283506

INERTROD 410NiMo

TOP FEATURES

- It contains less chromium and more nickel than standard 410 to eliminate ferrite in the microstructure due to the deleterious effect on mechanical properties

CLASSIFICATION

AWS A5.9 ER410NiMo*
EN ISO 14343-A W 13 4

* Nearest classification

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.04	0.5	0.4	≤0.030	≤0.020	12.5	4	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20°C
I1	PWHT 600°C/8h	≥550	≥760	≥15	≥50

*PWHT = Post Welding Heat Treatment

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283511

INERTROD 22 9 3

TOP FEATURES

- The weld metal has a PREN value >35 giving a high resistance to pitting and stress corrosion cracking especially in high chloride media.
- The nickel is over matches the parent material by 2-3% to provide an optimum balance of austenite and ferrite in the as welded condition.
- Excellent corrosion resistance and mechanical characteristics of the deposit

TYPICAL APPLICATIONS

- Pipelaying
- Shipbuilding
- Petrochemical

CLASSIFICATION

AWS A5.9 ER2209
EN ISO 14343-A W 22 9 3 N L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	N
0.020	1.7	0.5	≤0.025	≤0.020	23	9	3	0.15

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20 °C	-40 °C
Typical values	I1	AW	≥480	≥690	≥22	≥50	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283520
2.0	PE Tube	5.0	W000283521
2.4	PE Tube	5.0	W000283522
3.2	PE Tube	5.0	W000378453

INERTROD 25 10 4

TOP FEATURES

- The weld metal has a high resistance to pitting with a PREN>40 value combined with a good resistance to crevice corrosion as well as stress corrosion cracking.
- The nickel over matches the parent material by 2-3% to provide an optimum balance of austenite and ferrite in the as welded condition.

TYPICAL APPLICATIONS

- Offshore
- Paper industry
- Oil Industry

CLASSIFICATION

AWS A5.9 ER2594
EN ISO 14343-A W 25 9 4 N L

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	N
0.03	1	0.5	≤0.020	≤0.020	25	9.5	4	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-40°C
Typical values	I1	AW	≥550	≥800	≥25	≥80	≥32

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283528
2.0	PE Tube	5.0	W000283529
2.4	PE Tube	5.0	W000283530
3.2	PE Tube	5.0	W000283531

CUROD

TOP FEATURES

- Suitable for wear-resistant surfacing, and also for oxyacetylene welding. In last case use deoxidisers.
- It is necessary to pre-heat the base material for section >3 mm. Good sliding.

TYPICAL APPLICATIONS

- Car and bus production
- Electrical domestic appliances
- Surfacing
- Pipes fabrication

CLASSIFICATION

AWS A5.7 ER Cu
EN ISO 24373-A S Cu 1898 (CuSn1)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Mn	Si	P	Cu	Pb	Sn	Al
0.3	0.3	≤0.15	≥98.0	≤0.02	0.75	≤0.01

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Tensile strength (MPa)
Typical values	I1	AW	210-245

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283603
2.4	PE Tube	5.0	W000272190

CUROD 70/30

TOP FEATURES

- Excellent corrosion resistance in saline solutions
- The nickel addition strengthens the weld metal and improves the corrosion resistance, particularly against salt water
- The weld metal has good hot and cold ductility

TYPICAL APPLICATIONS

- Desalination plants
- Evaporators, condensers
- Cladding

CLASSIFICATION

AWS A5.7 ER CuNi
EN ISO 24373-A S Cu 7158 (CuNi30Mn1FeTi)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Mn	Si	Ni	Fe	Ti	Cu
0.9	0.2	30	0.5	0.3	Rest

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
Typical values	I1	AW	≥250	≥345	≥20	>150

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000371881
2.4	PE Tube	5.0	W000374659

ALUROD ALSI5

TOP FEATURES

- Use on many weldable cast and wrought aluminum alloys
- Better puddle and fluidity makes it less prone to cracks
- Generally recommended for welding 5052, any 6XXX series alloys and castings

TYPICAL APPLICATIONS

- Bicycle frames
- Pressure vessels

CLASSIFICATION

AWS A5.10 R4043
EN ISO 18273-A S Al 4043 (AlSi5)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Zn	Ti	Be
bal.	5.01	0.13	0.008	0.009	0.03	0.002	0.007	0.0002

Note: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	20-40	120-165	3-18

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000378507
2.0	PE Tube	5.0	W000283559
2.4	PE Tube	5.0	W000283560
3.2	PE Tube	5.0	W000283561

ALUROD ALMG3

TOP FEATURES

- Magnesium alloyed aluminium for welding of alloys with a maximum of 3.5%
- Good corrosion resistance and excellent colour match after anodizing
- Higher strength comparing with Si-alloyed Al welding wires.

TYPICAL APPLICATIONS

- General Constructions
- Structural Industry

CLASSIFICATION

AWS A5.10 R5754
EN ISO 18273-A S Al 5754 (AlMg3)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Cr	Ti	Be
bal.	0.07	0.13	0.01	0.29	3.0	0.06	0.05	0.0004

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	70-80	180-200	15-20

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000283574
3.2	PE Tube	5.0	W000283575

ALUROD ALMG4.5MN

TOP FEATURES

- Designed for welding heat-treatable base alloys and more specifically the 6XXX series alloys
- Low sensitivity to weld cracking with the 6XXX series base alloys
- Lower melting point and more fluidity than the 5XXX series filler alloys

TYPICAL APPLICATIONS

- Shipbuilding
- Marine
- Cryogenic Industries

CLASSIFICATION

AWS A5.10 R5183
EN ISO 18273-A S Al 5183 (AlMg4.5Mn0.7(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Be
bal.	0.03	0.13	0.001	0.65	4.99	0.10	0.02	0.07	0.0002

Note: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	125-165	270-290	16-25

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283593
2.4	PE Tube	5.0	W000283594
3.2	PE Tube	5.0	W000283595
4.0	PE Tube	5.0	W000283596

ALUROD ALMG4.5MNZR

TOP FEATURES

- Designed to meet the tensile strength requirements of high magnesium alloys
- For base metals with a max. of 5% Mg
- Reduced tendency of solidification cracking in highly restrained welds

TYPICAL APPLICATIONS

- Shipbuilding
- Railway Industry
- Automotive

CLASSIFICATION

AWS A5.10 R5087
EN ISO 18273-A S Al 5087 (AlMg4.5MnZr)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Mn	Mg	Cr	Ti	Zr	Be
bal.	0.06	0.13	0.7	4.9	0.07	0.01	0.12	0.0002

Note: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	125-140	275-300	17-30

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.4	PE Tube	5.0	W000273542

ALUROD ALMG5

TOP FEATURES

- Aluminium-magnesium alloy for use on many weldable cast and wrought aluminum alloys
- Excellent for color matching after anodizing
- General purpose filler alloy for 5XXX and 6XXX series alloys

TYPICAL APPLICATIONS

- Architectural structures
- Armoured vehicles
- Gun mount bases

CLASSIFICATION

AWS A5.10 R5356
EN ISO 18273-A S Al 5356 (AlMg5Cr(A))

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

APPROVALS

TÜV	DB	CE
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Be
bal.	0.06	0.09	0.02	0.12	4.84	0.12	0.001	0.09	0.0002

Notes: Unspecified elements should not exceed a total of 0.15%

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)
Typical values	I1	AW	110-120	240-296	17-26

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283582
2.0	PE Tube	5.0	W000283583
2.4	PE Tube	5.0	W000283584
3.2	PE Tube	5.0	W000283585
4.0	PE Tube	5.0	W000283586

NIROD 600

TOP FEATURES

- Used for 3%, 5% and 9% nickel steels to give good strength and toughness in LPG and LNG processing or storage plant. In sulphurous atmosphere the weld metal can be used <500°C
- Used for joining ferritic to austenitic steels (dissimilar) with operating temperatures or postweld heat treatment higher than 300°C.
- Even at higher temperatures there is only limited carbon diffusion in the weld metal thus avoiding crack-prone carbide commissures in the weld interface of dissimilar joints.

TYPICAL APPLICATIONS

- Cryogenic Applications
- Cladding
- Nuclear Power generation
- Petrochemical
- Dissimilar joints

CLASSIFICATION

AWS A5.14 ER NiCr-3
EN ISO 18274-A S Ni 6082 (NiCr20Mn3Nb)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Nb	Fe	Ti	Ni
0.050	3	0.3	≤0.020	≤0.015	20	2.5	2	0.5	Rest

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	I1	AW	≥380	≥620	≥35	≥100	≥55

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
2.0	PE Tube	5.0	W000283539
2.4	PE Tube	5.0	W000283540

NIROD 625

TOP FEATURES

- In sulphur-free atmospheres the weld metal is non-scaling <1200°C, in sulphurous atmospheres the weld metal can be used <500°C.
- Used for joining ferritic to austenitic steels (dissimilar) with operating temperatures or postweld heat treatment >300°C.
- Very resistant to stress corrosion cracking and pitting corrosion in a range of media including phosphoric acid, organic acids, sea water and polluting environments

TYPICAL APPLICATIONS

- Cryogenic Applications
- Cladding
- Petrochemical
- Pipelaying
- LNG

CLASSIFICATION

AWS A5.14 Er NiCrMo-3
EN ISO 18274-A S Ni 6625 (NiCr22Mo9Nb)

SHIELDING GASES (ACC. EN ISO 14175)

I1 Inert gas Ar (100%)

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	Nb	Fe	Ti
0.025	0.4	0.3	≤0.020	≤0.015	21	Rest	9	3.5	0.3	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						+20°C	-196°C
Typical values	I1	AW	≥480	≥750	≥30	≥120	≥40

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Diameter x Length (mm)	Packaging	Weight (kg)	Item number
1.6	PE Tube	5.0	W000283544
2.0	PE Tube	5.0	W000283545
2.4	PE Tube	5.0	W000283546

FCAW-G & FCAW-S CONSUMABLES

FLUX-CORED WIRES

SEAMLESS METAL-CORED MILD STEEL

FLUXOFIL M 8	254
FLUXOFIL M10.....	255
FLUXOFIL M10S.....	256
FLUXOFIL MC466M.....	257

SEAMLESS METAL-CORED LOW ALLOY STEEL

FLUXOFIL M 41.....	258
FLUXOFIL M 42.....	259
FLUXOFIL M 48.....	260

SEAMLESS FLUX-CORED MILD STEEL

FLUXOFIL 14HD	261
FLUXOFIL 464M.....	262
FLUXOFIL 71	263
FLUXOFIL 19HD	264
FLUXOFIL 31	265
FLUXOFIL 31S.....	266

SEAMLESS FLUX-CORED LOW ALLOY STEEL

FLUXOFIL 20HD	267
FLUXOFIL 40	268
FLUXOFIL 41	269
FLUXOFIL 42	270
FLUXOFIL 29HD	271
FLUXOFIL 45	272
FLUXOFIL 18HD	273
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METAL-CORED GAS-SHIELDED MILD STEEL

CITOFLUX M00	280
CRISTAL F 206	281
CITOFLUX M60 A	282
CITOFLUX M60	283

METAL-CORED GAS-SHIELDED LOW ALLOY STEEL

CITOFLUX M20	284
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FLUX-CORED GAS-SHIELDED MILD STEEL

CITOFLUX R00	285
CITOFLUX R00C.....	286
CITOFLUX R71	287
CITOFLUX GALVA	288

FLUX-CORED GAS-SHIELDED LOW ALLOY STEEL

CITOFLUX R00Ni.....	289
CITOFLUX R00NiC.....	290
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CITOFLUX R82 SR.....	294
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FLUX-CORED GAS-SHIELDED STAINLESS STEEL

FLUXINOX 307.....	297
FLUXINOX 308L.....	298
FLUXINOX 308L PF	299
FLUXINOX 316L.....	300
FLUXINOX 316L PF	301

FLUXINOX 309L.....	302
FLUXINOX 309L PF	303
FLUXINOX 309MoL	304
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SEAMLESS METAL-CORED HARDFACING

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SEAMLESS FLUX-CORED HARDFACING

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FLUXOFIL 52	312
FLUXOFIL 54	313
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FLUXOFIL 58	315
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FLUXOFIL 70	317

FLUX-CORED GAS-SHIELDED HARDFACING

CITOFLUX H06.....	318
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FLUX-CORED SELF-SHIELDED MILD STEEL

CITOFLUX B13-O	319
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FCAW-G
& FCAW-S
CONSUMABLES
FLUX-CORED WIRES

FLUXOFIL M 8

TOP FEATURES

- General purpose seamless copper coated metal cored wire.
- Little formation of silicates on the weld surface.
- High deposition rate and fast travel speeds, good side wall fusion, very regular bead appearance.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications

TYPICAL APPLICATIONS

- Steel construction

CLASSIFICATION

AWS A5.18 E70C-3M H4
EN ISO 17632-A T 46 2 M M 1 H5
EN ISO 17632-B T552T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

BV	DB	DNV	GL	LRS	TÜV	CE
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.07	1.3	0.7	0.010	0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20 °C
Typical values	M21	AW	≥460	550-680	≥24	≥50

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000281001
	DRUM	200.0	W000281002
1.2	SPOOL (S200)	5.0	W000386322
	SPOOL (BS300)	15.0	W000381017
	SPOOL (B300)	16.0	W000281004, W000385085
	DRUM	200.0	W000281006
1.4	SPOOL (B300)	16.0	W000281008
	DRUM	200.0	W000281009
1.6	SPOOL (B300)	16.0	W000281011
	DRUM	200.0	W000281012

FLUXOFIL M10

TOP FEATURES

- Seamless copper coated metal cored wire for welding of steel with Re up to 460MPa and very good impact properties at -40°C.
- Better tolerance of variable gap and surface conditions in relation to MAG process.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.
- Bridging and root passing capabilities with short and pulsed arc.

CLASSIFICATION

AW5 A5.18 E70C-6M H4
 EN ISO 17632-A T 46 4 M M 1 H5
 EN ISO 17632-B T494T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.08	1.5	0.4	0.010	0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	≥460	550-680	≥24	≥80
	AW	≥460	550-680	≥24	≥60

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000281014
	SPOOL (S200)	5.0	W000404342
1.2	SPOOL (B300)	16.0	W000281017, W000404198
	DRUM	200.0	W000281019
1.6	SPOOL (B300)	16.0	W000281022

FLUXOFIL M10S

TOP FEATURES

- Seamless copper coated metal cored wire for welding of steel with Re up to 420MPa and very good impact properties at -60°C.
- Better tolerance of variable gap and surface conditions in relation to MAG process.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.
- Bridging and root passing capabilities with short and pulsed arc.

CLASSIFICATION

AWS A5.18 E70C-6M H4
 EN ISO 17632-A T 42 6 M M 1 H5
 EN ISO 17632-B T496T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.07	1.6	0.4	0.010	0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
Typical values	M21	AW	≥420	500-640	≥26	≥60
		620°C x 1h	≥420	500-640	≥27	≥80

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281027

FLUXOFIL MC466M

TOP FEATURES

- Seamless copper coated metal cored wire for welding of steel with Re up to 460MPa and very good impact properties at -60°C.
- Better tolerance of variable gap and surface conditions in relation to MAG process.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.
- Bridging and root passing capabilities with short and pulsed arc.

CLASSIFICATION

AWS A5.18 E70C-6M H4
EN ISO 17632-A T 46 6 M M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	RINA	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.06	1.40	0.55	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
Typical values	M21	AW	≥460	≥550	≥25	≥50
		620°C/2h	≥420	≥500	≥30	≥60

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000404204
	DRUM	200.0	W000404504
1.4	SPOOL (B5300)	16.0	W000404206

FLUXOFIL M 41

TOP FEATURES

- Seamless copper coated metal cored wire for welding of high strength steels with minimum yield strength of 620 MPa.
- Stable operating characteristics and low spatter formation with short, spray and pulsed arc applications alike.
- Safe side wall fusion and very good gap bridging characteristics
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.

TYPICAL APPLICATIONS

- Steel construction
- Transportation.

CLASSIFICATION

AWS A5.28 E90C-GM H4
EN ISO 18276-A T625T15-1MA-3M2-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.06	1.7	0.6	0.015	0.015	0.6	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -50°C
M21	AW	≥550	640-820	≥22	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000385490

FLUXOFIL M 42

TOP FEATURES

- Seamless copper coated metal cored wire for welding of high strength steels with minimum yield strength of 690 MPa.
- Due to the easily controllable weld pool in the short-arc range, FLUXOFIL M 42 is suitable for positional welding both on CV and pulse modes.
- Higher deposition rate and more regular weld profile comparing to MAG welding with solid wires.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.
- Meets AWS A5.28: E110C-GM H4.

TYPICAL APPLICATIONS

- Steel construction
- Transportation.

CLASSIFICATION

AWS A5.29 E110C-GM H4
EN ISO 18276-A T 69 4 Mn2NiCrMo M M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.05	1.5	0.5	0.01	0.01	0.4	2	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C	
Typical values	M21	580°C x 2 h/furnace (**)	≥690	770-896	≥17	≥80
	M21	AW(***)	≥690	770-896	≥17	≥80

* AW = As welded

Gas test: M21 (**), 82% Ar+18% CO₂ (***)

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281216
	DRUM	200.0	W000281217
1.6	SPOOL (B300)	16.0	W000281219

FLUXOFIL M 48

TOP FEATURES

- Seamless copper coated metal cored wire for welding of weathering steels.
- Good side wall wetting, regular bead profile, optimized amount of silicates and reduced spatters.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.

TYPICAL APPLICATIONS

- Steel construction

CLASSIFICATION

AWS A5.28 E80C-GM H4
EN ISO 17632-A T 46 3 Z M M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Cu
0.05	1.1	0.4	≤0.020	≤0.020	0.6	0.5	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
Typical values	M21	AW	≥470	550-680	≥24	≥47

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281193
1.4	SPOOL (B300)	16.0	W000281194

FLUXOFIL 14HD

TOP FEATURES

- All positional capability with outstanding performance in vertical up welding of fillet and butt welds
- Coefficient of flux fill and current capacity designed to deliver all positional weldability
- Savings in welding cost resulting from easy slag removal and lack of spatters.
- Ideal for applications in shibulding and steel construction.
- Designed for mix gas, use of CO₂ is possible.

