

OK Tigrod 12.60 GTAW

ER70S-3

Description

OK Tigrod 12.60 is a copper-coated Mn-Si-alloyed W2Si/ER70S-3 solid rod for the GTAW of non-alloyed steels, as used in general construction, pressure vessel fabrication and shipbuilding.

Welding current

DC(-)

Classifications

SFA/AWS A5.18	ER70S-3
EN 1668	W2Si

Wire composition

C	Si	Mn
0.1	0.6	1.1

Typical properties all weld metal

Yield stress, MPa	420
Tensile strength, MPa	515
Elongation, %	26

Charpy V

Test temps, °C	Impact values, J
-30	90

Approvals

Sepros	UNA 485178
--------	------------

Packing data

Diameter, mm	Length, mm	Weight of rods/box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 12.62

E

Description

A triple desoxidized copper cated rod designed for GTAW of mild and fine grained structural and pressure vessel steels as well as ship building steels. The rod is capable of producing high quality welds in semi-killed and rimmed steel as well as steel of various carbon levels. Because of added desoxidants, Al-Ti-Zr, the rod can also be used for welding steels with a rusty or dirty surface, without any sacrifice of weld quality.

Welding current

DC+

Classifications

SFA/AWS A5.18	ER70S-2
EN 1668	W2Ti

Wire composition

C	Si	Mn
0.06	0.60	1.10

Typical mech. properties all weld metal

Yield stress, MPa
Tensile strength, MPa
Elongation, %

Charpy V

Test temps, °C	Impact values, J
-40	180

Packing data

Diameter, mm	Length, mm	Weight of rods/box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 12.64 GTAW

ER70S-6

Description

OK Tigrod 12.64 is a copper-coated Mn-Si-alloyed W4Si1/ER70S-6 solid rod for the GTAW of non-alloyed steels, as used in general construction, pressure vessel fabrication and shipbuilding. It has a slightly higher manganese and silicon content than OK Tigrod 12.61 to increase the weld metal strength. This also promotes low sensitivity to surface impurities and contributes to smooth, sound welds.

Welding current

DC(-)

Classifications

SFA/AWS A5.18	ER70S-6
EN 1668	W4Si1

Wire composition

C	Si	Mn
0.09	1.0	1.7

Typical properties all weld metal

Yield stress, MPa	525
Tensile strength, MPa	595
Elongation, %	26

Charpy V

Test temps, °C	Impact values, J
-30	70

Approvals

ABS	3, 3Y
CL	EN 1668
DNV	III YM(I1)
GL	3Y
LR	3 3Y
UDT	DIN 8559
VdTÜV	05260

Packing data

Diameter, mm	Length, mm	Weight of rods/box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.08 GTAW

ER80S-D2

Description

OK Tigrod 13.08 is a 1.5Mn-0.4Mo-alloyed (ER80S-D2), copper-coated 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. The rod can also be used for welding low-alloyed, high tensile strength steels.

Welding current

DC(-)

Classifications

SFA/AWS A5.28	ER80S-D2
BS 2901 part 1	A31
EN 1668	W 46 2 W4Mo

Wire composition

C	Si	Mn	Mo
0.9	0.6	1.9	0.5

Typical mech. properties all weld metal

Yield stress, MPa	520
Tensile strength, MPa	615
Elongation, %	28

Charpy V

Test temps, °C	Impact values, J
-29	200

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.12 GTAW

ER80S-G

Description

OK Tigrod 13.12 is a 1.0Cr-0.5Mo-alloyed, copper-coated rod for the GTAW of creep-resistant steels of the same type, such as pipes in pressure vessels and boilers. The rod can also be used for welding low-alloyed, high strength steels with a minimum tensile strength of 550 MPa.

Welding current

DC(-)

Classifications

SFA/AWS A5.28	ER80S-G
DIN 8575	W.nr. 1.7339
EN 12070	W CrMo1Si

Wire composition

C	Si	Mn	Cr	Mo
0.1	0.6	1.0	1.2	0.5

Typical mech. properties all weld metal

Yield stress, MPa	560
Tensile strength, MPa	720
Elongation, %	24

Charpy V

Test temps, °C	Impact values, J
+20	120
-20	50
-30	40
-40	20
-60	20

Approvals

UDT	DIN 8575
VdTÜV	04952

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.13 GTAW

ER100S-G

Description

OK Tigrod 13.13 is a 0.5Cr-0.5Ni-0.2Mo-alloyed, copper-coated rod for the GTAW of high strength steels with a minimum tensile strength of 690 MPa. The rod is also suitable for welding steels where good impact strength at low temperatures is required.

Welding current

DC(-)

Classifications

SFA/AWS A5.28 ER100S-G
EN 12534 Mn3NiCrMo

Wire composition

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

Typical mech. properties all weld metal

Yield stress, MPa 585
Tensile strength, MPa 750
Elongation, % 27

Charpy V

Test temps, °C	Impact values, J
0	150
-20	85
-40	69

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.16 GTAW

ER80S-B2

Description

OK Tigrod 13.16 is a 1.3Cr-0.5Mo-alloyed (ER80S-B2), copper-coated rod for the GTAW of creep-resistant steels like SA-387 Grade 11, A 335 Grade P11 or similar materials. The rod has a high purity chemistry with a guaranteed Brucato factor $X < 15$.

Welding current

DC-

Classifications

SFA/AWS A5.28 ER80S-B2

Wire composition

C	Si	Mn	Cr	Mo
0.09	0.6	0.6	1.4	0.5

Typical mech. properties all weld metal

Yield stress, MPa	640
Tensile strength, MPa	730
Elongation, %	24

Charpy V

Test temps, °C	Impact values, J
-40	>47

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.17 GTAW

ER90S-B3

Description

OK Tigrod 13.17 is a 2.5Cr-1.1Mo-alloyed (ER90S-B3), copper-coated rod for the GMAW of creep-resistant steels like SA-387 Grade 22, A335 Grade P22 or similar materials. The rod has a high purity chemistry with a guaranteed Bruscato factor $X < 15$.

Welding current

DC-

Classifications

SFA/AWS A5.28 ER90S-B3

Wire composition

C	Si	Mn	Cr	Mo
0.09	0.6	0.6	2.5	1.0

Typical mech. properties all weld metal

Yield stress, MPa	620
Tensile strength, MPa	730
Elongation, %	22

Charpy V

Test temps, °C	Impact values, J
-40	>47

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.22 GTAW

ER90S-G

Description

OK Tigrod 13.22 is a 2.5Cr-1.0Mo-alloyed, copper-coated rod for the GTAW of creep-resistant steels such as pipes in pressure vessels and boilers of similar composition, with service temperatures of up to 600°C, but it is also suitable for welding high strength steels.

Welding current

DC(-)

Classifications

SFA/AWS A5.28	ER90S-G
DIN 8575	W.nr 1.7384
EN 12070	W CrMo2Si

Wire composition

C	Si	Mn	Cr	Mo
0.08	0.7	1.0	2.6	1.0

Typical mech. properties all weld metal

	SR 750°C/0.5h
Yield stress, MPa	>400
Tensile strength, MPa	>500
Elongation, %	>18

Charpy V

Test temps, °C	Impact values, J
+20	200

Approvals

Sepros	UNA 046731
UDT	EN 12070
VdTÜV	

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.23 GTAW

ER80S-Ni1

Description

OK Tigrod 13.23 is a 0.9Ni-alloyed (ER80S-Ni1), copper-coated rod for the GTAW of low-temperature, fine-grained steels. The wire provides good impact toughness down to -50°C and is especially suitable for use in the offshore industry.

Welding current

DC(-)

Classifications

SFA/AWS A5.28 ER80S-Ni1

Wire composition

C	Si	Mn	Ni	Mo
0.08	0.6	1.0	0.9	0.3

Typical mech. properties all weld metal

Yield stress, MPa	500
Tensile strength, MPa	600
Elongation, %	25

Charpy V

Test temps, °C	Impact values, J
0	230
-20	200
-46	140
-60	90

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.28 GTAW

ER80S-Ni2

Description

OK Tigrod 13.28 is 2.4Ni-alloyed (ER80S-Ni2), copper-coated rod for the GTAW of low-temperature, fine-grained steels in applications such as pressure vessels, pipes and the offshore industry, with a minimum yield strength of up to 470 MPa. The wire provides good impact toughness down to -60°C.

Welding current

DC(-)

Classifications

SFA/AWS A5.28	ER80S-Ni2
EN 1668	W2Ni2

Wire composition

C	Si	Mn	Ni
0.1	0.6	1.1	2.4

Typical mech. properties all weld metal

Yield stress, MPa	540
Tensile strength, MPa	630
Elongation, %	30

Charpy V

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

Approvals

UDT VdTÜV	EN 440
--------------	--------

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 13.32 GTAW

ER80S-B6

Description

OK Tigrod 13.32 is a 5Cr-0.5Mo-alloyed (ER80S-B6), copper-coated rod for the GTA of creep-resistant steels of similar composition. The rod is also suitable for welding high strength steels with a minimum yield strength of up to 730 MPa.

AWS has changed the classification for this product. The previous classification was A5.9 ER502.

Welding current

DC(-)

Classifications

SFA/AWS A5.28	ER80S-B6
DIN 8575	W.nr. 1.7373
EN 12070	WCrMo5

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
0.07	0.4	0.6	5.8	<0.3	0.6	<0.4

Typical mech. properties all weld metal

Yield stress, MPa	730
Tensile strength, MPa	900
Elongation, %	22

Charpy V

Test temps, °C	Impact values, J
+20	100
-20	80
-29	50

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 13.37 GTAW

ER80S-B8

Description

OK Tigrod 13.37 is a 9Cr-1Mo-alloyed, copper-coated rod for the GTA of high temperature steels and steels for hot hydrogen service, especially in oil refineries. The electrode is a plain ER505 type.

Welding current

DC(-)

Classifications

SFA/AWS A5.28 ER80S-B8
EN 12070 W CrMo9

Wire composition

C	Si	Mn	Cr	Mo
0.08	0.4	0.6	9.0	1.0

Typical mech. properties all weld metal

Yield stress, MPa 540
Tensile strength, MPa 660
Elongation, % 26

Charpy V

Test temps, °C	Impact values, J
-20	140
-40	120
-60	90

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 13.38 GTAW

ER90S-B9

Description

OK Tigrod 13.38 is a 9CrMoVN-alloyed rod for the GTA of high-temperature steels and steels for hot hydrogen service, especially in oil refineries. It should preferably be used for 9% Cr steels, such as P 91/T 91 steels.

The alloy is modified in terms of the limits for impurity elements and is extremely "clean". This produces improved strength levels both at room temperature and at higher temperatures.

AWS has changed the classification for this product. The previous classification was A5.9 ER505.

Welding current

DC(-)

Classifications

SFA/AWS A5.28 ER90S-B9
EN 12070 W CrMo91

Wire composition

C	Si	Mn	Cr	Ni	Mo
0.1	0.2	0.5	8.9	0.7	1.0

Typical mech. properties all weld metal

Yield stress, MPa 690
Tensile strength, MPa 785
Elongation, % 20

Charpy V

Test temps, °C	Impact values, J
+20	200
0	180
-20	150
-40	90
-60	70

Approvals

UDT DIN 8575
VdTÜV 07686

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 19.12

GTAW
ERCu

Description

Bare copper wire for the GTA joining of oxygen-free, pure copper and low-alloyed copper. OK Tigrod 19.12 is alloyed with tin and has good flow properties. Preheating is recommended when welding large pieces. OK Tigrod 19.12 is normally welded with pure Ar as the shielding gas.

