P 31

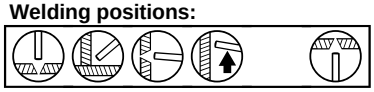
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 23

Description:
P 31 is a medium-coated rutile electrode suitable for shipbuilding and structural steels as well as general purpose fabrication in mild and medium carbon steels. It has particularly good operability in both downhand and positional welding. The coating of the electrode is of higher basicity than most other rutile types and provides weld deposits of high metallurgical, Grade 3, quality.

Welding positions:



Coating type:
Rutile

Welding current:
DC +/-, AC OCV≥ 50 V
For root passes: DC -

Metal recovery:
95%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,10	0,5				
Typical	0,05	0,2	0,8	0,015	0,015		
Max	0,10	0,40	1,0	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 380 MPa	450 MPa
Tensile Strength, Rm:	470-550 MPa	530 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	-20 °C • ≥47 J	-20 °C • 50 J

Classification:

EN 499	E 38 2 R 12
EN ISO 2560-A	E 38 2 R 12
AWS A5.1	E 6013

Approvals:

CE	
BV	3
DNV	3
MOD (Navy)	MS < 25 mm, B & BX< 12 mm
LR	3m, 3Ym
ABS	3

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71312500	70-100	18	0,62	88	0,9	45
3,2	450	71313200	90-120	19	0,69	36	1,3	53
4,0	450	71314000	130-180	20	0,71	25	1,7	61

P 39

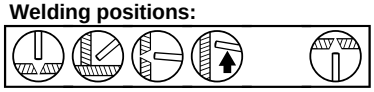
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 18

Description:
P 39 is a rutile-acid coated electrode specially designed for welding the root and first pass in mild steel pipe with wall thickness 4-10 mm. It has a forceful, penetrating arc and mixed-mode droplet transfer. It is an AC/DC electrode, with (-) polarity preferred and is suitable for all positions except vertical down. For both root and first pass the electrode should be weaved, with a slight dwell at the joint edges.

Welding positions:



Coating type:
Rutile

Welding current:
DC -, AC OCV> 65 V

Metal recovery:
95%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,10	0,6				
Typical	0,10	0,20	0,8	0,020	0,020		
Max	0,12	0,50	1,1	0,030	0,020	0,2	0,3

	Mo	Cu	V
Min			
Typical			
Max	0,2	0,3	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 380 MPa	390 MPa
Tensile Strength, Rm:	470-550 MPa	520 MPa
Elongation, A5	≥24%	25%
Impact energy, CV:	-20 °C • 47 J	0 °C • 65 J

Classification:

EN 499	E 38 2 RB 12
EN ISO 2560-A	E 38 2 RB 12
AWS A5.1	E 6013

Approvals:

CE	
DB	Kennblatt Nr. 10.042.02
TÜV	
GL	3Y

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71392500	90-110	25	0,60	87	0,8	46
3,2	350	71393200	130-155	24	0,6	49	1,1	59
4,0	350	71394000	160-200	24	65	30	1,5	71

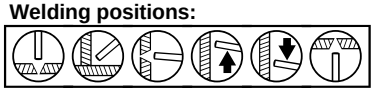
P 40

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 22

Description:
P 40 is a thicker-coated, all positional rutile-cellulosic electrode suitable for general purpose applications in mild steel. It is particularly recommended for vertical up and overhead applications, but can also be used in the vertical down position. The electrode welds with a smooth, low spatter arc to produce a finely rippled bead surface and good slag detachability. Combined with good striking/restriking and tolerance to large gaps, the electrode is very easy to use and recommended for all-round fabrication work.

Welding positions:



Coating type:
Rutile-cellulosic

Welding current:
DC +/-, AC OCV ≥ 50 V
For root passes: DC -

Metal recovery:
95%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,3	0,5				
Typical	0,09	0,6	0,7	0,015	0,015		
Max	0,10	0,8	1,0	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥420 MPa	510 MPa
Tensile Strength, Rm:	510-640 MPa	580 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥47 J	0 °C • 50J

Classification:

EN 499	E 42 0 RC 11
EN ISO 2560-A	E 42 0 RC 11
AWS A5.1	E 6013

Approvals:

CE	
DNV	2
LR	2m, 2Ym
GL	2Y

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71402500	60-90	22	0,57	90	0,7	61
3,2	350	71403200	90-150	23	0,58	55	1,3	54
4,0	350	71404000	130-190	24	0,57	36	1,6	62

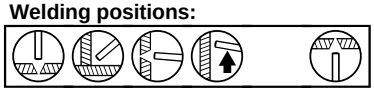
P 43

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 18

Description:
P 43 is a medium-coated rutile electrode intended for welding light to medium sections in mild steel. The electrode operates with a very smooth arc and is suitable for all positions except vertical down. It is easy to strike and re-strike and produces a self-detaching slag leaving a finely rippled bead appearance. With its excellent bead surface and smooth transition with the base material P 43 is ideal for butt and fillet welding of sheet metal work.

Welding positions:



Coating type:
Rutile
Welding current:
DC +/-, AC OCV ≥ 50 V
For root passes: DC -

Metal recovery:
95%
Redrying temperature:
90 °C, 2h
Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,30				
Typical	0,07	0,4	0,5	0,015	0,015		
Max	0,11	0,60	0,75	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	480 MPa
Tensile Strength, Rm:	510-560 MPa	550 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥ 47 J	0 °C • 50 J

Classification:

EN 499	E 42 0 R 12
EN ISO 2560-A	E 42 0 R 12
AWS A5.1	E 6013

Approvals:

LR	2m
CE	
DNV	2

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71432500	55-100	23	0,62	81	0,8	50
3,2	450	71433200	75-140	23	0,67	36	1,2	72
3,2	350	71433235	75-140	23	0,67	48	1,2	54
4,0	450	71434000	110-190	25	0,64	26	1,7	81
5,0	450	71435000	140-265	29	0,65	16	2,7	77

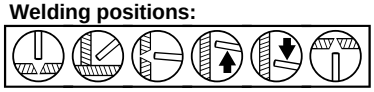
P 44

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 24

Description:
P 44 is a thinner-coated, all positional, rutile-cellulosic electrode for general purpose fabrication in mild steel, but with exceptionally good vertical down operability. It can be welded in all positions without the need to alter the current setting and is particularly suitable for working conditions with restricted space or difficult access. The electrode is easy to use where joint fit-up is poor or outside corner joints are to be welded. Excellent strike and restriking characteristics make it ideal for tack-welding. P 44 is highly tolerant to plate contaminated by rust, mill scale, paint, dirt etc., making it suitable for repair and maintenance work as well as shipyard applications.

Welding positions:



Coating type:
Rutile-cellulosic

Welding current:
DC +/-, AC OCV ≥ 50 V
For root passes: DC -

Metal recovery:
95%

Redrying temperature:
90°C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,20	0,35				
Typical	0,07	0,4	0,6	0,015	0,015		
Max	0,10	0,60	0,85	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥380 MPa	460 MPa
Tensile Strength, Rm:	470-560 MPa	530 MPa
Elongation, A5	≥22%	24%
Impact energy, CV:	0 °C • ≥47 J	0 °C • 60 J

Classification:

EN 499	E 38 0 RC 11
EN ISO 2560-A	E 38 0 RC 11
AWS A5.1	E 6013

Approvals:

DNV	2
DB	Kennblatt Nr. 10.042.04
CE	
LR	2m, 2Ym
TÜV	

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71442500	70-100	22	0,69	80	0,8	46
3,2	350	71443200	90-150	23	0,69	49	1,3	51
4,0	350	71444000	120-190	23	0,7	34	1,6	61

P 45S

SMAW - (Stick) - MMA

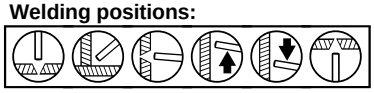
Un-alloyed

Date: 2007-10-19
Revision: 20

Description:
P 45S is a multi-purpose rutile-cellulosic coated electrode suitable for a wide application range in mild steel. The electrode is fully positional, including vertical down and welds with a crisp, steady arc to produce a smooth bead surface with good slag detachability. It is relatively insensitive to rust, dirt and surface coatings. Together with its ability to bridge gaps, the general versatility of P 45S makes it ideal for both shop and site fabrication.

Applications:

Welding positions:



Coating type:
Rutile-cellulosic

Welding current:
DC +/-, AC OCV ≥ 50 V
For root passes: DC -

Metal recovery:
90%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,30				
Typical	0,07	0,4	0,5	0,015	0,015		
Max	0,10	0,70	0,75	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥420 MPa	470 MPa
Tensile Strength, Rm:	510-560 MPa	550 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥ 47 J	0 °C • 50 J

Classification:

EN 499	E 42 0 RC 11
EN ISO 2560-A	E 42 0 RC 11
AWS A5.1	E 6013

Approvals:

CE	
BV	2Y
LR	2m, 2Ym
MRS	2
ABS	2
DNV	2
GL	2Y
MOD (Navy)	MS 25 mm

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,0	300	71452000	40-80	24	0,7	139	0,4	40
2,5	350	71452500	70-100	25	0,7	78	0,8	48
3,2	350	71453200	90-145	25	0,7	48	1,2	49
4,0	350	71454000	120-195	25	0,7	33	1,7	58
5,0	450	71455000	180-270	26	0,75	21	2,3	64

Maxeta 5

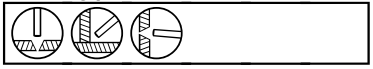
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 22

Description:
Maxeta 5 is an acid-rutile iron powder electrode with 160% recovery, intended for the welding of general construction steels in the horizontal and horizontal-vertical positions. The electrode is designed to give a fast burn-off rate enabling the user to make extended run lengths and thereby produce small fillet welds at high deposition rates.
It is particularly recommended for plate where the surface has been treated with primer or contaminated by rust, mill scale, paint etc. Both the weld appearance and transition with the base material are exceptionally smooth and consistent, making Maxeta 5 a suitable choice when demands on fatigue resistance of the joint are high.

Welding positions:



Coating type:
Acid-rutile

Welding current:
DC +/-, AC OCV> 65 V

Metal recovery:
160%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,10	0,70				
Typical	0,07	0,2	0,9	0,02	0,01		
Max	0,12	0,40	1,10	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	480 MPa
Tensile Strength, Rm:	510-560 MPa	540 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	-20 °C • ≥ 47 J	-20 °C • 70 J

Classification:

EN 499	E 42 2 RA 73
EN ISO 2560-A	E 42 2 RA 73
AWS A5.1	E 7027

Approvals:

GL	3Y
CE	
DNV	3
LR	3m, 3Ym
TÜV	
BV	3, 3Y
DB	Kennblatt Nr. 10.042.06
ABS	3

Note

72016000, TÜV only

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	72013200	110-170	32	0,73	22	1,9	77
4,0	450	72014000	150-240	35	0,71	15	2,9	78
5,0	450	72015000	200-360	37	0,71	9	4,8	75
5,0	700	72015070	200-330	37	0,73	6	5,0	118
6,0	450	72016000	280-440	37	0,71	7	5,5	90

Maxeta 10

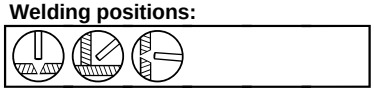
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 21

Description:
Maxeta 10 is rutile-coated iron powder electrode with 135% recovery intended for welding medium thick sections in general construction steels. The electrode design has been optimised to produce
fillet welds with a good mitre profile and throat thickness in the 3.5-4.0 mm range. Maxeta 10 produces a finely rippled bead surface, minimum spatter and a self-detaching slag.