CLASSIFICATION

AWS A5.20	E71T-1M-JH4 E71T-1C-H4
EN ISO 17632-A	T 46 3 P M 1 H5 T 46 2 P C 1
EN ISO 17632-B	T492T1-1CA-UH5 T493T1-1MAUH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	LR	BV	DNV	RMRS	PRS	TÜV	DB
+	+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.4	0.5	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-30°C
Typical values	M21	AW	≥460	550-650	≥24	≥80	≥50

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (S200)	5.0	W000281096
	SPOOL (B300)	16.0	W000281097
1.2	SPOOL (S200)	5.0	W000281098, W000381098
	SPOOL	12.5	W000373239
	SPOOL	16.0	W000381099
	SPOOL (B300)	16.0	W000281099
	DRUM	200.0	W000281100
1.4	SPOOL (B300)	16.0	W000281102
1.6	SPOOL (B300)	16.0	W000281105
	SPOOL (B5300)	16.0	W000381105

FLUXOFIL 464M

TOP FEATURES

- FLUXOFIL 464M is rutile seamless copper coated flux cored wire for welding of steel with Re up to 460MPa and meets impact requirements at -40°C
- The wire is characterized by reduced emission of welding fumes.
- Excellent operator appeal due to new flux formulation and exceptional arc stability.
- Very good performance in vertical up welding, including root passing on ceramic backing.

CLASSIFICATION

AWS A5.20 E71T-1M-JH4
EN ISO 17634-A T 46 4 P M21 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	RINA	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mi	Si	P	S
0.07	1.5	0.5	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥460	≥550	≥23	≥76

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W000424203
	SPOOL (B300)	16.0	W000404203
	SPOOL (BS300)	16.0	W000414203

FLUXOFIL 71

TOP FEATURES

- Seamless copper coated rutile flux cored wire for welding of mild steels in shipbuilding and steel construction
- Shipbuilding and general applications.
- All positional capability with outstanding performance in positional welding of fillet and butt welds.
- Savings in total welding cost resulting from high deposition rate, easy slag removal and lack of spatters.

TYPICAL APPLICATIONS

- Shipbuilding
- Steel construction

CLASSIFICATION

AWS A5.20	E71T-1M-H4 E71T-1C-H4
EN ISO 17632-A	T 46 2 PC 1 H5 T 46 2 PM 1 H5
EN ISO 17632-B	T552T1-1CA-UH5 T552T1-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	BV	RINA	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.4	0.5	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	M21	AW	≥460	550-650	≥24	≥80

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000400964

FLUXOFIL 19HD

TOP FEATURES

- All positional capability with outstanding performance in vertical up welding of fillet and butt welds.
- Coefficient of flux fill and current capacity designed to deliver all positional weldability.
- Savings in welding cost resulting from easy slag removal and lack of spatters.
- Ideal for applications in shipbuilding and steel construction.

CLASSIFICATION

AWS A5.20 E71T-1C-JH4
EN ISO 17632-A T 46 3 P C 1 H5
EN ISO 17632-B T493T1-1CA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	RINA	RMRS	PRS	TÜV
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.3	0.5	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-30°C
Typical values	C1	AW	≥460	550-650	≥24	≥80	≥50

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W000281118
	SPOOL (B300)	12.5	W000268225
	SPOOL (B300)	16.0	W000281119
	SPOOL (BS300)	16.0	W000381119
	DRUM	200.0	W000281120
1.4	SPOOL (B300)	16.0	W000281121
	SPOOL (B300)	16.0	W000281122
1.6	SPOOL (BS300)	16.0	W000381122
	DRUM	200.0	W000281123

FCAW

FLUXOFIL 31

TOP FEATURES

- General purpose seamless copper coated basic flux cored wire. High quality welds with good slag removal.
- Weld metal with very low content of diffusible hydrogen (HD< 3 ml/100g deposited weld metal)
- Excellent mechanical properties and purity of weld metal.

CLASSIFICATION

AWS A5.20	E70T-5C-JH4 E70T-5M-JH4
EN ISO 17632-A	T 42 4 B M 2 H5 T 42 4 B C 2 H5
EN ISO 17632-B	T494T5-1CA-UH5 T494T5-1MAUH5

CURRENT TYPE

DC-

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	LR	BV	DNV	RMRS	PRS	TÜV	DB
+	+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.2	0.3	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	C1	AW	≥420	500-640	≥25	≥80

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000281163
	SPOOL (B300)	16.0	W000281166
1.2	DRUM	200.0	W000281167
	SPOOL (B300)	16.0	W000281169
	SPOOL (B5300)	16.0	W000282169
	DRUM	200.0	W000281170

FLUXOFIL 31S

TOP FEATURES

- General purpose seamless copper coated basic flux cored wire with optimized slag solidification rate.
- Pore-free welds, easy slag removal.
- Suitable for depositing very crack resistant and tough welded joints, especially when welding steels having a higher carbon content

CLASSIFICATION

AWS A5.20	E70T-5C-JH4 E70T-5M-JH4
EN ISO 17632-A	T 42 4 B M 2 H5 T 42 4 B C 2 H5
EN ISO 17632-B	T494T5-1CA-UH5 T494T5-1MAUH5

CURRENT TYPE

DC-

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	BV	DNV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.2	0.3	≤0.010	≤0.010

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	C1	AW	≥420	500-640	≥25	≥80

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281172
1.6	DRUM	200.0	W000281176

FLUXOFIL 20HD

TOP FEATURES

- Seamless high deposition rutile flux cored wire with 1%Ni and impact toughness at -40°C.
- Excellent mechanical properties and diffusible Hydrogen content below 5 ml per 100g of deposited weld metal.
- All positional capability with outstanding performance in vertical up welding of fillet and butt welds.
- Ideal for applications in steel construction, offshore and shipbuilding segments.

CLASSIFICATION

AWS A5.29 E81T1-Ni1M-JH4
 EN ISO 17632-A T 46 4 1Ni P M 1 H5
 EN ISO 17632-B T554T1-1MA-N2-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	RMRS	TÜV	DB
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.3	0.4	≤0.010	≤0.010	≤1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥470	550-680	≥24	≥60
	M21	580°C x 2h/f.	≥470	550-680	≥24	≥47

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W000281132
	SPOOL (B300)	16.0	W000281133
	SPOOL (B5300)	16.0	W000281333
1.6	SPOOL (B300)	16.0	W000281135
	SPOOL (B5300)	16.0	W000381135

FLUXOFIL 40

TOP FEATURES

- Seamless flux cored basic wire for welding of steels with Re up to 460 MPa and impact tested at -60°C.
- Very stable mechanical properties thanks to 1%Ni and basic slag system.
- Good productivity and high purity of weld metal

TYPICAL APPLICATIONS

- Offshore
- Steel construction

CLASSIFICATION

AWS A5.29 E80T5-GM-H4
EN ISO 17634-A T 46 6 1Ni B M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.3	0.4	≤0.010	≤0.010	1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60 °C
Typical values	M21	AW	≥470	550-680	≥20	≥60

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281180

FLUXOFIL 41

TOP FEATURES

- Seamless copper coated basic cored wire for welding of high strength steels with minimum Re of 550 MPa and impact tested at -40°C.
- 1.1% Ni and 0.4% Mo, basic slag system.
- Good productivity and high purity of weld metal.

TYPICAL APPLICATIONS

- Steel construction
- Offshore

CLASSIFICATION

AWS A5.29	E90T5-GC-H4 E90T5-GM-H4
EN ISO 18276-A	T 55 4 1NiMo B M 2 H5 T 55 4 1NiMo B C 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

RMRS	TÜV	DB
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.07	1.3	0.4	0.01	0.01	1.1	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥550	640-760	≥18	≥60

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281197

FLUXOFIL 42

TOP FEATURES

- Seamless basic flux cored wire for gas shielded metal arc welding of high-strength fine grain structural steels with minimum yield strength of 690 MPa and impact toughness at -60°C.
- Very stable mechanical properties thanks to precisely controlled chemical composition and basic slag system.
- Good productivity and high purity of weld metal

TYPICAL APPLICATIONS

- Offshore
- Steel construction

CLASSIFICATION

AWS A5.29 E110T5-K4M-H4
EN ISO 18276-A T 69 6 Mn2NiCrMo B M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

DNV	TÜV	DB
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.06	1.5	0.3	0.01	0.01	0.4	2.3	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-40°C	-60°C
Typical values	M21	AW	≥690	770-895	≥17	≥80	≥47
		580°C x 2 h	≥690	770-895	≥17	≥80	≥47

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281205
1.6	SPOOL (B300)	16.0	W000281207

FLUXOFIL 29HD

TOP FEATURES

- Seamless high deposition rutile flux cored wire for welding of steels with Re 690 MPa.
- All positional capability with outstanding performance in positional welding of fillet and butt welds.
- Savings in welding cost resulting from easy slag removal and lack of spatters.

CLASSIFICATION

AWS A5.29 E111T1-GM-H4
 EN ISO 18276-A T 69 4 Z P M 1 H5
 EN ISO 18276-B T763T1-1MA-G-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Mo
0.06	1.4	0.4	≤0.010	≤0.010	2.9	0.35

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	AW	≥690	770-895	≥17	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000278606

FLUXOFIL 45

TOP FEATURES

- Seamless copper coated basic flux cored wire for welding high-strength structural steels with Re up to 890 MPa.
- Very stable mechanical properties thanks to precisely controlled chemical composition and basic slag system.

TYPICAL APPLICATIONS

- Welding of extra high strength steels

CLASSIFICATION

AWS A5.29 E120T5-GM-H4
EN ISO 18276-A T 89 4 Z B M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo
0.09	2	0.5	0.01	0.01	1	1.8	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥890	940-1034	≥15	≥47

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281221

FLUXOFIL 18HD

TOP FEATURES

- Seamless copper coated special rutile cored wire for welding of weathering steels such as Patinox or Corten.
- Excellent weldability. Very good slag removal, regular bead profile and side wall wetting.
- Flux fill ration and current capacity designed to deliver optimal all positional performance.
- Designed for mix gas
- Easy slag removal, regular bead profile and side wall wetting

CLASSIFICATION

AWS A5.29 E81T1-GM-H4
EN ISO 17632-A T 50 3 Z P M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

RINA

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Cu
0.04	1.1	0.5	0.6	0.6	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
Typical values	M21	AW	≥500	560-690	≥21	≥47

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281189

FLUXOFIL 48

TOP FEATURES

- Seamless copper coated basic flux cored wire for welding of weathering steels.
- Very stable mechanical properties thanks to precisely controlled chemical composition and basic slag system.
- The weld metal is very crack-resistant, cold-tough down to -60°C with very low hydrogen content.

TYPICAL APPLICATIONS

- Steel construction

CLASSIFICATION

AWS A5.29 E80T5-GM-H4
EN ISO 17634-A T 46 6 Z B M 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni	Cu
0.05	1.1	0.25	0.010	0.010	1.2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
Typical values	M21	AW	≥470	550-680	≥20	≥47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281195

FLUXOFIL 25

TOP FEATURES

- All positional 0.5% Mo seamless copper coated rutile flux cored wire with a fast-freezing slag.
- Exceptional productivity in positional welding.

TYPICAL APPLICATIONS

- Power Generation

CLASSIFICATION

AWS A5.29 E81T1-A1M-H4
EN ISO 17634-A T MoL P M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Mo
0.05	1.1	0.4	0.01	0.01	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20° C
Typical values	M21	AW	≥490	550-650	≥22	≥70
	M21	620°C x 1h	≥470	550-690	≥22	≥70

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281233

FLUXOFIL 35

TOP FEATURES

- 0.5% Mo seamless copper coated basic flux cored wire suitable for the welding of creep resistant steels.
- Good productivity and high purity of weld metal.

TYPICAL APPLICATIONS

- Power Generation

CLASSIFICATION

AWS A5.29 E80T5-GC-H4
E80T5-GM-H4
EN ISO 17634-A T MoL B C 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Mo
0.05	1.1	0.3	0.010	0.010	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	M21	620°C x 1h	≥470	550-690	≥22	>70

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281235
1.6	SPOOL (B300)	16.0	W000281237

FLUXOFIL 36

TOP FEATURES

- B2 seamless copper coated basic flux cored wire suitable for welding of Cr Mo-alloyed creep resistant steels.
- Good productivity and high purity of weld metal.

CLASSIFICATION

AWS A5.29	E80T5-B2M-H4
	E80T5-B2C-H4
EN ISO 17634-A	T CrMo1 BM2H5
	T CrMo1 BC2H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.08	0.8	0.3	0.010	0.010	1.2	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
Typical values	C1	690°C x 1h	≥470	550-690	≥20	≥120

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281239
1.6	SPOOL (B300)	16.0	W000281240

FLUXOFIL 37

TOP FEATURES

- 2.4% Cr and 1.1% Mo seamless copper coated basic flux cored wire suitable for the welding of Cr Mo-alloyed creep resistant steels.
- Good productivity and high purity of weld metal.

CLASSIFICATION

AWS A5.29	E80T5-B3M-H4 E80T5-B3C-H4
EN ISO 17634-A	T CrMo2 B M 2 H5 T CrMo2 B C 2 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All position, except vertical down

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Mo
0.1	0.8	0.4	0.010	0.010	2.4	1.1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
Typical values	M21	700 °C x 1 h	≥470	550-690	≥20	≥100

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281244

FLUXOFIL 38C

TOP FEATURES

- Seamless copper coated basic flux cored wire, suitable for the welding of Cr Mo V-alloyed creep resistant steels.
- Good productivity and high purity of weld metal.

TYPICAL APPLICATIONS

- Power Generation

CLASSIFICATION

AWS A5.36	E70T5-GM-JH4
	E70T5-GC-JH4
EN ISO 17634-A	T Z B M 3 H5
	T Z B C 3 H5

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Mo	V
0.1	0.7	0.3	0.010	0.010	1.3	0.3	0.9	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C	
Typical values	M21	950 °C x 0,5h + 700 °C x 16h	≥400	483-655	≥22	≥47

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281247

CITOFLEX M00

TOP FEATURES

- CITOFLEX M00 is a high deposition rate metal cored wire with impact properties at - 50°C. Better tolerance of variable gap and surface conditions in relation to MAG process
- Good side wall wetting, regular bead profile, optimized amount of silicates, reduced spatters
- Bridging and root passing capabilities with short and pulsed arc
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications
- Applicable for welding of flanges of wind mill towers

CLASSIFICATION

AWS A5.18 E70C-6M H4
 EN ISO 17632-A T 46 5 M M 1 H5
 EN ISO 17632-B T555T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	CWB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.04	1.5	0.4	≤0.012	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -50°C
Typical values	M21	AW	≥460	530-680	≥27	≥47

* AW = As welded

Gas test: M21

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281055

CRISTAL F 206

TOP FEATURES

- Reduced welders' exposure to welding fumes
- CRISTAL F 206 is a high deposition rate metal cored wire with very good impact properties at -30°C. Better tolerance of variable gap and surface conditions in relation to MAG process.
- Good side wall wetting, regular bead profile, optimized amount of silicates and reduced spatters.
- Bridging and root passing capabilities with short and pulsed arc.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.

CLASSIFICATION

AWS A5.18 E70C-6M H4
 EN ISO 17632-A T 42 3 M M 1 H5
 EN ISO 17632-B T493T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.35	0.6	≤0.015	≤0.023

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -30°C
Typical values	M21	AW	≥420	500-610	≥26	≥60

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000262195
	DRUM	200.0	W001262197
1.4	DRUM	200.0	W001262198

CITOFLEX M60 A

TOP FEATURES

- CITOFLEX M60A is a high deposition rate metal cored wire with very good impact properties at -20°C. Better tolerance of variable gap and surface conditions in relation to MAG process
- Good side wall wetting, regular bead profile, optimized amount of silicates and reduced spatters
- Bridging and root passing capabilities with short and pulsed arc
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications

CLASSIFICATION

AWS A5.18 E70C-3M H8
 EN ISO 17632-A T 42 2 M M 1 H5
 EN ISO 17632-B T492T15-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	RINA	TÜV	DB	CWB
+	+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.35	0.6	≤0.015	≤0.023

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	M21	AW	≥420	500-640	≥26	≥90

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000281040
1.2	SPOOL (B300)	16.0	W000281042
	DRUM	200.0	W000281043
1.4	SPOOL (B300)	16.0	W000281044
1.6	SPOOL (B300)	16.0	W000281046

CITOFUX M60

TOP FEATURES

- CITOFUX M60 is a high deposition rate metal cored wire with very good impact properties at -40°C. Better tolerance of variable gap and surface conditions in relation to MAG process
- Good side wall wetting, regular bead profile, optimized amount of silicates and reduced spatters
- Bridging and root passing capabilities with short and pulsed arc
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications
- Applicable for welding of flanges of wind mill towers.

CLASSIFICATION

AWS A5.18 E70C-6M H4
 EN ISO 17632-A T 46 4 M M 1 H5
 EN ISO 17632-B T494T1-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	TÜV	DB	CWB
+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.04	1.5	0.4	≤0.012	≤0.02

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21	AW	≥460	530-680	≥27	≥90

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281048
	DRUM	200.0	W000281049
1.4	DRUM	200.0	W000281051

CITOFLEX M20

TOP FEATURES

- CITOFLEX M20 is a high deposition rate metal cored wire with impact properties at -60°C. Better tolerance of variable gap and surface conditions in relation to MAG process.
- Good side wall wetting, regular bead profile, reduced spatters.
- Bridging and root passing capabilities with short and pulsed arc.
- Very good weldability with short, pulsed and spray arc. Suitable for robotic applications.

CLASSIFICATION

AWS A5.18 E70C-GM H4
 EN ISO 17632-A T 46 6 Mn1Ni M M 1 H5
 EN ISO 17632-B T556T15-1MA-N1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

DNV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.05	1.45	0.9	≤0.010	≤0.010	0.8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
Typical values	M21	AW	≥460	530-680	≥26	≥80

* AW = As welded

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281061

CITOFLEX R00

TOP FEATURES

- CITOFLEX R00 is rutile flux cored wire for gas shielded metal arc welding of unalloyed steels.
- The optimized fill ratio results in increased deposition rate and productivity leading to savings in total welding cost.
- The weld pool is easily controllable in positional welding with outstanding arc properties and quality levels.
- Low spatter and easy slag removal result in smooth and regular welds.
- Can be used in semiautomatic and mechanized processes, very well suited for use on ceramic backing.
- Preferably used under mixed gas. The use of CO₂ is possible.