Welding current

DC(-)

Classifications

SFA/AWS A5.7 ERCu
EN 14640 S Cu 1898 (CuSn1)

Wire composition

Si	Mn	Cu	Sn
0.3	0.3	>98.0	0.8

Typical mech. properties all weld metal

Yield stress, MPa 75
Tensile strength, MPa 220
Elongation, % 30

Charpy V

Test temps, °C Impact values, J
+20 75
-20 40

Packing data

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

OK Tigrod 19.82 GTAW

ERNiCrMo-3

Description

A nickel-based, corrosion- and heat-resistant, 22% Cr, 9% Mo, 3.5% Nb rod for the GTAW of high-alloyed steel, heat-resistant steel, corrosion-resistant steel, 9% Ni steels and similar steel with high notch toughness at low temperatures. It is also suitable for joining dissimilar metals of the types mentioned above. OK Tigrod 19.82 is normally welded with pure Ar as the shielding gas.

Welding current

DC(-)

Classifications

SFA/AWS A5.14	ERNiCrMo-3
EN ISO 18274	S Ni 6625 (NiCr22Mo9Nb)

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu	Al	Ti	Fe
<0.1	<0.5	<0.5	21.5	>60.0	9.0	<0.5	<0.4	<0.4	<2.0

Typical mech. properties all weld metal

Yield stress, MPa	500
Tensile strength, MPa	780
Elongation, %	40

Charpy V

Test temps, °C	Impact values, J
+20	130
-105	120
-196	110

Approvals

UDT VdTÜV	DIN 1736
--------------	----------

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 19.85 GTAW

ERNiCr-3

Description

A nickel-based, corrosion- and heat-resistant, 20% Cr, 3% Mn, 2.5% Nb rod for the GTAW of high-alloyed steel, heat-resistant steel, corrosion-resistant steel, 9% Ni steels and similar steels with high notch toughness at low temperatures. It is also suitable for joining dissimilar metals of the types mentioned above. OK Tigrod 19.85 is usually welded with pure Ar as the shielding gas.

Welding current

DC(-)

Classifications

SFA/AWS A5.14	ERNiCr-3
EN ISO 18274	S Ni 6082 (NiCr20Mn3Nb)

Wire composition

C	Si	Mn	Cr	Ni	Cu	Ti	Fe
<0.1	<0.5	3.0	20.0	>67.0	<0.5	<0.7	<3.0

Typical mech. properties all weld metal

Yield stress, MPa	440
Tensile strength, MPa	670
Elongation, %	40

Charpy V

Test temps, °C	Impact values, J
+20	150
-196	100

Approvals

UDT VdTÜV	DIN 1736
--------------	----------

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 19.93 GTAW

ERNiCu-7

Description

A nickel-based rod alloyed with about 30% Cu, 2% Ti and 1% Fe for the GTAW of base materials of the same type. It can also be used for joining these alloys to steels. OK Tigrod 19.93 is normally welded with pure Ar as the shielding gas.

Welding current

DC(-)

Classifications

SFA/AWS A5.14	ERNiCu-7
DIN 1736	SG-NiCu30MnTi
Werkstoff Nr.	2.4377

Wire composition

C	Si	Mn	Ni	Nb	Cu	Ti	Fe
0.15	<1.0	3.0	65.5	<0.5	30.0	2.3	1.5

Typical mech. properties all weld metal

Yield stress, MPa	300
Tensile strength, MPa	530
Elongation, %	45

Charpy V

Test temps, °C	Impact values, J
+20	130
0	140
-20	150

Approvals

UDT VdTÜV	DIN 1736
--------------	----------

Packing data

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

OK Tigrod 2209

GTAW
ER2209

Description

Bare, corrosion-resistant, duplex welding rods for welding austenitic-ferritic stainless alloys of the 22% Cr, 5% Ni, 3% Mo types.

OK Tigrod 2209 has high general corrosion resistance. In media containing chloride and hydrogen sulphide, the alloy has high resistance to intergranular corrosion, pitting and especially to stress corrosion. The alloy is used in a variety of applications across all industrial segments.

Welding current

DC(-)

Classifications

SFA/AWS A5.9	ER2209
EN 12072	W 22 9 3 NL

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
<0.03	0.5	1.7	22.5	8.5	3.3	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	600
Tensile strength, MPa	765
Elongation, %	28

Charpy V

Test temps, °C	Impact values, J
+20	100
-20	85
-60	60

Approvals

Sepros	UNA 485179
UDT	DIN 8556
VdTÜV	

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.2	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 308H

GTAW
ER308H

Description

Bare, corrosion-resistant, chromium-nickel rods for welding austenitic chromium-nickel alloys of the 18% Cr-8% Ni type.

OK Tigrod 308H has good general corrosion resistance. The alloy has a high carbon content, which makes it suitable for applications at higher temperatures. The alloy is used in the chemical and petrochemical industries for the welding of tubes, cyclones and boilers.

Welding current

DC(-)

Classifications

SFA/AWS A5.9	ER308H
EN 12072	W 19 9 H

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
0.06	0.5	1.8	20.3	10.0	<0.3	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	>350
Tensile strength, MPa	>550
Elongation, %	>30

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



Product Data Sheet

W 'Tungsten inert gas arc welding'

OK Tigrod 308L

Signed by Mats Linde	Approved by Per-Åke Pettersson/Christos Skodras	Reg no EN003798	Cancelling EN002981	Reg date 2007-02-02	Page 1 (2)
-------------------------	--	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Approvals updated.

GENERAL

Bare corrosion resisting chromium-nickel rods.

OK Tigrod 308L has a good general corrosion resistance.

The alloy has a low carbon content which makes this alloy particularly recommended where there is a risk of intergranular corrosion.

The alloy is widely used in the chemical and food processing industries as well as for pipes, tubes and boilers.

For joining of stainless steels of 18% Cr - 8% Ni-type with low carbon content and Nb-stabilized steels of the same type if the service temperature will not exceed 350°C.

Can also be used for welding of Cr-steels except in sulphur rich environments.

Shielding Gas: I1 (EN 439)

Alloy Type: Austenitic (with approx. 8 % ferrite) 19% Cr - 9% Ni - Low C

CLASSIFICATIONS Wire Electrode

EN 12072 W 19 9 L
SFA/AWS A5.9 ER308L
Werkstoffnummer ~1.4316

APPROVALS

CE EN 13479
CWB AWS A5.9 (Item no
 ending with A)
DNV 308L (-60 °C)
VdTÜV 04269

CHEMICAL COMPOSITION

	All Weld Metal (%)	Wire/Strip (%)	
	Nom	Min	Max
C	0.01		0.030
Si	0.4	0.30	0.65
Mn	1.8	1.5	2.0
P	0.020		0.030
S	0.015		0.020
Cr	20	19.5	21.0
Ni	10	9.0	11.0
Mo	0.1		0.3
Cu	0.1		0.3
N			0.08
Others tot			0.50



Product Data Sheet

W 'Tungsten inert gas arc welding'

OK Tigrod 308L

Signed by Mats Linde	Approved by Per-Åke Pettersson/Christos Skodras	Reg no EN003798	Cancelling EN002981	Reg date 2007-02-02	Page 2 (2)
-------------------------	--	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

All Weld Metal

Properties	As welded		SHT 1050°C 0.5h
	Min	Typ	Typ
Rp0.2 (MPa)	320	450	320
Rm (MPa)	510	645	600
A4-A5 (%)	30	36	45
Charpy V at 20°C (J)		170	200
Charpy V at -80°C (J)		135	
Charpy V at -196°C (J)		90	110

OK Tigrod 309L

GTAW
ER309L

Description

Bare, corrosion-resistant, chromium-nickel welding rod for welding the 24%Cr, 13%Ni alloyed types of steel. The alloy is also used for welding buffer layers on CMn steels and for welding dissimilar joints. When using the wire for buffer layers and dissimilar joints, it is necessary to control the dilution of the weld.

OK Tigrod 309L has good general corrosion resistance. When used for joining dissimilar materials, the corrosion resistance is of secondary importance.

Welding current

DC (-)

Classifications

SFA/AWS A5.9	ER309L
EN 12072	W 23 12 L
Werkstoffnummer	~1.4332

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
<0.03	0.5	1.8	24.0	13.0	<0.3	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	430
Tensile strength, MPa	590
Elongation, %	40

Charpy V

Test temps, °C	Impact values, J
+20	160
-60	130
-110	90

Approvals

VdTÜV

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.2	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 309MoL

GTAW

W 23 12 2 L

Description

Bare, corrosion-resistant rod of the "309LMo" type. OK Tigrod 309MoL is used for the overlay welding of unalloyed and low-alloyed steels and for welding dissimilar steels such as 316L to unalloyed and low-alloyed steels when Mo is essential.

Welding current

DC -

Classifications

EN 12072

W 23 12 2 L

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
<0.03	0.5	1.6	22.0	14.8	2.7	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	400
Tensile strength, MPa	600
Elongation, %	40

Charpy V

Test temps, °C	Impact values, J
+20	140

Approvals

DNV

For C- & C/Mn -steels to 316L

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 310

GTAW
ER310

Description

Bare, corrosion-resistant, chromium-nickel welding rod for welding heat-resistant austenitic steels of the 25Cr-20Ni type.

The wire has a high Cr content and provides good oxidation resistance at high temperatures. Common applications include industrial furnaces and boiler parts, as well as heat exchangers.

Welding current

DC(-)

Classifications

SFA/AWS A5.9	ER310
EN 12072	W 25 20

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
0.1	0.5	1.8	26.0	21.0	<0.3	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	390
Tensile strength, MPa	590
Elongation, %	43

Charpy V

Test temps, °C	Impact values, J
+20	175
-196	60

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 316L

GTAW
ER316L

Description

Bare, corrosion-resistant, chromium-nickel-molybdenum rods for welding austenitic stainless alloys of the 18% Cr-8% Ni and 18% Cr-10% Ni-3% Mo types.

OK Tigrod 316L has good general corrosion resistance, particularly to corrosion in acid and chlorinated environments. The alloy has a low carbon content which makes it particularly recommended when there is a risk of intergranular corrosion. The alloy is widely used in the chemical and food-processing industries, as well as in shipbuilding and various types of architectural structure.

Welding current

DC(-)

Classifications

SFA/AWS A5.9	ER316L
EN 12072	W 19 12 3 L
Werkstoffnummer	~1.4430

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
<0.03	0.5	1.8	19.0	12.5	2.8	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	470
Tensile strength, MPa	650
Elongation, %	32

Charpy V

Test temps, °C	Impact values, J
+20	140
-60	110
-196	70

Approvals

CL	
DNV	316L (-60°C)
Sepros	UNA 485179
UDT	DIN 8556
VdTÜV	

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.2	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 347

GTAW
W 19 9 Nb

Description

Bare, corrosion-resistant, chromium-nickel rods for welding stabilised austenitic chromium-nickel alloys of the 18% Cr-8% Ni type.

The rods are stabilised with niobium, which provides good resistance to the intergranular corrosion of the weld metal. Due to the niobium content, this alloy is recommended for use at higher temperatures.