Welding positions:



Coating type:
Rutile
Welding current:
DC +/-, AC OCV ≥ 65 V

Metal recovery:
135%
Redrying temperature:
90 °C, 2h
Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,40	0,40				
Typical	0,07	0,7	0,6	0,02	0,01		
Max	0,10	0,80	0,80	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥420 MPa	470 MPa
Tensile Strength, Rm:	510-610 MPa	570 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥47 J	0 °C • 50 J

Classification:

EN 499	E 42 0 RR 53
EN ISO 2560-A	E 42 0 RR 53
AWS A5.1	E 7024

Approvals:

GL	2Y
CE	
ABS	2
BV	2, 2Y
DNV	2
LR	2m, 2Ym

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	72022500	90-125	28	0,7	45	1,6	46
3,2	450	72023200	130-160	39	0,73	23	2,2	61
4,0	450	72024000	140-220	30	0,65	17	2,6	73
4,5	600	72024560						
5,0	450	72025000	190-310	31	0,66	11	3,7	78

Maxeta 11

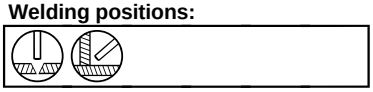
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 18

Description:
Maxeta 11 is a rutile-coated iron powder electrode with 190% recovery designed for high productivity welding in heavier section mild steel. The electrode is particularly suitable for high speed fillet welding in the downhand and horizontal-vertical positions as well as downhand butt welds. Excellent mitre profile fillets are produced having a smooth transition with the base material. The electrode runs with a smooth stable arc leaving a finely rippled bead surface with self-detaching slag and minimum spatter. It operates equally well on primer-treated material. Maxeta 11 is specially designed to give very low fume emission.

Welding positions:



Coating type:
Rutile

Welding current:
AC OCV> 50V, DC +/-

Metal recovery:
190%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,40	0,70				
Typical	0,08	0,6	0,9	0,015	0,01		
Max	0,10	0,80	1,15	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	500 MPa
Tensile Strength, Rm:	510-610 MPa	580 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥47 J	0 °C • 50 J

Classification:

EN 499	E 42 0 RR 73
EN ISO 2560-A	E 42 0 RR 73
AWS A5.1	E 7024

Approvals:

CE	
MOD (Navy)	MS<25 mm
DNV	2
GL	2Y
LR	2m, 2Ym
MRS	2
RINA	E 51 2
BV	2
ABS	2

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	72043200	130-170	28	0,72	20	2,5	67
4,0	450	72044000	150-260	31	0,73	13	3,3	76
4,5	450	72044500	170-335	34	0,73	11	5,3	60
4,5	600	72044560	170-250	30	0,73	8	4,2	101
5,0	450	72045000	200-390	35	0,72	8	6,7	61
5,0	600	72045060	200-300	34	0,72	7	5,3	104
5,0	700	72045070	200-290	33	0,72	5	5,4	119
6,0	450	72046000	300-450	35	0,72	6	7,7	71
6,0	600	72046060	300-390	35	0,73	4	7,2	109
6,0	700	72046070	300-380	35	0,73	4	7,2	121

Maxeta 11DC

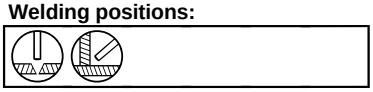
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 6

Description:
Maxeta 11DC is a high recovery rutile coated electrode optimized for DC+/DCEP welding. The electrode produces a very nice bead surface and profile with smooth transition to the base material. Slag detachability is good.

Welding positions:



Coating type:
Rutile

Welding current:
DC+

Metal recovery:
190%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,40	0,80				
Typical	0,08	0,60	1,00	0,015	0,010		
Max	0,10	0,80	1,20	0,030	0,020	0,10	0,20

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,10	0,20	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	510 MPa
Tensile Strength, Rm:	510-610 MPa	580 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥47 J	0 °C • 55 J

Classification:

EN 499	E 42 0 RR 83
EN ISO 2560-A	E 42 0 RR 83
AWS A5.1	E 7024

Approvals:

LR	2, 2Y
CE	

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	72103200	130-170	26	0,72	19,7	2,1	80
4,0	450	72104000	180-230	30	0,72	13,0	2,9	89
5,0	450	72105000	270-340	32	0,72	8,3	4,8	81

Maxeta 16

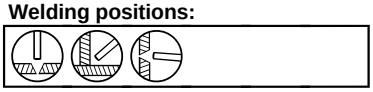
SMAW - (Stick) - MMA

Un-alloyed

Date:	2007-10-19
Revision:	17

Description:
Maxeta 16 is a rutile-coated iron powder electrode with 160% recovery intended for horizontal and fillet welding of heavier section construction steels. The electrode has been specially designed to achieve the highest possible productivity when depositing fillet welds with a throat thickness in the 3.0-4.0 mm range. Fillet welds can be made in primer-treated material without porosity or fusion problems along the top edge. As with the other high recovery electrodes in Elga's programme, Maxeta 16 has excellent slag detachability and very low fume emission.

Welding positions:



Coating type:
Rutile

Welding current:
DC +/-, AC OCV>50 V

Metal recovery:
160%

Redrying temperature:
90 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,60				
Typical	0,07	0,5	0,7	0,02	0,01		
Max	0,10	0,70	0,95	0,030	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	470 MPa
Tensile Strength, Rm:	510-610 MPa	560 MPa
Elongation, A5	≥ 22%	24%
Impact energy, CV:	0 °C • ≥ 47 J	0 °C • 50 J

Classification:

EN 499	E 42 0 RR 73
EN ISO 2560-A	E 42 0 RR 73
AWS A5.1	E 7024

Approvals:

DNV	2
ABS	2
GL	2Y
CE	
LR	2m, 2Ym
BV	2Y
TÜV	

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	72053200	130-160	28	0,72	21	2,2	72
4,0	450	72054000	150-235	31	0,71	14	3	78
5,0	450	72055000	200-320	31	0,71	9	4,1	86

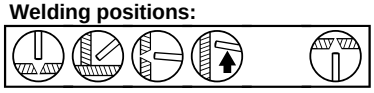
P 47D

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 20

Description:
P 47D is a basic double coated low hydrogen AC/DC electrode for welding mild and medium tensile steels in all positions except vertical down. It has an exceptionally stable arc making it particularly suitable for root passes. The electrode can be used on small welding transformers with a low OCV and operates with minimal spatter to deposit smooth weld beads featuring easy slag detachability and excellent mitre fillet profile. P 47D is very easy to strike and combines good metallurgical quality with extreme ease of use, making it ideal for general repair and maintenance applications.

Welding positions:



Coating type:
Basic

Welding current:
DC +, AC OCV ≥ 55 V

Hydrogen content / 100 g weld metal
≤10 ml

Metal recovery:
98%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,25	0,60				
Typical	0,07	0,7	0,9	0,015	0,015		
Max	0,10	0,75	1,60	0,030	0,020	0,30	0,30

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,30	0,20	0,08	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥420 MPa	465 MPa	400 MPa
Tensile Strength, Rm:	510-610 MPa	550 MPa	510 MPa
Elongation, A5	≥ 22%	26%	31%
Impact energy, CV:	-20 °C • ≥47 J	-20 °C · 60 J	-20 °C · 100 J

Classification:

EN 499	E 42 2 B 12 H10
EN ISO 2560-A	E 42 2 B 12 H10
AWS A5.1	E 7016

Approvals:

DB	Kennblatt Nr. 10.042.05
TÜV	
CE	

Note

PWHT 600 C, 1 h

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71492500	60-90	25	0,65	77	0,8	53
3,2	450	71493200	80-140	25	0,67	36	1,3	66
3,2	350	71493235	80-140	25	0,67	45	1,3	52
4,0	450	71494000	130-200	25	0,69	22	1,7	76

P 47

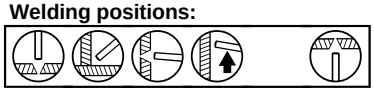
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 23

Description:
P 47 is a basic-coated, 105% recovery electrode intended for general welding applications in those cases where a "7016" type is preferred. P 47 has very good positional operability and excellent resistance to porosity in plate coated with primer or contaminated by mill scale and rust. Suitable for shipbuilding, storage tanks and general construction purposes.

Welding positions:



Coating type:
Basic;

Welding current:
DC +/-, AC OCV ≥ 60 V
For root passes: DC -

Hydrogen content / 100 g weld metal
≤ 5 ml;

Metal recovery:
105%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,85				
Typical	0,06	0,5	1,1	0,015	0,005		
Max	0,09	0,70	1,25	0,030	0,015	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥460 MPa	490 MPa	420 MPa
Tensile Strength, Rm:	530-640 MPa	570 MPa	515 MPa
Elongation, A5	≥ 22%	26%	31%
Impact energy, CV:	-40 °C • ≥47 J -46 °C • ≥27 J	-46 °C • 70 J	-40 °C • 150 J

Classification:

EN 499	E 46 4 B 12 H5
EN ISO 2560-A	E 46 4 B 12 H5
AWS A5.1	E 7016-1

Approvals:

BV	3, 3 Y HH
CE	
DNV	3Y H5
GL	3Y H5
LR	3m, 3Ym H5
ABS	4YQ420

Note

PWHT 620 C, 1 h
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71472533	60-90	24	0,64	80	0,9	50
3,2	350	71473233	80-160	26	0,66	44	1,2	65
4,0	350	71474033	110-210	25	0,66	29	1,7	70
4,0	450	71474045	110-200	24	0,67	22	1,7	86

P 48M

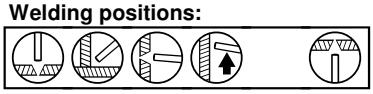
SMAW - (Stick) - MMA
Un-alloyed

Date: 2008-12-19
Revision: 12

Description:

P 48M is a basic coated low hydrogen DC+ electrode designed for welding mild and higher strength steels. It is particularly suitable for heavily restrained sections and also steels with higher impurity levels. The electrode operates with a very smooth and stable arc and shows no tendency to "freeze", even on low current.
Root passes can be welded with DC-.
P 48M has very good fracture toughness at temperatures down to -50 °C.

