



Consumables for Low-alloyed steels

OK 48.08

Type Basic

SMAW

E7018-G

Description

OK 48.08 is an LMA electrode with very good mechanical properties suitable for demanding applications, e.g. offshore. The weld metal contains approximately 1% Ni for high impact values down to -40°C. The coating is of the latest LMA type for optimum resistance to porosity and hydrogen cracking. OK 48.08 is CTOD tested.

Recovery

125%

Welding current

DC+(-), AC OCV 70 V



Classifications

AWS A5.5-81	E7018-G
CSA 48.3 M1982	E48018-G
DIN 8529	E SY 46 76 1Ni B H5
ISO 2560	E 51 5 B 120 24 H
EN 499	E 46 5 1Ni B 32 H5

Typical all weld metal composition

C	Si	Mn	Ni
0.06	0.35	1.2	0.9

Typical properties all weld metal

Yield stress	540 MPa
Tensile strength	600 MPa
Elongation	26%

Charpy V

Test temps	Impact values
-20°C	160 J
-40°C	130 J
-50°C	100 J
-60°C	60 J

Approvals

ABS	3HH 3Y
CO	
CWB	E48018-G
DB	10.039.31
DnV	3YHH
DS	E51 5B(H)
GL	5YHH
LR	3 3YH CMnLt40
RS	3YHH
SFS	E 51 60 H10 2
SŞ	14 32 12-H10
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of electrodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/electrode
2.0	300	55-80	22	0.57	135.1	0.6	42
2.5	350	75-110	22	0.57	88.2	1.0	41
3.2	350	110-150	22	0.62	42.3	1.3	66
3.2	450	110-150	22	0.66	30.0	1.4	85
4.0	350	150-200	22	0.66	26.5	2.0	68
4.0	450	150-200	22	0.69	20.3	2.0	90
5.0	450	190-275	23	0.69	14.0	3.0	85
6.0	450	220-360	26	0.66	10.0	3.8	95

OK 73.08

Type Basic

SMAW
E8018-G

Description

OK 73.08 is a NiCu-alloyed LMA electrode, which deposits a weld metal with good corrosion resistance to sea-water and flue gases, for welding of weathering steel and for ship hull construction steel. The weld metal has excellent mechanical properties. It is particularly suitable for welding the shell plating of ice breakers and other ships, which work under conditions where the protective paint-coating wears off.

Recovery

125%

Welding current

DC+, AC OCV 65 V



Classifications

AWS A5.5	E8018-G
DIN 8529	EY 46 65 1 NiCuB
DS 323	E51 5 B 120 26 H
ISO 2560	E51 5 B 120 26 H
EN 499	E 46 5 Z B 32

Typical all weld metal composition

C	Si	Mn	Ni	Cu
0.06	0.4	1.1	0.7	0.4

Typical properties all weld metal

Yield stress	500 MPa
Tensile strength	590 MPa
Elongation	27%

Charpy V

Test temps	Impact values
-20°C	160 J
-40°C	130 J
-50°C	70 J

Approvals

ABS	3H5 3Y
BV	3 3YHH
DB	10.039.20
DnV	3 YH10
DS	E51 5B(H)
GL	3YH
LR	3 3YH15
RS	3YHH
SFS	E 5165 H10 2
SS	143212-H10
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	60-90	20	0.62	113.0	0.7	42
2.5	350	80-115	21	0.62	66.0	0.9	59
3.2	350	100-150	22	-	-	-	-
3.2	450	100-150	22	0.66	30.5	1.3	90
4.0	450	130-200	23	0.68	20.0	1.8	100
5.0	450	190-280	27	0.70	13.5	1.8	106
6.0	450	240-370	28	0.68	9.5	3.3	115

OK 73.68

SMAW

Type Basic

E8018-C1

Description

OK 73.68 is a 2.5% nickel-alloyed LMA electrode suitable for welding of low-alloy steels with impact requirements down to -60°C. The composition of the weld metal is such that good, low temperature impact properties are obtained, even when welding vertically-up. The weld metal of OK 73.68 is also noted for its good corrosion resistance to sea-water and sulphuric acid fumes.