CLASSIFICATION

AWS A5.20	E71T-1M-JH4 E71T-1C-H4
EN ISO 17632-A	T 42 3 P M 1 H5 T 42 2 P C 1 H5
EN ISO 17632-B	T492T1-1CA-UH5 T493T1-1MA-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

ABS	LR	BV	DNV	RINA	RMRS	CRS	PRS
+	+	+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.47	0.5	≤0.015	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-30°C
Typical values	M21	AW	min 420	500-640	≥28	≥80	≥50

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W000281146
	SPOOL (B300)	16.0	W000281147

CITOFLEX ROOC

TOP FEATURES

- The optimized fill ratio results in increased deposition rate and productivity leading to savings in total welding cost.
- The weld pool is easily controllable in positional welding with outstanding arc properties and quality levels.
- Low spatter and easy slag removal result in smooth and regular welds.
- Can be used in semiautomatic and mechanized processes, very well suited for use on ceramic backing.

CLASSIFICATION

AWS A5.20 E71T-1C-JH4
EN ISO 17632-A T 42 3 P C 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LRS	PRS	RINA	RMRS	CE
3YSH5 (C1)	3Y40SH5 (C1) 3YSH5 (C1)	3Y40SMH5 (M21) 3YSH5 (C1)	3Y40SMH5 (M21) 3YSH5 (C1)	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.3	0.4	≤0.015	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-30°C
Typical values	M21	AW	min 460	530-680	≥26	≥80	
	C1	AW	min 420	500-640	≥25		≥70

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000382937

CITOFLEX R71

TOP FEATURES

- Rutile flux-cored wire for gas-shielded metal arc welding of unalloyed steels in all welding positions
- Optimized fume emission rate. Product design, deep penetration and outstanding weldability make this wire an ideal solution for shipbuilding applications.
- It can be used in manual and fully-mechanised processes, very well suited for use on ceramic backing and with long liner.
- Very low spatter presence and easy slag removal
- Savings in total welding cost comparing to manual stick electrodes.

CLASSIFICATION

AWS A5.20	E71T-1/9C-H8
	E71T-1/9M-H8
EN ISO 17632-A	T 42 2 P C 1 H10
	T 46 2 P M 1 H10

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1	Active gas 100% CO ₂
M21	Mixed gas Ar+ >15-25% CO ₂

APPROVALS

LR	RINA	RMRS	PRS
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S
0.05	1.3	0.40	≤0.015	≤0.015

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	C1	AW	≥530	≥590	25	>47

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W000386375
	SPOOL (B300)	16.0	W000386374

CITOFLEX GALVA

TOP FEATURES

- The best solution for robotic and semiautomatic welding of Zn coated steel
- Low spatter level and very regular bead appearance
- Improved quality of welds by optimized solidification time resulting in reduced level of porosity
- To be used with Ar/CO₂ gas shielding both on CV and pulsed modes.

CLASSIFICATION

AWS A5.18 E70C-GS

CURRENT TYPE

DC-

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV	DB
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Al
0.4	1.2	0.3	<3

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.0	SPOOL (B300)	16.0	W000281064
	DRUM	200.0	W000383531
1.2	SPOOL (B300)	16.0	W000281065
	DRUM	200.0	W000281066

CITOFLEX ROONI

TOP FEATURES

- CITOFLEX ROONI is rutile flux cored delivering good impact properties at -40°C. Ni alloyed, for welding with mix gas.
- The optimized fill ratio results in increased deposition rate and productivity leading to savings in total welding cost.
- At least two times higher productivity comparing to basic manual electrode in positional welding.
- Can be used in semiautomatic and mechanized processes, very well suited for use on ceramic backing.
- The weld pool is easily controllable in positional welding with outstanding arc properties and quality levels.
- Low spatter and easy slag removal result in smooth and regular welds.

CLASSIFICATION

AWS A5.29 E81T1-GM-H4
 EN ISO 17632-A T 46 4 1Ni P C 1 H5
 EN ISO 17632-B T554T1-1M21A-N1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.2	0.4	≤0.015	≤0.015	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	M21**	AW	≥460	570-680	≥24	≥80

* AW = As welded

** Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281150
	SPOOL (B5300)	16.0	W000403658

FCAW

CITOFLEX R00NiC

TOP FEATURES

- CITOFLEX R00NiC is folded rutile flux cored for CO₂ shielding gas wire with impact properties tested at -40°C.
- High productivity, especially in positional welding, leading to savings in total welding cost.
- Low spatter and easy slag removal result in smooth and regular welds.
- Can be used in semiautomatic and mechanized processes, very well suited for use on ceramic backing.
- Can be used for PWHT applications.

CLASSIFICATION

AWS A5.20 E71T-1C-JH4
 EN ISO 17632-A T 46 4 P C 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.06	1.2	0.4	≤0.015	≤0.015	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -40°C
Typical values	C1	AW	≥460	510-610	≥24	≥80
	C1	580°C x 2h/f.	≥460	510-610	≥24	≥80

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S300)	16.0	W000375124

CITOFLEX R111

TOP FEATURES

- Slow-freezing slag and outstanding welding properties in downhand welding.
- Typical application is the heavy transport vehicles and road construction machinery
- Designed for welding single pass and multi-layer welds. High recovery, easy slag removal, smooth and regular welds.

CLASSIFICATION

EN ISO 17632-A T 42 2 1Ni R C 3 H5

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Ni
0.04	0.8	0.4	0.8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -20°C
Typical values	M21**	AW	≥ 420	500-620	≥23	Min. 47J
	C1	AW	≥ 420	500-620	≥23	Min. 47J

* AW = As welded

** Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL (B300)	16.0	W000370798

CITOFLEX R550

TOP FEATURES

- CITOFLEX R550 is E91 rutile cored wire for positional welding of high-strength steels with minimum yield strength of 550 MPa and -50°C impact.
- Rutile flux cored very good positional weldability. Very good slag removal, regular high quality welds.
- Applicable both for semiautomatic and mechanised welding.
- Ideal for offshore, wind tower foundations and structural applications.

CLASSIFICATION

AWS A5.29 E91T1-G M H4
 EN ISO 18276-A T55 5 Mn1,5Ni P M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

DNV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.07	1.3	0.4	≤0.015	≤0.015	1.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -50°C
Typical values	M21	AW	≥550	620-760	≥20	≥47

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000275204

FCAW

CITOFLEX R82

TOP FEATURES

- Rutile 0.9%Ni flux cored wire with excellent all-positional weldability and good impact toughness at -50°C.
- Best in class welding performance and productivity in positional welding.
- Optimal solution for welding of wind mill foundations, offshore and steel constructions.
- Can be applied for applications requiring CTOD testing.

CLASSIFICATION

AWS A5.29 E81T1-Ni1M-H4
 EN ISO 17632-A T 46 5 1Ni P M 1 H5
 EN ISO 17632-B T555T1-1MA-N1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	DNV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.05	1.3	0.4	≤0.010	≤0.010	0.85

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-40°C	-50°C
Typical values	M21	AW	≥460	550-690	≥22	≥80	≥60

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281158

CITOFLEX R82 SR

TOP FEATURES

- CITOFLEX R82SR is a folded rutile flux cored wire for all-positional welding with good impact toughness at -50°C (as welded and after PWHT)
- Best in class welding performance in positional welding.
- Optimal solutions for wind mill, oil and gas, structural and pipeline applications.
- Very stable impact properties.
- Can be applied for applications requiring CTOD testing.

CLASSIFICATION

AWS A5.29 E81T1-Ni1M-H4
 EN ISO 17632-A T 46 6 1Ni P M 1 H5
 EN ISO 17632-B T555T1-1MA-N1-UH5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

ABS	LR	BV	DNV	TÜV	DB
+	+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.05	1.4	0.2	≤0.015	≤0.015	0.95

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -50°C
Typical values	M21	AW	min 470	550-690	≥24	≥60
	M21	600°C / 1h	min 470	550-690	≥25	≥70

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281161

FCAW

CITOFLEX R83

TOP FEATURES

- Rutile flux cored gas shielded 1.5% Ni, Ti and B alloyed flux cored wire with very good impact toughness down to -60°C.
- Best in class consumable for welding of wind mill foundations and applications in offshore oil and gas and structural segments. Superior weldability, low spatter, good bead appearance.
- Exceptional mechanical properties (CVN >80) at -60°C.
- Superior product consistency with optimal alloy control.
- Can be applied for applications requiring CTOD testing.

CLASSIFICATION

AWS A5.29 E81T1-Ni1
E81T1-M21G-Ni1-H4
EN ISO 17732-A T 50 6 1.5Ni P M 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	CWB
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.04	1.4	0.2	≤0.014	≤0.014	1.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -60°C
Typical values	M21	AW	min. 470	550-690	≥23	≥80

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000383907

CITOFLEX R83 C

TOP FEATURES

- CITOFLEX R83C is best in class rutile flux cored wire with excellent positional weldability and good impact toughness down to -60°C.
- Best in class welding performance and productivity in positional welding.
- Ideal for wind mill foundations, offshore and structural applications.
- Meets NACE MR-0175 requirements.

CLASSIFICATION

AWS A5.29 E81T1-Ni1C
 EN ISO 17632-A T 46 6 1Ni P C 1 H5

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

APPROVALS

ABS	DNV
+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Ni
0.05	1.2	0.4	≤0.014	≤0.014	0.85

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-40°C	-60°C
Typical values	C1	AW	min. 470	550-690	min. 20		min. 47
	C1	PWHT 620°C/2h	min. 470	550-690	min. 20	min. 47	

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000383908

FCAW

FLUXINOX 307

TOP FEATURES

- Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- Optimal semiautomatic process for positional welding, high productivity reduces labor and total welding costs.
- Reduced spatter, better performance and weldability comparing to solid wires.
- Fluxinox 307 delivers welds with high corrosion resistance due to low carbon and balanced chemical composition.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.

CLASSIFICATION

EN ISO 17633-A T 18 8 Mn R C 3

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni
0.04	6.5	0.7	19	9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20° C
Typical values	M21	AW	≥400	600-700	≥30	≥30

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B5300)	15.0	W000281317

FLUXINOX 308L

TOP FEATURES

- FLUXINOX 308L produces welds with high corrosion resistance due to low carbon and balanced chemical composition.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle.
- Savings in total welding cost resulting from reduced cleaning, Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E308LT0-1
 EN ISO 17633-A T 19 9 L R C 3
 EN ISO 17633-B TS308L-FB0

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
≤0.04	1.7	0.6	20	10	6-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20 °C	-196 °C
Typical values	M21	AW	≥350	≥520	≥35	≥40	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281257

FCAW

FLUXINOX 308L PF

TOP FEATURES

- Fluxinox 308 L PF delivers welds with high corrosion resistance due to low carbon and balanced chemical composition.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.
- Suitable for positional welding.

CLASSIFICATION

AWS A5.22 E308LT1-1
 EN ISO 17633-A T 19 9 L P C 1
 EN ISO 17633-B TS308L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
≤0.04	1.4	0.6	20	10	6-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20 °C	-196 °C
Typical values	M21	AW	≥350	≥520	≥35	≥40	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281261

FCAW

FLUXINOX 316L

TOP FEATURES

- FLUXINOX 316L produces welds with high corrosion resistance due to low carbon and balanced chemical composition.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E316LT0-1
 EN ISO 17633-A T 19 12 3 L R C 3
 EN ISO 17633-B TS316L-FB0

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Ferrite
≤0.04	1.7	0.6	19	12	2.8	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						20°C	-110°C
Typical values	M21	AW	≥320	≥510	≥30	≥47	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281274, W000281278

FCAW

FLUXINOX 316L PF

TOP FEATURES

- FLUXINOX 316L PF delivers welds with high corrosion resistance due to low carbon and balanced chemical composition.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.
- Suitable for positional welding.

CLASSIFICATION

AWS A5.22 E316LT1-1
E316LT1-4
EN ISO 17633-A T 19 12 3 L P C 1
T 19 12 3 L P M 1
EN ISO 17633-B TS316L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	RINA	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Ferrite
≤0.04	1.5	0.6	19	12	2.8	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -110°C
Typical values	M21	AW	≥320	≥510	≥30	≥32

* AW = As welded

FLUXINOX 309L

TOP FEATURES

- FLUXINOX 309L delivers welds with high corrosion resistance due to low carbon and balanced chemical composition.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E309LTO-1
 EN ISO 17633-A T 23 12 L R C 3
 EN ISO 17633-B TS309L-FB0

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	TÜV	DB
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Cr	Ni	Ferrite
≤0.04	1.5	0.6	≤0.03	≤0.03	24	13	12-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-60°C
Typical values	M21	AW	≥320	≥520	≥30	≥40	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281304

FCAW

FLUXINOX 309L PF

TOP FEATURES

- High alloyed rutile flux cored wire with fast freezing slag for the welding of dissimilar joints, buffer layers or cladding.
- FLUXINOX 309L PF exhibits outstanding, almost spatter-free, welding properties with very easy slag removal. Designed for welding in the horizontal (PD), overhead (PE) and vertical-up (PF) positions.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E309LT1-4
 EN ISO 17633-A T 23 12 L P C 1
 EN ISO 17633-B TS309L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	DNV	RINA	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
≤0.04	0.7	0.6	24	13	10-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-60°C
Typical values	M21	AW	≥320	≥520	≥30	≥40	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B5300)	15.0	W000281308

FLUXINOX 309MoL

TOP FEATURES

- Delivers welds with optimal corrosion resistance due to balanced chemical composition.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E309LMoT0-1
E309LMoT0-4
EN ISO 17633-A T 23 12 2 L R C 3
EN ISO 17633-B TS309LMo-FB0

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Ferrite
≤0.04	1.2	0.7	24	13	2.5	20-30

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20° C
Typical values	M21	AW	≥350	≥550	≥25	≥40

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281311

FLUXINOX 347

TOP FEATURES

- Alloyed rutile flux cored wire for the welding of stabilized corrosion resistant Cr Ni-steels.
- High productivity generates savings in total welding costs. Optimal semiautomatic process with high duty cycle. Application of standard Ar/CO₂ or CO₂ shielding gases optimizes welding cost.
- The best quality of welds with standard CV power sources helps to reduce investment expenditures.
- Savings in total welding cost resulting from reduced cleaning. Spatter free welds with easy slag removal.
- Higher overall performance and weldability comparing to solid wires and manual stick electrodes.

CLASSIFICATION

AWS A5.22 E347T0-1
EN ISO 17633-A T 19.9 Nb R C 3
EN ISO 17633-B TS347L-FB0

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

TÜV

+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Nb	Ferrite
≤0.04	1.8	0.4	20	10	0.4	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) 20° C
Typical values	M21	AW	≥350	≥550	≥30	≥47

Gas test: 82% Ar + 18% CO₂

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000281267

FCAW

CLEARINOX F 308L PF

TOP FEATURES

- Reduced welders' exposure to welding fumes.
- High alloyed rutile flux cored wire with fast freezing slag for the welding of 308 corrosion resistant Cr Ni-steels.
- Reduced welding fume (up to -40%).
- Reduced emission of hexavalent Cr content (up to -60%).
- Easy slag removal.

CLASSIFICATION

AWS A 5.22 E308LT1-1
 EN ISO 17633-A T 19 9 L P C 1
 EN ISO 17633-B TS308L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	BV	TÜV
+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
0.03	1.3	0.7	19.5	10	3-12

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20 °C	-196 °C
Typical values		AW	≥350	≥520	≥35	≥40	≥27

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (BS300)	15.0	W000387175

FCAW

CLEARINOX F 309L PF

TOP FEATURES

- Reduced welders' exposure to welding fumes
- High alloyed rutile flux cored wire with fast freezing slag for welding of dissimilar joints, buffer layers or cladding.
- Reduced welding fume (up to -40%).
- Reduced emission of hexavalent Cr content (up to -60%).
- Easy slag removal.

CLASSIFICATION

AWS A 5.22 E309LT1-1
E309LT1-4
EN ISO 17633-A T 23 12 L P M 1
EN ISO 17633-B TS309L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	BV	DNV	TÜV
+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Ferrite
≤0.04	0.7	0.6	24	13	10-20

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						-20°C	-60°C
Typical values	M21	AW	≥320	≥520	≥30	≥40	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W001387176

CLEARINOX F 316L PF

TOP FEATURES

- Reduced welders' exposure to welding fumes.
- High alloyed rutile flux cored wire with fast freezing slag for the welding of 316 corrosion resistant Cr-Ni-Mo steels.
- Reduced welding fume (up to -40%).
- Reduced emission of hexavalent Cr content (up to -60%).
- Easy slag removal.

CLASSIFICATION

AWS A 5.22 E316LT1-1
 EN ISO 17633-A T 19 12 3 L P C 1
 EN ISO 17633-B TS316L-FB1

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
 M21 Mixed gas Ar+ >15-25% CO₂

APPROVALS

LR	BV	DNV	TÜV	DB
+	+	+	+	+

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Ferrite
≤0.04	1.4	0.6	19	12	2.8	5-10

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
						20°C	-110°C
Typical values	M21	AW	≥320	≥510	≥30	≥47	≥27

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	5.0	W001387177
	SPOOL (BS300)	15.0	W000387177

FCAW

FLUXOFIL M 58

TOP FEATURES

- FLUXOFIL M 58 is a seamless copper coated metal cored wire for the hardfacing of wear parts.
- Hardness 57-62 HRC.

TYPICAL APPLICATIONS

- Hardfacing.

CLASSIFICATION

EN 14700 T Fe8

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo
0.6	1.9	0.7	5.4	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HRC)
Typical values	C1	AW	57-62

* AW = As welded

Gas test: 100% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281401

FLUXOFIL 50

TOP FEATURES

- Seamless copper coated basic flux cored wire for the hardfacing of wear components.
- 225-275 HB hardness.