Welding positions:



Coating type:
Basic
Welding current:
DC + (-)
Hydrogen content / 100 g weld metal
≤ 4 ml
Metal recovery:
120%
Redrying temperature:
350 °C, 2h
Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0 ,40	1,10				
Typical	0,05	0,5	1,4	0,015	0,010		
Max	0,09	0,75	1,60	0,020	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	420-500 MPa	480 MPa
Tensile Strength, Rm:	510-660 MPa	560 MPa
Elongation, A5	≥ 24%	28%
Impact energy, CV:	-40 °C • ≥47 J	-40 °C • 80 J
	-46 °C • ≥27 J	-46 °C • 70 J
		-50 °C • 60 J

Classification:

EN 499	E 42 5 B 42 H5
EN ISO 2560-A	E 42 5 B 42 H5
AWS A5.1	E 7018-1 H4R*

Approvals:

GL	3Y40 H5
DNV	4Y40 H5
LR	4Y40 H5
CE	
RINA	3Y H5
MRS	4Y40 H5

Note

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

* AWS Suffix R only guaranteed for hermetically sealed or newly redried consumables

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,0	300	71552000	40-80	23	0,64	112	0,7	43
2,5	350	71552500	70-110	23	0,69	62	0,9	58
3,2	450	71553200	80-145	24	0,71	30	1,3	85
4,0	450	71554000	120-210	25	0,73	20	1,8	90
5,0	450	71555000	200-285	25	0,75	13	2,7	93

P 48P

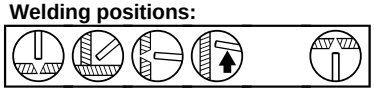
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 13

Description:
P 48P is a basic-coated, low hydrogen, carbon manganese electrode specially designed for pipewelding. The all-positional AC/DC electrode is exceptionally easy to use. P 48P has an extremely stable arc which enables it to be manipulated in the most difficult welding positions without any risk of arc extinction due to freezing. Root beads are even and slightly convex, providing a smooth blend-in with the base material. Operating characteristics are not sensitive to variations in the root gap or edge misalignment. Fill and capping passes fuse flush with the joint edges, minimising the risk of edge defects when using either the stringer bead or weaving technique. The flat-to slightly convex bead profile results in the need for only a bare minimum of grinding and therefore considerable reduction in the associated problems of dust and noise pollution. P 48P combines the special operability needs of the pipe welder with the general requirement for improved productivity.

Welding positions:



Coating type:
Basic

Welding current:
DC +/-, AC OCV> 70 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
105%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,25	0,90				
Typical	0,06	0,60	1,20	0,015	0,010		
Max	0,08	0,75	1,60	0,020	0,015	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥460 MPa	530 MPa
Tensile Strength, Rm:	530-650 MPa	620 MPa
Elongation, A5	≥ 22 %	25 %
Impact energy, CV:	-20 °C • ≥47 J	-20 °C • 80 J
	-30 °C • ≥28 J	-30 °C • 70 J

Classification:

EN 499	E 46 2 B 12 H5
EN ISO 2560-A	E 46 2 B 12 H5
AWS A5.1	E 7018-H8

Approvals:

CE	
ABS	3, 3Y
LR	3m, 3Ym, H5
GL	3Y H5
TÜV	
DNV	3Y H5
BV	3 Y HH

Note

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,0	300	71592000	45-65	20	0,61	155	0,6	52
2,5	350	71592500	60-85	22	0,62	80	0,6	65
3,2	450	71593200	70-130	23	0,75	30	1,1	88
3,2	350	71593235	70-130	23	0,75	42	1	66
4,0	450	71594000	120-190	24	0,73	23	1,7	84

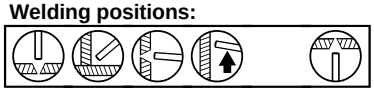
P 48S

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 25

Description:
P 48S is a basic-coated, low hydrogen, general purpose electrode for use on DC+ only, for which the outstanding all-round operability has been optimised. The smooth, soft arc, easy slag control, all-positional welding, low spatter and excellent slag release provide maximum welder-appeal.
P 48S combines the good running characteristics required for general fabrication work with the exacting operability needs for pipe welding, where the fine spray transfer provides precise weld pool control and ensures an exceptionally regular and smooth root bead.

Welding positions:



Coating type:
Basic

Welding current:
DC + (-)

Hydrogen content / 100 g weld metal
≤ 4 ml

Metal recovery:
120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,40	1,10				
Typical	0,05	0,60	1,40	0,015	0,01		
Max	0,09	0,75	1,60	0,020	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥420 MPa	530 MPa	490 MPa
Tensile Strength, Rm:	510-640 MPa	600 MPa	580 MPa
Elongation, A5	≥ 22%	26%	29%
Impact energy, CV:	-40 °C • 47 J	-40 °C • 60 J	-20 °C • 130 J
	-46 °C • ≥27 J	-46 °C • 40 J	

Classification:

EN 499	E 42 4 B 42 H5
EN ISO 2560-A	E 42 4 B 42 H5
AWS A5.1	E 7018-1H4

Approvals:

BV	3 3Y HH
TÜV	
CE	
GL	3Y H5
ABS	3, 3Y
DB	Kennblatt Nr 10.042.01
DNV	3YH5
MRS	3Y 40 HHH
LR	3m, 3Ym, H5

Note

PWHT 600 C, 1 h
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
1,6	300	71481620	30-60	23	0,65	170	0,5	46
2,0	300	71482020	40-80	23	0,64	115	0,7	43
2,5	350	71482520	80-110	23	0,71	60	1,0	54
3,2	450	71483220	110-155	24	0,72	28	1,6	76
3,2	350	71483520	110-165	24	0,72	36	1,6	57
4,0	450	71484020	140-205	25	0,74	19	2,1	82
5,0	450	71485020	200-285	25	0,75	13	2,9	91

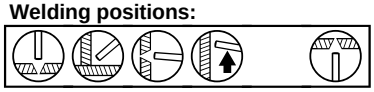
P 51

SMAW - (Stick) - MMA
Un-alloyed

Date: 2007-10-19
Revision: 28

Description:
P 51 is a basic-coated low hydrogen AC/DC electrode designed for welding mild and higher strength steels. It combines strength and toughness and is particularly suitable for heavily restrained sections where there can be risk of cracking due to weld stresses. With its excellent general operability and good positional welding characteristics P 51 is often used for pipe welding. It operates without difficulties on both primer-treated and rusty material. The electrode produces a finely rippled bead surface and smooth transition with the base material. This together with the exceptionally good slag detachability, even in root runs, gives P 51 superior radiographic quality.

Welding positions:



Coating type:
Basic

Welding current:
DC - (+), AC OCV ≥ 70 V
For root passes: DC -

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	1,10				
Typical	0,05	0,5	1,35	0,01	0,01		
Max	0,09	0,75	1,60	0,020	0,015	0,1	0,2

	Mo	Cu	V	Al	Nb
Min					
Typical					
Max	0,1	0,2	0,05	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥460 MPa	560 MPa	520 MPa
Tensile Strength, Rm:	530-650 MPa	600 MPa	600 MPa
Elongation, A5	≥ 22%	25%	26%
Impact energy, CV:	-46 °C • ≥27 J	-46 °C • 30 J	
	-40 °C • ≥47 J	-40 °C • 60 J	-40 °C • 60 J

Classification:

EN 499	E 46 4 B 32 H5
EN ISO 2560-A	E 46 4 B 32 H5
AWS A5.1	E 7018-1H8

Approvals:

CE	
TÜV	
GL	3YHH
DB	Kennbl. Nr 10.042.03
LR	3m, 3Ym, H5
BV	3, 3Y HH
DNV	3YH5
ABS	3, 3Y
MOD (Navy)	MS 25 mm, B & BX 12 mm

Note

PWHT 600 C, 1 h
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71512500	70-110	23	0,68	60	1,0	55
3,2	450	71513200	110-150	24	0,68	30	1,3	82
3,2	350	71513235	110-150	24	0,68	38	1,3	64
4,0	450	71514000	140-200	24	0,72	19	1,8	94
4,0	350	71514035	140-200	24	0,72	25	1,8	74
5,0	450	71515000	200-270	24	0,72	13	2,6	100

P 52T

SMAW - (Stick) - MMA

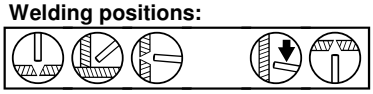
Un-alloyed

Date: 2009-04-15
Revision: 9

Description:
P 52T is a basic-coated low hydrogen electrode especially designed for tack welding mild and higher strength steels up to 500 MPa. It produces a flat-to-concave weld deposit exhibiting high ductility which minimises the risk of cracking in highly restrained joints. The electrode is easy to use in the vertical -down position, combined with excellent restriking and slag removal characteristics. P 52T has special slag properties that make it highly suitable for tack welding joints prior to using FCAW.

Applications:
Tack welding structural steels used in general fabrication, ship building, bridge construction and heavy plant.

Welding positions:



Coating type:
Basic

Welding current:
DC+, AC OCV> 50 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
125 %

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,80				
Typical	0,06	0,40	0,95	0,015	0,010		
Max	0,09	0,60	1,20	0,020	0,015	0,1	0,2

	Mo	V
Min		
Typical		
Max	0,1	0,08

Mechanical properties

	Specified	Typical
Yield strength, Re:	>420 MPa	440 MPa
Tensile Strength, Rm:	500 MPa	540 MPa
Elongation, A5	> 22 %	30 %
Impact energy, CV:	-40 °C • > 47 J	-20 °C • 100 J
		-40 °C • 70 J

Classification:

EN 499	E 42 4 B 35 H5
EN ISO 2560-A	E 42 4 B 35 H5
AWS A5.1	E7048-H4

Approvals:

DNV	3YH5
BV	3YHH
LR	3YH5
GL	3YH5
CE	

Note

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71522500	60-110	21	0,76	60		
3,2	350	71523235	110-160	25,5	0,76	36		
4,0	350	71524035	160-210	27	0,78	24		

P 54

SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 19

Description:
P 54 is a basic AC/DC electrode specially designed for vertical down welding of ordinary and higher strength steels. The vertical down technique is characterized by high welding speeds and low heat input, giving enhanced productivity combined with low stress and deformation. P 54 produces a clean bead profile with minimum spatter and gives very good mechanical properties.