Recovery

120%

Welding current

DC+, AC OCV 65 V



Classifications

AWS A5.5	E8018-C1
BS 2493	2Ni BH
EN 499	E 46 6 2Ni B 32 H5

Typical all weld metal composition

C	Si	Mn	Ni
0.05	0.35	1.0	2.4

Typical properties all weld metal

Yield stress	520 MPa
Tensile strength	610 MPa
Elongation	26%

Charpy V

Test temps	Impact values
-55°C	110 J
-60°C	105 J

Approvals

ABS	3H5 3Y40
BV	UP (KV-60°C)
CO	
DnV	5 YH10
LR	2 5Y40 H15
PRS	4YH10
RS	3YHH
SFS	E 5170 H10 2
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of electrodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/electrode
2.0	300	55-75	21	0.62	130.0	0.6	46
2.5	350	70-110	23	0.62	70.0	0.9	55
3.2	450	105-150	23	0.62	32.0	1.4	81
4.0	450	140-190	23	0.65	21.0	2.0	88
5.0	450	190-270	27	0.65	13.5	2.5	104

OK 73.79

Type Basic

SMAW

E8016-C2

Description

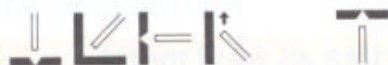
OK 73.79 is a nickel-alloyed, LMA electrode for welding 3.5 Ni steel with impact requirements down to -101°C, in LPG tanks for ethane and chemical plants, for example.

Recovery

100%

Welding current

DC (+-), AC OCV 65 V



Classifications

AWS A5.5	E8016-C2
EN 499	E46 6 B 3Ni 12

Typical all weld metal composition

C	Si	Mn	Ni
0.06	0.3	0.6	3.3

Typical properties all weld metal

Yield stress	520 MPa
Tensile strength	610 MPa
Elongation	26%

Charpy V

Test temps	Impact values
-60°C	160 J
-73°C	90 J
-95°C	40 J
-101°C	35 J

Approvals

DnV	5 YH10
RS	5YHH46

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of electrodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/electrode
2.5	350	70-110	25	0.60	76.0	0.8	60
3.2	350	80-150	25	0.60	39.0	1.4	71
3.2	450	80-150	25	0.60	37.0	1.5	77
4.0	450	90-190	27	0.63	26.0	1.8	88
5.0	450	110-240	29	0.60	15.0	2.1	100

OK 75.75

Type Basic

SMAW

E11018-G

Description

OK 75.75 is an LMA electrode dried to a very low moisture content, therefore suitable for welding low-alloy, high-strength weldable structural steels at room temperature or with moderate preheat.

Recovery

125%

Welding current

DC(+), AC OCV 70 V



Classifications

AWS A5.5	E11018-G
DIN 8529	E Y 6965 Mn2 NiCrMoB
EN 757	E 69 4 Mn 2 NiCrMoB 32 H5

Typical all weld metal composition

C	Si	Mn	Cr	Ni	Mo
0.055	0.35	1.75	0.45	2.25	0.45

Typical properties all weld metal

Yield stress	755 MPa
Tensile strength	820 MPa
Elongation	20%

Charpy V

Test temps	Impact values
-20°C	85 J
-40°C	70 J
-51°C	55 J
-60°C	45 J

Approvals

ABS	according to AWS A5.5
DnV	4Y62H10
RS	4Y62
DB	10.039.19
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	50-75	21	0.67	120.0	0.7	41
2.5	350	70-110	22	0.67	66.0	1.0	54
3.2	450	100-150	23	0.67	31.5	1.4	80
4.0	450	135-200	24	0.65	21.0	1.9	92
5.0	450	180-260	25	0.63	12.0	2.5	105
6.0	450	200-300	25	0.63	9.5	3.3	116

OK 76.18

Type Basic

SMAW

E8018-B2

Description

OK 76.18 is an LMA electrode for welding creep-resistant steels of the 1.Cr0.5Mo type. The electrode welds with a quiet, stable arc and produces a minimum of spatter loss. OK 76.18 deposits a weld metal which is resistant to cracking as well as porosity. The scaling temperature of the weld metal is about 575°C.