TYPICAL APPLICATIONS

- Hardfacing

CLASSIFICATION

EN 14700 T Fe1

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr
0.2	1.6	0.5	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HB)
Typical values	C1	AW	225-275

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.4	SPOOL (B300)	16.0	W000281335

FLUXOFIL 51

TOP FEATURES

- Seamless copper coated basic flux cored wire for hardfacing of wearing parts
- 275-325 HB hardness.

TYPICAL APPLICATIONS

- Hardfacing

CLASSIFICATION

EN 14700 T Fe1

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr
0.2	1.6	0.6	1.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HB)
Typical values	C1	AW	275-325

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281338
1.6	SPOOL (B300)	16.0	W000281340

FLUXOFIL 52

TOP FEATURES

- Seamless copper coated basic flux cored wire for hardfacing of wear parts.
- 325-375 HB hardness.

TYPICAL APPLICATIONS

- Hardfacing

CLASSIFICATION

EN 14700 T Fe1

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr
0.25	1.5	0.4	1.8

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HB)
Typical values	C1	AW	325-375

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.4	SPOOL (B300)	16.0	W000281344
1.6	SPOOL (B300)	16.0	W000281345

FLUXOFIL 54

TOP FEATURES

- FLUXOFIL 54 is a seamless copper coated basic flux cored wire for the hardfacing of wear parts
- 37-42 HRC hardness.

TYPICAL APPLICATIONS

- Hardfacing

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo
0.07	1.6	0.3	6	0.9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HRC)
Typical values	C1	AW	37-42

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL (B300)	16.0	W000129066

FLUXOFIL 56

TOP FEATURES

- Seamless copper coated basic flux cored wire for the hardfacing of wear parts
- 52-57 HRC hardness.

CLASSIFICATION

EN 14700 T Fe8

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂
M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo
0.4	1.7	0.6	6	0.7

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Typical values	Shielding gas	Condition*	Hardness (HRC)
	C1	AW	52-57

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL (B300)	16.0	W000281351

FLUXOFIL 58

TOP FEATURES

- Seamless copper coated basic flux cored wire for the hardfacing of wear parts.
- 57-62 HRC hardness.

CLASSIFICATION

EN 14700 T Fe8

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

C1 Active gas 100% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Mo
0.5	1.5	0.6	5.5	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HRC)
Typical values	C1	AW	57-62

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281355
1.4	SPOOL (B300)	16.0	W000281356

FLUXOFIL 66

TOP FEATURES

- Seamless copper coated metal cored wire for high hardness wear overlay.
- Hardness 57-62 HRC.

TYPICAL APPLICATIONS

- Hardfacing

CLASSIFICATION

EN 14700 T Fe8

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo	Nb	W
1.4	0.9	0.9	6.3	0.8	0.2	9	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Typical values	Shielding gas	Condition*	Hardness (HRC)
	M21	AW	57-62

* AW = As welded

Gas test: 82% Ar+ 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL (B300)	16.0	W000281360

FLUXOFIL 70

TOP FEATURES

- Seamless copper coated basic flux cored wire for the joining and surfacing of stamping and pressing tools.

TYPICAL APPLICATIONS

- Maintenance and repair.

CLASSIFICATION

AWS A5.36 E120T5-GM-H4
EN ISO 18276-A T 69 A Z B M 3 H5

CURRENT TYPE

DC+

WELDING POSITIONS

Flat/Horizontal

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr	Ni	Mo
0.08	1.1	0.4	1	2.2	1

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
Typical values	M21	640 °C x 2 h	≥745	827-940	≥17	≥50

Gas test: 82% Ar+18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.4	SPOOL (B300)	16.0	W000281224

CITOFLEX H06

TOP FEATURES

- Metal cored gas shielded wire for hardfacing
- Can be used for hardfacing of wear parts, such as excavator components, scraper blades, dipper teeth, worm conveyors, beaters, crusher jaws, crusher cones, subjected to heavy wear
- The weld metal is tough, free of cracks and therefore resistant to shock and impact
- Machining is only possible by grinding

CLASSIFICATION

EN 14700 T Fe8

CURRENT TYPE

DC+

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

M21 Mixed gas Ar+ >15-25% CO₂

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	Cr
0.42	0.55	2.6	9.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Shielding gas	Condition*	Hardness (HRC)
Typical values	M21	AW	57-60

* AW = As welded

Gas test: 82% Ar + 18% CO₂

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (B300)	16.0	W000281367
	DRUM	200.0	W000282367
1.6	SPOOL (B300)	16.0	W000281369

CITOFLEX B13-0

TOP FEATURES

- General purpose self-shielded wire.
- No shielding gas required, optimal solution for outdoor applications.
- Can be used for welding of galvanized parts.

CLASSIFICATION

AWS A5.20 E71-T7
EN ISO 17632-A T 42 Z Y 1 H15

CURRENT TYPE

DC-

WELDING POSITIONS

All positions

SHIELDING GASES (ACC. EN ISO 14175)

No Gas

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

C	Mn	Si	P	S	Al
0.3	0.6	0.15	≤0.025	≤0.025	1.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
Typical values	AW	≥420	≥540	≥22	≥30

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.2	SPOOL (S200)	4.0	W000281393
	SPOOL (B300)	16.0	W000281394
1.6	SPOOL (B300)	16.0	W000281395

SUBMERGED ARC WELDING CONSUMABLES

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SAW WIRES

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SUBMERGED
ARC WELDING
CONSUMABLES
SAW WIRES
& FLUXES

OE-S1

TOP FEATURES

- A low carbon, low manganese, low silicon general purpose wire
- Provides the lowest hardness and is best suited for use with the Oerlikon active fluxes
- Excellent choice when welding on oily plates.

CLASSIFICATION

AWS A5.17 EL12
EN ISO 14171-A S1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.1	0.5	0.06	≤0.02	≤0.02

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.0	SPOOL	25.0	OES1-2-25VCI
2.4	SPOOL	25.0	OES1-24-25VCI
3.2	SPOOL	25.0	OES1-32-25VCI
4.0	SPOOL	25.0	OES1-4-25VCI

OE-S2

TOP FEATURES

- Primary choice as a general purpose wire
- Used on 355MPa grade or below
- Lower Si content than OE-SD2

CLASSIFICATION

AWS A5.17 EM12K
EN ISO 14171-A S2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.1	1	0.12	≤0.025	≤0.025

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	16.0	W000285014
	SPOOL	25.0	OES2-16-25VCI
	DRUM	600.0	OES2-16-600AC
2.0	SPOOL	16.0	W000285017
	SPOOL	25.0	OES2-2-25VCI
	REEL	300.0	OES2-2-300MR
	DRUM	400.0	OES2-2-400
	DRUM	600.0	OES2-2-600AC
2.4	SPOOL	25.0	OES2-24-25VCI
	DRUM	400.0	OES2-24-400
	DRUM	600.0	OES2-24-600AC
	DRUM	1000.0	OES2-24-1000
3.2	SPOOL	25.0	OES2-32-25VCI
	SPOOL	100.0	OES2-32-100
	DRUM	300.0	OES2-32-300E-CCW
	DRUM	400.0	OES2-32-400, OES2-32-400-CCW
	COIL	1000.0	OES2-32-1T-CCW
4.0	SPOOL	25.0	OES2-4-25VCI
	SPOOL	100.0	OES2-4-100
	DRUM	300.0	OES2-4-300E-CCW
	DRUM	400.0	OES2-4-400, OES2-4-400-CCW
	COIL	700.0	W000278289
	COIL	1000.0	OES2-4-1T, OES2-4-1T-CCW, OES2-4-1TSP, OES2-4-1TSP-CCW
	DRUM	1000.0	OES2-4-1000
4.8	SPOOL	25.0	OES2-48-25VCI
	SPOOL	100.0	OES2-48-100

SAW

OE-SD2

TOP FEATURES

- Higher silicon content than OE-S2
- Suitable with a wide range of fluxes
- Industry standard for submerged arc welding applications

CLASSIFICATION

AWS A5.17 EM12K
EN ISO 14171-A S2Si

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.1	1	0.25	≤0.025	≤0.025

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OESD2-24-25VCI
3.2	SPOOL	25.0	OESD2-32-25VCI
4.0	SPOOL	25.0	OESD2-4-25VCI
	SPOOL	100.0	OESD2-4-100, OESD2-4-100E
	COIL	1000.0	OESD2-4-1T-CCW

OE-SD3

TOP FEATURES

- A low carbon, high manganese, medium silicon wire primarily designed to be used in multirun conditions
- Capable of producing weld deposits with impact properties exceeding 47 J at -62°C when used with OP121TT in As Welded or after post weld heat treatment conditions
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available
- Industry standard grade covering a very wide range of requirements

CLASSIFICATION

AWS A5.17 EH12K
EN ISO 14171-A S35i

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.1	1.7	0.3	≤0.015	≤0.015

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	25.0	OESD3-16-25VCI
	DRUM	400.0	OESD3-16-400
	DRUM	600.0	OESD3-16-600AC
2.0	SPOOL	25.0	OESD3-2-25VCI
	DRUM	300.0	107203, OESD3-2-300AC
	REEL	300.0	107173
	DRUM	400.0	OESD3-2-400, OESD3-2-400-CCW
2.4	DRUM	600.0	OESD3-2-600AC
	SPOOL	25.0	OESD3-24-25VCI
	SPOOL	100.0	OESD3-24-100
	REEL	300.0	OESD3-24-300
	DRUM	350.0	OESD3-24-350E
	DRUM	400.0	OESD3-24-400
2.5	COIL	1000.0	OESD3-24-1T
	SPOOL	25.0	OESD3-25-25VCI
3.2	SPOOL	25.0	OESD3-32-25VCI
	SPOOL	100.0	OESD3-32-100
	REEL	300.0	OESD3-32-300MR
	DRUM	400.0	OESD3-32-400, OESD3-32-400-CCW
4.0	SPOOL	25.0	OESD3-4-25VCI
	SPOOL	100.0	OESD3-4-100, OESD3-4-100E, OESD3-4-100R
	DRUM	300.0	OESD3-4-300E-CCW
	REEL	300.0	OESD3-4-300
	DRUM	350.0	OESD3-4-350E, OESD3-4-350E-CCW
	DRUM	400.0	OESD3-4-400, OESD3-4-400-CCW
	COIL	1000.0	OESD3-4-1T, OESD3-4-1T-CCW
4.8	SPOOL	25.0	OESD3-48-25VCI
	REEL	300.0	OESD3-48-300

SAW

OE-S4

TOP FEATURES

- For yield strength above 420MPa
- Recommended with neutral fluxes
- Good alternative to EH12K grade

CLASSIFICATION

AWS A5.17 EH14
EN ISO 14171-A S4

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S
0.13	1.9	0.1	≤0.02	≤0.02

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OES4-24-25VCI
3.2	SPOOL	25.0	OES4-32-25VCI
4.0	SPOOL	25.0	OES4-4-25VCI
	REEL	300.0	OES4-4-300MR

OE-S2MO

TOP FEATURES

- A low carbon, medium manganese, low silicon, 0,5% molybdenum wire used for single or multiple pass welds
- A standard choice for pipe fabrication and other limited pass applications
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EA2
EN ISO 14171-A S2Mo

TYPICAL APPLICATIONS

- Longitudinal and spiral pipe welding

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Mo
0.1	1	0.15	≤0.02	≤0.02	0.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.0	SPOOL	25.0	OES2MO-2-25VCI
	REEL	300.0	OES2MO-2-300MR
	DRUM	400.0	OES2MO-2-400
	DRUM	600.0	OES2MO-2-600AC
2.4	SPOOL	25.0	OES2MO-24-25VCI
	SPOOL	25.0	OES2MO-32-25VCI
3.2	DRUM	350.0	OES2MO-32-350E, OES2MO-32-350E-CCW
	DRUM	400.0	OES2MO-32-400, OES2MO-32-400-CCW
	COIL	1000.0	OES2MO-32-1T-CCW
	SPOOL	25.0	OES2MO-4-25VCI
4.0	SPOOL	100.0	OES2MO-4-100
	REEL	300.0	OES2MO-4-300MR
	DRUM	350.0	OES2MO-4-350E, OES2MO-4-350E-CCW
	DRUM	400.0	OES2MO-4-400, OES2MO-4-400-CCW
	COIL	1000.0	OES2MO-4-1T-CCW

OE-TIBOR 25

TOP FEATURES

- High Manganese and microalloying elements to optimize impact toughness in 2-run technique at low temperature
- Molybdenum free composition to limit the secondary hardening phenomena
- Suitable for pipe grade up to X90

CLASSIFICATION

AWS A5.23 EG
EN ISO 14171-A SZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ti	B
0.08	1.55	0.3	≤ 0.015	≤ 0.015	0.15	0.015

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	TIBOR25-32-25VCI
	SPOOL	25.0	TIBOR25-4-25VCI
4.0	DRUM	300.0	TIB25-4-300E-CCW
	DRUM	350.0	TIB25-4-350E-CCW, TIBOR25-4-350MR
	REEL	500.0	TIB25-4-05T-CCW

OE-TIBOR 33

TOP FEATURES

- 0.5%Mo and microalloying elements to optimize impact toughness in 2-run technique at low temperature
- Suitable for limited passes applications
- Suitable for pipe grade up to X90

CLASSIFICATION

AWS A5.23 EA2TiB
EN ISO 14171-A S2MoTiB

TYPICAL APPLICATIONS

- Longitudinal and spiral pipe welding

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Mo	Ti	B
0.06	1.1	0.25	≤0.015	≤0.015	0.5	0.13	0.013

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	TIBOR33-32-25VCI
	DRUM	300.0	TIB33-32-300E, TIB33-32-300E-CCW
	DRUM	350.0	TIB33-32-350E, TIB33-32-350E-CCW
	DRUM	400.0	TIBOR33-32-400
4.0	SPOOL	25.0	TIBOR33-4-25VCI
	DRUM	300.0	TIB33-4-300E, TIB33-4-300E-CCW
	DRUM	350.0	TIB33-4-350E, TIB33-4-350E-CCW, TIBOR33-4-350E
	REEL	350.0	TIBOR33-4-350MR
	DRUM	400.0	TIBOR33-4-400

OE-S2NiCu

TOP FEATURES

- Contains Nickel and Copper
- For Cor-ten steels and equivalent
- Recommended with OP 121TT flux

CLASSIFICATION

AWS A5.23 EG
EN ISO 14171-A S2NiCu

TYPICAL APPLICATIONS

- Weathering steel structure

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Cu
0.1	1	0.25	≤0.02	≤0.02	<0.4	0.8	0.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	OES2NICU-32-25VCI
4.0	SPOOL	25.0	OES2NICU-4-25VCI

OE-S2Ni1

TOP FEATURES

- 1% Nickel addition
- Optimum results in multipass technique
- Comply with NACE requirement

CLASSIFICATION

AWS A5.23 ENi1
EN ISO 14171-A S2Ni1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Ni
0.1	1	0.15	0.9

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	W000285164
4.0	SPOOL	25.0	W000285166

OE-S2Ni2

TOP FEATURES

- 2% Nickel addition
- Excellent impact toughness at -60°C
- Recommended for multirun technique in combination with basic fluxes

CLASSIFICATION

AWS A5.23 ENi2
EN ISO 14171-A S2Ni2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.1	1	0.15	≤0.015	≤0.015	2.2

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285174
3.2	SPOOL	25.0	W000285176
4.0	SPOOL	25.0	OES2Ni2-4-25VCI

OE-S2Ni3

TOP FEATURES

- Copper coated solid wire
- 3% Ni content for optimum impact toughness at low temperature

CLASSIFICATION

AWS A5.23 ENi3
EN ISO 14171-A S2Ni3

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni
0.08	1	0.2	≤0.015	≤0.015	3.2

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	W000285188
4.0	SPOOL	25.0	W000285190

OE-SD3 1Ni 1/4Mo

TOP FEATURES

- 1% Nickel and 0,2% Molybdenum wire to combine high strength and high toughness properties
- Impact toughness properties down to -60°C
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available
- Comply with NACE requirement

CLASSIFICATION

AWS A5.23 ENi5
EN ISO 14171-A S3Ni1Mo0,2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Mo
0.1	1.5	0.20	<0.015	<0.015	0.95	0.25

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OE14MO-24-25VCI
	DRUM	300.0	OE14MO-24-300-CCW
3.2	SPOOL	25.0	OE14MO-32-25VCI
	SPOOL	100.0	OE14MO-32-100
4.0	SPOOL	25.0	OE14MO-4-25VCI
	SPOOL	100.0	OE14MO-4-100
	DRUM	300.0	OE14MO-4-300, OE14MO-4-300E, OE14MO-4-300E-CCW
	DRUM	350.0	OE14MO-4-350E, OE14MO-4-350E-CCW

OE-SD3 1Ni 1/2Mo

TOP FEATURES

- Delivers a high strength and low temperature fracture toughness weld metal
- Compatible with NACE requirement on Ni content
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EF3
 EN ISO 26304-A S3Ni1Mo
 EN ISO 14171-A S3Ni1Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Ni	Mo
0.12	1.7	0.2	≤0.015	≤0.015	0.95	0.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OE12MO-24-25VCI
	DRUM	350.0	OE12MO-24-350E, OE12MO-24-350E-CCW
	DRUM	400.0	OE12MO-24-400, OE12MO-24-400-CCW
3.2	SPOOL	25.0	OE12MO-32-25VCI
	DRUM	350.0	OE12MO-32-350E, OE12MO-32-350E-CCW
	DRUM	400.0	OE12MO-32-400, OE12MO-32-400-CCW
4.0	SPOOL	25.0	OE12MO-4-25VCI
	SPOOL	100.0	OE12MO-4-100
	DRUM	300.0	OE12MO-4-300
	DRUM	350.0	OE12MO-4-350E, OE12MO-4-350E-CCW
	DRUM	400.0	OE12MO-4-400, OE12MO-4-400-CCW

OE-SD2 1NiCrMo

TOP FEATURES

- For high strength steel up to 690MPa Yield strength
- Good impact toughness down to -40°C in As welded conditions
- Recommended with OP 120TT

CLASSIFICATION

AWS A5.23 EG
EN ISO 26304-A SZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo
0.1	1	0.25	1.1	1	0.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285246
3.2	SPOOL	25.0	W000285249
4.0	SPOOL	25.0	W000285252