Welding positions:

Coating type:
Basic

Welding current:
AC OCV≤ 65 V, (DC +)

Hydrogen content / 100 g weld metal
≤ 10 ml

Metal recovery:
110%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,40	0,70				
Typical	0,06	0,5	0,9	0,015	0,01		
Max	0,10	0,80	1,15	0,020	0,015	0,1	0,2

	Mo	Cu	V	Al	Nb
Min					
Typical					
Max	0,1	0,2	0,05	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 460 MPa	530 MPa
Tensile Strength, Rm:	530-650 MPa	590 MPa
Elongation, A5	≥ 22%	25%
Impact energy, CV:	-20 °C • ≥47	-20 °C • 90 J
	-40 °C • ≥ 27	-40 °C • 40 J

Classification:

EN 499	E 46 2 B 35 H5
EN ISO 2560-A	E 46 2 B 35 H5
AWS A5.1	E 7048-H4

Approvals:

CE	
LR	3m, 3Ym H5
DNV	3YH5
GL	3 Y HH

Note

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	71543200	110-150	23	0,78	32	1,7	59
4,0	450	71544000	150-200	24	0,76	22	2,1	73
5,0	450	71545000	200-280	25	0,75	14	2,9	81

Maxeta 20

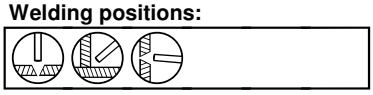
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 21

Description:
Maxeta 20 is a basic-rutile low hydrogen iron powder electrode with 150% recovery intended for welding of heavier section construction steels. The electrode is particularly suitable for welding of standing fillets enabling the user to make extended run lengths and thereby achieve small fillet welds at high deposition rates. Excellent mitre profile fillets are produced having a smooth transition with the base material. The electrode runs with a stable arc leaving a finely rippled bead surface with self-detaching slag and minimum spatter. It operates equally well on primer-treated material without porosity or fusion line problems along the top edge.

Welding positions:



Coating type:
Basic-rutile

Welding current:
DC+/-, AC OCV> 65 V

Hydrogen content / 100 g weld metal
≤ 10 ml

Metal recovery:
150%

Redrying temperature:
300 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,2	0,9				
Typical	0,05	0,4	1,2	0,010	0,010		
Max	0,10	0,6	1,50	0,030	0,025	0,1	0,1

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,1	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	480 MPa
Tensile Strength, Rm:	510-640 MPa	550 MPa
Elongation, A5	≥ 22%	27%
Impact energy, CV:	-20 °C • ≥47 J	-20 °C • 90 J

Classification:

EN 499	E 42 2 RB 53 H10
EN ISO 2560-A	E 42 2 RB 53 H10
AWS A5.1	E 7028

Approvals:

LR	3m, 3Ym, H10
DNV	3YH10
CE	

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
3,2	450	72083200	140-170	29	0,60	24	1,6	85
4,0	450	72084000	180-220	30	0,62	18	2,1	102
5,0	450	72085000	250-320	32	0,64	11	3,6	90

Maxeta 21

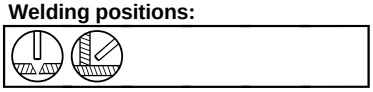
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 22

Description:
Maxeta 21 is a zircon-basic low hydrogen iron powder electrode with 170% recovery, intended for welding heavier sections in construction and ship steels. It is designed for fast and easy welding in the horizontal position and operates well on both AC and DC. Maxeta 21 can be used on primer-treated material without porosity or other problems and gives good mechanical properties.

Welding positions:



Coating type:
Zircon-basic

Welding current:
DC +/-, AC OCV> 70 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
170%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,20	1,1				
Typical	0,06	0,4	1,25	0,01	0,01		
Max	0,09	0,60	1,4	0,020	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥ 420 MPa	460 MPa	430 MPa
Tensile Strength, Rm:	500-610 MPa	560 MPa	530 MPa
Elongation, A5	≥ 22%	24%	30%
Impact energy, CV:	-40 °C • ≥47J	-20 °C • 150 J	-20 °C • 160 J
		-40 °C • 70 J	-40 °C • 110J

Classification:

EN 499	E 42 4 B 73 H5
EN ISO 2560-A	E 42 4 B 73 H5
AWS A5.1	E 7028

Approvals:

CE	
LR	3m, 3Ym, H5
DNV	3YH5
GL	3Y H10

Note

PWHT 600 C 2 h

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
4,0	450	72064000	170-240	30	0,72	14	3,0	80
5,0	450	72065000	225-355	33	0,71	9	4,6	78

Maxeta 22

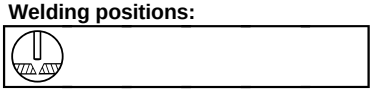
SMAW - (Stick) - MMA

Un-alloyed

Date: 2007-10-19
Revision: 21

Description:
Maxeta 22 is a zircon-basic low hydrogen iron powder electrode with 240% recovery. It is designed for high productivity welding of heavy section mild steel and higher strength steels in the downhand position. Deposition rates with Maxeta 22 are comparable with those for submerged arc welding. The electrode operates on AC/DC but AC is preferable. Maxeta 22 produces a weld metal with very good mechanical properties.

Welding positions:



Coating type:
Zircon-basic

Welding current:
DC +/-, AC OCV> 65 V

Hydrogen content / 100 g weld metal
≤ 10 ml

Metal recovery:
240%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,75				
Typical	0,05	0,5	1,0	0,01	0,01		
Max	0,09	0,70	1,25	0,020	0,020	0,1	0,2

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥420 MPa	450 MPa	430 MPa
Tensile Strength, Rm:	510-610 MPa	560 MPa	540 MPa
Elongation, A5	≥22%	26%	
Impact energy, CV:	-20 °C • ≥47J	-20 °C • 110 J	-20 °C • 130 J
	-40 °C • ≥27J	-40 °C • 50J	-40 °C • 70J

Classification:

EN 499	E 42 3 B 74 H10
EN ISO 2560-A	E 42 3 B 74 H10
AWS A5.1	E 7028

Approvals:

CE	
DNV	3Y, H5
GL	3Y H5
LR	3m, 3Ym H5

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
4,0	450	72074000	190-240	33	0,74	11,0	4,9	62
5,0	450	72075000	240-360	34	0,76	6,0	8,0	72
5,0	600	72075060	240-340	34	0,75	5,0	7,5	91
6,0	450	72076000	300-470	39	0,75	4,0	10,8	73
6,0	600	72076060	300-450	39	0,75	3,0	10,3	94

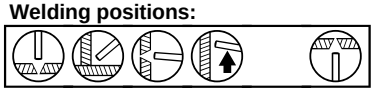
P 62MR

SMAW - (Stick) - MMA
Low-alloyed

Date: 2007-10-19
Revision: 28

Description:
P 62MR is a basic-coated low hydrogen electrode producing a nominal 0.9% Ni weld metal, designed to give excellent fracture toughness at temperatures down to -60 °C. It is an AC/DC electrode with optimised welder-appeal, especially in the vertical up position, producing a finely rippled bead surface and good slag detachability.
Electrode sizes 3,2x350 mm also available with a thin coating, "tc", ideally suited for root pass welding and joints with restricted access. P 62MR conforms to NACE requirements for oil and gas production equipment in sour service and has excellent CTOD values, making it highly suitable for offshore applications.

Welding positions:



Coating type:
Basic

Welding current:
DC +/-, AC OCV ≥ 70 V, For root passes: DC -

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
110-120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,20	1,05				0,8
Typical	0,06	0,3	1,3	0,01	0,005		0,9
Max	0,08	0,50	1,60	0,015	0,015	0,1	1,0

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥460 MPa	530 MPa	500 MPa
Tensile Strength, Rm:	530-650 MPa	610 MPa	580 MPa
Elongation, A5	≥ 23%	25%	23%
Impact energy, CV:	-50 °C • ≥47 J	-60 °C • 60 J	-50 °C •70 J

Classification:

EN 499	~E 46 5 1Ni B 32 H5
EN ISO 2560-A	~E 46 5 1Ni B 32 H5
AWS A5.5	E7018-G / (E 8018-G)**

Approvals:

MRS	5Y42 HHH
BV	3Y HHH
LR	3m, 5Y 40 H5
CE	
ABS	3,3Y
DNV	5Y46 H5

Note

PWHT: 600°C, 1h
(PWHT: 620°C, 2h: -20°C 150J, -46°C 70J, -60°C 40J)
CTOD -10°C > 0.25 mm
Part no. 7162-2500, -3250: thin coating.

EN: slight deviation in Mn
** Meet also 8018-G in dia up to 4,0 mm
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71622500	60-110	22	0,73	71	0,8	54
3,2 tc	350	71623250	80-155	23	0,72	42	1,3	54
3,2	350	71623235	80-150	24	0,71	37	1,4	58
3,2	450	71623200	80-150	24	0,71	28	1,4	82
4,0	450	71624000	140-200	24	0,72	19	1,9	89
5,0	450	71625000	200-270	24	0,72	13	2,6	100

P 65MR

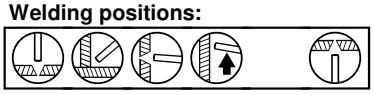
SMAW - (Stick) - MMA

Low-alloyed

Date: 2008-11-04
Revision: 17

Description:
P 65MR is a basic-coated low hydrogen electrode producing a nominal 0.9% Ni weld metal with molybdenum addition, designed for welding steels with a minimum yield strength of 450 MPa e.g. BS 7191-450 EM, BS 4360-55E/F and similar materials, used in offshore fabrication etc.
P 65MR gives a minimum yield strength of 560 MPa, minimum tensile strength of 610 MPa and has excellent fracture toughness down to -60 ℃. It is an AC/DC, all-positional electrode producing a finely rippled bead surface and good slag detachability. Electrode sizes 3,2x350 mm also available with a thin coating, "tc", ideally suited for root pass welding and joints with restricted access.

Welding positions:



Coating type:
Basic

Welding current:
DC +/-, AC OCV ≥ 70 V, For root passes: DC -

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
110-120%

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,20	1,40				0,7
Typical	0,06	0,4	1,6	0,01	0,005		0,8
Max	0,08	0,50	1,70	0,015	0,015	0,1	1,0

	Mo	Cu	V	Nb
Min				
Typical	0,15			
Max	0,20	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥500 MPa	610 MPa	590 MPa
Tensile Strength, Rm:	560-720 MPa	650 MPa	≥630 MPa
Elongation, A5	≥ 19%	22%	≥ 19%
Impact energy, CV:	-60 ℃ • ≥47 J	-60 ℃ • 60 J	-40 ℃ • ≥60 J

Classification:

EN 499 / EN 757	E 50 6 Mn 1 Ni B 32 H5
EN ISO 2560-A	E 50 6 Mn 1 Ni B 32 H5
AWS A5.5	8018-G

Approvals:

DNV	5Y 46 H5
CE	
LR	5Y 46 H5

Note

PWHT 600℃, 1h
Part no. 7165-2500 and 7165-3250: thin coating.