Welding current

DC(-)

Classifications

EN 12072	W 19 9 Nb
SFA/AWS A5.9	ER347
Werkstoffnummer	~1.4551

Wire composition

C	Si	Mn	Cr	Ni	Mo	Nb	Cu
<0.08	0.5	1.4	20.0	10.0	<0.3	<1.0	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	>350
Tensile strength, MPa	>550
Elongation, %	>25

Charpy V

Test temps, °C	Impact values, J
-20	90

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0

OK Tigrod 347Si

GTAW
ER347Si

Description

Bare, corrosion-resistant, chromium-nickel rods for welding austenitic chromium nickel alloys of the 18% Cr-8% Ni type.

OK Tigrod 347Si has good general corrosion resistance. The alloy is stabilised with niobium to improve resistance to the intergranular corrosion of the weld metal. The higher silicon content improves the welding properties such as wetting. Due to the niobium content, this alloy is recommended for use at higher temperatures.

Welding current

DC(-)

Classifications

SFA/AWS A5.9	ER347Si
EN 12072	W 19 9 NbSi
Werkstoffnummer	~1.4551

Wire composition

C	Si	Mn	Cr	Ni	Mo	Nb	Cu
<0.08	0.8	1.8	20.0	10.0	<0.3	<1.0	<0.3

Typical mech. properties all weld metal

Yield stress, MPa	440
Tensile strength, MPa	640
Elongation, %	35

Charpy V

Test temps, °C	Impact values, J
+20	90

Approvals

Sepros	UNA 046731
VdTÜV	

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.0	1000	5.0
1.2	1000	5.0
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0
4.0	1000	5.0

OK Tigrod 385

GTAW
W 20 25 5 CuL

Description

Bare, corrosion-resistant welding rods for welding austenitic stainless steels of the 20Cr-25Ni-4.5Mo-1.5Cu type. The weld metal has good resistance to stress corrosion and intergranular corrosion and shows very good resistance to attack in non-oxidising acids. The resistance to pitting and crevice corrosion is better than that of ordinary 18Cr-8Ni-Mo steels.

Welding current

DC(-)

Classifications

EN 12072 W 20 25 5 CuL
SFA/AWS A5.9 ER385

Wire composition

C	Si	Mn	Cr	Ni	Mo	Cu
<0.03	<0.5	1.8	20.5	25.0	4.7	1.6

Typical mech. properties all weld metal

Yield stress, MPa	340
Tensile strength, MPa	540
Elongation, %	37

Charpy V

Test temps, °C	Impact values, J
+20	120

Approvals

UDT DIN 8556
VdTÜV

Packing data

Diameter, mm	Length, mm	Weight of rods/ box, kg
1.6	1000	5.0
2.0	1000	5.0
2.4	1000	5.0
3.2	1000	5.0



Product Data Sheet

OK Flux 10.71/OK Autrod 12.22

S 'Submerged arc welding'

Signed by Lars Andersson	Approved by Martin Gehring/Christos Skodras	Reg no EN003971	Cancelling EN003240	Reg date 2007-06-22	Page 1 (2)
-----------------------------	--	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Mechanical Properties of Weld Metal rearranged, toughness values at 20°C removed. Approvals updated (Ü, DS, Sepros, UDT deleted; CE, ClassNK, RS added), General description added.

GENERAL

Agglomerated aluminate-basic flux-wire-combination for Submerged Arc Welding. General purpose combination with excellent welding performance and very good operating characteristics. Impact toughness values down to -40°C. Higher Si content in order to increase the fluidity of the molten pool. For structural steels, fine grained steels, pressure vessel steels, shipbuilding steels up to F40, line pipe steels, etc. Designed for single and multi wire procedures, for butt and fillet welds. Suitable for DC and AC welding. Single layer and multi layer welding of unlimited plate thickness.

CLASSIFICATIONS Flux

EN 760 SA AB 1 67 AC H5

CLASSIFICATIONS Weld Metal (as welded)

EN 756 S 38 4 AB S2Si

SFA/AWS A5.17 F7A5-EM12K

CLASSIFICATIONS Weld Metal (PWHT)

SFA/AWS A5.17 F6P5-EM12K

CLASSIFICATIONS Wire Electrode

EN 756 S2Si

SFA/AWS A5.17 EM12K

APPROVALS

ABS 4Y400M

BV 4Y40M

CE EN 13479

DB 51.039.05 - 52.039.05

DNV IVY40M

GL 4Y40M

LR 4Y40M

VdTÜV 07376

APPROVALS (SPECIFIC)

ClassNK KAW54Y40M ID

RS 4YM PL

CHEMICAL COMPOSITION

	All Weld Metal (%)				Wire/Strip (%)	
	DC+, 580A, 29V		AC, 580A, 29V		Min	Max
	Max	Nom	Max	Nom		
C		0.05		0.06	0.08	0.12
Si		0.5		0.4	0.15	0.30
Mn		1.4		1.2	0.90	1.15
P	0.03		0.03			0.015
S	0.02		0.02			0.020



Product Data Sheet

OK Flux 10.71/OK Autrod 12.22

S 'Submerged arc welding'

Signed by Lars Andersson	Approved by Martin Gehring/Christos Skodras	Reg no EN003971	Cancelling EN003240	Reg date 2007-06-22	Page 2 (2)
-----------------------------	--	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal								
	AWS DC+			AWS DC+			EN AC		
	As welded			Stress relieved 620°C 1.0h			As welded		
	Min	Max	Typ	Min	Max	Typ	Min	Max	Typ
Rp0.2 (MPa)	400		425	330		390			
ReL (MPa)							380		450
ReH (MPa)									460
Rm (MPa)	480	650	520	415	550	500	470	600	550
A4-A5 (%)	22		29	22		32	20		28
Z (%)			70			72			70
Charpy V at 0°C (J)			140			120			145
Charpy V at -20°C (J)			100			80			125
Charpy V at -40°C (J)			60			65	47		90
Charpy V at -46°C (J)	27		40	27		45			



Product Data Sheet

E 'Manual metal-arc welding'

PIPEWELD 6010 Plus

Signed by P-O Oskarsson	Approved by Rune Pedersen/Barbro Karlström	Reg no EN002756	Cancelling EN002011	Reg date 2005-03-16	Page 1 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Approvals updated

GENERAL

Cellulosic-coated electrode designed for welding of pipes and pipelines in all positions using conventional and stovepipe techniques with AC or DC.

Polarity: AC, DC+

Alloy Type: Carbon - Manganese

Coating Type: Cellulosic

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 499 E 38 2 C 21
SFA/AWS A5.1 E6010

APPROVALS

ABS 3
LR 3

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.03	0.13
Si	0.05	0.25
Mn	0.25	0.55
P		0.02
S		0.02

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal			
	ISO		AWS	
	Min	Max	Min	Typ
Rp0.2 (MPa)			330	410
ReL (MPa)	380			
Rm (MPa)	470	600	415	495
A4-A5 (%)	20		22	26
Charpy V at -20°C (J)	47			60
Charpy V at -29°C (J)			27	40



Product Data Sheet

E 'Manual metal-arc welding'

PIPEWELD 6010 Plus

Signed by P-O Oskarsson	Approved by Rune Pedersen/Barbro Karlström	Reg no EN002756	Cancelling EN002011	Reg date 2005-03-16	Page 2 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 350	50	70	1.6	90	0.69	91	0.71	55	31.5
3.2 x 350	65	120	2.6	97	0.71	54	0.9	76	29
4.0 x 350	90	180	3.9	97	0.72	36	1.3	78	28
5.0 x 350	150	240	6.1	94	0.71	23	1.58	98	29

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)



Product Data Sheet

E 'Manual metal-arc welding'

OK PIPEWELD 7010 PLUS

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN005008	Cancelling EN004996	Reg date 2009-10-28	Page 1 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

GENERAL

Cellulosic coated electrode with an increase in deposition rate with both stovepipe and conventional techniques.

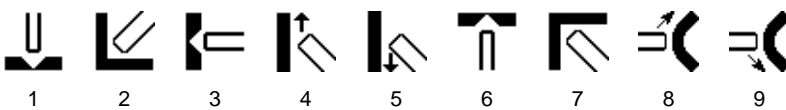
Suitable for welding pipes of steel type API 5LX , X42, X46, X52, X56 , X60.

Polarity: DC+

Alloy Type: C-Mn-Ni-Mo

Coating Type: Cellulosic

WELDING POSITIONS



CLASSIFICATIONS Electrode

SFA/AWS A5.5 E7010-P1
 EN ISO 2560-A E 42 2 C 21

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.05	0.16
Si	0.03	0.25
Mn	0.30	0.60
P		0.03
S		0.03
Cr		0.05
Ni	0.35	0.50
Mo	0.25	0.35
V		0.05

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal			AWS	
	ISO			As welded	
	Min	Max	Typ	Min	Typ
Rp0.2 (MPa)				415	465
ReL (MPa)	420		480		
Rm (MPa)	500	640	570	490	560
A4 (%)				22	27
A5 (%)	20		23		
Charpy V at -20°C (J)	47		60		60
Charpy V at -30°C (J)				27	50



Product Data Sheet

E 'Manual metal-arc welding'

OK PIPEWELD 7010 PLUS

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN005008	Cancelling EN004996	Reg date 2009-10-28	Page 2 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U	Welding Positions
	Min	Max								
3.2 x 350	65	120	2.7	79	0.58	65	0.62	90	31	1,2,3,4,5,6,7,8,9
4.0 x 350	90	180	4	83	0.59	42	0.93	93	30.5	1,2,3,4,5,6,7,8,9
5.0 x 350	150	240	6.1	90	0.67	24	1.47	100	28.6	1,2,3,4,5,6,7,8,9

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)



Product Data Sheet

E 'Manual metal-arc welding'

OK 308L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003790	Cancelling EN003214	Reg date 2007-01-23	Page 1 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Mechanical data revised.

GENERAL

Extra low carbon stainless steel electrode for welding steels of the 19Cr10Ni-type.

Also suitable for welding stabilized stainless steels of the similar composition, except when the full creep resistance of the base material is to be met.

Min AC OCV: 50

Polarity: AC, DC+

Alloy Type: Austenitic CrNi

Coating Type: Acid Rutile

Ferrite Content: FN 3-10

WELDING POSITIONS



CLASSIFICATIONS Electrode

SFA/AWS A5.4

E308L-16

JIS Z 3221

D308L-16

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.030
Si	0.50	0.90
Mn	0.50	1.20
P		0.025
S		0.020
Cr	18.5	20.5
Ni	9.0	11.0
Mo		0.5
Cu		0.5



Product Data Sheet

E 'Manual metal-arc welding'

OK 308L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003790	Cancelling EN003214	Reg date 2007-01-23	Page 2 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal		
	Min	Max	Typ
	AWS		
	As welded		
Rp0.2 (MPa)	320		420
Rm (MPa)	520	700	570
A4 (%)	35		45
Z (%)			60
Charpy V at -60°C (J)	32		50

Comments:

Interpass temp. at welding <150 °C.

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 300	50	90	1.8	105	0.55	99	1.1	36	31
3.2 x 350	70	130	3.9	105	0.60	49	1.4	54	31
4.0 x 350	90	180	5.2	105	0.60	33	2.0	60	32
5.0 x 350	140	250	8.0	105	0.60	20	3.0	60	33

- W** = Weight (kg / 100 electrodes)
η = Efficiency (g weld metal x 100 / g core wire)
N = Effective value (kg weld metal / kg electrodes)
B = Changes (number of electrodes / kg weld metal)
H = Deposit rate at 90% of max current (kg weld metal / hour arc time)
T = Fusion time at 90% of max current (s / electrode)
U = Arc voltage (V)

OTHER DATA

Redrying: 350 °C, 2h.