OE-SD3 2NiCrMo

TOP FEATURES

- For high strength steel up to 720MPa Yield strength
- Good impact toughness down to -60°C in As welded conditions
- Recommended with OP 121TT and OP 121TTW

CLASSIFICATION

AWS A5.23 EG
EN ISO 26304-A S3Ni2.5CrMo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo
0.12	1.5	0.2	0.6	2.4	0.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285261
3.2	SPOOL	25.0	W000285264
4.0	SPOOL	25.0	W000285267

OE-S2 CrMo1

TOP FEATURES

- For maximal operating temperature of 550°C
- Low bruscato factor
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EB2R
EN ISO 24598-A S Cr Mo1

TYPICAL APPLICATIONS

- Creep resistant steel

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo	X-Factor (ppm)
0.12	0.8	0.1	≤0.01	≤0.01	1.2	0.5	≤13

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OES2CRM01-24-25VCI
	DRUM	300.0	OES2CRM01-24-300SF
3.2	SPOOL	25.0	OES2CRM01-32-25VCI
	DRUM	300.0	OES2CRM01-32-300SF
4.0	SPOOL	25.0	OES2CRM01-4-25VCI
	DRUM	300.0	OES2CRM01-4-300

OE-S1 CrMo2

TOP FEATURES

- For maximal operating temperature of 600°C
- Low bruscato factor
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EB3R
EN ISO 24598-A S Cr Mo2

TYPICAL APPLICATIONS

- Creep resistant steel

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.12	0.5	0.12	≤0.15	≤0.15	2.5	1

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285329
3.2	SPOOL	25.0	W000285332
4.0	SPOOL	25.0	W000285335

OE-CROMO S225

TOP FEATURES

- For maximal operating temperature of 600°C
- Low bruscato factor
- Actual (Type 3.1) certificates for each lot of wire showing chemical composition are available

CLASSIFICATION

AWS A5.23 EB3R
EN ISO 24598-A S Cr Mo2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Mo
0.12	0.6	0.12	≤0.01	≤0.01	2.5	1

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OES225-24-25VCI
	DRUM	300.0	OES225-32-300
3.2	SPOOL	25.0	OES225-32-25VCI
	DRUM	300.0	OES225-32-300
4.0	SPOOL	25.0	OES225-4-25VCI
	DRUM	300.0	OES225-4-300

OE-CROMO S225V

TOP FEATURES

- Unique chemistry
- Low bruscato factor
- Recommended to be used with OP CroMo F537 flux

CLASSIFICATION

AWS A5.23 EG
EN ISO 24598-A SZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Mo	Nb	V
≤0.13	≤1	≤0.2	2.5	1	0.02	0.25

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	OES225V-24-25VCI
3.2	SPOOL	25.0	OES225V-32-25VCI
	DRUM	300.0	OES225V-32-300
4.0	DRUM	300.0	OES225V-4-300

OE-S1 CrMo5

TOP FEATURES

- Creep resistance grade for high pressure high temperature services
- Used in thermal power plant erection
- Recommended with OP125W

CLASSIFICATION

AWS A5.23 EB6
EN ISO 24598-A S CrMo5

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Mo	Nb	V
0.1	0.5	0.3	5.5	0.6	-	-

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285342
3.2	SPOOL	25.0	W000285343
4.0	SPOOL	25.0	W000285344

OE-S1 CrMo91

TOP FEATURES

- For P91 steel grade
- Recommended with OP 90W flux

CLASSIFICATION

AWS A5.23 EB91
EN ISO 24598-A S CrMo91

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo	Nb	V	N
0.1	0.5	0.2	9	0.4	0.9	0.05	0.2	0.04

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285394
3.2	SPOOL	25.0	W000285396

OE-S1 CrMo92

TOP FEATURES

- For P92 steel grade
- Recommended with OP 9W flux
- Precision layer wound

CLASSIFICATION

AWS A5.23 EG
EN ISO 24598-A SZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo	Nb	V	W	N
0.1	0.5	0.2	9	0.5	0.5	0.05	0.2	1.7	0.05

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	25.0	W000377105
2.4	SPOOL	25.0	W000377104

OE-308L

TOP FEATURES

- Cr-Ni Austenitic wire
- High resistance to intergranular corrosion and oxidizing environments

CLASSIFICATION

AWS A5.9 ER308L
EN ISO 14343-A S 19 9 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.02	1.8	0.4	≤0.02	≤0.02	20	10

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	16.0	W000285600
	SPOOL	25.0	W000285601
2.0	SPOOL	25.0	W000285604
2.4	SPOOL	25.0	W000285606
3.2	SPOOL	25.0	W000285608
4.0	SPOOL	25.0	W000285611

OE-309L

TOP FEATURES

- Designed to be used primarily with basic fluxes that recover nearly all of the wire chromium in the deposit
- Reduced carbon levels (0.03% max) that offer increased resistance to inter-granular corrosion

CLASSIFICATION

AWS A5.9	ER309L
EN ISO 14343-A	S 23 12 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni
0.02	1.8	0.4	≤0.03	≤0.03	24	13

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.0	SPOOL	25.0	W000285682
2.4	SPOOL	25.0	W000285684
3.2	SPOOL	25.0	W000285686
4.0	SPOOL	25.0	W000285689

OE-309LMo

TOP FEATURES

- For dissimilar welds
- For cladding purpose
- 309L chemistry with about 2,5%Mo addition

CLASSIFICATION

AWS A5.9 EG
EN ISO 14343-A S 23 12 2 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.02	1.5	0.4	≤0.02	≤0.02	21.5	14.5	2.6

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285697
3.2	SPOOL	25.0	W000285699
4.0	SPOOL	25.0	W000285702

OE-316L

TOP FEATURES

- High resistance to intergranular corrosion and general corrosion conditions
- The 2-3% molybdenum improve pitting corrosion resistance of the weld deposit
- Precision layer wound spool

CLASSIFICATION

AWS A5.9 ER316L
EN ISO 14343-A S 19 12 3 L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo
0.02	1.7	0.4	≤0.02	≤0.02	18.5	12	2.75

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	25.0	W000285640
2.0	SPOOL	25.0	W000285643
2.4	SPOOL	25.0	W000285645
3.2	SPOOL	25.0	W000285647
4.0	SPOOL	25.0	W000285650

OE-318

TOP FEATURES

- A 19%Cr-12,5%Ni-2,7%Mo stainless steel wire
- Recommended with OP F500
- High resistance to crevice corrosion by oxidising acids

CLASSIFICATION

AWS A5.9 ER318
EN ISO 14343-A S 19 12 3 Nb

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr	Ni	Mo
<0.05	1.3	0.4	19	12.5	2.7

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285671
3.2	SPOOL	25.0	W000285673
4.0	SPOOL	25.0	W000285676

OE-347

TOP FEATURES

- The addition of niobium reduces intergranular corrosion in severe operating conditions
- Niobium stabilized stainless steel wire used for the welding of 347 and 321 stainless steel grades
- Recommended with OP 33 and OP F500 fluxes

CLASSIFICATION

AWS A5.9	ER347
EN ISO 14343-A	S 19 9 Nb

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Nb
0.04	1.6	0.4	≤0.02	≤0.02	19.5	9.7	0.6

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285632
3.2	SPOOL	25.0	W000285634
4.0	SPOOL	25.0	W000285637

OE-S 22 09

TOP FEATURES

- For duplex stainless steel

CLASSIFICATION

AWS A5.9 ER2209
EN ISO 14343-A S 22 9 3 N L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	N
0.015	1.6	0.5	≤0.02	≤0.003	23	8.6	3.1	0.16

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285710
3.2	SPOOL	25.0	W000285712
4.0	SPOOL	25.0	W000285715

OE-S 25 10

TOP FEATURES

- Recommended with OP F500
- High pitting corrosion resistance

CLASSIFICATION

AWS A5.9 ER2594
EN ISO 14343-A S 25 9 4 N L

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	P	S	Cr	Ni	Mo	N
0.02	2	0.4	≤0.02	≤0.02	26	10	4	0.25

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	W000285725

OE-430

TOP FEATURES

- A 16,5% Cr stainless steel wire
- Resistant to intergranular corrosion

CLASSIFICATION

AWS A5.9 ER430
EN ISO 14343-A S 17

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

C	Mn	Si	Cr
≤0.1	≤0.6	≤0.5	16.5

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000285786
3.2	SPOOL	25.0	W000285788
4.0	SPOOL	25.0	W000285790

FLUXOCORD 31

TOP FEATURES

- Seamless copper coated flux cored wire
- Weld metal composition similar to what obtained with an EH12K solid wire grade
- Impact toughness down to -40°C in both As welded and PWHT conditions

CLASSIFICATION

Flux	AWS 5.17
OP 121TT	F7A4/F7P4-EC-1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si
OP 121TT	0.05	1.6	0.2

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-20°C	-40°C
OP 121TT	AW	≥ 460	520-650	≥25	140	100
OP 121TT	PWHT 580°C/2h	≥ 440	520-620	≥25	140	100

*AW = As welded; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
3.2	SPOOL	25.0	W000282008
4.0	SPOOL	25.0	W000282012

FLUXOCORD 35 25

TOP FEATURES

- Seamless copper coated flux cored wire
- Micro alloyed wire for 2 run technique application
- Excellent impact toughness in combination with OP122 and OP121TT

CLASSIFICATION

Flux	AWS 5.23	EN ISO 14171-A
OP 121TT	F7A4-EC-G	S 46 4 FB TZ
OP 122	F7A4-EC-G	S 46 4 FB TZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	P	S	Ti	B
OP 121TT	0.04	1.4	0.30	≤0.025	≤0.020	0.020	0.003
OP 122	0.04	1.5	0.25	≤0.025	≤0.020	0.020	0.003

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-20°C	-40°C
OP 121TT	AW	≥ 460	530-620	≥24	≥80	≥60
OP 122	AW	≥ 460	530-620	≥24	≥80	≥60

* AW = As welded

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000282038
3.2	SPOOL	25.0	W000282040
4.0	SPOOL	25.0	W000282043
	SPOOL	80.0	W000387581

FLUXOCORD 40

TOP FEATURES

- Seamless copper coated flux cored wire
- Nickel content to ensure high impact toughness down to -60°C
- Also compatible with applications requiring a post weld heat treatment

CLASSIFICATION

Flux	AWS 5.23
OP 121TT	F7A8-EC-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Ni
OP 121TT	0.05	1.3	0.2	1.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-60°C
OP 121TT	AW	≥ 450	540-620	≥24	≥140	≥100	
OP 121TT	PWHT 580°C/2h	≥ 440	520-600	≥24	≥140	≥100	≥60

*AW = As welded; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
4.0	SPOOL	25.0	W000379143

FLUXCORD 40C

TOP FEATURES

- Low alloy seamless copper coated flux cored wire
- Limited drop of yield properties after PWHT
- Compatible with NACE requirements. Nickel content below 1%

CLASSIFICATION

Flux	AWS 5.23
OP 121TT	F7A8/F7P8-EC-Ni1

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Ni
OP 121TT	0.1	1.3	0.2	0.9

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-40 °C	-60 °C
OP 121TT	AW	≥ 480	550-680	≥22	≥80	≥ 47
OP 121TT	PWHT 620 °C/1h	≥ 460	530-660	≥24	≥100	≥ 47

*AW = As welded; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000377272
4.0	SPOOL	25.0	W000379137

FLUXOCORD 41

TOP FEATURES

- Seamless copper coated flux cored wire
- Nickel and Molybdenum addition to ensure both high strength properties and high impact toughness down to -60°C
- Also compatible with applications requiring a post weld heat treatment

CLASSIFICATION

Flux	AWS 5.23	EN ISO 26304-A
OP 121TT	F9A8/F8P6-EC-G	S 55 6 FB TZ

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Ni	Mo
OP 121TT	0.05	1.5	0.3	1.5	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-60°C
OP 121TT	AW	≥ 550	640-760	≥20	≥ 100	≥ 60	≥ 47
OP 121TT	PWHT 620°C/1h	≥ 500	600-710	≥22	≥ 120	≥100	≥60

*AW = As welded; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
4.0	SPOOL	25.0	W000379128

FLUXCORD 42

TOP FEATURES

- Seamless copper coated fluxcored wire
- Maintain high yield strength above 690MPa in both as welded and after stress relieved conditions
- Low diffusible hydrogen in combination with OP121TTW

CLASSIFICATION

Flux	AWS 5.23	EN ISO 26304-A
OP 121TTW	F11A8/F11P5-EC-F5	S 69 6 FB (T3Ni2,5CrMo) H5

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Cr	Ni	Mo
OP 121TTW	0.07	1.4	0.25	0.5	2.5	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-60°C
OP 121TTW	AW	≥ 690	760-900	≥ 16	≥ 90	≥ 80	≥ 69
OP 121TTW	PWHT 620°C/1h	≥ 690	740-880	≥ 16	≥ 69	≥ 47	

*AW = As welded; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
1.6	SPOOL	16.0	W000282112
2.0	SPOOL	25.0	W000282115
2.4	SPOOL	25.0	W000282117
3.2	SPOOL	25.0	W000282119
4.0	SPOOL	25.0	W000380453
	SPOOL	80.0	W000386904
	SPOOL	90.0	W000380434

FLUXOCORD 43.1

TOP FEATURES

- Seamless copper coated flux cored wire
- Designed for normalizing/Normalizing+ stress relief conditions to provide impact toughness down to -60°C
- Recommended with OP 121TT

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Ni	Mo
OP 121TT	0.05	1.40	0.10	1.90	0.35

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-60°C
OP 121TT	N + PWHT 940°C+600°C	≥ 460	570-670	≥22	100	80	47
OP 121TT	N 940°C	≥ 420	550-650	≥22	100	80	47

* N = Normalising; PWHT = Post weld heat treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
4.0	SPOOL	25.0	W000282067

FLUXCORD 44 TN

TOP FEATURES

- Seamless copper coated flux cored wire
- Designed for 3,5%Ni steels that are sensitive to decarburization of the heat affected zone by the post weld heat treatment
- Excellent impact toughness down to -90°C after post weld heat treatment
- Recommended in DC+ only

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, WIRE

	C	Mn	Si	Ni	Mo
OP 121TTW	0.05	0.8	0.3	3	0.3

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Flux	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-40°C	-75°C	-90°C
OP 121TTW	PWHT 595°C/4h	> 485	> 520	≥20	≥155	≥70	≥27

*PWHT = Post Weld Heat Treatment

PACKAGING AND AVAILABLE SIZES

Wire diameter (mm)	Packaging	Weight (kg)	Item number
2.4	SPOOL	25.0	W000282075

OP 143

TOP FEATURES

- Active flux suitable for high speed welding conditions
- Fast freezing slag
- High current capacity
- Easy slag removal

CLASSIFICATION

Flux	EN ISO 14174: SA CS 1 98 AC	
Flux/wire	AWS A5.17	AWS A5.23
OE-S1	F6A0-EL12	
OE-S2	F7A0-EM12K	
OE-S2Mo		F8A0-EA2-A3

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S1	0.04	1.30	0.80	
OE-S2	0.05	1.70	0.90	
OE-S2Mo	0.05	1.70	0.90	0.50

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20 °C	0 °C	-20 °C
OE-S1	AW	≥360	460-560	≥24	≥90	≥50	≥30
OE-S2	AW	≥400	530-630	≥24	≥90	≥50	≥35
OE-S2Mo	AW	≥480	600-700	≥22	≥65	≥50	≥35

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1.0
Grain size (EN ISO 14174)	2-20
Redrying	300-350 °C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280028

OP 181

TOP FEATURES

- Recommended for limited amount of passes applications
- For high speed welding fillet welds
- High Mn and Si pick-up from the flux

CLASSIFICATION

Flux	EN ISO 14174: SA AR 1 88 AC	
Flux/wire	AWS A5.17	EN ISO 14171-A
OE-S1	F7A0/F7PZ-EL12	S 42 0 AR S1
OE-S2	F7A0/F7PZ-EM12K	S 42 2 AR S2
OE-S2Mo		S 46 0 AR S2Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S1	0.03	1.1	0.6	
OE-S2	0.04	1.3	0.6	
OE-S2Mo	0.04	1.3	0.6	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					0° C	-20° C
OE-S1	AW	≥420	520-620	≥22	≥47	
OE-S2	AW	≥450	560-660	≥22		≥47
OE-S2Mo	AW	≥490	610-710	≥18	≥47	

* AW = As welded

FLUX CHARACTERISTICS

Basicity (Boniszewski)	0.4
Grain size (EN ISO 14174)	2-16
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280009

OP 191

TOP FEATURES

- Active flux for limited amount of passes
- A good choice for fillet welds and small diameter spiral pipes welding
- Good slag detachability
- Good weldability on rusty plate
- Suitable for high welding speed applications

CLASSIFICATION

Flux	EN ISO 14174: SA AR 1 87 AC		
Flux/wire	AWS A5.17	AWS A5.23	EN ISO 14171-A
	OE-S1 F7A0-EL12		S 42 A AR S1
	OE-S2 F7A0-EM12K		S 42 0 AR S2
OE-S2 NiCu		F8AZ-EG-G	S 46 0 AR S2Ni1Cu

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Ni	Cu
OE-S1	0.04	1.1	0.6		
OE-S2	0.04	1.3	0.6		
OE-S2 NiCu	0.04	1.3	0.6	0.7	0.04

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					0 °C	-20 °C
OE-S1	AW	≥400	520-650	≥22		27
OE-S2	AW	≥400	520-650	≥22		27
OE-S2 NiCu	AW	≥470	550-690	≥22	≥47	

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	0.4
Grain size (EN ISO 14174)	2-16
Redrying	300-350 °C x 2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280011

Uniflux D1

TOP FEATURES

- High speed fillet welding flux
- Fine grain size distribution
- Designed for general structural steel with limited mechanical requirements

CLASSIFICATION

Flux	EN ISO 14174: SA AR 1 97 AC
Flux/wire	AWS 5.17
OE-S1	F7A0-EL12
OE-S2	F7A0-EM12K

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S1	0.06	1.1	0.6	
OE-S2	0.05	1.4	0.7	
OE-S2Mo	0.06	1.4	0.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
OE-S1	AW	≥360	450-550	≥22	≥60
OE-S2	AW	≥400	500-600	≥22	≥50
OE-S2Mo	AW	≥450	580-680	≥18	≥50