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71652500	60-110	22	0,71	71	0,8	56
3,2 tc	350	71653250	80-155	23	0,74	42	1,3	53
3,2	350	71653235	80-150	24	0,68	37	1,4	57
3,2	450	71653200	80-150	24	0,68	31	1,5	79
4,0	450	71654000	140-200	24	0,72	20	1,9	85
5,0	450	71655000	200-270	24	0,73	13	2,6	101

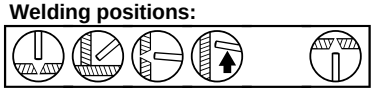
P 48K

SMAW - (Stick) - MMA
Low-alloyed

Date: 2007-10-19
Revision: 20

Description:
P 48K is a basic-coated low hydrogen electrode producing a 2.5 % Ni weld metal. The all-positional electrode is designed for applications demanding high yield strength and excellent fracture toughness at temperatures down to -60 °C, both in the as welded and stress relieved condition, and is suitable for offshore fabrication and LPG work.
P 48K is CTOD tested

Welding positions:



Coating type:
Basic

Welding current:
DC +/-, AC OCV ≥ 70 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,70				2,0
Typical	0,05	0,5	0,8	0,01	0,005		2,4
Max	0,09	0,60	1,25	0,015	0,015	0,1	2,6

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 460 MPa	530 MPa
Tensile Strength, Rm:	550-650 MPa	620 MPa
Elongation, A5	≥ 22%	25%
Impact energy, CV:	-60 °C • ≥47 J	-60 °C • 90 J

Classification:

EN 499	E 46 6 2Ni B 32 H5
EN ISO 2560-A	E 46 6 2Ni B 32 H5
AWS A5.5	E8018-C1

Approvals:

CE	
LR	3m, 5Y40m H5
ABS	3, 3Y
BV	U.P. -60°C
DNV	5Y H5
MRS	5Y 42 HHH

Note

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71582500	80-110	24	0,64	63	0,9	64
3,2	450	71583200	110-150	25	0,67	33	1,3	84
4,0	450	71584000	140-200	27	0,7	22	1,9	88
5,0	450	71585000	200-270	27	0,71	13	2,6	95

P 4130

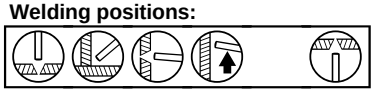
SMAW - (Stick) - MMA
Low-alloyed

Date: 2008-01-09
Revision: 6

Description:
P 4130 is a basic coated low hydrogen electrode for welding of high strength steel. The electrode is specially developed for welding of pipes and other equipment in base material AISI 4130 e.g high pressure mud piping for offshore work. The weld metal retain high strength even after post- weld heat treatment.

Applications:
High preassure mud pipes.

Welding positions:



Coating type:
Basic

Welding current:
AC/DC +(-), For root passes: DC -

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	1,6				0,6
Typical	0,07	0,60	1,80	0,01	0,01		0,8
Max	0,15	0,8	2,0	0,03	0,03	0,1	0,9

	Mo	Cu	V	Nb
Min	0,25			
Typical	0,4			
Max	0,5	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	600 MPa*	730 MPa**	640 MPa
Tensile Strength, Rm:	>690 MPa*	770 MPa**	730 MPa
Elongation, A5	>16%	21%**	23%
Impact energy, CV:	-40°C • 35 J	-20°C • 100 J** -40°C • 75 J**	-40°C • 40 J

Classification:
AWS A5.5 ~E 10018-D2

Approvals:

Note

*Specified values in PWHT condition, welding procedure acc. to AWS.
PWHT, 620°C, 1h

** Column Typical indicate As-welded condition

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71632500	50-95	23	0,69	72	0,7	60
3,2	450	71633200	100-150	23	0,71	28	1,4	82
4,0	450	71634000	140-200	23	0,71	20	1,8	95
5,0	450	71635000	200-270	24	0,70	13	2,6	101

P 110MR

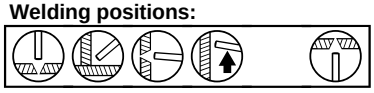
SMAW - (Stick) - MMA

Low-alloyed

Date: 2007-10-19
Revision: 18

Description:
P 110MR is a basic-coated low hydrogen electrode specially designed for welding high-strength low-alloy quenched and tempered steels with a yield strength of 700 MPa. The weld metal combines very high strength properties with good fracture toughness at temperatures down to -60°C.
P 110MR is an all-positional electrode with strong welder-appeal and produces mechanical properties highly suitable for applications such as mobile jack-up rigs and submarine construction.

Welding positions:



Coating type:
Basic

Welding current:
DC +/(-), AC OCV ≥ 70 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
120%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,20	1,50				1,6
Typical	0,05	0,40	1,70	0,010	0,007	0,35	2,2
Max	0,08	0,60	1,90	0,020	0,015	0,45	2,5

	Mo	Cu	V	Nb
Min	0,20			
Typical	0,25	0,60		
Max	0,40	0,70	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	670-760 MPa	740 MPa
Tensile Strength, Rm:	760-960 MPa	790 MPa
Elongation, A5	≥ 20%	24%
Impact energy, CV:	-60°C • ≥47 J	-40°C • 80 J
		-60°C • 70 J

Classification:

EN 757	~E 69 6 Mn2NiCrMo B 32 H5
AWS A5.5	E 11018-G

Approvals:

ABS	4YQ690
LR	4Y69
CE	

Note

EN: Slight deviation in Mo.

ABS: 55J@ -60C
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	71602500	70-110	22	0,7	66	0,9	52
3,2	450	71603200	100-150	24	0,7	29	1,4	81
3,2	350	71603235	100-150	24	0,7	35	1,4	55
4,0	450	71604000	135-200	24	0,72	19	1,9	93
5,0	450	71605000	200-270	24	0,72	13	2,6	100

Maxeta 110

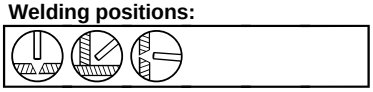
SMAW - (Stick) - MMA

Low-alloyed

Date: 2007-10-19
Revision: 19

Description:
Maxeta 110 is a zircon-basic low hydrogen electrode with 160% recovery, specially designed for welding quenched and tempered steels with a yield strength of 700 MPa, e.g. Weldox 700, HY 100, N-A-XTRA 70, TI, Suprafort 700, STE 690, etc. The weld metal gives very high strength properties with good fracture toughness at temperatures down to -60 °C. Maxeta 110 is intended for high productivity welding, producing a mitre fillet profile with smooth blend-in with the base plate. The combination of very high strength, good toughness and fast deposition rate makes this electrode particularly suitable for offshore and mobile cranes, jack-up rigs, submarine hulls and earth moving equipment.

Welding positions:



Coating type:
Zircon-basic

Welding current:
DC +/-, AC OCV ≥ 70 V

Hydrogen content / 100 g weld metal
< 5 ml

Metal recovery:
160%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,25	1,10				2,4
Typical	0,05	0,4	1,2	0,015	0,015		2,8
Max	0,09	0,60	1,60	0,020	0,020	0,1	3,0

	Mo	Cu	V	Nb
Min	0,30			
Typical	0,5			
Max	0,60	0,2	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	≥ 690 MPa	720 MPa	700 MPa
Tensile Strength, Rm:	760-960 MPa	780 MPa	760 MPa
Elongation, A5	≥ 20%	20%	22%
Impact energy, CV:	-40°C • ≥ 69 J	-40°C • 75 J	-20°C • 50 J

Classification:

EN 757	~E 69 5 Mn 2NiMo B 73 H5
AWS A5.5	~E 11018-G

Approvals:

CE	
DNV	4Y69 H5

Note

AWS: no designation for high recovery.
AWS: slight deviation in yield strength.
AWS: slight deviation in Mn, Ni and Mo.
EN: slight deviation in Mn and Ni.

PWHT 640 C 1 h
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
4,0	450	72114000	170-240	28	0,74	14	3	81
5,0	450	72115000	225-355	30	0,74	9	4,9	78

Maxeta 24

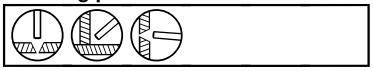
SMAW - (Stick) - MMA

Low-alloyed

Date: 2007-10-19
Revision: 21

Description:
Maxeta 24 is a zircon-basic low hydrogen electrode with 160% recovery, producing a nominal 0.9 % Ni weld metal. It is intended for welding fillets and butt joints in the horizontal-vertical and flat positions, combining high deposition rates with very good fracture toughness at temperatures down to -60 °C. Maxeta 24 has excellent CTOD values and is particularly suitable for offshore construction.

Welding positions:



Coating type:
Zircon-basic

Welding current:
DC +/-, AC OCV ≥ 70 V

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
160%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,30	0,90				0,7
Typical	0,05	0,3	1,1	0,01	0,01		0,8
Max	0,09	0,60	1,35	0,020	0,015	0,1	1,0

	Mo	Cu	V	Nb
Min				
Typical				
Max	0,1	0,2	0,05	0,05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 460 MPa	510 MPa
Tensile Strength, Rm:	530-650 MPa	600 MPa
Elongation, A5	≥ 22%	25%
Impact energy, CV:	-50°C • ≥47 J	-50°C • 70 J

Classification:

EN 499	E 46 5 1Ni B 53 H5
EN ISO 2560-A	E 46 5 1Ni B 53 H5
AWS A5.5	~E7018-G

Approvals:

CE	
DNV	4Y42 H5
ABS	4Y40 H5
LR	4Y40m H5

Note

CTOD -10°C > 0.25 mm (t: 90 mm, 2G)
AWS: No designation for high recovery.

Approvals are valid for dim.< 5.0 mm.
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
4,0	450	72094000	170-240	29	0,74	14	3,0	80
5,0	450	72095000	225-355	33	0,71	10	4,6	78

P 81CR

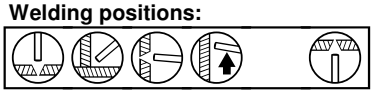
SMAW - (Stick) - MMA

Low-alloyed

Date: 2008-08-29
Revision: 20

Description:
P 81CR is a basic-coated, low hydrogen electrode which deposits a 0.5% Mo type weld metal. It is primarily intended for welding similar composition steels, used where creep rupture strength and ductility at service temperatures up to 550°C are required e.g. EN 16Mo3 and ASTM A335 Grade P1. The Mo content confers some resistance to hydrogen attack in chemical process plant applications. P 81CR is also suitable for ordinary C-Mn steels when higher tensile strength weld metal is required. Preheat and interpass temperature of 100-150 °C is recommended. Post-weld heat treat at 620 °C.