Product Data Sheet

E 'Manual metal-arc welding'

OK 309L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003978	Cancelling EN003181	Reg date 2007-06-25	Page 1 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Cr content range adjusted.

GENERAL

Acid-rutile coated MMA-electrode giving an overalloyed weld metal.

Suitable for welding stainless steel to mild and low alloyed steels.

Also suitable for welding of transition layers when surfacing mild steel with stainless steel weld metal.

Min AC OCV: 55

Polarity: AC, DC+

Alloy Type: Austenitic CrNi

Coating Type: Acid Rutile

Ferrite Content: FN 12 - 22

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 1600

E 23 12 L R 3 2

SFA/AWS A5.4

E309L-16

APPROVALS

Not applicable

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.030
Si	0.50	0.90
Mn	0.50	1.20
P		0.025
S		0.020
Cr	22.7	24.7
Ni	12.0	14.0
Mo		0.3
Cu		0.3



Product Data Sheet

E 'Manual metal-arc welding'

OK 309L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003978	Cancelling EN003181	Reg date 2007-06-25	Page 2 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal			
	ISO		AWS	
	Min	Typ	Min	Typ
Rp0.2 (MPa)	380	470	380	
Rm (MPa)	520	580	520	
A4 (%)			30	
A5 (%)	27	32		
Z (%)		50		50
Charpy V at 20°C (J)	40	50		
Charpy V at -10°C (J)	32	40		

Comments:

Interpass temperature max. 150 °C. Hardness weld metal HV 200 - 225.

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 300	45	90	2.0	115	0.60	85	1.1	38	28
3.2 x 350	65	120	3.8	115	0.60	45	1.6	51	29
4.0 x 350	85	180	5.7	115	0.60	29	2.5	51	31

- W** = Weight (kg / 100 electrodes)
 η = Efficiency (g weld metal x 100 / g core wire)
N = Effective value (kg weld metal / kg electrodes)
B = Changes (number of electrodes / kg weld metal)
H = Deposit rate at 90% of max current (kg weld metal / hour arc time)
T = Fusion time at 90% of max current (s / electrode)
U = Arc voltage (V)

OTHER DATA

Redrying: 350 °C, 2h.



Product Data Sheet

E 'Manual metal-arc welding'

OK 316L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Barbro Karlström	Reg no EN003206	Cancelling EN003180	Reg date 2005-11-30	Page 1 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Deletion of dimension 2.0 and 5.0mm.

GENERAL

Extra low carbon stainless steel electrode for welding steels of the 18Cr12Ni2.8Mo-type.

Also suitable for welding stabilized steels of similar composition except when full creep resistance of the base material is to be matched.

Min AC OCV: 50

Polarity: AC, DC+

Alloy Type: CrNi

Coating Type: Acid-Rutile

Ferrite Content: FN 3-10

WELDING POSITIONS



CLASSIFICATIONS Electrode

SFA/AWS A5.4

E316L-16

JIS Z3221

D316L-16

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.030
Si	0.50	0.90
Mn	0.50	1.20
P		0.025
S		0.020
Cr	17.0	19.0
Ni	11.0	13.0
Mo	2.5	3.0
Cu		0.20



Product Data Sheet

E 'Manual metal-arc welding'

OK 316L

Signed by Claes Gillenius	Approved by Tapio Huhtala/Barbro Karlström	Reg no EN003206	Cancelling EN003180	Reg date 2005-11-30	Page 2 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal	
	Min	Typ
	AWS	
	As welded	
Rp0.2 (MPa)	340	435
Rm (MPa)	520	580
A4 (%)	30	40
Z (%)		55
Charpy V at 20°C (J)	47	60
Charpy V at -125°C (J)	32	

Comments:

Interpass temp. at welding <150 °C.

Hardness HV 180-220 all weld metal.

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 300	45	90	1.9	100	0.55	96	0.9	45	29
3.2 x 350	60	125	3.5	100	0.55	52	1.4	57	30
4.0 x 350	70	190	5.3	100	0.56	34	2.0	57	32

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)

OTHER DATA

Redrying: 350 °C, 2h.



Product Data Sheet

E 'Manual metal-arc welding'

OK 48.00

Prepared by P-O Oskarsson	Qualified by Tero Borg	Approved by J-P Ernoult	Reg no EN006953	Cancelling EN005613	Reg date 2016-01-11	Page 1 (3)
------------------------------	---------------------------	----------------------------	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

New AWS classification.

GENERAL

A reliable, general purpose electrode for manual metal arc welding of carbon steels, carbon manganese steels and fine-grained carbon manganese steels with elevated yield strength. OK 48.00 deposits a tough, crack-resistant weld metal. The coating is of the low moisture absorption type.

High welding speed in the vertical-up position. OK 48.00 is insensitive to the composition of the base material within fairly wide limits.

The electrode can be used for welding structures where difficult stress conditions cannot be avoided.

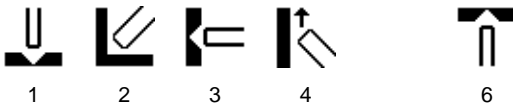
Polarity: DC+(-)

Alloy Type: Carbon-Manganese

Coating Type: Lime Basic

Diff Hydrogen: < 4.0 ml/100g

WELDING POSITIONS



CLASSIFICATIONS Electrode

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

APPROVALS

ABS 3Y H5
BV 3Y H5
CE EN 13479
DB 10.039.12
DNV 3Y H5
GL 3Y H5
LR 3Ym H5
PRS 3Y H5
RS 3Y H5
VdTÜV 00690

APPROVALS (SPECIFIC)

NAKS/HAKC 2.0-5.0 mm
Seproz UNA 272580

APPROVAL COMMENT

Approvals Specific: Valid for lot numbers starting with SF



Product Data Sheet

E 'Manual metal-arc welding'

OK 48.00

Prepared by P-O Oskarsson	Qualified by Tero Borg	Approved by J-P Ernoult	Reg no EN006953	Cancelling EN005613	Reg date 2016-01-11	Page 2 (3)
------------------------------	---------------------------	----------------------------	--------------------	------------------------	------------------------	---------------

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.02	0.10
Si	0.30	0.70
Mn	0.90	1.40
P		0.020
S		0.015
Cr		0.1
Ni		0.1
Mo		0.06
V		0.04
Nb		0.02
Cu		0.1
Al		0.03
Sn		0.02
Ti		0.03
Pb		0.02
As		0.03
Mn+Ni+Cr+Mo+V		1.75

MECHANICAL PROPERTIES OF WELD METAL

Properties	ISO			AWS	
	As welded Min	Max	Typ	As welded Min	Typ
Rp0.2 (MPa)				400	
ReL (MPa)	420		475		
Rm (MPa)	530	640	565	490	
A4 (%)				22	
A5 (%)	22		29		
Charpy V at -30°C (J)				27	130
Charpy V at -40°C (J)	47		115		
	Comments: EN standard requires Rm min 500 Mpa and A5 Min 20%.			Comments:	



Product Data Sheet

E 'Manual metal-arc welding'

OK 48.00

Prepared by P-O Oskarsson	Qualified by Tero Borg	Approved by J-P Ernoult	Reg no EN006953	Cancelling EN005613	Reg date 2016-01-11	Page 3 (3)
------------------------------	---------------------------	----------------------------	--------------------	------------------------	------------------------	---------------

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U	Welding Positions
	Min	Max								
1.6 x 300	30	55	0.9	127	0.59	192	0.38	50	24	1,2,3,4,6
2.0 x 300	55	80	1.4	128	0.65	125	0.63	45	22	1,2,3,4,6
2.5 x 350	70	110	2.5	129	0.67	65	0.96	57	24	1,2,3,4,6
3.2 x 350	90	140	4.7	124	0.70	42	1.24	68	23	1,2,3,4,6
3.2 x 450	90	140	4.7	124	0.73	31	1.33	85	23	1,2,3,4,6
4.0 x 350	120	190	5.5	118	0.70	29	1.63	75	24	1,2,3,4,6
4.0 x 450	120	190	7.0	118	0.71	22	1.76	92	24	1,2,3,4,6
5.0 x 450	190	260	10.6	119	0.75	13	2.61	99	24	1,2,3,4
6.0 x 450	220	340	14.6	120	0.80	9	3.88	97	26	1,2,3
7.0 x 450	280	410	19.6	118	0.79	7.0	4.83	104	27	1,2,3

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)



Product Data Sheet

OK 53.00

ESAB-MÓR Kft Hungary

Signed by P-O Oskarsson	Approved by Rune Pedersen/Barbro Karlström	Reg no EN003121	Cancelling EN002431	Reg date 2005-10-28	Page 1 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

UDT deleted

GENERAL

OK 53.00 is a basic electrode with especially good mechanical properties and therefore often used when the requirements are extra tough. The electrode tolerates wide variations in the analyses of the base metal and the result is a rule excellent. Very stable for root runs

Min AC OCV: 65 V

Polarity: AC, DC+-

Alloy Type: Carbon Manganese

Coating Type: Lime basic

Diff Hydrogen: <10.0 ml/100g

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 499	E 42 4 B 12 H10
SFA/AWS A5.1	E7016
ISO 2560	E 51 5B 24 (H)

APPROVALS

ABS	3H10, 3Y
BV	3, 3YHH
CL	EN 499
DB	10.039.09
DNV	3 YH15
DS	EN 499
GL	3YH10
LR	3, 3Y H15
VdTÜV	00630
Ü	10.039/1

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.10
Si	0.45	0.75
Mn	0.85	1.25
P		0.030
S		0.030



Product Data Sheet

OK 53.00

ESAB-MÓR Kft Hungary

Signed by P-O Oskarsson	Approved by Rune Pedersen/Barbro Karlström	Reg no EN003121	Cancelling EN002431	Reg date 2005-10-28	Page 2 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal		
	ISO		
	As welded		
	Min	Max	Typ
ReH (MPa)	420		430
Rm (MPa)	510	600	530
A4-A5 (%)	22		27
Charpy V at -20°C (J)	54		100
Charpy V at -40°C (J)	47		60
	Comments: Elongation=A5		

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
\varnothing x Length									
2.5 x 350	80	110	1.9	102	0.63	83	0.82	53	26
3.2 x 350	80	150	3.1	100	0.68	48	1.28	59	26
3.2 x 450	80	150	4.1	106	0.65	38	1.41	67	26
4.0 x 350	100	220	4.8	99	0.65	32	1.72	65	25
4.0 x 450	100	220	6.2	103	0.64	25	2.05	70	25
5.0 x 450	180	320	9.5	100	0.67	16	2.62	88	30

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)



Product Data Sheet

OK 53.04

PT Karya Yasantara Cakti Indonesia

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004197	Cancelling EN003948	Reg date 2007-11-02	Page 1 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Amendment to polarity

GENERAL

OK 53.04 offers tough crack resistant welds in mild and low-alloyed steels.