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	0.4
Redrying	300-350°C x 2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000281007

OP 160

TOP FEATURES

- Primarily used with low or medium Si & Mn wire grades
- Particularly adequate for fillet weld application
- Mn and Si pick-up from the flux

CLASSIFICATION

Flux	EN ISO 14174: SA AB 1 77 AC H5	
Flux/wire	AWS A5.17	EN ISO 14171-A
OE-S2	F7A2-EM12K	S 38 2 AB S2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si
OE-S2	0.05	1.3	0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					0°C	-20°C
OE-S2	AW	>400	>490	>22	80	47

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	1.2
Grain size (EN ISO 14174)	2-16
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280027

OP 132

TOP FEATURES

- A nitrogen limiting flux designed for seam welding of pipes
- Recommended for automatic single pass/2-run welding with up to five arcs
- Very high current carrying capacity

CLASSIFICATION

Flux	EN ISO 14174: SA AB 1 67 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-S2	F7A5-EM12K	
OE-S2		F8TA2G-EM12K
OE-SD3	F7A5-EH12K	
OE-S2Mo		F8A5/F7P5-EA2-G
OE-S2Mo		F8TA4G-EA2
OE-SD3 1Ni 1/4Mo		F8A8/F8P5-ENi5-G
OE-SD3 1Ni 1/4Mo		F8TA4G-ENi5
OE-SD3 1Ni 1/2Mo		F8TA4G-EF3
OE-SD3 1Ni 1/2Mo		F9A6/F9P5-EF3-F3
OE-TIBOR 25		F8TA6G-EG
OE-TIBOR 33		F9A4-EA2TiB-G
OE-TIBOR 33		F9TA6G-EA2TiB

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Ni	Mo
OE-S2	0.07	1.3	0.2		
OE-SD3	0.07	1.8	0.4		
OE-S2Mo	0.07	1.3	0.2		0.5
OE-SD3 1Ni 1/4Mo	0.06	1.7	0.4	0.9	0.25
OE-SD3 1Ni 1/2Mo	0.07	1.7	0.3	0.9	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)				
					-20°C	-30°C	-40°C	-50°C	-60°C
OE-S2	AW	≥400	480-610	≥27	≥140	≥100	≥60		
OE-SD3	AW	≥470	530-580	≥25			≥70	≥47	
OE-S2Mo	AW	≥470	550-620	≥21	≥110		≥80	≥47	
OE-SD3 1Ni 1/4Mo	AW	≥510	600-650	≥23					≥60
OE-SD3 1Ni 1/4Mo	PWHT 620°C/1h	≥490	580-620	≥24			60		
OE-SD3 1Ni 1/2Mo	AW	≥550	620-760	≥21				≥47	
OE-SD3 1Ni 1/2Mo	PWHT 620°C/1h	≥550	620-760	≥21			≥47		

*AW = As welded; PWHT = Post weld heat treatment

OP 132

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	1.5
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280015
	500.0	W000280020
	1000.0	W000402778
BIG BAG	400.0	W000375396
	1000.0	W000273054

OP 139

TOP FEATURES

- Versatile range of applications for this semi-basic flux
- Suitable for narrow groove
- High current carrying capacity

CLASSIFICATION

Flux	EN ISO 14174: SA AB 1 68 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-S1	F6A2-EL12	
OE-S2	F7A5/F7P5-EM12K	
OE-S2Mo		F8A5/F8P5-EA2-A3
OE-S2NiCu		F8A6-EG-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Ni	Mo	Cu
OE-S1	0.05	0.85	0.15			
OE-S2	0.06	1.8	0.3			
OE-S2Mo	0.06	1.8	0.3		0.4	
OE-S2NiCu	0.06	1.8	0.3	0.7		0.4

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-50°C
OE-S1	AW	≥370	460-520	≥27	≥80		
OE-S2	AW	≥430	500-570	≥27	≥140	≥60	
OE-S2	PWHT 620°C/1h	≥400	490-560	≥25	≥100	≥50	
OE-S2Mo	AW	≥480	570-630	≥21	≥110	≥60	
OE-S2Mo	PWHT 620°C/1h	≥470	550-620	≥22		≥50	
OE-S2NiCu	AW	≥470	550-620	≥22			≥40

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	1.7
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280023

OP 190

TOP FEATURES

- Nice bead surface and good slag detachability
- Excellent profile of fillet welds
- High current carrying capacity

CLASSIFICATION

Flux	EN ISO 14174: S A AB 1 67 AC H5		
Flux/wire	AWS A5.17	AWS A5.23	EN ISO 14171-A
OE-S1	F6A0-EL12		
OE-S2	F7A5/F6P5-EM12K		S 38 4 AB S2
OE-SD2	F7A5/F6P5-EM12K		S 38 5 AB S2Si
OE-S2Mo		F8A5/F8P2-EA2-A4	S 46 5 AB S2Mo

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S1	0.05	1.0	0.2	
OE-S2	0.06	1.35	0.2	
OE-SD2	0.06	1.35	0.4	
OE-S2Mo	0.06	1.35	0.2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-46°C
OE-S1	AW	>360	420-520	>24	>47		
OE-S2	AW	≥400	510-690	≥22		≥80	≥47
OE-S2	PWHT 620°C/1h	≥340	430-550	≥22		≥60	≥27
OE-SD2	AW	≥400	480-600	≥22		≥100	≥80
OE-S2Mo	AW	≥500	600-680	≥22		≥60	≥47
OE-S2Mo	PWHT 620°C/1h	≥480	560-670	≥22		≥47	

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	1.5
Grain size (EN ISO 14174)	2-20
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000384243

OP 192

TOP FEATURES

- Agglomerated aluminate-basic flux recommended for both two-run and multi-run techniques
- Good slag detachability
- High current carrying capacity allowing the use of multi-wire processes

CLASSIFICATION

Flux	EN ISO 14174: S A AB 1 67 AC H5		
Flux/wire	AWS A5.17	AWS A5.23	EN ISO 14171-A
OE-S1	F6A2/F6P2-EL12		
OE-S2	F7A2/F7P4-EM12K		
OE-SD3	F7A6/F7P6-EH12K		
OE-S2Mo		F8A2/F8P2-EA2-A2	
OE-S2 NiCu		F7A2-EG-G	S 42 2 AB S2Ni1Cu

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Ni	Mo	Cu
OE-S1	0.05	1	0.4			
OE-S2	0.05	1.5	0.6			
OE-SD3	0.07	1.7	0.7			
OE-S2Mo	0.07	1.5	0.6		0.5	
OE-S2 NiCu	0.07	1.5	0.6	0.7		0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)			
					-20°C	-30°C	-40°C	-50°C
OE-S1	AW	≥355	440-550	≥24	≥40	≥27		
OE-S1	PWHT 620°C/1h	≥330	420-550	≥22	≥60	≥27		
OE-S2	AW	≥420	510-620	≥24	≥100	≥60	≥27	
OE-S2	PWHT 620°C/1h	≥400	490-650	≥22	≥100	≥60	≥47	
OE-SD3	AW	≥440	530-650	≥22	≥90		≥70	≥27
OE-SD3	PWHT 620°C/1h	≥420	510-650	≥22	≥90		≥60	≥27
OE-S2Mo	AW	≥500	560-680	≥22	≥100	≥27		
OE-S2Mo	PWHT 620°C/1h	≥480	560-690	≥20	≥90	≥27		
OE-S2 NiCu	AW	≥450	500-600	≥25	≥60	≥27		

*AW = As welded; PWHT = Post weld heat treatment

OP 192

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1.3
Grain size (EN ISO 14174)	2-16
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280032

OP 192C

TOP FEATURES

- High silicon pick-up flux
- Smooth bead surface
- Suitable for one side welding as well

CLASSIFICATION

Flux	EN ISO 14174: S A AB 1 87 AC H5	
Flux/wire	AWS 5.17	AWS 5.23
OE-S1	F6A2/F6P2-EL12	
OE-S2	F7A4/F7P4-EM12K	
OE-S2		F7TA0G-EM12K
OS-SD3		F8A2/F8P2-EA2 A2
OS-S2Mo		F8A2/F8P2-EA2 A2
OE-S2Mo		F8TA4G-EA2-A2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S1	0.05	1.0	0.4	
OE-S2	0.06	1.5	0.7	
OS-SD3	0.07	1.7	0.7	
OE-S2Mo	0.05	1.6	0.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)			
					-20°C	-30°C	-40°C	-50°C
OE-S1	AW	≥355	440-550	≥24	40	27		
OE-S1	PWHT 620°C/1h	≥330	420-550	≥22	60	27		
OE-S2	AW	≥420	510-640	≥22	100	50	27	
OE-S2	PWHT 620°C/1h	≥400	490-650	≥22	110	60	40	
OS-SD3	AW	≥440	530-650	≥22	90		50	27
OS-SD3	PWHT 620°C/1h	≥420	510-650	≥22	90		50	27
OE-S2Mo	AW	≥490	570-680	≥20	50	27		
OE-S2Mo	PWHT 620°C/1h	≥480	560-690	≥20	50	27		

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1.3
Redrying	300-350°C x 2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000379883

OP 122

TOP FEATURES

- Usable in DC and AC polarity
- Excellent slag removal
- High current carrying capacity
- Recommended for large throat fillet welds

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 65 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-S2	F7A5/F6P5-EM12K	
OE-SD3	F7A4/F6P4-EH12K	
OE-S2Mo		F7A2-EA2-A2

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S2	0.07	1.0	0.2	
OE-SD3	0.07	1.5	0.3	
OE-S2Mo	0.07	1.0	0.2	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)			
					20°C	0°C	-20°C	-40°C
OE-S2	AW	≥400	450-550	≥24	≥150	≥110	≥90	
OE-SD3	AW	≥400	500-600	≥24	≥160	≥130	≥100	≥70
OE-S2Mo	AW	≥480	550-650	≥20	≥90	≥70	≥40	

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1.7
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000400118
	400.0	W000379124

OP 120 TT

TOP FEATURES

- For multipass welding applications
- Excellent toughness with OE-S2 wires
- Good slag release in narrow grooves
- Slightly contributes to the Manganese and Silicon content in the weld

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 66 DC H5	
Flux/wire	AWS 5.17	AWS 5.23
OE-S2	F7A8/F7P8-EM12K- H4	
OE-S2Mo		F8A4-EA2-A2
OE-SD2 1NiCrMo		F10P4-EG-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo
OE-S1	0.05	0.8	0.2			
OE-S2	0.06	1.2	0.4			
OE-S2Mo	0.06	1.2	0.4			0.5
OE-SD3 1Ni½Mo	0.05	1.6	0.4		0.9	0.5
OE-S2 CrMo1	0.07	1.2	0.3	1.0		0.5
OE-SD2 1NiCrMo	0.06	1.4	0.5	1.0	0.9	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)				
					+20°C	0°C	-20°C	-40°C	-60°C
OE-S1	AW	≥360	440-540	≥25	≥150	≥90			
OE-S2	AW	≥420	500-600	≥24		≥130	≥100	≥70	≥50
OE-S2Mo	AW	≥450	600-700	≥24		≥90	≥70	≥40	
OE-SD3 1Ni½Mo	PWHT 620°C/1h	≥580	680-800	≥30				≥40	
OE-S2 CrMo1	PWHT 680°C/2h	≥380	570-670	≥22	≥200	≥150			
OE-S2 CrMo1	PWHT 920°C/air+720°C	≥310	430-530	≥28		≥200			
OE-SD2 1NiCrMo	AW	≥760	840-870	≥24				≥40	
OE-SD2 1NiCrMo	PWHT 660°C/3h	≥590	690-720	≥26				≥27	

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	3.1
Redrying	300-350°C x 2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000386313

OP 121TT

TOP FEATURES

- Fully basic agglomerated submerged-arc welding flux for multiple pass welding
- Consistent low temperature impact and CTOD toughness
- Suitable for single and multiple arc systems

TYPICAL APPLICATIONS

- Offshore
- Pressure vessels

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 55 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-S2	F7A6/F6P8-EM12K	
OE-SD3	F7A8/F7P8-EH12K	
OE-S2Mo		F8A4/F8P4-EA2-A2
OE-SD3Mo		F8A6/F8P6-EA4-A4
OE-S2 Ni2		F7A10/F7P10-ENi2-Ni2
OE-SD3 1Ni 1/4Mo		F8A10/F8P10-ENi5-Ni5
OE-SD3 1Ni 1/2Mo		F9A8/F9P8-EF3-F3
OE-SD3 2 NiCrMo		F11A8/F11P5-EG-G
OE-S2 CrMo1		F8P4-EB2R-B2
OE-S1 CrMo2		F8P2-EB3R-B3
OE-TIBOR22		F7A8-EG-G
OE-TIBOR33		F8A6-EA2TiB-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Ti	B
OE-S2	0.07	0.9	0.2					
OE-SD3	0.07	1.6	0.3					
OE-S2Mo	0.07	0.9	0.2			0.5		
OE-SD3Mo	0.07	1.3	0.2			0.5		
OE-S2 Ni2	0.06	0.9	0.2		2.1			
OE-S2 Ni3	0.06	0.9	0.2		3.3			
OE-SD3 1Ni 1/4Mo	0.07	1.3	0.3		0.9	0.2		
OE-SD3 1Ni 1/2Mo	0.07	1.5	0.3		0.95	0.5		
OE-SD3 2NiCrMo	0.07	1.4	0.4	0.6	2.2	0.5		
OE-S2 CrMo1	0.07	0.9	0.3	1.1		0.5		
OE-S1 CrMo2	0.08	0.6	0.3	2.2		1		
OE-TIBOR22	0.06	1	0.1			0.3	0.013	0.0010
OE-TIBOR33	0.07	1.2	0.3			0.5	0.15	0.012

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MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					0°C	-40°C	-60°C
OE-S2	AW	≥405	480-550	≥28	≥160	≥50	
OE-SD3	AW	≥460	530-630	≥25	≥180	≥100	≥70
OE-SD3	PWHT 600°C/2h	≥400	490-590	≥27	≥200	≥120	≥90
OE-SD2 Mo	AW	≥470	550-680	≥24	≥120	≥50	
OE-SD3Mo	AW	≥550	610-670	≥29		≥110	≥80
OE-SD3Mo	PWHT 620°C/1h	≥520	600-660	≥27		≥130	≥60
OE-S2 Ni2	AW	≥420	500-600	≥24	≥140	≥100	≥70
OE-S2 Ni2	PWHT 600°C/2h	≥380	470-550	≥26	≥160	≥130	≥100
OE-S2 Ni3	AW	≥480	560-660	≥25	≥160	≥130	≥100
OE-SD3 1Ni 1/2Mo	AW	≥550	650-750	≥20	≥120	≥70	≥47
OE-SD3 1Ni 1/2Mo	PWHT 600°C/2h	≥540	630-730	≥22	≥140	≥90	≥70
OE-SD3 1Ni 1/4Mo	AW	≥500	560-680	≥22		≥145	≥70
OE-SD3 1Ni 1/4Mo	PWHT 600°C/2h	≥470	550-660	≥24		≥160	≥70
OE-SD3 2NiCrMo	AW	≥720	760-900	≥18			≥69
OE-SD3 2NiCrMo	PWHT 580°C/2h	≥600	700-850	≥19		≥47	
OE-S2 CrMo1	PWHT 680°C/2h	≥380	530-630	≥24	≥180		
OE-S2 CrMo1	PWHT 920°C/air+710°C	≥310	430-530	≥30	≥200		
OE-S1 CrMo2	PWHT 720°C/8h	≥450	550-650	≥22	≥100		
OE-S1 CrMo2	PWHT 940°C/air+740°C	≥400	520-620	≥22	≥90		
OE-TIBOR22	AW	≥430	500-650	≥20			≥50
OE-TIBOR33	AW	≥530	580-700	≥20		≥50	

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	3.1
Grain size (EN ISO 14174)	2-20
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280042
	1000.0	W000412642
BIG BAG	400.0	W000280044

OP 121TTW

TOP FEATURES

- Highly basic flux for multiple passes applications
- Very low impurity level in the weld deposit
- Recommended with high strength wire grades and post weld heat treatment conditions
- Very good CTOD properties of the weld metal

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 55 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-S2	F7A6/F6P8-EM12K	
OE-SD3	F7A8/F7P8-EH12K	
OE-S2Mo		F8A4/F8P4-EA2-A2
OE-S2 Ni2		F7A10/F7P10-ENi2-Ni2
OE-S2 Ni3		F8A15/F7P15-ENi3-Ni3
OE-SD3 1Ni 1/4Mo		F8A10/F8P10-ENi5-Ni5
OE-SD3 1Ni 1/2Mo		F9A8/F9P8-EF3-F3
OE-SD3 2NiCrMo		F11A8/F11P5-EG-G
OE-S2 CrMo1		F8P4-EB2R-B2
OE-S1 CrMo2		F8P2-EB3R-B3

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo
OE-S2	0.07	0.9	0.2			
OE-SD3	0.07	1.6	0.3			
OE-S2Mo	0.07	0.9	0.2			0.5
OE-S2 Ni2	0.07	0.9	0.3		2.3	
OE-S2 Ni3	0.06	0.9	0.2		3.3	0.15
OE-SD3 1Ni 1/4Mo	0.07	1.3	0.3		0.9	0.2
OE-SD3 1Ni 1/2Mo	0.07	1.5	0.3		0.95	0.5
OE-SD3 2NiCrMo	0.07	1.4	0.4	0.6	2.2	0.5
OE-S2 CrMo1	0.07	0.9	0.3	1.1		0.5
OE-S1 CrMo2	0.08	0.6	0.3	2.2		1

OP 121TTW

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)				
					-20°C	-40°C	-60°C	-80°C	-101°C
OE-S2	AW	≥360	450-550	≥25	≥100	≥50			
OE-SD3	AW	≥400	480-580	≥25	≥140	≥100	≥70		
OE-S2Mo	AW	≥470	550-680	≥24	≥100	≥50			
OE-S2 Ni2	AW	≥450	550-600	≥24	≥120	≥100	≥70	≥50	
OE-S2 Ni2	PWHT 600°C/2h	≥430	500-600	≥26	≥140	≥130	≥100	≥80	
OE-S2 Ni3	AW	≥480	560-660	≥25	≥140	≥130	≥100	≥80	≥40
OE-S2 Ni3	PWHT 600°C/2h	≥430	500-610	≥26	≥140	≥120	≥90	≥70	≥30
OE-SD3 1Ni 1/4Mo	AW	≥500	560-680	≥22		≥145	≥70		
OE-SD3 1Ni 1/4Mo	PWHT 600°C/2h	≥470	550-660	≥24		≥160	≥70		
OE-SD3 1Ni 1/2Mo	AW	≥550	650-750	≥20	≥90	≥70	≥47		
OE-SD3 1Ni 1/2Mo	PWHT 600°C/2h	≥540	630-730	≥22	≥120	≥90	≥70		
OE-SD3 2NiCrMo	AW	≥720	760-900	≥18			≥69		
OE-SD3 2NiCrMo	PWHT 580°C/2h	≥600	700-850	≥19		≥47			
OE-S2 CrMo1	PWHT 680°C/2h	≥380	530-630	≥24	≥160				
OE-S2 CrMo1	PWHT 920°C/air+710°C	≥310	430-530	≥30	≥160				
OE-S1 CrMo2	720°Cx8h	≥450	550-650	≥22	≥80				
OE-S1 CrMo2	PWHT 940°C/air+740°C	≥400	520-620	≥22	≥80				

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	3.1
Grain size (EN ISO 14174)	2-20
Redrying	350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280051

OP 126

TOP FEATURES

- Highly basic flux for mild steel wires
- Primarily designed with OE-S2/OE-SD2
- Combines good toughness in multirun and two-run techniques with OE-S2 and OE-SD2

CLASSIFICATION

Flux	EN ISO 14174: S A FB 1 55 AC H5	
Flux/wire	AWS 5.17	EN ISO 14174
OE-SD2	F7A5-EM12K	S42 4 FB S2Si
	F7TA5G-EM12K	
OE-SD3	F7A8 EH12K	

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	P	S
OE-SD2	0.07	1.1	0.3	≤0.025	≤0.025
OE-SD3	0.07	1.6	0.3	≤0.025	≤0.025

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)				
					+20°C	0°C	-20°C	-40°C	-60°C
OE-SD2	AW	≥420		≥22				≥100	
OE-SD3	AW	≥450	540-620	≥24	≥200	≥180	≥140	≥90	≥50

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	2.7
Redrying	300-350°C x 2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280056

OP 128TT

TOP FEATURES

- Highly basic flux for multiple passes applications
- Easy slag removal even in narrow groove
- High current carrying capacity making it suitable for high productivity procedures
- Excellent behavior in multi arc and long stick-out process.