Recovery

115%

Welding current

DC(+)



Classifications

AWS A5.5	E8018-B2
DIN 8575	E CrMo 1B 20
EN 1599	E CrMo 1B 42 H5

Typical all weld metal composition

C	Si	Mn	Cr	Mo
0.06	0.3	0.7	1.3	0.5

Typical properties all weld metal

Yield stress	530 MPa
Tensile strength	620 MPa
Elongation	20%

Charpy V

Test temps	Impact values
+20°C	120 J
-20°C	80 J
-40°C	50 J

Approvals

ABS	SR, see list of approved consumables
BV	UP H.T. (+500°C)
CO	
DnV	-H10 For NV1Cr0.5Mo
DS	EV 18 H
LR	See list of approved consumables
SS	143272-H
SFS	E 1 Cr Mo B 24
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	55-80	22	0.58	136.0	0.7	40
2.5	300	70-110	24	0.58	88.0	0.8	52
3.2	450	95-140	26	0.59	37.0	1.2	82
3.2	350	95-150	25	0.59	49.0	1.1	65
4.0	450	130-190	27	0.64	23.0	1.7	90
5.0	450	150-260	28	0.64	14.5	2.7	95
6.0	450	200-350	30	0.64	10.5	3.7	93

OK 76.28

Type Basic

SMAW

E9018-B3

Description

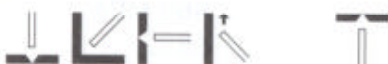
OK 76.28 is an LMA electrode for welding creep-resistant steels containing approx. 2.25Cr1Mo. The electrode runs with a quiet, stable arc and produces a minimum of spatter loss. OK 76.28 deposits a weld metal with good cracking resistance. The scaling temperature of the weld metal is about 625°C.

Recovery

115%

Welding current

DC(+)



Classifications

AWS A5.5	E9018-B3
DIN 8575	E CrMo 2 B 20
EN 1599	E CrMo 2 B 42 H5

Typical all weld metal composition

C	Si	Mn	Cr	Mo
0.06	0.3	0.7	2.3	1.1

Typical properties all weld metal

Yield stress	550 MPa
Tensile strength	650 MPa
Elongation	18%

Charpy V

Test temps	Impact values
+20°C	120 J
-20°C	80 J

Approvals

ABS	SR, see list of approved consumables
BV	UP H.T. (+550°C)
CO	
DnV	-H10 For NV2.25Cr1Mo
DS	EV 19 H
LR	See list of approved consumables
NK	KMW53H10
SFS	E 2 Cr Mo B 24
SS	143273-H
TÜV	

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	55-80	23	0.58	136.0	0.7	40
2.5	300	70-110	25	0.58	88.0	0.8	52
3.2	350	95-150	26	0.59	49.0	1.2	62
4.0	450	130-190	28	0.64	23.0	1.8	88
5.0	450	150-260	29	0.64	14.5	2.7	92
6.0	450	200-350	30	0.64	10.5	3.9	90

OK 76.35

SMAW

Type Basic

E8015-B6

Description

OK 76.35 is an LMA electrode containing 5Cr0.5Mo for welding creep-resistant steels, especially good for pipe welding. The electrode runs with a quiet, stable arc and gives a minimum amount of spatter loss. Preheat and interpass temperature 150-260°C is normally required. Mechanical data after heat treatment 850°C, 2h.

Recovery

115%

Welding current

DC(+/-)



Classifications

AWS A5.5	E8015-B6
BS 2493	5 CrMo B
DIN 8575	E CrMo 5 B 42 H5
EN 1599	E CrMo 5 B

Typical all weld metal composition

C	Si	Mn	Cr	Mo
0.05	0.4	0.7	5.0	0.55

Typical properties all weld metal

Tensile strength	460 MPa
Elongation	35%

Charpy V

Test temps	Impact values
+20°C	145 J
-20°C	75 J

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	55-75	22	0.60	135.0	0.6	44
2.5	300	75-100	23	0.60	89.0	0.9	47
3.2	350	90-135	24	0.58	49.0	1.2	62
4.0	450	130-200	24	0.63	23.0	1.9	82
5.0	450	150-280	25	0.63	14.5	2.8	88
6.0	450	200-350	26	0.63	10.0	3.9	93

OK 76.96

SMAW

Type Basic

E8015-B8

Description

OK 76.96 is an LMA electrode containing 9Cr1Mo for welding of creep-resistant steels, especially good for pipe welding. The electrode runs with a quiet, stable arc and gives a minimum amount of spatter loss. Preheat and interpass temperature 150-260°C is normally required. Mechanical data after heat treatment 850°C, 2h.