Min AC OCV: 65

Polarity: AC, DC+(-)

Alloy Type: Carbon Manganese

Coating Type: Lime Basic

Diff Hydrogen: <5.0 ml/100g

WELDING POSITIONS



CLASSIFICATIONS Electrode

SFA/AWS A5.1	E7016
EN ISO 2560-A	E 42 4B 12 H5

APPROVALS

ABS	3Y, 3H5
BKI	3 Y H15
DNV	3YH10
GL	3YH10
LR	3, 3YH15

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.035	0.104
Si	0.30	0.70
Mn	0.85	1.35
P		0.030
S		0.030

MECHANICAL PROPERTIES OF WELD METAL

All Weld Metal

ISO

As welded

Properties	Min	Typ
ReL (MPa)	420	500
Rm (MPa)	510	590
A4-A5 (%)	24	27
Charpy V at -20°C (J)	54	150
Charpy V at -30°C (J)	47	130
Charpy V at -40°C (J)	47	110

Comments:

Elongation=A5



Product Data Sheet

OK 53.04

PT Karya Yasantara Cakti Indonesia

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004197	Cancelling EN003948	Reg date 2007-11-02	Page 2 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

ECONOMICS & CURRENT DATA

Dimension (mm) Ø x Length	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 350	70	110	2.2	108	0.56	81.0	0.9	50	23
3.2 x 350	90	140	3.4	105	0.60	48.0	1.2	62	23
4.0 x 350	120	190	5.1	104	0.61	33	1.7	66	23
5.0 x 400	150	240							

- W** = Weight (kg / 100 electrodes)
η = Efficiency (g weld metal x 100 / g core wire)
N = Effective value (kg weld metal / kg electrodes)
B = Changes (number of electrodes / kg weld metal)
H = Deposit rate at 90% of max current (kg weld metal / hour arc time)
T = Fusion time at 90% of max current (s / electrode)
U = Arc voltage (V)

OTHER DATA

Diffusible hydrogen in the weld metal according to the mercury method <5 ml/100 g weld metal.

Application:

Manual metal arc welding of carbon steels, carbon-manganese steels and steels with elevated yield strength.

OK 53.16 SPEZIAL SMAW

Type Basic

E7016

Description

OK 53.16 is a double-coated electrode combining the running characteristics of a rutile electrode with the mechanical properties of a basic electrode. OK 53.16 welds on both AC and DC and the spatter loss is minimal.

Recovery

105%

Welding current

DC+, AC OCV 50 V



Classifications

SFA/AWS A5.1	E7016
EN 499	E38 2 B 32 H10
ISO 2560	E 51 4 B 21(H)

Typical all weld metal composition, %

C	Si	Mn
0.07	0.6	0.9

Typical mech. properties all weld metal

Yield stress, MPa	450
Tensile strength, MPa	530
Elongation, %	28

Charpy V

Test temps, °C	Impact values, J
-20	120

Approvals

ABS	3, H10, 3Y
BV	3, 3YHH
CL	EN 499
DB	10.039.29
DNV	3YH10
DS-EN 499	E 38 2 B 32 H10
GL	3YH10
LR	3, 3YH10
UDT-EN 499	E 38 2 B 32 H10
VdTÜV	02762

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, s/ electrode
2.5	350	50-90	26	0.63	77	0.86	54
3.2	350	90-150	25	0.65	46	1.4	57
4.0	450	120-190	26	0.64	24	1.9	79
5.0	450	160-230	26	0.63	15	2.4	99

OK 53.68

Type Lime-basic

SMAW

E7016-1

Description

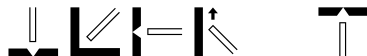
OK 53.68 is an extra-high quality LMA electrode, particularly suitable for on-site welding. OK 53.68 yields a homogeneous, high-quality weld metal with an extra low content of impurities. The electrode operates well on AC as well as DC positive and negative. DC negative is preferred, as it produces a small, easily controlled weld pool, minimising the risk of burn-through or undercutting. OK 53.68 is CTOD tested.

Recovery

100%

Welding current

AC, DC +(-) OCV 65 V



Classifications

SFA/AWS A5.1	E7016-1
EN 499	E 42 5 B 12 H5

Typical all weld metal composition, %

C	Si	Mn
0.06	0.4	1.3

Typical mech. properties all weld metal

Yield stress, MPa	>420
Tensile strength, MPa	510-640
Elongation, %	26

Charpy V

Test temps, °C	Impact values, J
-20	>150
-40	>80
-50	>47

Approvals

ABS	3H5, 3Y
BV	3YH5
DNV	4 YH5
DS	EN 499
GL	4YH5
LR	4Y40 H15
PRS	4YH10
SFS	EN 499
SS	EN 499
UDT	EN 499
VdTÜV	06807

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, s/ electrode
2.5	350	55-85	22	0.58	90	0.8	50
3.2	450	80-130	22	0.61	41	1.2	73
4.0	450	110-170	22	0.65	26	1.7	83
5.0	450	180-230	22	0.66	17	2.4	90



OK 53.70

Low hydrogen MMA electrode for welding of pipes and general structures

General Description:

A low hydrogen AC/DC electrode for one sided welding of pipes and general structures. The stable arc and the well balanced slag system make the electrode easy to weld in all position.

Typical Application:

For pipe material up to and including 5LX52. The easy root filling and flat bead makes it perfect for one sided welding of pipes. Ideal also for root beads on higher tensile material. Very suitable for use with misaligned and poor fit-up joints.

Typical All-Weld Metal Mechanical Properties:

Yield Stress	U.T.S.	Elongation
430 N/mm ²	520 N/mm ²	30 %

Welding Current: AC, DC+ (-) OCV: 60 V min.

Typical All-Weld Metal Composition (Wt%):

C	Si	Mn	P	S
0.07	0.4	1.0	<0.02	<0.02

Impact Toughness:

at -20°C 180 J
at -40°C 120 J

Weld Metal Hydrogen:

Because of the LMA coating the remoistening is very low which means that the very low hydrogen content of the weld metal can be utilized for a longer time. According to ISO 3690 diffusible hydrogen is below 5 ml per 100 g of weld metal.

Current Ranges:

Size (mm)	2.5	3.25	4.0
Minimum Current (A)	60	80	90
Maximum Current (A)	85	130	190

Positional Welding:
Recommended.



Classifications:

AWS	E 7016-1
DIN 1913	E 51 55 B 10
ISO 2560	E 51 5B 24 H
GOST 9466-75	E50A

Approvals:

ABS:	3H H, 3Y
LR:	3, 3YH
DnV:	3YHH
VNIIST	
GASPROM	

Packaging information:

Diameter (mm)	2.5	3.25	3.2	4.0	4.0
Length (mm)	350	350	450	350	450
Box weight (kg)	4.5	4.7	6.0	4.4	6.0
Approx. No of Electrodes per Box	248	149	150	93	95

OK 53.70 is also available in **VacPac**.

We reserve the right to change specifications without notice.



Esab AB
Box 8004
S-402 77 GÖTEBORG
SWEDEN
Phone: +46 31 50 90 00
Fax: +46 31 50 93 60

XA00064320
Inf. 9906066





Product Data Sheet

OK 55.00

E 'Manual metal-arc welding'
ESAB-MÓR Kft Hungary

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN003776	Cancelling EN003394	Reg date 2007-01-12	Page 1 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

AWS classification up dated

GENERAL

Basic, high quality electrode for welding high strength mild steels. Good impact strength and resistance to hot cracking.

Min AC OCV: 65
Polarity: AC, DC+

Alloy Type: Carbon Manganese
Coating Type: Lime Basic
Diff Hydrogen: <4.0 ml/100g

WELDING POSITIONS



CLASSIFICATIONS Electrode

SFA/AWS A5.1 E7018-1H4 R
EN ISO 2560-A E 46 5 B 32 H5

APPROVALS

ABS 3H5, 3Y H5
BV 3Y HHH
CE EN 13479
DB 10.039.03
DNV 4YH5
GL 3YH5
LR 3, 3Y H5
RS 3YHH
VdTÜV 00632

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.05	0.10
Si	0.30	0.70
Mn	1.10	1.60
P		0.030
S		0.030
Cr		0.1
Ni		0.1
Mo		0.1
V		0.03
Nb		0.02
Cu		0.1
Al		0.03
Sn		0.01
Ti		0.03
Pb		0.02
As		0.03



Product Data Sheet

OK 55.00

E 'Manual metal-arc welding'
ESAB-MÓR Kft Hungary

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN003776	Cancelling EN003394	Reg date 2007-01-12	Page 2 (2)
----------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal		
	ISO		
	As welded		
	Min	Max	Typ
ReL (MPa)	460		480
Rm (MPa)	560	680	590
A4-A5 (%)	22		28
A5 (%)	22		28
Charpy V at -20°C (J)	54		115
Charpy V at -50°C (J)	47		50

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
\varnothing x Length	Min	Max							
2.5 x 350	80	110	2.4	127	0.64	66	0.9	64	23
3.2 x 350	110	140	3.9	126	0.62	41	1.2	72	23
3.2 x 450	110	140	5.0	125	0.69	30	1.4	88	24
4.0 x 350	140	200	5.8	122	0.62	28	1.77	72.5	23.2
4.0 x 450	140	200	7.4	125	0.71	19	2.0	94	24
5.0 x 450	200	270	10.8	125	0.72	13	3.0	94	24
6.0 x 450	215	360	12.6	125	0.71	9	4.0	98	25

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)



Product Data Sheet

E 'Manual metal-arc welding'

OK 61.35 Cryo

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003564	Cancelling None	Reg date 2006-09-25	Page 1 (2)
------------------------------	---	--------------------	--------------------	------------------------	---------------

REASON FOR ISSUE

New product.

GENERAL

A basic stainless stick electrode of the 308L-type especially designed for cryogenic applications. Provides controlled low ferrite content to ensure lateral expansion of min. 0.38 mm at -196°C.

Polarity: DC+

Alloy Type: Austenitic CrNi

Coating Type: Basic

Ferrite Content: FN 2-4

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 1600 E 19 9 L B 2 2
SFA/AWS A5.4 E308L-15
Werkstoffnummer 1.4316

APPROVALS

VdTÜV 10721

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.04
Si	0.20	0.70
Mn	1.30	2.00
P		0.020
S		0.010
Cr	18.0	20.0
Ni	9.0	11.0
Mo		0.3
Cu		0.3
Ferrite FN	2	4



Product Data Sheet

E 'Manual metal-arc welding'

OK 61.35 Cryo

Signed by Claes Gillenius	Approved by Tapio Huhtala/Christos Skodras	Reg no EN003564	Cancelling None	Reg date 2006-09-25	Page 2 (2)
------------------------------	---	--------------------	--------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal			
	ISO		AWS	
	Min	Typ	Min	Typ
As welded			As welded	
Rp0.2 (MPa)	320		320	450
Rm (MPa)	520		520	590
A4 (%)			35	43
A5 (%)	32			
Z (%)			50	60
Charpy V at -196°C (J)	32	50	32	50

Comments:

Lateral expansion min. 0.38mm. (0.015 inch).