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 55 AC H5		
Flux/wire	AWS A5.17	AWS A5.23	EN ISO 14171-A
OE-S2	F7A6-EM12K		
OE-SD2	F7A6-EM12K		
OE-SD3	F7A8/F7P8-EH12K		S 46 6 FB S3Si
OE-S2Mo		F8A4-EA2-A2	
OE-SD3Mo		F8A6/F8P6-EA4-A4	
OE-SD3 1Ni 1/4Mo		F8A10-ENi5-Ni5	
OE-SD3 1Ni 1/2Mo		F9A8-EF3-F3	
OE-S2 CrMo1		F8P4-E2R-B2	
OE-S1 CrMo2		F8P2-EB3R-B3	

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo
OE-S2	0.07	0.9	0.2			
OE-SD2	0.06	1.1	0.3			
OE-SD3	0.07	1.6	0.3			
OE-S2Mo	0.07	0.9	0.2			0.5
OE-SD3Mo	0.08	1.4	0.2			0.5
OE-SD3 1Ni 1/4Mo	0.07	1.4	0.3		0.9	0.2
OE-SD3 1Ni 1/2Mo	0.07	1.5	0.3		0.95	0.5
OE-S2 CrMo1	0.07	0.9	0.3	1.1		0.5
OE-S1 CrMo2	0.08	0.6	0.3	2.2		1

OP 128TT

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)			
					0 °C	-20 °C	-40 °C	-60 °C
OE-S2	AW	≥360	450-550	≥28	≥160	≥100	≥50	
OE-SD2	AW	≥400	480-550	>27			>100	
OE-SD3	AW	≥460	530-630	≥25	≥180		≥100	≥70
OE-SD3	PWHT 620°C/1h	≥400	480-550	>24		≥120	≥100	≥70
OE-S2Mo	AW	≥470	550-680	≥24	≥120	≥100	≥50	
OE-SD3Mo	PWHT 620°C/1h	≥530	580-620	>24			≥70	≥47
OE-SD3Mo	AW	≥540	600-650	≥22			≥60	≥30
OE-SD3 1Ni 1/2Mo	AW	≥550	650-750	≥20	≥120	≥90	≥70	≥47
OE-SD3 1Ni 1/4Mo	AW	≥500	570-630	≥22			≥145	≥70
OE-S2 CrMo1	PWHT 680°C/2h	≥380	530-630	≥24	≥50	≥80	>180	
OE-S1 CrMo2	PWHT 720°C/8h	≥450	550-650	≥22	≥30	≥50	>100	

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC; DC+
Basicity (Boniszewski)	2.2
Grain size (EN ISO 14174)	2-20

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000374083
	1000.0	W000374085

OP 41TT

TOP FEATURES

- Highly basic flux for welding high-tensile fine-grain structural steels
- Used with wire containing a higher level of manganese and silicon
- Suitable for DC+ and AC welding, single or tandem configurations

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 53 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-SD3	F7A8/F6P8-EH12K	
OE-S2Mo		F8A8/F6P5-EA2-A2
OE-SD3Mo		F8A6/F8P6-EA4-A4
OE-S2 Ni1		F7A8/F7P10-ENi1-Ni1
OE-SD3 1Ni 1/2Mo		F9A8/F9P8-EF3-F3

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo
OE-SD3	0.07	1.6	0.3			
OE-S2Mo	0.07	0.8	0.2			0.5
OE-SD3Mo	0.07	1.3	0.2			0.5
OE-S2 Ni1	0.07	1.1	0.3	0.15	1.15	0.3
OE-SD3 Ni 1/2Mo	0.07	1.6	0.3		0.9	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)					
					+20°C	0°C	-20°C	-40°C	-46°C	-60°C
OE-SD3	AW	≥420	530-630	≥24	≥170	≥150	≥120	≥70		≥40
OE-S2Mo	AW	≥490	570-670	≥20	≥140	≥120	≥100	≥70		≥50
OE-SD3Mo	AW	≥500	560-660	≥24					≥40	
OE-SD3Mo	PWHT 620°C/2h	≥470	550-650	≥25					≥40	
OE-S2 Ni1	AW	≥420	500-600	≥24	≥150	≥130	≥100	≥70		≥50
OE-S2 Ni1	PWHT 600°C/2h	≥380	480-500	≥26	≥170	≥140	≥110	≥90		≥70
OE-SD3 Ni 1/2Mo	AW	≥560	650-700	≥20			≥50	≥80		≥100
OE-SD3 Ni 1/2Mo	PWHT 620°C/16h	≥540	620-700	≥22			≥50	≥80		≥100

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	3.1
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280057

OP 41TTW

TOP FEATURES

- Generates a high purity weld metal chemistry
- Recommended with long post weld heat treatment
- Widely used in Nuclear industry

CLASSIFICATION

Flux	EN SO 14174: SA FB 1 65 AC H5	
Flux/wire	AWS A5.17	AWS A5.23
OE-SD3	F7A8/F7P8-EH12K	
OE-SD3 Ni 1/4Mo		F9A8/F8P8-EG
OE-SD3 Ni 1/2Mo		F9A8/F9P8-EF3-F3
OE-S2 CrMo1		F8P6-EB2R-B2
OE-S1 CrMo2		F9P2-EB3R-B3

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo
OE-SD3	0.1	1.6	0.4			
OE-SD3 Ni 1/4Mo	0.1	1.35	0.35		0.9	0.25
OE-SD3 Ni 1/2Mo	0.1	1.5	0.4		0.95	0.5
OE-S2 CrMo1	0.1	0.8	0.3	1.1		0.5
OE-S1 CrMo2	0.1	0.6	0.3	2.1		1.0

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-40°C	-50°C	-60°C
OE-SD3	AW	≥460	480-660	≥22			≥47
OE-SD3	PWHT 620°C/12h	≥400	510-650	≥25			≥47
OE-SD3	PWHT 620°C/16h	≥400	500-650	≥25			≥47
OE-SD3 Ni 1/4Mo	AW	≥540	620-760	≥22		≥55	
OE-SD3 Ni 1/4Mo	PWHT 620°C/2h	≥510	590-720	≥22		≥55	
OE-SD3 Ni 1/2Mo	AW	≥600	650-760	≥20		≥47	
OE-SD3 Ni 1/2Mo	PWHT 690°C/2h	≥590	650-760	≥20		≥47	
OE-SD3 Ni 1/2Mo	PWHT 620°C/16h	≥540	620-760	≥20		≥47	
OE-S2 CrMo1	PWHT 690°C/1h	≥500	570-690	≥20	≥54	≥27	
OE-S2 CrMo1	PWHT 690°C/26h	≥485	550-690	≥22	≥54	≥47	
OE-S1 CrMo2	PWHT 690°C/8h	≥460	550-690	≥20	≥54		
OE-S1 CrMo2	PWHT 690°C/26h	≥450	540-690	≥20	≥54		

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	2.5
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000374082

OP 49

TOP FEATURES

- Combines high yield and tensile strength after PWHT and good toughness at low temperature with mild steel wires
- Highly basic flux with silicon and manganese pick-up
- Offers good toughness in two-run and multirun with S2Mo wire grade

CLASSIFICATION

Flux	EN ISO 14174: S A FB 1 76 AC H5		
Flux/wire	AWS 5.17	AWS 5.23	EN ISO 14171-A
OE-S2	F7A6/F7P6-EM12K		S 42 5 FB S2
OE-SD2	F7A6/F7P6-EM12K		S 42 5 FB S2
OE-SD3	F7P5-EH12K		
OE-SD3	F8A4-EH12K		
OE-S2Mo		F8P5-EA2-A4	S 46 4 FB S2Mo
OE-S2Mo		F9A4-EA2-A4	

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Mo
OE-S2	0.06	1.4	0.5	
OE-SD2	0.06	1.4	0.6	
OE-SD3	0.07	2.0	0.9	
OE-S2Mo	0.06	1.5	0.7	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					-20°C	-40°C	-50°C
OE-S2	AW	≥ 440	530-620	≥ 24	≥ 90	≥ 60	≥ 47
OE-S2	PWHT 600°C/2h	≥ 410	500-590	≥ 26	≥ 120	≥ 70	≥ 47
OE-SD2	AW	≥ 440	550-620	≥ 24		≥ 80	≥ 47
OE-SD2	PWHT 620°C/1h	≥ 420	510-590	≥ 26	≥ 100	≥ 60	≥ 47
OE-SD3	AW	≥ 520	620-690	≥ 20	≥ 80	≥ 40	
OE-SD3	PWHT 600°C/2h	≥ 420	560-620	≥ 20	≥ 100	≥ 50	≥ 27
OE-S2Mo	AW	≥ 570	650-700	≥ 20	≥ 80	≥ 50	
OE-S2Mo	PWHT 620°C/1h	≥ 520	620-670	≥ 20	≥ 100	≥ 60	

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	2.1

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280058

OP 125W

TOP FEATURES

- Designed for creep resistant steels
- Extremely low Si pick-up
- Specifically recommended with EB6 wire grade

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 55 AC H5
Flux/wire	AWS A5.23
OE-S1 CrMo5	F8P0-EB6-B6

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Mo
OE-S1 CrMo5	0.06	0.6	0.2	5.0	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	0°C
OE-S1 CrMo5	PWHT 740°C	≥450	520-620	≥22	≥150	≥120
OE-S1 CrMo5	PWHT 950°C/air+740°C	≥400	500-600	≥22	≥130	≥100

*PWHT = Post Weld Heat Treatment

FLUX CHARACTERISTICS

Grain size (EN ISO 14174)	2-20
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280064

OP 90W

TOP FEATURES

- Designed for P91 and P92 grades
- High hot cracking resistance at high interpass temperatures
- High impact toughness

CLASSIFICATION

Flux	EN ISO 14174: S A FB 1 55 DC H5
Flux/wire	AWS A5.23
OE-S1 CrMo91	F9PZ-EB91-B91
OE-S1 CrMo92	F9PZ-EG-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	V	W	N
OE-S1 CrMo91	0.10	0.7	0.2	8.5	0.4	0.95	0.05	0.2		0.04
OE-S1 CrMo92	0.10	0.7	0.2	8.5	0.5	0.4	0.05	0.2	1.7	0.04

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20°C	0°C
OE-S1 CrMo91	PWHT 760°C/4h	≥540	620-760	≥17	≥50	≥27
OE-S1 CrMo92	PWHT 760°C/4h	≥540	620-760	≥17	≥50	

*PWHT = Post Weld Heat Treatment

FLUX CHARACTERISTICS

Current type	DC+
Basicity (Boniszewski)	3.0
Grain size (EN ISO 14174)	2-16
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000374906

OP 9W

TOP FEATURES

- For P91/P92 steel grades
- Designed for OE-S1 CrMo91 and OE-S1 CrMo92 wires
- Resistant to hot cracking at high interpass temperatures

CLASSIFICATION

Flux	EN ISO 14174: S A FB 1 55 DC H5
Flux/wire	AWS A5.23
OE-S1 CrMo91	F9PZ-EB91-B91
OE-S1 CrMo92	F9PZ-EG-G

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	V	W	N
OE-S1 CrMo91	0.1	0.7	0.2	9	0.4	0.95	0.05	0.2		0.04
OE-S1 CrMo92	0.1	0.7	0.2	9	0.5	0.4	0.04	0.2	1.7	0.04

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20 °C
OE-S1 CrMo91	PWHT 760°C/4h	≥540	620-760	≥17	≥50
OE-S1 CrMo92	PWHT 760°C/4h	≥540	620-760	≥17	≥50

*PWHT = Post Weld Heat Treatment

FLUX CHARACTERISTICS

Current type	DC+
Basicity (Boniszewski)	3.0
Grain size (EN ISO 14174)	2-16
Redrying	300-350 °C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000384329

OP CROMO F537

TOP FEATURES

- Designed for the welding of creep resistant steels 2,25Cr-1Mo-0,25V and 2,25Cr-1Mo
- Very low X-factor and J factor in the weld metal
- Very low silicon pick-up
- No reduction in toughness after "Step Cool" heat treatment with OE-CROMO S225 wire

CLASSIFICATION

Flux	EN ISO 14174: SA FB 1 55 AC H5
Flux/wire	AWS A5.23
OE-SD3 1Ni 1/2Mo	F10A8/F9P8-EF3-F3
OE-S1 CrMo5	F8P0-EB6-B6
OE-CROMO S225	F9P2-EB3R-B3
OE-CROMO S225V	F9P2-EGR-GR

CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	V
OE-SD3 1Ni 1/2Mo	0.11	1.8	0.3		0.93	0.5		
OE-S1 CrMo5	≤0.12	≤1	≤0.5	5		0.5		
OE-CROMO S225	≤0.12	≤1	≤0.25	2.2		1		
OE-CROMO S225V	≤0.12	≤1	≤0.25	2.4		1	0.02	0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)			
					0°C	-20°C	-40°C	-60°C
OE-SD3 1Ni 1/2Mo	AW	≥650	740-800	≥21				>47
OE-SD3 1Ni 1/2Mo	PWHT 640°C/6h	≥570	700-740	≥22				>47
OE-S1 CrMo5	PWHT 760°C/2h	≥470	550-700	≥20		≥54		
OE-CROMO S225	PWHT 690°C/8h	≥540	620-750	≥18	≥100	≥100	≥50	
OE-CROMO S225V	PWHT 710°C/8h	≥540	620-750	≥18		≥27		

*AW = As welded; PWHT = Post weld heat treatment

FLUX CHARACTERISTICS

Current type	DC, AC
Basicity (Boniszewski)	~2.6
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000380061

OP 33

TOP FEATURES

- Neutral flux for stainless steel application
- No chromium lost in weld metal despite no chromium compensation from flux
- Ideal for fillet welds

CLASSIFICATION

Flux	EN ISO 14174: SA AF 2
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb
OE-308L	≤0.03	1.5		18	9		
OE-309LMo	≤0.03	1.8		21	15	3	
OE-316L	≤0.03	1.6		18	10	2.7	
OE-318	≤0.07	1.3		18	10	2.7	0.05
OE-347	≤0.07	1.6		18	9		0.05
OE-317L	≤0.03	1.5		20	13	3.5	
OE-20 16 L	≤0.015	7		20	16	3	
OE-S 22 09	≤0.03	1.8		23	9	3	
OE-410 NiMo	0.010	0.6	0.05	12.2	4.0	0.05	

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)		
					+20 °C	-60 °C	-196 °C
OE-308L	AW	≥350	≥500	≥35	≥75	60	
OE-309LMo	AW	≥420	≥600	≥25	≥80		
OE-316L	AW	≥350	≥525	≥30	≥75	60	
OE-318	AW	≥370	≥600	≥30	≥65		
OE-347	AW	≥370	≥575	≥30	≥65		
OE-317L	AW	≥350	≥550	≥30	≥75	60	
OE-20 16 L	AW	≥390	≥570	≥35	≥70		≥30
OE-S 22 09	AW	≥550	≥750	≥25		70	
OE-410 NiMo	PWHT 590 °C/2h	≥800	≥850	≥15	≥50		

* AW = As welded, PWHT = Post Weld Heat Treatment

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1.8
Grain size (EN ISO 14174)	2-20
Redrying	300-350 °C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000376543

OP F500

TOP FEATURES

- Neutral agglomerated flux
- Excellent behavior on stabilized stainless steel grades
- Excellent slag detachability even at high interpass temperatures