Recovery

115%

Welding current

DC(+)



Classifications

AWS A5.5	E8015-B8
BS 2493	E 9 CrMo B
DIN 8575	E Cr Mo 9 B 20 +
ISO 3580	E 9 Cr Mo B 20
AFNOR A81-345	E C 9 Mo B 20 BH
EN 1599	E Cr Mo 9 B

Typical all weld metal composition

C	Si	Mn	Cr	Mo
0.05	0.5	0.8	9.5	1.0

Typical properties all weld metal

Tensile strength	>450 MPa
Elongation	>20%

Charpy V

Test temps +20°C	Impact values >80 J
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Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.0	300	55-75	23	0.58	131.0	0.5	49
2.5	300	70-100	25	0.55	92.0	0.8	51
3.2	350	90-135	26	0.55	50.0	1.1	70
4.0	450	130-200	21	0.64	22.5	1.9	80
5.0	450	160-270	25	0.64	14.5	2.7	92

OK 76.98

Type Basic

SMAW

E9015-B9

Description

OK 76.98 is a low-hydrogen electrode for welding modified 9 Cr steels like T91/P91. The electrode is suitable for all-positional welding in pipes and plates. Mechanical data after heat treatment 750°C, 2 h.

Welding current

DC(+)



Classifications

AWS 5.5	E9015-B9
EN 1599	E CrMo 91 B

Typical all weld metal composition

C	Si	Mn	Cr	Ni	Mo	N	V	Nb
0.1	0.35	0.8	9.0	0.7	1.0	0.035	0.2	0.06

Typical properties all weld metal

Yield stress	650 MPa
Tensile strength	760 MPa
Elongation	18%

Charpy V

Test temps +20°C	Impact values 70 J
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Approvals

TÜV

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N.	B.	H.	T.
				Kg weld metal/kg electrodes	No. of elect- rodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time, secs/ electrode
2.5	350	70-100	21	0.66	71.4	0.9	56
3.2	350	90-135	22	0.6	45.5	1.2	68
4.0	450	130-200	23	0.64	22.6	1.9	85

Pipeweld 7010

Type Cellulosic

SMAW
E7010-G

Description

Pipeweld 7010 is a cellulosic electrode, suitable for conventional as well as "stovepipe" techniques. Pipeweld 7010 is designed for welding high-strength pipelines and pipe steel. Also suitable for use in root, capping and filling runs in 5LX52 to 5LX56 grade line pipe.

Welding current

DC+(-)



Classifications

AWS A5.5	E7010-G
ISO	E 51 3 C 10
EN 499	E 42 2 Z C 21

Typical all weld metal composition

C	Si	Mn	Ni	Mo
0.12	0.1	0.7	0.2	0.2

Typical properties all weld metal

Yield stress	460 MPa
Tensile strength	540 MPa
Elongation	24%

Charpy V

Test temps	Impact values
0°C	80 J
-20°C	60 J

Approvals

ABS	3
CO	
DnV	3

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of elect- rodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/ electrode
2.5	350	40-80	30	-	-	-	-
3.2	350	75-125	31	0.55	65	0.9	60
4.0	350	110-200	32	0.57	48	1.5	56
5.0	350	130-230	31	0.56	30	1.9	70

Pipeweld 8010

Type Cellulosic

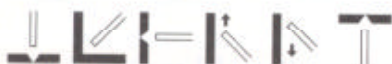
SMAW
E8010-G

Description

Pipeweld 8010 is a cellulosic electrode, suitable for both stove-pipe and conventional techniques. Pipeweld 8010 is designed for welding high-strength pipelines and pipe steel in the 570-620 MPa tensile strength range. Can also be used for root, filling and capping runs in 5LX60 to 5LX70 grade pipe.