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
2.5 x 300	55	85	1.7	100	0.61	92	0.9	37	22
3.2 x 350	80	120	3.3	100	0.61	50	1.3	54	25
4.0 x 350	80	180	4.9	100	0.61	33	1.9	58	27
5.0 x 350	160	210	7.8	98	0.58	22	2.3	70	26

- W** = Weight (kg / 100 electrodes)
- η** = Efficiency (g weld metal x 100 / g core wire)
- N** = Effective value (kg weld metal / kg electrodes)
- B** = Changes (number of electrodes / kg weld metal)
- H** = Deposit rate at 90% of max current (kg weld metal / hour arc time)
- T** = Fusion time at 90% of max current (s / electrode)
- U** = Arc voltage (V)

OTHER DATA

Redrying 200 °C, 2 h



Product Data Sheet

E 'Manual metal-arc welding'

OK 67.13

Signed by Claes Gillenius	Approved by Tapio Huhtala/Barbro Karlström	Reg no EN003184	Cancelling EN003096	Reg date 2005-11-23	Page 1 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Current ranges revised.

GENERAL

Austenitic stainless steel electrode for welding 25Cr20Ni steels. The weld metal does not contain any measureable ferrite and resists scaling up to 1100-1150 °C.

Min AC OCV: 65
Polarity: DC+, AC

Alloy Type: Austenitic CrNi
Coating Type: Basic Rutile
Ferrite Content: FN 0

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 1600 E 25 20 R 1 2
SFA/AWS A5.4 E310-16
Werkstoffnummer 1.4842

APPROVALS

Not
applicable

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.08	0.15
Si	0.20	0.70
Mn	1.4	2.5
P		0.025
S		0.020
Cr	25.0	27.0
Ni	20.0	22.0
Cu		0.20



Product Data Sheet

E 'Manual metal-arc welding'

OK 67.13

Signed by Claes Gillenius	Approved by Tapio Huhtala/Barbro Karlström	Reg no EN003184	Cancelling EN003096	Reg date 2005-11-23	Page 2 (2)
------------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal	
	Min	Typ
	AWS	
	As welded	
Rp0.2 (MPa)	370	560
Rm (MPa)	560	600
A4 (%)	30	35
Z (%)	45	55
Charpy V at 20°C (J)	47	60

Comments:

Interpass temp. < 125 °C.

Hardness: 185-215 HV.

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
\emptyset x Length									
2.5 x 300	50	85	1.9	95	0.51	101	0.8	42	21
3.2 x 350	65	120	3.8	95	0.51	53	1.2	58	24
4.0 x 350	70	160	5.7	95	0.51	34	1.7	61	28
5.0 x 350	150	220	8.9	100	0.54	21	2.6	67	31

W = Weight (kg / 100 electrodes)

η = Efficiency (g weld metal x 100 / g core wire)

N = Effective value (kg weld metal / kg electrodes)

B = Changes (number of electrodes / kg weld metal)

H = Deposit rate at 90% of max current (kg weld metal / hour arc time)

T = Fusion time at 90% of max current (s / electrode)

U = Arc voltage (V)

OTHER DATA

Redrying: 250 °C, 2 h.

OK 67.45

Type Lime-basic

SMAW
(E307-15)

Description

Austenitic stainless-steel electrode producing a weld metal with less than 5% ferrite. The tough weld metal has excellent crack resistance, even when welding steels with very poor weldability. Suitable for joining 12-14% manganese steel to itself or other steels. Also suitable for buffer layers before hardfacing.

Welding current

DC+



Classifications

EN 1600 E 18 8 Mn B 4 2
SFA/AWS A5.4 (E307-15)

Typical all weld metal composition, %

C	Si	Mn	Cr	Ni	Mo	Cu
0.11	0.5	6.0	18.5	8.5	<0.5	<0.5

Typical mech. properties all weld metal

Yield stress, MPa 470
Tensile strength, MPa 605
Elongation A5, % 35

Charpy V

Test temps, °C +20
Impact values, J 85

Ferrite content FN <5

Approvals

ABS Stainless
Sepros UNA 409820
UDT EN 1600
VdTÜV 01580

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, s/ electrode
2.5	300	50-80	23	0.58	102	0.7	50
3.2	350	70-100	24	0.60	51	1.1	71
4.0	350	100-140	24	0.60	33	1.5	73
5.0	350	150-200	25	0.60	22	2.2	80

OK 67.50

Type Acid-rutile

SMAW

E2209-17

Description

OK 67.50 is a rutile coated electrode for welding ferritic-austenitic stainless steels, e.g. UNS S31803. Special applications include the welding of pipes with high resistance to stress corrosion up to 300°C, the so-called Duplex steels. OK 67.50 is particularly suitable for welding duplex cargo tanks.

Welding current

DC+, AC OCV 60 V



Classifications

EN 1600	E 22 9 3 N L R 3 2
SFA/AWS A5.4	E2209-17
Werkstoff Nr.	1.4462
CSA W48	E2209-17

Typical all weld metal composition, %

C	Si	Mn	Cr	Ni	Mo	Cu	N
<0.03	0.7	0.9	22.3	9.5	3.0	<0.3	0.16

Typical mech. properties all weld metal

Yield stress, MPa	660
Tensile strength, MPa	820
Elongation A5, %	25

Charpy V

Test temps, °C	Impact values, J
+20	50

Ferrite content	FN 25-40
-----------------	----------

Approvals

ABS	For welding duplex steels
BV	2209
CWB	CSA W48
DNV	For duplex SS
GL	4462
LR	S 31803
RINA	2209
Sepros	UNA 409820
UDT	EN 1600
VdTUV	04368

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, s/ electrode
2.0	300	30-65	29	0.55	152	0.7	33
2.5	300	50-90	27	0.58	91	1.0	38
3.2	350	80-120	28	0.58	47	1.4	55
4.0	350	100-160	29	0.58	32	1.9	59
5.0	350	150-220	30	0.58	20	2.8	64

OK 73.08

Type Lime-basic

SMAW

E8018-G

Description

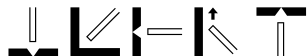
OK 73.08 is a NiCu-alloyed LMA electrode, which deposits a weld metal with good corrosion resistance to sea-water and flue gases, for the welding of weatherproof steel and for ship's hull structural steel. The weld metal has excellent mechanical properties. It is particularly suitable for welding the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

Recovery

125%

Welding current

AC, DC(+) OCV 65 V



Classifications

SFA/AWS A5.5	E8018-G
EN 499	E 46 5 Z B 32
ISO 2560	E 51 5 B 120 26 H

Typical all weld metal composition, %

C	Si	Mn	Ni	Cu
0.06	0.4	1.0	0.7	0.4

Typical mech. properties all weld metal

Yield stress, MPa	500
Tensile strength, MPa	590
Elongation, %	27

Charpy V

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

Approvals

ABS	3H5, 3Y
BV	3Y HH
DB	10.039.20
DNV	3 YH10
DS	EN 499
GL	3YH15
LR	3, 3Y H15
RS	3YHH
Sepros	UNA 485154
SFS	EN 499
SS	EN 499
UDT	EN 499
Ü	10.039/1
VdTÜV	02115

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, s/ 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	23	0.62	43	1.2	68
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	2.6	106
6.0	450	240-370	28	0.68	9.5	3.3	115

OK 73.68

Type Lime-basic

SMAW

E8018-C1

Description

OK 73.68 is a 2.5% nickel-alloyed LMA electrode suitable for the 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

AC, DC+ OCV 65 V



Classifications

SFA/AWS A5.5	E8018-C1
EN 499	E 46 6 2Ni B 32 H5

Typical all weld metal composition, %

C	Si	Mn	Ni
0.05	0.3	1.0	2.4

Typical mech. properties all weld metal

Yield stress, MPa	520
Tensile strength, MPa	610
Elongation, %	26

Charpy V

Test temps, °C	Impact values, J
-55	110
-59	105
-60	105

Approvals

ABS	3H5, 3Y400
BV	UP
CL	EN 499
DNV	5 YH10
GL	6Y55H10
LR	5Y40H15
PRS	4YH10
RS	3YHH
Sepros	UNA 485154
SFS	EN 499
UDT	EN 499
VdTÜV	01529

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, s/ 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 74.46

Type Lime-basic

SMAW

E7018-A1

Description

OK 74.46 is an LMA electrode alloyed with 0.5% Mo for welding steels for pressure vessels. The running characteristics make it suitable for welding joints in inclined positions. The composition of the coating is adapted for welding with low currents, making OK 74.46 very suitable for the welding of pipes.

Recovery

115%

Welding current

DC+, AC OCV 65 V



Classifications

SFA/AWS A5.5	E7018-A1
EN 1599	E Mo B 42 H5
ISO 3580	E Mo B 20

Typical all weld metal composition, %

C	Si	Mn	Mo
0.06	0.5	0.7	0.5

Typical mech. properties all weld metal

Yield stress, MPa	460
Tensile strength, MPa	560
Elongation, %	27

Charpy V

Test temps, °C	Impact values, J
+20	175
0	>31

Approvals

CL	EN 1599
SFS	EN 1599
UDT	DIN 8575
VdTÜV	01043

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, s/ electrode
2.0	300	55-80	22	0.59	136.0	0.7	40
2.5	350	75-110	23	0.59	73.0	0.9	55
3.2	350	105-150	23	0.54	53.0	1.0	66
3.2	450	105-150	25	0.59	37.0	1.2	81
4.0	450	140-200	26	0.65	22.5	1.8	90
5.0	450	190-270	27	0.65	14.5	2.4	104
6.0	450	260-370	28	0.65	10.0	3.4	108

OK 75.75

Type Lime-basic

SMAW

E11018-G

Description

OK 75.75 is an LMA electrode dried to a very low moisture content and suitable for the welding of high-strength, low-alloyed steels, at room temperature or with moderate preheating.

Recovery

125%

Welding current

DC+



Classifications

SFA/AWS A5.5 E11018-G
EN 757 E 69 4 Mn2NiCrMoB 42 H5

Typical all weld metal composition, %

C	Si	Mn	Cr	Ni	Mo
0.06	0.3	1.7	0.4	2.2	0.4

Typical mech. properties all weld metal

Yield stress, MPa 755
Tensile strength, MPa 820
Elongation, % 20

Charpy V

Test temps, °C	Impact values, J
+20	115
-20	85
-40	70
-51	55
-60	45

Approvals

ABS E11018-G
DB 10.039.19
RS 4Y62HH
Sepros UNA 485155
UDT DIN 8529
Ü 10.039/3
VdTÜV 01028

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, s/ electrode
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

OK 84.58

Type Lime-basic

SMAW

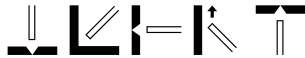
E6-UM-55-G

Description

OK 84.58 is a hardfacing electrode depositing a semi-corrosion-resistant martensitic steel. Full hardness is obtained even in the first bead, irrespective of the cooling rate. Suitable for hardfacing parts exposed to abrasive and impact wear, such as farm equipment, forestry tools, loading machines and mixers.