CLASSIFICATION

Flux	EN ISO 14174: S A FB 2
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	Cu	N
OE-308L	0.02	1.5	0.5	18	9			≤0.35	
OE-309L	0.02	1.5	0.5	22	13				
OE-309LMo	0.02	1.5	0.5	20	14	2.5			
OE-316L	0.02	1.5	0.5	18	10	2.5			
OE-318	0.07	1.5	0.5	18	10	2.5			
OE-347	0.07	1.5	0.5	18	9		1	≤0.35	
OE-S 22 09	0.03	1.5	0.5	22	8.5	3			0.18
OE-410	0.06	0.3	0.6	12					
OE 410NiMo	0.015	0.3	0.6	12	4.2	0.5			

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					-20 °C	+60 °C
OE-308L	AW	≥350	≥500	≥35	≥75	
OE-309L	AW	≥400	≥550	≥30	≥70	≥70
OE-309LMo	AW	≥370	≥550	≥25	≥65	
OE-316L	AW	≥350	≥520	≥30	≥75	
OE-318	AW	≥390	≥600	≥30		≥100
OE-347	AW	≥500	≥570	≥30		≥70
OE-S 22 09	AW	≥600	≥700	≥30	≥50	

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	2.2
Grain size (EN ISO 14174)	2-16
Redrying	300-350 °C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000402727

OP 76

TOP FEATURES

- Provide a high hot cracking resistance
- Suitable for duplex and fully austenitic grades
- Good slag removal with non stabilized stainless steel grades

CLASSIFICATION

Flux	EN ISO 14174: SA FB 2
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	Cu	N
OE-410NiMo	0.01	0.07		12	4.2	0.5			
OE-904L	0.02	1.8	0.2	20.5	25	4.9		1.5	
OE-NIFIL 600	0.03			22	74		2.5		
OE-NIFIL 625	0.03	0.3		23	60	10	3.5		
OE-308L	0.03	1.2		19	9				
OE-347	0.07	1.5		19	9		0.5		
OE-316L	0.03	1.6		19	10	3			
OE-318	0.07	1.3		19	10	3	0.5		
OE-20 16 L	0.03	7		20	16	3	0.5		0.15
OE-S 22 09	0.03	1.8		23	9	3			0.1
OE-S 25 10	0.04	0.5		25	10	4			0.25

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J)	
					+20 °C	-40 °C
OE-410NiMo	600 °C x 2h	≥600	≥800	≥20	≥30	
OE-904L	AW	≥320	≥550	≥30	≥75	
OE-NIFIL 600	AW	≥380	≥600	≥30	≥100	
OE-NIFIL 625	AW	≥450	≥760	≥23	≥75	
OE-308L	AW	≥350	≥550	≥35	≥75	
OE-347	AW	≥370	≥575	≥30	≥65	
OE-316L	AW	≥370	≥550	≥30	≥75	
OE-318	AW	≥370	≥600	≥30	≥65	
OE-20 16 L	AW	≥410	≥600	≥30	≥120	
OE-S 22 09	AW	≥550	≥750	≥25		≥90
OE-S 25 10	AW	≥550	≥650	≥20		≥50

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	3.0
Grain size (EN ISO 14174)	2-20
Redrying	300-350 °C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280065

OPXNi

TOP FEATURES

- Good slag removal with nickel based wires
- Good hot cracking resistance
- Suitable for both joining and cladding applications

CLASSIFICATION

Flux	EN ISO 14174: SA AB 2
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	Fe
OE-NIFIL 600	0.02	4	0.35	21.5	70		2.5	0.8
OE-NIFIL 625	0.015	2	0.4	21	60	9	3.5	0.5

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) -196°C
OE-NIFIL 600	AW	≥350	≥600	≥42	≥95
OE-NIFIL 625	AW	≥460	≥730	≥42	≥80

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	2.0
Grain size (EN ISO 14174)	2-16
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000382167

OP 1350A

TOP FEATURES

- Hardfacing alloying flux in Carbon, Chromium and Molybdenum
- Recommended with OE-S2 and OE-S2Mo wires
- Maximum hardness of 330HB with OE-S2

CLASSIFICATION

Flux	EN ISO 14174: SA CS 3
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	Layer	C	Mn	Si	Cr	Mo
OE-S2	1	0.1	1.5	0.6	1.2	0.2
OE-S2	2	0.1	1.7	0.7	1.4	0.2
OE-S2	3	0.1	1.9	0.9	1.9	0.3
OE-S2Mo	1	0.1	1.5	0.6	1.3	0.4
OE-S2Mo	2	0.1	1.7	0.8	1.5	0.5
OE-S2Mo	3	0.1	1.9	1.0	2.1	0.6

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Layer	Condition*	Hardness (HB)
OE-S2	1	AW	260
OE-S2	2	AW	320
OE-S2	3	AW	330
OE-S2Mo	1	AW	280
OE-S2Mo	2	AW	370
OE-S2Mo	3	AW	390

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC; DC+
Grain size (EN ISO 14174)	2-20
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280090

OP 10U

TOP FEATURES

- To be used as backing flux
- Excellent back bead shape
- Easy slag removal

CLASSIFICATION

Flux	EN ISO 14174: SA CS 1
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FLUX CHARACTERISTICS

Current type	AC; DC+
Grain size (EN-ISO 14174)	1-12
Redrying	300-350°Cx2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000400068

OP 87

TOP FEATURES

- Designed for strip cladding. Can be used for welding as well
- Low basicity flux for an enhanced operability
- Compatible with stabilized stainless steel grades

CLASSIFICATION

Flux	EN ISO 14174: SA CS 2
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Cr	Ni	Mo	Nb
OE-308L	0.03	18	9		
OE-316L	0.03	18	10	2.5	
OE-318	0.07	18	10	2.5	≥8xC
OE-347	0.07	18	9		≥8xC

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Wire grade	Condition*	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Impact ISO-V (J) +20°C
OE-308L	AW	≥350	≥550	≥35	≥75
OE-316L	AW	≥370	≥550	≥30	≥75
OE-318	AW	≥370	≥600	≥30	≥65
OE-347	AW	≥350	≥575	≥30	≥65

* AW = As welded

FLUX CHARACTERISTICS

Current type	AC, DC+
Basicity (Boniszewski)	1
Grain size (EN ISO 14174)	2-20
Redrying	300-350°C x 2-4h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000280076

ELT 300S

TOP FEATURES

- Designed for stainless steel electroslag cladding
- Excellent slag removal and good wettability
- Very low moisture pick up
- Perfectly suitable for standard and high speed

CLASSIFICATION

Flux	EN ISO 14174: ES A FB 2B
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	Layer	C	Mn	Si	Cr	Ni	FN
CladStrip 24.13L	1	0.02	1.4	0.45	19.5	11	6

FLUX CHARACTERISTICS

Current type	DC+
Basicity (Boniszewski)	>3
Redrying	300-350°Cx2h

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000376630

ELT 600S

TOP FEATURES

- Designed for nickel base electroslag cladding
- Excellent welding characteristics
- High hot cracking resistance
- Perfectly suitable for the standard and high cladding welding speeds

CLASSIFICATION

Flux	EN ISO 14174: ES A FB 2B
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CHEMICAL COMPOSITION (WEIGHT %), TYPICAL, ALL WELD METAL

Wire grade	C	Mn	Si	Cr	Ni	Mo	Nb	Fe
CladStrip 625	0.02	0.2	0.4	20.6	bal.	8.6	3.2	4.3

FLUX CHARACTERISTICS

Current type	DC+
Basicity (Boniszewski)	4
Redrying	300-350°Cx2h
Grain size (EN-ISO 14174)	2-20

PACKAGING AND AVAILABLE SIZES

Packaging	Weight (kg)	Item number
DRY BAG	25.0	W000384602

BENEFITS

For a well-made welding bead:

- Without copper contamination
- Without risk of burn through in the first pass position (used as a support)
- Without re-welding
- Without risk of lack of fusion
- No turning of the work piece
- Bigger root thickness permits higher welding current for the hot pass
- An increase in first pass deposit rate
- Wide root gap
- Total penetration without turning the parts to be welded
- Total penetration of joints difficult to access in reverse position
- Smooth profile of the root pass

For a well-made weld preparation before welding:

- Ideal to compensate for variations in preparation of sheet edge backlashes
- Easy to use (adhesive/metallic support)
- Simplify chamfering preparations

For higher productivity:

- Without gouging operation
- Without grinding operation
- Provides time saving and high quality
- Easy-to-use slats technique

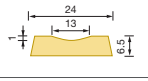

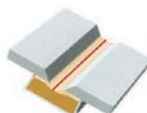
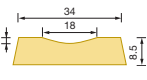
KERALINE has a very low moisture absorption rate and a high melting point, allowing use at high welding intensity, up to 600A.



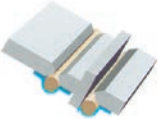







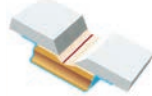





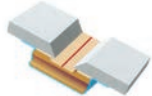













The selection of KERALINE slat types for different welding processes

	MMA	TIG	MIG/MAG	SAW		MMA	TIG	MIG/MAG	SAW
KERALINE TA 1	-	✓	✓	-	KERALINE TR 2	✓	-	✓	-
KERALINE TA 2	-	✓	✓	-	KERALINE TR 3	✓	-	✓	-
KERALINE TA 3	✓	-	✓	-	KERALINE TR 4	✓	-	✓	-
KERALINE TF 1	-	✓	✓	-	KERALINE TR 5	✓	-	✓	-
KERALINE TF 2	-	✓	✓	-	KERALINE TR 6	✓	-	✓	-
KERALINE TF 3	✓	-	✓	-	KERALINE TM 1	✓	✓	✓	✓
KERALINE TR 1	✓	-	✓	-	KERALINE TM 2	✓	✓	✓	✓

The selection of KERALINE slat types for different supports, shapes and dimensions

	Type	Item number	Dimensions (mm)	3D diagram	Application	Packing
Ceramic-on-metallic support	KERALINE TM1-13 mm	W000010403				600 mm / piece 10 pieces per bag (6 meters) 7 bags/carton (42 meters)
	KERALINE TM2-18 mm	W000010404				600 mm / piece 9 pieces per bag (5.4 meters) 5 bags/carton (27 meters)

Type	Item number	Dimensions (mm)	3D diagram	Application	Packing
KERALINE TR1-6 mm	W000010397	 Ø 6			600 mm / piece 50 pieces per bag (30 meters) 5 bags/carton (150 meters)
KERALINE TR2-7 mm	W000010398	 Ø 7			
KERALINE TR3-8 mm	W000010399	 Ø 8			
KERALINE TR4-9 mm	W000010400	 Ø 9			
KERALINE TR5-12 mm	W000010401	 Ø 12			
KERALINE TR6-15 mm	W000010402	 Ø 15			
KERALINE TA1-6 mm	W000010391				600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters)
KERALINE TA2-9 mm	W000010392				
KERALINE TA3-13 mm	W000010393				
KERALINE TF1-6 mm	W000010394				
KERALINE TF2-9 mm	W000010395				600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters)
KERALINE TF3-13 mm	W000010396				
KERALINE TJ10 T FULL PENETRATION	W000262368				600 mm / piece 10 pieces per bag (6 meters) 6 bags/carton (36 meters)
SET OF CERAMIC BACKING RAD 150	W000275493				16 pieces /Circle 18 Circles/carton (18 meters)
SET OF CERAMIC BACKING RAD 200	W000275532				4 pieces /Segment 20 Segments / SET 12 Sets/carton (12 meters)
SET OF CERAMIC BACKING RAD 100	W000404095				12 pieces /Circle 22 Circles/carton (22 meters)

A			
ALUFIL ALMG3	200	CARBOROD CRMO1	218
ALUFIL ALMG4.5MN	202	CARBOROD CRMO2	219
ALUFIL ALMG5	201	CARBOROD CRMO5	220
ALUFIL ALSI5	199	CARBOROD CRMO9	221
ALUROD ALMG3	246	CARBOROD CRMO91	222
ALUROD ALMG4.5MN	247	CARBOROD GALVA	211
ALUROD ALMG4.5MNZR	248	CARBOROD KV3	223
ALUROD ALMG5	249	CARBOROD KV5	224
ALUROD ALSI5	245	CARBOROD MNMO	213
B		CARBOROD MO	212
BASINOX 22 9 3 N	138	CARBOROD NI1	216
BASINOX 25 10 4 N	140	CARBOROD NI2	215
BASINOX 307	116	CARBOROD NI3	217
BASINOX 308H	141	CARBOROD NIMO1	214
BASINOX 308L	118	CARBOROD W 225V	225
BASINOX 309L	122	CITOCORD	56
BASINOX 309Nb	144	CITOCUT	79
BASINOX 310	130	CITOFIX	42
BASINOX 316L	126	CITOFUX B13-O	319
BASINOX 347	135	CITOFUX GALVA	288
BASINOX 4 10	145	CITOFUX HO6	318
BASINOX 4 10 NiMo	146	CITOFUX MO0	280
BOR SP6	78	CITOFUX M20	284
C		CITOFUX M60	283
CARBOCAST NIFE	203	CITOFUX M60 A	282
CARBOFIL	162	CITOFUX R00	285
CARBOFIL 1	163	CITOFUX R00C	286
CARBOFIL 1 GOLD	165	CITOFUX R00Ni	289
CARBOFIL 1A	166	CITOFUX R00NiC	290
CARBOFIL 1A GOLD	167	CITOFUX R11	291
CARBOFIL 2NIMOCR	181	CITOFUX R550	292
CARBOFIL 3NIMOCR	182	CITOFUX R71	287
CARBOFIL A 600	206	CITOFUX R82	293
CARBOFIL CRMO1	168	CITOFUX R82 SR	294
CARBOFIL CRMO2	169	CITOFUX R83	295
CARBOFIL CRMO5	170	CITOFUX R83 C	296
CARBOFIL CRMO91	171	CITORAIL	153
CARBOFIL KV3	172	CITORAPID	41
CARBOFIL KV5	173	CITOREX	50
CARBOFIL MNMO	174	CLEARINOX E 308L	121
CARBOFIL MNNIMOCR	175	CLEARINOX E 309L	125
CARBOFIL MO	176	CLEARINOX E 316L	129
CARBOFIL NI2	177	CLEARINOX F 308L PF	306
CARBOFIL NICU	178	CLEARINOX F 309L PF	307
CARBOFIL NIMO1	179	CLEARINOX F 316L PF	308
CARBOFIL NIMOCR	180	COPPERFIL CUAL8	197
CARBOROD	208	COPPERFIL CUSI3	198
CARBOROD 1	209	CRISTAL F 206	281
CARBOROD 1A	210	CROMO E225	99
		CROMO E225V	103
		CROMO E91	108
		CROMO E92	111
		CROMOCORD 10M	107
		CROMOCORD 5	104
		CROMOCORD 5L	105
		CROMOCORD 9	106
		CROMOCORD 91	109
		CROMOCORD 92	110
		CROMOCORD 9M	112
		CROMOCORD KV3HR	100
		CROMOCORD KV3L	102
		CROMOCORD KV5HR	95
		CROMOCORD KV5L	97
		CROMOCORD N125	98
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		FERROMATIC 200	61
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		FINCORD DB	49
		FINCORD M	44
		FLEXAL 60	40
		FLEXAL 70	81
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		FLUXINOX 308L PF	299
		FLUXINOX 309L	302
		FLUXINOX 309L PF	303
		FLUXINOX 309MoL	304
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		FLUXOCORD 35 25	355
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		FLUXOCORD 40C	357
		FLUXOCORD 41	358
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		FLUXOCORD 43.1	360
		FLUXOCORD 44 TN	361
		FLUXOFIL 14HD	261
		FLUXOFIL 18HD	273
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FLUXOFIL 29HD	271	INERTROD 308LSI	228	OE-SD3 2NiCrMo	337
FLUXOFIL 31	265	INERTROD 309L	229	OE-TIBOR 25	328
FLUXOFIL 31S	266	INERTROD 309LMO	234	OE-TIBOR 33	329
FLUXOFIL 35	276	INERTROD 309LSI	230	OP 10U	395
FLUXOFIL 36	277	INERTROD 310	235	OP 120TT	375
FLUXOFIL 37	278	INERTROD 316L	231	OP 121TT	376
FLUXOFIL 38C	279	INERTROD 316LSI	232	OP 121TTW	378
FLUXOFIL 40	268	INERTROD 318SI	236	OP 122	374
FLUXOFIL 41	269	INERTROD 347	237	OP 125W	386
FLUXOFIL 42	270	INERTROD 347SI	238	OP 126	380
FLUXOFIL 45	272	INERTROD 410NIMO	240	OP 128TT	381
FLUXOFIL 464M	262	INERTROD 904L	239	OP 132	367
FLUXOFIL 48	274	M		OP 1350A	394
FLUXOFIL 50	310	MOLYCORD KV2HR	93	OP 139	369
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FLUXOFIL 54	313	NIFIL 600	204	OP 181	363
FLUXOFIL 56	314	NIFIL 625	205	OP 190	370
FLUXOFIL 58	315	NIROD 600	250	OP 191	364
FLUXOFIL 66	316	NIROD 625	251	OP 192	371
FLUXOFIL 70	317	O		OP 192C	373
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FLUXOFIL M 41	258	OE-309L	346	OP 41TT	383
FLUXOFIL M 42	259	OE-309LMO	347	OP 41TTW	384
FLUXOFIL M 48	260	OE-316L	348	OP 49	385
FLUXOFIL M 58	309	OE-318	349	OP 76	392
FLUXOFIL M 8	254	OE-347	350	OP 87	396
FLUXOFIL M10	255	OE-430	353	OP 90W	387
FLUXOFIL M10S	256	OE-CROMO S225	340	OP 9W	388
FLUXOFIL MC466M	257	OE-CROMO S225V	341	OP CROMO F537	389
I		OE-S 22 09	351	OP F500	391
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INERTFIL 308LSI	185	OE-S1 CrMo5	342	OVERCORD R 10	52
INERTFIL 309L	186	OE-S1 CrMo91	343	OVERCORD R 12	53
INERTFIL 309LMO	187	OE-S1 CrMo92	344	OVERCORD R 92	54
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INERTFIL 347	193	OE-S2Ni3	333	SUPERCITO A	68
INERTFIL 347SI	194	OE-S2NiCu	330	SUPERCORD	47
INERTFIL 410NIMO	196	OE-S4	326	SUPERCORD 45	48
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Handwriting practice area consisting of 20 horizontal dotted lines.