Welding current

DC+(-)



Classifications

AWS A5.5	E8010-G
ISO	E 51 3 C 10
EN 499	E 46 2 Z C 21

Typical all weld metal composition

C	Si	Mn	Ni	Mo
0.12	0.1	0.7	0.2	0.4

Typical properties all weld metal

Yield stress	515 MPa
Tensile strength	595 MPa
Elongation	24%

Charpy V

Test temps	Impact values
0°C	75 J
-20°C	65 J

Approvals

ABS	3
CO	
DnV	3
LR	3.3Y

Welding parameters

Diameter mm	Length mm	Welding current A	Arc voltage V	N. Kg weld metal/kg electrodes	B. No. of electrodes/kg weld metal	H. Kg weld metal/hour arc time	T. Burn-off time, secs/electrode
3.2	350	75-125	31	0.55	65	0.9	60
4.0	350	110-200	32	0.57	48	1.5	56
5.0	350	130-230	31	0.56	30	1.9	70

OK Autrod 13.09 GMAW

ER80S-G

Description

A copper-coated, low-alloyed, 0.5%Mo electrode for the GMAW of creep-resistant steels of the same type, such as pipes in pressure vessels and boilers with a working temperature of up to about 500°C. It can also be used for welding low-alloyed high tensile strength steels. OK Autrod 13.09 is usually welded with Ar/20 CO₂ as the shielding gas. The mechanical properties are given in the stress-relieved condition.

Welding current

DC(+)

Classifications

AWS A5.28-79	ER80S-G
EN 440	G 38 0 C G2Mo, G 46 4 M G2Mo

Wire composition

C	Si	Mn	Mo
0.1	0.7	1.1	0.5

Typical properties all weld metal

Yield stress	430 MPa
Tensile strength	545 MPa
Elongation	26%

Charpy V

Test temps	Impact values
+20°C	150 J
0°C	130 J
-20°C	95 J
-40°C	90 J

Approvals

DB	42.039.09
DnV	IIIYMS, DC+ (M21)
TÜV	
UDT	

Welding parameters

Diameter mm	Wire feed m/min	Welding current A	Arc voltage V	Deposition rate kg weld metal/hour
0.8	2.0-10.8	40-170	16-22	0.4-2.6
1.0	2.7-14.7	80-280	18-28	1.0-5.4
1.2	2.7-12.4	120-350	20-33	1.5-6.6
1.6	3.1-8.1	225-480	26-38	3.3

OK Autrod 13.12 GMAW

ER80S-G

Description

A copper-coated, low-alloyed, 1% Cr, 0.5% Mo electrode for the GMAW of creep-resistant steels of the same type and other low-alloyed high tensile strength steels. OK Autrod 13.12 is usually welded with Ar/20CO₂ as the shielding gas. The mechanical properties are given in the stress-relieved condition.

Welding current

DC(+)

Classifications

AWS A5.28-79	ER80S-G
DIN 8575 (1984)	SGCrMo1

Wire composition

C	Si	Mn	Cr	Mo
0.1	0.7	1.0	1.1	0.5

Typical properties all weld metal

Yield stress	480 MPa
Tensile strength	600 MPa
Elongation	23%

Charpy V

Test temps	Impact values
+20°C	55 J
0°C	40 J
-20°C	20 J

Approvals

TÜV
UDT

Welding parameters

Diameter mm	Wire feed m/min	Welding current A	Arc voltage V	Deposition rate kg weld metal/hour
0.8	2.0-10.8	40-170	16-22	0.4-2.6
1.0	2.7-14.7	80-280	18-28	1.0-5.4
1.2	2.7-12.4	120-350	20-33	1.5-6.6
1.6	3.1-8.1	225-480	26-38	3.3

OK Autrod 13.13 GMAW

ER100S-G

Description

A copper-coated, low-alloyed electrode for the GMAW of high tensile strength steels, with a minimum yield strength (0.2%) of 610 MPa and a minimum tensile strength of 710 MPa. Also for welding steels where good impact strength at lower temperature is required. OK Autrod 13.13 is usually welded with Ar/20CO₂ as the shielding gas. The mechanical properties are given in the as welded condition. After stress-relieving, the mechanical properties decrease by about 30 MPa for yield and tensile strength.