Welding current

AC, DC+ OCV 65 V



Classifications

DIN 8555 E6-UM-55-G

Typical all weld metal composition, %

C	Si	Mn	Cr
0.7	0.6	0.7	10.0

Typical mech. properties all weld metal

Weld metal hardness, a w deposited on mild steel, no preheat, interpass temperature 250°C)	53-59 HRC
1st layer	52-59 HRC
2nd layer	52-59 HRC
3rd layer	53-59 HRC
Machinability	Grinding only
Abrasion resistance	Very good
High temp. wear resistance	Good
Corrosion resistance	Good

Tempering resistance

Temp°C/1h	HRC
100	55
200	55
300	52
400	50
500	54
600	46
700	31

Annealing and hardening of weld metal:

Soft annealing: 840-860°C

Rehardening procedure:

Hardening temperature, °C: 950- 1000

Quenching medium: compressed air or oil

Deposition data at max current

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, s/ electrode
2.5	350	75-110	23	0.67	58.0	1.0	62
3.2	450	110-150	23	0.67	27.0	1.4	95
4.0	450	145-200	24	0.67	17.5	1.9	107
5.0	450	190-270	26	0.66	11.5	2.8	110
6.0	450	250-370	28	0.65	8.5	4.0	110

OK 84.78

Type Rutile-basic

SMAW

E10-UM-60-CZ

Description

Electrode producing a weld metal with coarse chromium carbides in an austenitic matrix. Suitable for surfacing worn parts exposed to abrasion and wear by coal, ore or other minerals. Typical applications include earth-moving machines, mixers, feeder screws, dust exhausters and crushers. It can also be used on components operating in corrosive environments and/or at elevated temperatures.

Welding current

AC, DC+ OCV 50 V



Classifications

DIN 8555 E10-UM-60-CZ

Typical all weld metal composition, %

C	Si	Mn	Cr
4.5	0.8	<1.6	33

Typical mech. properties all weld metal

Weld metal hardness, a w	59-63 HRC
No preheat and interpass temperature 100°C:	
3rd layer:	59-63 HRC
Preheat and interpass temperature 500°C:	
3rd layer:	55-61 HRC
Machinability	Grinding only
Abrasion resistance	Excellent
High temp. wear resistance	Good
Corrosion resistance	Excellent

Tempering resistance

Temp°C/1h	HRC
100	58
300	59
400	57
490	59
600	57
700	58

Deposition data at max current

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, s/ electrode
2.5	350	90-120	24	0.62	48.0	1.2	60
3.2	350	115-170	24	0.62	26.0	1.6	85
4.0	450	130-210	26	0.64	13.5	2.0	135
5.0	450	150-300	26	0.64	9.0	2.9	140

OK 92.18

SMAW

Type Basic special, high graphite

ENi-CI

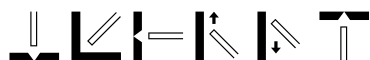
Description

A nickel-cored electrode for welding normal grades of cast iron. The weld metal is soft and easily machinable. Deposition is performed on cold or slightly preheated material.

The electrode is suitable for joining cast iron for the rectification of casting and the repair of broken parts.

Welding current

AC, DC+ OCV 50 V



Classifications

SFA/AWS A5.15 ENi-CI
EN ISO 1071 E C Ni-CI 3

Typical all weld metal composition, %

C	Si	Mn	Ni	Fe
0.9	0.7	0.6	>92.0	3.5

Typical mech. properties all weld metal

Tensile strength, MPa 300
Hardness: 150 HB

Approvals

Sepros UNA 409820

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, s/ electrode
2.5	300	55-110	20	0.71	83.3	0.9	46
3.2	350	80-140	20	0.68	44.8	1.2	66
4.0	350	100-190	20	0.70	29.4	1.7	71

OK 92.26

Type Basic

SMAW

ENiCrFe-3

Description

A nickel-based electrode for welding nickel alloys such as Inconel 600 and similar Inconel alloys, cryogenic steels, martensitic to austenitic steels, dissimilar steels, heat-resistant steels and castings with limited weldability.

Welding current

DC+



Classifications

SFA/AWS A5.11	ENiCrFe-3
EN ISO 14172	E Ni 6182 (NiCr15Fe6Mn)

Typical all weld metal composition, %

C	Si	Mn	Cr	Ni	Nb	Cu	Ti	Ta	Fe
0.03	0.5	6.6	15.8	67	1.7	<0.5	<0.5	<0.3	8.8

Typical mech. properties all weld metal

Yield stress, MPa	410
Tensile strength, MPa	640
Elongation A4, %	40

Charpy V

Test temps, °C	Impact values, J
+20	100
-196	80

Approvals

ABS	ENiCrFe-3
Sepros	UNA 409820
UDT	DIN 1736

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, s/ electrode
2.5	300	45-70	22	0.63	88	0.9	50
3.2	350	70-105	23	0.62	57	1.2	60
4.0	350	90-130	24	0.64	31	2.0	60
5.0	350	120-170	25	0.64	20	2.7	68

OK 92.58

SMAW

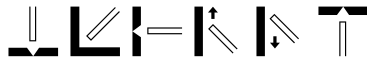
Type Basic Special high graphite ENiFe-CI-A

Description

A nickel-iron-cored electrode for joining normal grades of cast iron, such as grey, ductile and malleable irons. It is also suitable for the rectification and repair of these grades and for joining them to steel. Deposition is performed on cold or slightly preheated cast iron. The weld metal is stronger and more resistant to impurities than the nickel-cored type.

Welding current

AC, DC+ - OCV 50 V



Classifications

SFA/AWS A5.15 ENiFe-CI-A
EN ISO 1071 E C NiFe-CI-A 1

Typical all weld metal composition, %

C	Si	Mn	Ni	Al	Fe
1.5	0.7	0.8	51	1.4	46

Typical mech. properties all weld metal

Tensile strength, MPa 375
Hardness (HB): 180

Welding parameters

24

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, s/ electrode
2.5	300	55-75	21	0.70	90	0.6	70
3.2	350	75-100	23	0.70	45	0.9	90
4.0	350	85-160	24	0.70	30	1.8	70

OK 92.86

Type Basic

SMAW
E NiCu-7

Description

A nickel-copper electrode for welding NiCu alloys to themselves and to steels and for corrosion-resistant surfacing. The weld metal of OK 92.86 is crack resistant and ductile and meets rigorous requirements relating to corrosion resistance in sea water and in reducing and oxidising acids. OK 92.86 is used for welding corrosion-resistant monel alloys within the petroleum and ammonium sulphate industry and in power plants.

Welding current

DC+



Classifications

SFA/AWS A5.11	E NiCu-7
EN ISO 14172	E Ni 4060 (NiCu30Mn3Ti)

Typical all weld metal composition, %

C	Si	Mn	Ni	Nb	Cu	Al	Ti	Fe
0.01	0.3	2.1	66	<0.3	29	<0.5	0.2	1.6

Typical mech. properties all weld metal

Yield stress, MPa	410
Tensile strength, MPa	640
Elongation A4, %	40

Charpy V

Test temps, °C	Impact values, J
+20	100
-196	80

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, s/ electrode
2.5	300	50-70	22	0.63	83	1.0	45
3.2	350	70-120	26	0.63	42	1.6	52
4.0	350	120-140	28	0.63	28	2.4	54



Product Data Sheet

S 'Submerged arc welding'

OK Autrod 12.22

Prepared by M Gustafsson	Approved by Martin Gehring/Christos Skodras	Reg no EN005440	Cancelling EN003642	Reg date 2011-06-17	Page 1 (1)
-----------------------------	--	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

EN 756 replaced by EN ISO 14171-A. TÜV approval for wire added. NAKS updated, Sepros taken out.

GENERAL

Copper-coated, unalloyed wire for Submerged Arc Welding. Suitable in combination with most fluxes. Increased Si content and thus especially suitable for neutral fluxes (e.g.: OK Flux 10.62) or in order to increase the fluidity of the molten pool. For structural steels, ship building steels, pressure vessel steels, fine grained steels, etc.

CLASSIFICATIONS Wire Electrode

SFA/AWS A5.17 EM12K
EN ISO 14171-A S2Si

APPROVALS

CE EN 13479
DB 52.039.05
VdTÜV 12103

APPROVALS (SPECIFIC)

NAKS/HAKC 2.0, 2.5, 3.0, 4.0, CZ
5,0mm

APPROVAL COMMENT

All others: See Flux-Wire combinations

CHEMICAL COMPOSITION

	Wire/Strip (%)	
	Min	Max
C	0.08	0.12
Si	0.15	0.30
Mn	0.90	1.15
P		0.015
S		0.020



Product Data Sheet

S 'Submerged arc welding'

OK Flux 10.71

Signed by M Gustafsson	Approved by Martin Gehring/Christos Skodras	Reg no EN004834	Cancelling EN004249	Reg date 2009-05-19	Page 1 (2)
---------------------------	--	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Grain Size distribution modified.

GENERAL

Agglomerated aluminate-basic flux for Submerged Arc Welding. General purpose flux with excellent welding performance, suitable for all kinds of steels. High impact toughness values. Fits to a large range of SAW wires. For general constructions, pressure vessels, shipbuilding, pipe mills, wind tower productions, transport industries, etc. Designed for single and multi wire procedures, for butt and fillet welds. Suitable for DC and AC welding. Single layer and multi layer welding of unlimited plate thickness.

CLASSIFICATIONS Flux

EN 760 SA AB 1 67 AC H5

APPROVALS

CE EN 13479
DB 51.039.05

APPROVALS (SPECIFIC)

NAKS/HAKC RD 03-613-03 PL, RU

APPROVAL COMMENT

All others: See Flux-Wire combinations

SLAG TYPE

Aluminate-basic

CHEMICAL COMPOSITION

	Flux (%)	
	Nom	
Al ₂ O ₃ +MnO	35	
CaF ₂	15	
CaO+MgO	25	
SiO ₂ +TiO ₂	20	

Other properties:

Alloy Transfer	Slightly Silicon and moderately Manganese alloying
Basicity (Boniszewski)	nom: 1.5
Bulk Density	nom: 1.2 kg/dm ³
Grain Size	0.2-1.6 mm (10x65 mesh) or 0.315 -2.0 mm (9x48 mesh)
Hydrogen	max 5 ml H/100g weld metal (Redried flux)

WELDING POLARITY

DC+, AC



Product Data Sheet

S 'Submerged arc welding'

OK Flux 10.71

Signed by M Gustafsson	Approved by Martin Gehring/Christos Skodras	Reg no EN004834	Cancelling EN004249	Reg date 2009-05-19	Page 2 (2)
---------------------------	--	--------------------	------------------------	------------------------	---------------

FLUX CONSUMPTION

Arc Voltage	(kg Flux / kg Wire/Strip)	
	DC+	AC
26	0.7	0.6
30	1.0	0.9
34	1.3	1.2
38	1.6	1.4

Current (A): 580
Travel Speed (cm/min): 55
Dimension (mm): Ø 4.0

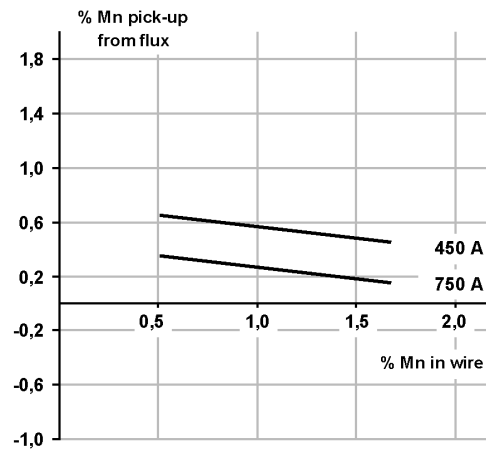
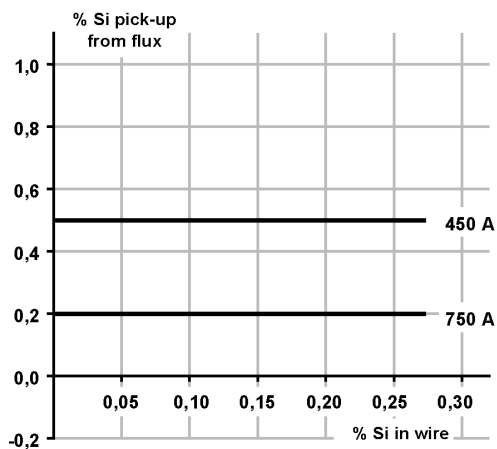
REDRYING

When handled and stored in suitable ways: Usually not necessary.