Welding positions:



Coating type:
Basic

Welding current:
DC+

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
110%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,10	0,60				
Typical	0,07	0,4	0,80	0,01	0,01	0,02	0,03
Max	0,10	0,60	0,90	0,015	0,015	0,05	0,05

	Mo	Cu	V
Min	0,45		
Typical	0,55	0,02	0,02
Max	0,60	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	≥ 390 MPa*	480 MPa**	480 MPa
Tensile Strength, Rm:	≥ 510 MPa*	590 MPa**	590 MPa
Elongation, A5	≥ 22%*	24%**	25%
Impact energy, CV:	20 °C • ≥47 J*	-20 °C • 100 J**	20 °C • 150 J -20 °C • 130 J 620°C x 1h

Classification:

EN ISO 3580-A	E Mo B 42 H5
AWS A5.5	E 7018-A1

Approvals:

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71812500	65-100	22	0,72	71	0,8	55
3,2	350	71813200	95-150	23	0,73	37	1,4	62
4,0	350	71814000	130-200	24	0,73	19	1,8	92
5,0	450	71815000	160-265	25	0,73	12	2,6	103

P 83CR

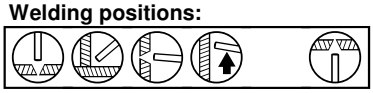
SMAW - (Stick) - MMA

Low-alloyed

Date: 2008-07-03
Revision: 23

Description:
P 83CR is a basic-coated, low hydrogen electrode which deposits a low carbon 1.25% Cr/ 0.5% Mo weld metal. It is intended for welding creep resisting steels of similar composition, used in power generation plant operating at temperatures up to 570℃, e.g. EN 13CrMo4-5, EN 10CrMo5-5, ASTM A335 Gr P11-P12 etc. Also suitable for use in the chemical and petrochemical industries where resistance to hydrogen attack, corrosion from sulphur bearing crude oil and stress corrosion cracking in sour environments is required. Preheat and interpass temperature of 150-200 ℃ is recommended. Post-weld heat treat at 690℃.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Hydrogen content / 100 g weld metal
≤ 5 ml

Metal recovery:
110%

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,05	0,20	0,60			1,0	
Typical	0,07	0,35	0,8	0,01	0,01	1,20	0,02
Max	0,10	0,60	0,90	0,015	0,015	1,4	0,05

	Mo	Cu	V
Min	0,45		
Typical	0,5	0,02	0,02
Max	0,65	0,05	0,05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	≥ 460 MPa*	700 MPa**	550 MPa
Tensile Strength, Rm:	≥ 550 MPa*	750 MPa**	630 MPa
Elongation, A5	≥ 20 %*	21 %**	23 %
Impact energy, CV:	20 ℃ • ≥47 J*	20 ℃ • 130 J**	20 ℃ • 170 J
			-20 ℃ • 80 J

Classification:

EN ISO 3580-A	E CrMo1 B 42 H5
AWS A5.5	E 8018-B2

Approvals:

Note

PWHT: 690℃, 1h

*Specified values in PWHT condition
**Column Typical indicate As-welded condition
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

P 83CR is also available to order as a version with controlled trace elements including following specification:
P max 0.010
Sb max 0.0030
Sn max 0.0040
As max 0.0080
Bruscato factor max 14

This composition makes P 83CR suitable when temper embrittlement resistance is required, as well as when step cooling tests are to be performed.

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71832500	65-100	22	0,72	71	0,8	55
3,2	350	71833200	95-150	23	0,73	37	1,4	62
4,0	350	71834000	130-200	24	0,73	19	1,8	92
5,0	450	71835000	160-265	25	0,73	12	2,6	103

P 84CR

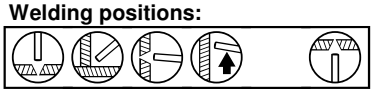
SMAW - (Stick) - MMA

Low-alloyed

Date: 2008-07-03
Revision: 20

Description:
P 84CR is a basic-coated, low hydrogen electrode which deposits a low carbon 2.25% Cr/1.0% Mo weld metal. It is intended for welding creep resisting steels of similar composition, used in steam generation plant operating at temperatures up to 600°C, e.g. EN 10CrMo9-10, EN 11CrMo9-10, ASTM 335 Gr. P22, ASTM 217 Gr WC9. Also suitable for use in the chemical and petrochemical industries where resistance to hydrogen attack, corrosion from sulphur bearing crude oil and stress corrosion cracking in sour environments is required. Preheat and interpass temperature of 200-250°C is recommended. Post-weld heat treat at 690°C.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Hydrogen content / 100 g weld metal
< 5 ml

Metal recovery:
110-120%

Redrying temperature:
350-400°C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Mo
Min		0,10	0,50			2,0	0,90
Typical	0,07	0,30	0,70	0,010	0,010	2,3	1,0
Max	0,10	0,45	0,90	0,015	0,015	2,5	1,20

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	≥ 530 MPa*	N/A**	610 MPa
Tensile Strength, Rm:	≥ 620 MPa*	N/A**	700 MPa
Elongation, A5	≥ 18%*	N/A**	20%
Impact energy, CV:	20°C • ≥47 J*	N/A**	20°C • 150 J
			-20°C • 90 J

Classification:

EN ISO 3580-A	E CrMo2 B 42 H5
AWS A5.5	E 9018-B3

Approvals:

Note

PWHT: 690°C, 2h
*Specified values in PWHT condition
**Column Typical indicate As-welded condition
Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

P 84CR is also available to order as a version with controlled trace elements including following specification:
P max 0.010
Sb max 0.0030
Sn max 0.0040
As max 0.0080
Bruscato factor max 14

This composition makes P 84CR suitable when temper embrittlement resistance is required, as well as when step cooling tests are to be performed.

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71842500	65-100	22	0,72	71	0,8	55
3,2	350	71843200	90-150	23	0,73	37	1,4	62
4,0	350	71845000	130-200	24	0,73	19	1,8	92
5,0	450	71845000	160-265	25	0,73	12	2,6	103

P 85CR

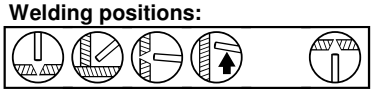
SMAW - (Stick) - MMA

Low-alloyed

Date: 2008-07-03
Revision: 2

Description:
P 85CR is a basic-coated, low hydrogen electrode depositing a 5% Cr /0.5% Mo weld metal. It is intended for welding creep resisting steels of matching composition, used widely in chemical and petrochemical plant because of their excellent resistance to hydrogen attack and corrosion by high sulphur crude oils at service temperatures up to 600℃, e.g. ASTM A 335Gr.P5, A387Gr.5. To avoid hydrogen cracking, preheat and interpass temperature of 200-300℃ must be carefully controlled. Maintain preheat for some time after completion of welding. Post-weld heat treat at a temperature according to appropriate standard, normally in the range of 710-750 ℃.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Hydrogen content / 100 g weld metal
< 5 ml

Metal recovery:
120%

Redrying temperature:
400℃, 1-2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Mo
Min	0,05	0,10	0,5			4,0	0,45
Typical	0,07	0,40	0,8	0,010	0,010	5,0	0,55
Max	0,10	0,50	1,0	0,020	0,015	6,0	0,65

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	≥ 460 MPa*	N/A**	530 MPa
Tensile Strength, Rm:	≥ 550 MPa*	N/A**	640 MPa
Elongation, A5	≥ 19%*	N/A**	20%
Impact energy, CV:	20℃ • ≥ 47	N/A**	20℃ • 90 J
			-10℃ • 45 J

Classification:

EN ISO 3580-A	E CrMo5 B 42 H5
AWS A5.5	E8018-B6

Approvals:

Note

PWHT 740 ℃/2h
* Specified according to AWS A5.5 in PWHT condition.
** Column Typical indicate As-welded condition

Core wire:
S ≤ 0.015%
P ≤ 0.015%
N ≤ 0.008%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	350	71852500	65-10	22	0,72	71	0,8	55
3,2	350	71853200	95-150	23	0,73	37	1,4	62
4,0	350	71854000	130-200	24	0,73	19	1,8	92
5,0	450	71855000	160-265	25	0,73	12	2,6	103

Cromarod 308L

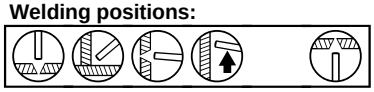
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 23

Description:
Cromarod 308L is a rutile flux coated AC/DC electrode designed for the welding of low carbon 18%Cr / 10%Ni, type 304L, austenitic stainless steels. Operability is excellent with a low spatter arc producing a smooth weld bead surface and self-releasing slag. The electrode is all-positional up to and including 3.25 mm diameter. Cromarod 308L is also suitable for welding stainless steel grade 304 material, as well as Nb or Ti stabilised grades 347 and 321, when resistance to corrosion is primarily required. For structural applications at temperatures above 400 °C, Cromarod 308H is recommended because of its superior strength at elevated temperatures.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 7 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion. Also good resistance to oxidising acids and cold reducing acids.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			18,0	9,0
Typical	0,02	0,8	0,7	0,02	0,02	20,0	10,0
Max	0,030	0,90	2,0	0,025	0,025	21,0	11,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	450 MPa
Tensile Strength, Rm:	≥ 550 MPa	580 MPa
Elongation, A5	≥ 35%	39%
Impact energy, CV:	-20 °C • ≥ 50 J	-20 °C • 60 J
		-120 °C • 45 J

Classification:

EN 1600	E 19 9 L R 12
AWS A5.4	E 308L-17
ISO 3581-A	E 19 9 L R 12

Approvals:

CE	
DB	Kennblatt Nr. 30.042.04
TÜV	
DNV	
ABS	
GL	

Note

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,0	300	74302000	35-60	28	0,62	143	0,7	31
2,5	300	74302500	40-80	28	0,62	91	1,0	33
3,2	350	74303200	80-120	29	0,64	45	1,5	45
4,0	350	74304000	100-160	30	0,64	31	2,0	55
5,00	450	74305000	140-220	30	0,62	15	2,8	79

Cromarod 308LP

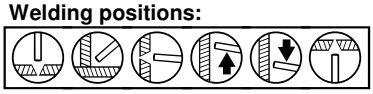
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 11

Description:
Cromarod 308LP is a fully-positional rutile coated electrode specially designed for applications requiring optimum positional operability. It is intended for stainless steel grades 304L and 304, but can also be used for the stabilised grades 347 and 321. With its exceptionally good arc stability, weld pool control and striking/re-striking characteristics it is highly suitable for the most demanding vertical and overhead pipewelding applications. The relatively thin coating and fast-freezing slag make Cromarod 308LP particularly advantageous to use when welding thinner walled material. For structural applications at temperatures above 400 °C, Cromarod 308H is recommended because of its superior strength properties at elevated temperatures.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 5 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			18,0	9,0
Typical	0,02	0,7	0,6	0,02	0,02	19,7	9,5
Max	0,030	1,0	2,0	0,030	0,025	21,0	11,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	450 MPa
Tensile Strength, Rm:	≥ 550 MPa	580 MPa
Elongation, A5	≥ 35%	40%
Impact energy, CV:		0 °C • 60 J
		-60 °C • 50 J

Classification:

EN 1600	E 19 9 L R 11
AWS A5.4	E 308L-17
ISO 3581-A	E 19 9 L R 11

Approvals:
CE

Note

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,0	300	74292000	20-45	21	0,67	148	0,7	40
2,5	300	74292500	35-85	21	0,68	91	0,9	45
3,2	350	74293200	40-100	23	0,73	44	1,4	53

Cromarod 308H

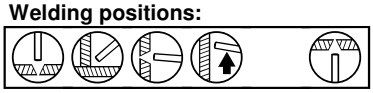
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 15