Welding current

DC(+)

Classifications

AWS A5.28-79 ER100S-G

Wire composition

C	Si	Mn	Cr	Ni	Mo
0.1	0.7	1.4	0.6	0.6	0.2

Typical properties all weld metal

Yield stress	690 MPa
Tensile strength	770 MPa
Elongation	20%

Charpy V

Test temps	Impact values
0°C	80 J
-20°C	75 J
-40°C	60 J
-60°C	50 J

Welding parameters

Diameter mm	Wire feed m/min	Welding current A	Arc voltage V	Deposition rate kg weld metal/hour
0.8	2.0-10.8	40-170	16-22	0.4-2.6
1.0	2.7-14.7	80-280	18-28	1.0-5.4
1.2	2.7-12.4	120-350	20-33	1.5-6.6
1.6	3.5-12.2	225-480	26-38	3.3

OK Autrod 13.28 GMAW

ER80S-Ni2

Description

A copper-coated, low-alloyed, 2.5%Ni electrode for the GMAW of low-alloyed and low-temperature steels for applications such as vessels, pipes and in offshore industry. Also for welding steels where good impact strength at lower temperature (-20°C) is required. OK Autrod 13.28 is usually welded with Ar/20CO₂ as the shielding gas. The minimum values for the mechanical properties are given in the post-weld, heat-treated condition.

Welding current

DC(+)

Classifications

AWS A5.28-79	ER80S-Ni2
EN 440	G 46 5 M G2Ni2

Wire composition

C	Si	Mn	Ni
0.1	0.6	1.1	2.4

Typical properties all weld metal

Yield stress	470 MPa
Tensile strength	550 MPa
Elongation	24%

Charpy V

Test temps -62°C	Impact values 27 J
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Welding parameters

Diameter mm	Wire feed m/min	Welding current A	Arc voltage V	Deposition rate kg weld metal/hour
0.8	2.0-10.8	40-170	16-22	0.4-2.6
1.0	2.7-14.7	80-280	18-28	1.0-5.4
1.2	2.7-12.4	120-350	26-33	1.5-6.6
1.6	3.1-8.1	225-480	26-38	3.3

OK Tigrod 13.09 GTAW ER80S-G

Description

A copper-coated, low-alloyed, 0.5% Mo rod for the GTAW of creep-resistant steels of the same type, such as pipes in pressure vessels and boilers with a working temperature of up to about 500°C. It can also be used for welding low-alloyed high tensile strength steels. OK Tigrod 13.09 is normally welded with pure Ar as the shielding gas. The mechanical properties are given in the stress-relieved condition.

Welding current

DC(-)

Classifications

AWS A5.28-79	ER80S-G
DIN 8575	SGMo
Werkstoff Nr.	1.5424

Wire composition

C	Si	Mn	Mo
0.1	0.7	1.1	0.5

Typical properties all weld metal

Yield stress	424 MPa
Tensile strength	560 MPa
Elongation	31%

Charpy V

Test temps	Impact values
+20°C	147 J
-20°C	127 J

Approvals

DB	42.039.08
DnV	IIIYMS(Ar)
DS	EV 17H
TUV	
UDT	

Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Tigrod 13.12 GTAW

ER80S-G

Description

A copper-coated, low-alloyed, 1% Cr, 0.5% Mo rod for the GTAW of creep-resistant steels of the same type and other low-alloyed high tensile strength steels. OK Tigrod 13.12 is normally welded with pure Ar as the shielding gas. The mechanical properties are given in the stress-relieved condition.

Welding current

DC(-)

Classifications

AWS A5.28-79 ER80S-G
DIN 8575 SGCrMo1

Wire composition

C	Si	Mn	Cr	Mo
0.1	0.7	1.0	1.1	0.5

Typical properties all weld metal

Yield stress 560 MPa
Tensile strength 650 MPa
Elongation 26%

Charpy V

Test temps +20°C Impact values 180 J

Approvals

TÜV
UDT

Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Tigrod 13.13 GTAW

ER100S-G

Description

A copper-coated, low-alloyed rod for the GTAW of high tensile strength steels, with a minimum tensile strength of 710 MPa. Also for welding steels where good impact strength at lower temperatures is required. OK Tigrod 13.13 is normally welded with pure Ar as the shielding gas. The mechanical properties are given in the as welded condition. After stress-relieving, the mechanical properties decrease by about 30 MPa for yield and tensile strength.