For hydrogen sensitive applications or when flux has picked up moisture: 300 +/- 25°C (570 +/- 45°F), 2 - 4 h

METALLURGICAL BEHAVIOR

Single Wire, Ø 4.0 mm, DC+, 30 V, 60 cm/min





Product Data Sheet

OK 76.18

ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004175	Cancelling EN004145	Reg date 2007-10-03	Page 1 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Amendment to dimension range.

GENERAL

Basic DC electrode for welding creep resisting steels of the type 1% Cr 0.5% Mo. Also suitable for root runs in joints welded with a filler material of the higher alloyed type 2.25% Cr 1% Mo.

Polarity: DC(+)

Alloy Type: Creep resisting

Coating Type: Lime Basic

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 1599 ECrMo1 B 42 H5
SFA/AWS A5.5 E8018-B2

APPROVALS

ABS For high temperature applications
BV C1M
DNV -H10 For NV 1Cr0.5Mo
Seproz
VdTUV 01387

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.05	0.10
Si	0.20	0.50
Mn	0.40	0.80
P		0.015
S		0.020
Cr	1.25	1.40
Ni		0.1
Mo	0.50	0.65
V		0.03
Nb		0.01
Cu		0.1
Al		0.03
Sn		0.01
Ti		0.03
Pb		0.02
As		0.01
Sb		0.01



Product Data Sheet

OK 76.18

ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004175	Cancelling EN004145	Reg date 2007-10-03	Page 2 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal			
	ISO		ISO	
	As welded		Stress relieved	
	Min	Typ	Min	Typ
Rp0.2 (MPa)	460		460	520
ReL (MPa)		530		
Rm (MPa)	550	620	550	610
A4-A5 (%)		20	20	24
Charpy V at 20°C (J)		55	47	120
Charpy V at -20°C (J)		38		80
Charpy V at -40°C (J)		19		50
	Comments:		Comments: S R 700 °C, 1h	

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
\emptyset x Length									
2.0 x 300	55	80	1.3	115	0.58	136.0	0.70	40	22
2.5 x 300	70	110	2.0	115	0.58	88.0	0.80	52	24
3.2 x 350	95	150	3.5	105	0.59	49.0	1.10	65	25
4.0 x 450	130	190	6.9	110	0.64	23.0	1.70	90	27
5.0 x 450	150	260	10.7	110	0.64	14.5	2.70	95	28
6.0 x 450	200	350	14.9	110	0.64	10.5	3.70	93	30

- W** = Weight (kg / 100 electrodes)
- η = Efficiency (g weld metal x 100 / g core wire)
- N** = Effective value (kg weld metal / kg electrodes)
- B** = Changes (number of electrodes / kg weld metal)
- H** = Deposit rate at 90% of max current (kg weld metal / hour arc time)
- T** = Fusion time at 90% of max current (s / electrode)
- U** = Arc voltage (V)



Product Data Sheet

OK 76.18

ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004175	Cancelling EN004145	Reg date 2007-10-03	Page 3 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

OTHER DATA

Welding and heat treatment conditions:

All weld specimens, welded at 250 °C interpass temperature.

Annealed 2 h at 700 °C, furnace cooled.

(+100 °C):.....Rp 0.2= 480 N/mm², Rm= 565 N/mm², A5= 23%, Z= 73%

(+200 °C):.....Rp 0.2= 465 N/mm², Rm= 550 N/mm², A5= 21%, Z= 71%

(+300 °C):.....Rp 0.2= 450 N/mm², Rm= 540 N/mm², A5= 21%, Z= 70%

(+400 °C):.....Rp 0.2= 420 N/mm², Rm= 520 N/mm², A5= 22%, Z= 70%

Creep rupture properties (values within brackets are extra-polated)

All weld specimens, welded at 250 °C interpass temperature.

Annealed 0.5 h at 700 °C, furnace cooled.

Stress N/mm², at a rupture time of:

500 h:.....(335) (at 500 °C), 183 (at 550 °C)

1000 h:.....295 (at 500 °C), 227 (at 525 °C), 154 (at 550 °C)

5000 h:.....210 (at 500 °C), 147 (at 525 °C), 105 (at 550 °C)

10000 h:.....183 (at 500 °C), (122) (at 525 °C), 88 (at 550 °C)

20000 h:.....75 (at 550 °C)



Product Data Sheet

OK 76.28

E 'Manual metal-arc welding'
ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004147	Cancelling EN002438	Reg date 2007-09-20	Page 1 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

REASON FOR ISSUE

Approvals up dated

GENERAL

Basic DC electrode for welding creep-resisting steels of the type 2 1/4% Cr 1% Mo.

Polarity: DC (+-)

Alloy Type: Creep-resisting

Coating Type: Lime Basic

WELDING POSITIONS



CLASSIFICATIONS Electrode

EN 1599 ECrMo2 B 42 H5
SFA/AWS A5.5 E9018-B3

APPROVALS

ABS SR
BV C2M1
Seproz
VdTÜV 00971

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C	0.05	0.10
Si	0.10	0.50
Mn	0.40	0.90
P		0.020
S		0.020
Cr	2.05	2.45
Ni		0.1
Mo	0.90	1.20
V		0.03
Nb		0.01
Cu		0.1
Sn		0.01
Pb		0.02
As		0.01
Sb		0.01

Comments:

*



Product Data Sheet

OK 76.28

E 'Manual metal-arc welding'
ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004147	Cancelling EN002438	Reg date 2007-09-20	Page 2 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

MECHANICAL PROPERTIES OF WELD METAL

Properties	All Weld Metal		
	ISO		ISO
	Min	Typ	Min
As welded			PWHT 750°C 1h
Rp0.2 (MPa)	530	550	530
Rm (MPa)	620	650	620
A4-A5 (%)	18		18
Charpy V at 20°C (J)	47	50	47
Charpy V at -20°C (J)		25	

ECONOMICS & CURRENT DATA

Dimension (mm)	Current (A)		W	η	N	B	H	T	U
	Min	Max							
\varnothing x Length									
2.0 x 300	55	80	1.3	115	0.58	136.0	0.7	40	23
2.5 x 300	70	110	2.0	115	0.58	88.0	0.8	52	25
3.2 x 350	95	150	3.5	105	0.59	49.0	1.2	62	26
4.0 x 450	130	190	6.9	110	0.64	23.0	1.8	88	28
5.0 x 450	150	260	10.7	110	0.64	14.5	2.7	92	29
6.0 x 450	200	350	15.1	110	0.64	10.5	3.9	90	30

- W** = Weight (kg / 100 electrodes)
 η = Efficiency (g weld metal x 100 / g core wire)
N = Effective value (kg weld metal / kg electrodes)
B = Changes (number of electrodes / kg weld metal)
H = Deposit rate at 90% of max current (kg weld metal / hour arc time)
T = Fusion time at 90% of max current (s / electrode)
U = Arc voltage (V)



Product Data Sheet

OK 76.28

E 'Manual metal-arc welding'
ESAB AB Sweden

Signed by P-O Oskarsson	Approved by Tony Dray/Christos Skodras	Reg no EN004147	Cancelling EN002438	Reg date 2007-09-20	Page 3 (3)
----------------------------	---	--------------------	------------------------	------------------------	---------------

OTHER DATA

Welding and heat treatment conditions:

All weld specimens, welded at 250 °C interpass temp:

As-welded:....Rp0.2 = >550 N/mm2, Rm = >650 N/mm2, A5 = >18 %, Z = >60 %

Annealed 2h at 750 °C, furnace-cooled:

Minimum:.....Rp0.2 = 440 N/mm2, Rm = 560 N/mm2, A5 = 20 %, Z = 65 %

Typical:.....Rp0.2 = 510 N/mm2, Rm = 620 N/mm2, A5 = 22 %, Z = 72 %

Annealed 1h at 700 °C, furnace-cooled:

(+20 °C):.....Rp0.2 = 545 N/mm2, Rm = 650 N/mm2, A5 = 22 %, Z = 70 %

(+100 °C):...Rp0.2 = 520 N/mm2, Rm = 610 N/mm2, A5 = 20 %, Z = 72 %

(+200 °C):...Rp0.2 = 490 N/mm2, Rm = 570 N/mm2, A5 = 18 %, Z = 72 %

(+300 °C):...Rp0.2 = 480 N/mm2, Rm = 550 N/mm2, A5 = 17 %, Z = 70 %

(+400 °C):...Rp0.2 = 480 N/mm2, Rm = 570 N/mm2, A5 = 15 %, Z = 66 %

(+450 °C):...Rp0.2 = 460 N/mm2, Rm = 535 N/mm2, A5 = 15 %, Z = 66 %

(+500 °C):...Rp0.2 = 445 N/mm2, Rm = 500 N/mm2, A5 = 17 %, Z = 70 %

(+550 °C):...Rp0.2 = 410 N/mm2, Rm = 445 N/mm2, A5 = 18 %, Z = 74 %

(+600 °C):...Rp0.2 = 360 N/mm2, Rm = 385 N/mm2, A5 = 24 %, Z = 80 %

Creep-rupture properties (values within brackets are extra-polated):

All-weld specimens, welded at 250 °C interpass temp. 0.5h at 700 °C, Furnace-cooled.

Stress, at a rupture time of:

Temp (°C) 1.....100 (h).....500 (h).....1000 (h).....5000 (h).....10000 (h).....20000 (h)

500.....307 (N/mm2).....272 (N/mm2)....220 (N/mm2).....198 (N/mm2).....180 (N/mm2)

550.....200 (N/mm2)...174 (N/mm2).....157 (N/mm2)....125 (N/mm2).....113 (N/mm2).....102 (N/mm2)

575.....>108 (N/mm2).....>96 (N/mm2).....>73 (N/mm2)....>65 (N/mm2).....>59 (N/mm2)



Product Data Sheet

Weld 71T

T 'Tubular cored electrode arc welding'

Prepared by Neil Farrow	Qualified by Tero Tolonen	Approved by Neil Farrow	Reg no EN006015	Cancelling None	Reg date 2013-03-21	Page 1 (1)
----------------------------	------------------------------	----------------------------	--------------------	--------------------	------------------------	---------------

GENERAL

A multi-purpose all positional rutile cored wire for use with CO2 shielding gas.

Shielding Gas: C1 (EN ISO 14175)

Alloy Type: C Mn

Polarity: DC+

Fill Type: Rutile

CLASSIFICATIONS Weld Metal

SFA/AWS A5.20 E71T-1C H8

CHEMICAL COMPOSITION

All Weld Metal (%)

	Min	Max
C		0.09
Si	0.3	0.6
Mn	1.00	1.50
P		0.03
S		0.03
Cr		0.2
Ni		0.5
Mo		0.2
V		0.08
Cu		0.3

MECHANICAL PROPERTIES OF WELD METAL

All Weld Metal

Properties	As welded	
	Min	Max
Rp0.2 (MPa)	400	
Rm (MPa)	490	660
A4 (%)	22	
Charpy V at -20°C (J)	47	