Description:
Cromarod 308H is a all-positional rutile flux coated electrode which deposits a 20%Cr / 10%Ni austenitic stainless steel weld metal with controlled carbon content (0.04% - 0.08%). It is designed to weld similar composition steels, used for creep strength and oxidation resistance at temperatures up to 800°C. Exceptionally good arc stability, weld pool control and re-striking characteristics make it particular suitable for pipewelding.
Cromarod 308H is also recommended for welding the controlled carbon stabilised grades 321H and 347H, used for structural applications at temperatures above 400 °C.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 4 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,04		0,5			18,0	9,0
Typical	0,05	0,7	0,8	0,02	0,02	19,5	10,0
Max	0,08	1,0	2,0	0,030	0,025	21,0	11,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	435 MPa
Tensile Strength, Rm:	≥ 560 MPa	585 MPa
Elongation, A5	≥ 35%	39%
Impact energy, CV:	20 °C • ≥ 50 J	20 °C • 75 J

Classification:

EN 1600	E 19 9 R 12
AWS A5.4	E308H-17
ISO 3581-A	E 19 9 H R 12

Approvals:
CE

Note
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74282500	35-85	21	0,68	95	0,9	45
3,2	350	74283200	40-100	23	0,73	46	1,4	53
4,0	350	74284000	100-160	24	0,65	30	1,6	65

Cromarod 347

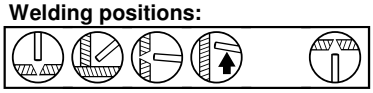
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 22

Description:
Cromarod 347 is a niobium stabilised, rutile flux coated electrode used for welding the Nb or Ti stabilised 18% Cr/ 10% Ni austenitic stainless steel grades 347 and 321. It is also suitable for the unstabilised grades 304 and 304L. Cromarod 347 is primarily intended for use where resistance to intergranular corrosion is required. For welding the controlled carbon material grades 321H and 347H, used for structural applications at temperatures above 400 °C, Cromarod 308H is recommended because of its superior creep strength. The electrode has good positional characteristics and produces low spatter levels and good slag detachability.

Welding positions:



Coating type:
Rutile

Welding current:
DC+, AC OCV > 39V

Ferrite content:
FN 8 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion particularly at elevated temperatures.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,6	0,5			18,0	9,0
Typical	0,03	0,9	0,7	0,020	0,015	20,0	10,0
Max	0,08	1,0	2,0	0,025	0,025	21,0	11,0

	Mo	Cu	V	Nb
Min				10xC
Typical	0,1	<0,1		0,4
Max	0,5	0,5	0,1	1,0

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	480 MPa
Tensile Strength, Rm:	≥ 560 MPa	620 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		-60 °C • 40 J

Classification:

EN 1600	E 19 9 Nb R 12
AWS A5.4	E 347-17
ISO 3581-A	E 19 9 Nb R 12

Approvals:
CE

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74482500	50-80	21	0,62	90	1,0	34
3,2	350	74483200	80-110	22	0,64	46	1,3	55
4,0	350	74484000	130-170	22	0,63	31	1,9	56
4,0	450	74484045	110-135	22	0,65	23	1,6	92
5,0	450	74485000	160-220	22	0,65	15	2,8	86

Cromarod 316L

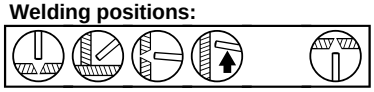
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 23

Description:
Cromarod 316L is a rutile flux coated AC/DC electrode intended for welding the low carbon, molybdenum alloyed, acid resisting austenitic stainless steels of similar composition (316L). Operability is excellent with a smooth low spatter arc producing an exceptionally good weld bead appearance. Fillet welds have a smooth surface, slightly concave profile with excellent toe line blend-in and a self-releasing slag. The electrode is all positional up to and including 3.25 mm diameter. Cromarod 316L is suitable for welding normal carbon 316 type grades and also Nb or Ti stabilised steels, provided service temperatures are below 400 °C. For 316 material grades used at elevated temperatures, Cromarod 318 is recommended.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 6 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion in the more severe environments e.g. dilute hot acids. Good resistance to chloride pitting corrosion.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			17,0	11,0
Typical	0,02	0,8	0,7	0,02	0,02	18,5	12,0
Max	0,030	0,90	2,0	0,025	0,025	20,0	13,0

	Mo	Cu	V	Nb
Min	2,5			
Typical	2,7	0,1		
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	490 MPa
Tensile Strength, Rm:	≥ 510 MPa	600 MPa
Elongation, A5	≥ 30%	32%
Impact energy, CV:	-20 °C • ≥ 47	-20 °C • 55 J
		-120 °C • 45 J

Classification:

EN 1600	E 19 12 3 L R 12
AWS A5.4	E 316L-17
ISO 3581-A	E 19 12 3 L R 12

Approvals:

DNV	
ABS	
DB	Kennblatt Nr. 30.042.02
GL	
LR	
BV	
CE	
TÜV	

Note

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
1,6	300	74401600	25-45	29	0,53	233	0,5	29
2,0	300	74402000	35-60	29	0,63	137	0,7	33
2,5	300	74402500	40-80	29	0,64	85	1,1	35
3,2	350	74403200	80-120	29	0,64	44	1,5	43
4,0	350	74404000	100-160	30	0,65	30	2,1	56
4,0	450	74404045	100-160	30	0,65	23	2,1	71
5,0	450	74405000	170-230	30	0,65	14	2,8	83

Cromarod 316LP

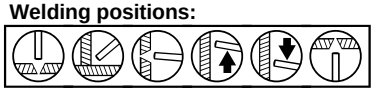
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 20

Description:
Cromarod 316LP is a fully-positional rutile flux coated electrode designed specially for welding thin walled (down to 1.5 mm) pipelines found in the chemical process and papermaking industries, where it offers considerably higher productivity than manual TIG. With its exceptionally good arc stability, weld pool control and restriking characteristics it is highly suitable for the most demanding vertical and overhead welding applications in fixed pipework and is ideal for cramped and difficult site conditions. Cromarod 316LP is also recommended for root runs and multipass welds in general fabrication of molybdenum alloyed stainless steels in all material thicknesses.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 4 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion in the more severe environments e.g. dilute hot acids. Good resistance to chloride pitting corrosion.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			17,0	11,0
Typical	0,02	0,7	0,8	0,02	0,02	18,3	12,2
Max	0,030	0,90	2,0	0,030	0,025	20,0	13,0

	Mo	Cu	V	Nb
Min	2,5			
Typical	2,7			
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	480 MPa
Tensile Strength, Rm:	≥ 510 MPa	580 MPa
Elongation, A5	≥ 30%	32%
Impact energy, CV:	-20 °C • ≥ 47 J	20 °C • 60 J
		-120 °C • 35 J

Classification:

EN 1600	E 19 12 3 L R 11
AWS A5.4	E 316L-17
ISO 3581-A	E 19 12 3 L R 11

Approvals:
DNV
CE
TÜV

Note
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
1,6	250	74431625	18-35	20	0,68	267	0,5	25
2,0	300	74432000	20-45	21	0,67	145	0,7	40
2,0	250	74432025	20-45	21	0,67	178	0,6	37
2,5	300	74432500	40-85	23	0,68	91	0,9	45
3,2	350	74433200	40-100	23	0,73	44	1,4	53
4,0	350	74434000	100-160	25	0,71	29	1,6	69

Cromarod 316LV

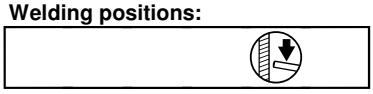
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 15

Description:
Cromarod 316LV is a rutile flux coated electrode designed specially for welding thin section acid resisting 316L austenitic stainless steels in the vertical down position. The special composition and very thin coating gives the electrode exceptionally good operating characteristics when vertical down welding of single pass butt, fillet and lap joints. Weld beads are neat and smooth with a slightly concave profile to fillets. The vertical down technique is characterised by high welding speeds and low heat input, giving enhanced productivity combined with minimum distortion. Cromarod 316LV is ideal for joining stainless steel cladding and linings.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 6 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion in the more severe environments e.g. dilute hot acids. Good resistance to chloride pitting corrosion.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			17,0	11,0
Typical	0,02	0,7	0,8	0,02	0,02	18,1	11,8
Max	0,030	1,0	2,0	0,030	0,025	20,0	13,0

	Mo	Cu	V	Nb
Min	2,5			
Typical	2,7			
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	490 MPa
Tensile Strength, Rm:	≥ 510 MPa	630 MPa
Elongation, A5	≥ 30%	32%
Impact energy, CV:		20 °C • 60 J

Classification:

EN 1600	E 19 12 3 L R 15
AWS A5.4	E 316L-17
ISO 3581-A	E 19 12 3 L R 15

Approvals:
CE

Note
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74412500	55-80	24	0,70	96	1,0	35
3,2	350	74413200	80-115	25	0,71	50	1,5	42

Cromarod 316L-140

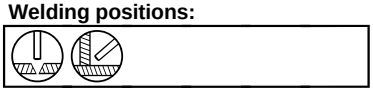
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 17

Description:
Cromarod 316L-140 is a rutile flux coated, high deposition electrode with a stainless core wire and 140% recovery. The electrode is intended for welding in the downhand and horizontal-vertical positions and is especially suitable for high productivity welding of medium to heavy section 18% Cr / 12% Ni / 2.5% Mo austenitic stainless steels. Operability is excellent producing smooth weld beads, slightly concave profile fillet welds, negligible spatter and self-releasing slag. Cromarod 316L-140 is also suitable for welding the stabilised material grades 347 and 321 if used at service temperatures below 400 °C.

Welding positions:



Coating type:
Rutile, high recovery 140%

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 8 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion in the more severe environments e.g. dilute hot acids. Good resistance to chloride pitting corrosion.

Scaling temperature:
Approx. 800 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			17,0	11,0
Typical	0,02	0,8	0,8	0,02	0,02	18,4	11,8
Max	0,030	0,90	2,0	0,030	0,025	20,0	13,0

	Mo	Cu	V	Nb
Min	2,5			
Typical	2,7	0,1		
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	490 MPa
Tensile Strength, Rm:	≥ 510 MPa	600 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		20 °C • 60 J

Classification:

EN 1600	E 19 12 3 L R 53
AWS A5.4	E 316L-17
ISO 3581-A	E 19 12 3 L R 53

Approvals:
DNV
CE

Note
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	300	74422500	60-90	32	0,67	61,0	1,4	42
3,2	350	74423200	110-130	34	0,77	27	2,2	62
4,0	450	74424000	130-170	38	0,77	14	3	70
5,0	450	74425000	170-230	40	0,77	9	4,3	80

Cromarod 318

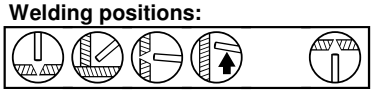
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 22

Description:
Cromarod 318 is a niobium stabilised, rutile flux coated electrode designed for welding Nb or Ti stabilised 18% Cr / 12% Ni / 3% Mo austenitic stainless steels type 318. The electrode has good positional characteristics and produces low spatter levels and good slag detachability. Cromarod 318 is primarily intended for service temperatures above 400 °C an can also be used for 316 material grades used at elevated temperatures.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 5 (WRC-92)

Corrosion resistance
Good resistance to general and intergranular corrosion in dilute hot acids. Good resistance to oxidation and corrosion at elevated temperatures.