Welding current

DC(-)

Classifications

AWS A5.28-79 ER100S-G

Wire composition

C	Si	Mn	Cr	Ni	Mo
0.1	0.7	1.4	0.6	0.6	0.2

Typical properties all weld metal

Yield stress	570 MPa
Tensile strength	710 MPa
Elongation	24%

Charpy V

Test temps	Impact values
+20°C	150 J
-20°C	85 J
-40°C	70 J
-60°C	40 J

Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Tigrod 13.22 GTAW

ER90S-G

Description

A copper-coated, low-alloyed, 2.5% Cr, 1% Mo rod for the GTAW of creep-resistant steels of the same type. Also for welding low-alloyed high tensile strength steels. OK Tigrod 13.22 is normally welded with pure Ar as the shielding gas. The mechanical properties are given in the stress-relieved condition.

Welding current

DC(-)

Classifications

AWS A5.28-79 ER90S-G
DIN 8575 SGCrMo2

Wire composition

C	Si	Mn	Cr	Mo
0.08	0.6	1.0	2.6	1.1

Typical properties all weld metal

Yield stress 510 MPa
Tensile strength 620 MPa
Elongation 24%

Charpy V

Test temps +20°C Impact values 200 J

Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Tigrod 13.28

GTAW

ER80S-Ni2

Description

A copper-coated, low-alloyed, 2.5%Ni rod for the GTAW of low-alloyed and low-temperature steels for applications such as vessels, pipes and in the offshore industry. Also for welding steels where good impact strength at lower temperature (-20°C) is required. OK Tigrod 13.28 is normally welded with pure Ar as the shielding gas.

Welding current

DC(-)

Classifications

AWS A5.28-79

ER80S-Ni2

Wire composition

C	Si	Mn	Ni
0.1	0.6	1.1	2.4

Typical properties all weld metal

Yield stress	540 MPa
Tensile strength	630 MPa
Elongation	30%

Charpy V

Test temps	Impact values
-20°C	200 J
-40°C	180 J
-60°C	150 J

Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Tigrod 13.32

GTAW
ER502

Description

A copper-coated, low-alloyed 5% Cr, 0.5% Mo rod for the GTAW of materials of similar composition. OK Tigrod 13.32 is normally welded with pure Ar as the shielding gas. The mechanical properties values are given in the stress-relieved condition.

Welding current

DC(-)

Classifications

AWS A5.9-93	ER502
BS 2901	A34
DIN 8575	SG CrMo5

Wire composition

C	Si	Mn	Cr	Ni	Mo
0.07	0.4	0.5	5.7	0.2	0.6

Typical properties all weld metal

Yield stress	580 MPa
Tensile strength	680 MPa
Elongation	22%

Charpy V

Test temps +20°C	Impact values 200 J
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Packing data

Diameter mm	Length mm	Weight of rods/ box kg
1.6	1000	5
2.0	1000	5
2.4	1000	5
3.2	1000	5

OK Autrod 13.10

SAW

Description

OK Autrod 13.10 is a copper-coated wire designed for submerged arc welding of creep resistant steel of the 1.25Cr0.5Mo type. Can be combined with OK Flux 10.62.

Classifications

AWS A5.23

EB2

DIN 8557

UP S2 CrMo1

Wire composition

C	Si	Mn	Cr	Mo
0.11	0.2	0.7	1.1	0.5

OK Autrod 13.27 SAW

Description

OK Autrod 13.27 is a copper-coated, low-alloyed, 2%Ni electrode for the submerged arc welding of low-alloyed and low-temperature steels for applications e.g. in the offshore industry. Can be combined with OK Flux 10.62, OK Flux 10.71 and OK Flux 10.75.

Classifications

AWS A5.23
EN 756

ENi2
S2Ni2

Wire composition

C	Si	Mn	Ni
0.08	0.2	1.0	2.3

OK Flux 10.62

SAW

Type High-basic EN 760: SA FB 1 55 AC H5

Description

OK Flux 10.62 is all-mineral, non-alloying and the weld metal can be fully controlled independently of the welding parameters through a suitable choice of wires. This makes OK Flux 10.62 suitable for the multi-run welding of thick materials using the single-wire and multiple-wire techniques. OK Flux 10.62 is designed for the multi-pass butt welding of mild, medium and high tensile steels, as well as low-alloyed steels, with an impact strength down to -40°/-60°C. As it is a flux of the high-basic type, OK Flux 10.62 permits high current-carrying capacity on both AC and DC. To increase productivity with no loss of mechanical properties, OK Flux 10.62 is best used together with iron powder addition. OK Flux 10.62 is especially well-suited for narrow gap welding, due to the good slag detachability and smooth blending with the side walls. Pressure vessels for nuclear applications and offshore constructions in which good CTOD values are required are some areas in which OK Flux 10.62 can be successfully used. OK Flux 10.62 operates better at the lower end of the voltage range. OK Flux 10.62 gives the weld metal a low oxygen content (approx. 300 ppm) and produces a low hydrogen content in the deposit weld metal (lower than 5 ml/100 g).

Density

≈1.1 kg/dm³

Basicity index

3.4

Flux consumption as kg flux/kg wire

Voltage	DC+	AC
26	0.7	0.6
30	0.9	0.75
34	1.2	1.0
38	1.5	1.25

Typical all weld metal composition

Wire	C	Si	Mn	Cr	Ni	Mo
OK Autrod 12.24	0.07	0.2	1.0	-	-	0.5
OK Autrod 12.34	0.1	0.21	1.45	-	-	0.5
OK Autrod 13.27	0.06	0.2	1.0	-	2.1	-
OK Autrod 13.43	0.08	0.25	1.35	0.6	2.2	0.5

Typical properties all weld metal

Wire	Yield stress MPa	Tensile strength MPa	Charpy V °C	J
OK Autrod 12.24	510	585	+20	140
			-20	80
			-40	60
			-50	45
OK Autrod 12.34	575	650	+20	170
			-20	140
			-40	115
			-50	65
OK Autrod 13.27	490	570	+20	180
			-20	160
			-40	130
			-60	90
OK Autrod 13.43	700	795	+20	135
			-20	100
			-40	75
			-60	55

Approvals

Wire	ABS	LR	DnV	BV	GL	RS	CO	TÜV
OK Autrod 12.24	3M 3YM	3YM	IIITM (IIIYM)	A3 3YM	3YM			
OK Autrod 12.34	3M 3YM	3M 3YM	IIIYM	A3 3YM	3YM	3YM	•	
OK Autrod 13.27			IIIYM NV 4-4(M)			3YM		•
OK Autrod 13.43						Q-T steel (-60 C/M)		

Classifications

Wire	EN 756	AWS A5.17
OK Autrod 12.24	S 46 4 FB S2Mo	F8A6-EA2-A2 F6P6-EA2-A2
OK Autrod 12.34	S 50 5 FB S3Mo	F8A8-EA4-A4 F8P6-EA4-A4
OK Autrod 13.27	S 46 6 FB S2Ni2	F8A10-ENi2-Ni2 F8P10-ENi2-Ni2
OK Autrod 13.43		F11A8-EG-G F11P4-EG-G

OK Flux 10.63

SAW

Type High-basic EN 760: SA FB 1 55 AC H5

Description

OK Flux 10.63 is a high-basic agglomerated all-mineral non-alloying flux designed primarily for the multi-run welding of creep-resistant steels in combination with low-alloy Cr-Mo wires. The very low impurity level of the flux helps to produce an exceptionally clean weld metal, with high impact properties, even after step cooling treatment.

Density

≈1.1 kg/dm³

Basicity index

3.2

Flux consumption as kg flux/kg wire

Voltage	DC+	AC
26	0.7	0.6
30	0.9	0.75
34	1.2	1.0
38	1.5	1.25

Classifications

Wire	EN 756	AWS A5.23
OK Autrod 13.20SC		F8P8-EB3-B3

Typical all weld metal composition

Wire	C	Si	Mn	Cr	Ni	Mo
OK Autrod 13.20SC	0.1	0.3	0.7	2.3	-	0.9

Typical properties all weld metal

Wire	Yield stress MPa	Tensile strength MPa	Charpy V °C	J
OK Autrod 13.20SC	525	620	+20	180
			0	150
			-40	110
			-62	90