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			17,0	10,0
Typical	0,02	0,9	0,7	0,02	0,02	18,0	12,0
Max	0,08	1,0	2,0	0,025	0,025	20,0	13,0

	Mo	Cu	V	Nb
Min	2,5			10xC
Typical	2,7			0,4
Max	3,0	0,5	0,1	1,0

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	480 MPa
Tensile Strength, Rm:	≥ 560 MPa	600 MPa
Elongation, A5	≥ 25%	30%
Impact energy, CV:		20 °C • 70 J

Classification:

EN 1600	E 19 12 3 Nb R 12
AWS A5.4	E 318-17
ISO 3581-A	E 19 12 3 Nb R 12

Approvals:
CE

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74462500	50-80	21	0,61	90	1,0	36
3,2	350	74463200	80-120	22	0,63	46	1,4	51
4,0	350	74464000	130-170	22	0,63	30	1,8	60
5,0	450	74465000	160-220	22	0,65	14	2,8	25

Cromarod 309L

SMAW - (Stick) - MMA

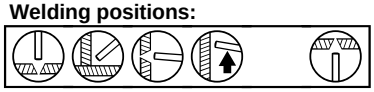
Stainless Steel

Date: 2007-10-19
Revision: 22

Description:
Cromarod 309L is a rutile flux coated electrode which deposits a 23%Cr / 13%Ni austenitic stainless steel weld metal. The high alloy content and ferrite level enable the weld metal to tolerate dilution from mild and low alloy steels without hot cracking or brittle structures.

Applications:
– Dissimilar joints between stainless and mild or low alloy steels.
– Buffer layers on mild and low alloy steels prior to overlaying with Cromarod 308L or Cromarod 347.
– Interface runs in clad steel joints.
– Joining of clad steels and dissimilar joints between stainless and mild or low alloy steels.
– Welding of similar composition 309 type austenitic stainless steels.
– Joining ferritic-martensitic 410 and 430 type stainless steels.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 9 (WRC-92)

Corrosion resistance
As Cromarod 309L is usually used for buffer layers and dissimilar joints, corrosion resistance is of less importance. Two layers on mild steel is about equivalent to 304L type material.

Scaling temperature:
Approx. 1000 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			22,0	12,0
Typical	0,02	0,8	0,8	0,02	0,02	23,0	13,0
Max	0,030	0,90	2,0	0,030	0,025	25,0	14,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 320 MPa	470 MPa
Tensile Strength, Rm:	≥ 520 MPa	560 MPa
Elongation, A5	≥ 30%	34%
Impact energy, CV:	-20 °C • ≥ 29 J	-20 °C • 48 J
		-60 °C • 45 J

Classification:

EN 1600	E 23 12 L R 12
AWS A5.4	E 309L-17
ISO 3581-A	E 23 12 L R 12

Approvals:
LR
DNV
CE
BV
ABS
GL

Note
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	300	74392500	40-80	27	0,67	83	0,9	42
3,2	350	74393200	80-120	28	0,67	42	1,4	53
4,0	350	74394000	100-160	29	0,67	28	1,9	59
4,0	450	74394045	100-160	29	0,67	21	1,9	75
5,0	450	74395000	170-230	30	0,65	14	2,8	86

Cromarod 309MoL

SMAW - (Stick) - MMA

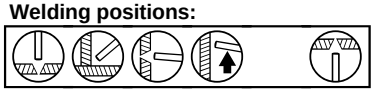
Stainless Steel

Date: 2007-10-19
Revision: 21

Description:
Cromarod 309MoL is a rutile flux coated electrode which deposits a 23% Cr / 12%Ni / 2.5%Mo austenitic stainless steel weld metal. The high alloy content and ferrite level enable the weld metal to tolerate dilution from dissimilar and difficult-to-weld materials without hot cracking or brittle structures.

Applications:
– Dissimilar joints between stainless and mild, low alloy or medium carbon steels.
– Buffer layers on mild and low alloy steels prior to overlaying with Cromarod 316L.
– Interface runs in 316L clad steels.
– Joining of medium carbon hardenable steels e.g. armour plate..

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 20 (WRC-92)

Corrosion resistance
The corrosion resistance after surfacing carbon steels with two layers of Cromarod 309MoL is about the same as for 316L material.

Scaling temperature:
Approx. 1000 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			22,0	12,0
Typical	0,02	0,8	0,8	0,02	0,02	22,8	12,8
Max	0,030	0,90	2,0	0,025	0,025	25,0	14,0

	Mo	Cu	V	Nb
Min	2,0			
Typical	2,4			
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	555 MPa
Tensile Strength, Rm:	≥ 560 MPa	680 MPa
Elongation, A5	≥ 30%	33%
Impact energy, CV:	-20 °C• ≥ 29 J	-20 °C • 50 J

Classification:

EN 1600	E 23 12 2 L R 32
AWS A5.4	E 309MoL-17
ISO 3581-A	E 23 12 2 L R 32

Approvals:

DB	Kennblatt Nr. 30.042.03
ABS	
DNV	
CE	
RINA	
TÜV	

Note

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,0	300	74342000	35-60	26	0,63	135	0,7	33
2,5	300	74342500	40-80	27	0,64	84	1,1	36
3,2	350	74343200	80-120	28	0,65	43	1,5	42
4,0	350	74344000	100-160	29	0,65	29	2,1	55
4,0	450	74344045	100-160	29	0,65	23	2,1	70
5,0	450	74345000	150-220	30	0,67	13	3,1	79

Cromarod 309MoLP

SMAW - (Stick) - MMA

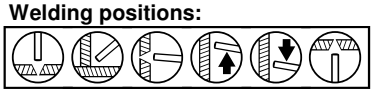
Stainless Steel

Date: 2009-02-27
Revision: 11

Description:
Cromarod 309MoLP is a fully-positional rutile flux coated electrode specially designed for applications requiring optimum positional operability. The high alloy content and ferrite level enables the weld metal to tolerate dilution from dissimilar and difficult-to-weld materials without hot cracking.The relatively thin coating and fast-freezing slag makes Cromarod 309MoLP particularly suitable for welding dissimilar joints of differing thicknesses e.g. 4 mm stainless to 7 mm medium carbon steel.

Applications:
- Dissimilar joints between stainless and mild, low or medium cartbon steels.
- Joining of medium carbon hardenable steels, e.g. armour plate.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 50V

Ferrite content:
FN 20 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,5	0,5			22,0	12,0
Typical	0,02	0,7	1,0	0,02	0,02	23,2	13,0
Max	0,040	1,0	2,0	0,030	0,025	25,0	14,0

	Mo	Cu	V	Nb
Min	2,0			
Typical	2,5			
Max	3,0	0,5	0,1	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	550 MPa
Tensile Strength, Rm:	≥ 560 MPa	720 MPa
Elongation, A5	≥ 30 %	33%
Impact energy, CV:		–20 °C • 50 J

Classification:

EN 1600	E 23 12 2 L R 11
AWS A5.4	E 309MoL-17
ISO 3581-A	E 23 12 2 L R 11

Approvals:
CE

Note

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74332500	35-80	23	0,66	98	0,9	45
3,2	350	74333200	40-100	23	0,73	41	1,4	53

Cromarod 309MoL-S

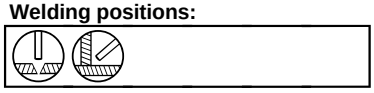
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 16

Description:
Cromarod 309MoL-S is a high effeciency electrode with a rutile, metal powder coating on an unalloyed core wire. This cost-effective design permits high welding currents to be used without risk of overheating and the 160% recovery gives extended run lenghts with increased productivity. The electrode is intended for dissimilar joints between stainless and mild or low alloy steels, as well as for buffer layers. A forceful and stable arc enables welding direct on to thick coated shop primer without risk of porosity. Cromarod 309MoL-S is extremely easy to handle, with self-detaching slag and smooth weld bead appearance.

Welding positions:



Coating type:
Rutile, high recovery 160%

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 15 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			21,0	11,0
Typical	0,05	0,9	0,7	0,02	0,02	23,3	12,2
Max	0,12	1,2	2,0	0,030	0,025	25,0	14,0

	Mo	Cu	V	Nb
Min	2,0			
Typical	2,3			
Max	3,0	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	530 MPa
Tensile Strength, Rm:	≥ 560 MPa	700 MPa
Elongation, A5	≥ 25%	28%

Classification:

EN 1600	~E 23 12 2 L R 73
AWS A5.4	~E 309Mo-26
ISO 3581-A	~E 23 12 2 L R 73

Approvals:

DNV
CE
GL

Note

AWS deviation in Si.
EN and ISO deviation in C

Core wire:
P ≤ 0.015%
S ≤ 0.015%
N ≤ 0.080%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	450	74373200	110-170	29	0,60	23	1,8	79
4,0	450	74374000	150-230	31	0,60	16	2,8	80

Cromarod 310

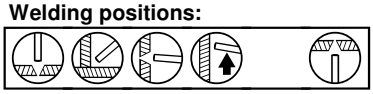
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-03-25
Revision: 20

Description:
Cromarod 310 is a rutile coated electrode primarily intended for welding the 25%Cr / 20%Ni, type 310, fully austenitic stainless steels, used for corrosion and oxidation resistance at elevated temperatures. Cromarod 310 can also be used to join difficult-to-weld steels such as armour plate and ferritic stainless steels, as well as dissimilar steels. Although the weld metal is fully austenitic the composition has been carefully balanced to give good resistance to hot cracking.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 0 (WRC-92)

Corrosion resistance
Cromarod 310 is designed for high temperature oxidation applications and its resistance to wet corrosion is limited.

Scaling temperature:
Approx. 1150 °C in air. Reducing combustion gas, free of sulphur 1080 °C, maximum 2g S/m3 1040 °C.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,06	0,5	2,0			25,0	20,0
Typical	0,10	0,65	2,5	0,02	0,02	26,0	21,0
Max	0,20	0,75	2,8	0,030	0,025	27,0	22,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	410 MPa
Tensile Strength, Rm:	≥ 560 MPa	600 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		-60 °C • 60 J

Classification:

EN 1600	E 25 20 R 12
AWS A5.4	~E 310-17
ISO 3581-A	E 25 20 R 12

Approvals:
CE

Note
AWS: Slight deviation in Mn
Core wire:
P ≤ 0.030%
S ≤ 0.030%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74362500	50-70	23	0,67	79	0,7	58
3,2	350	74363200	70-110	23	0,67	40	1,1	74
4,0	350	74364000	110-155	25	0,67	27	1,5	78

Cromarod 310

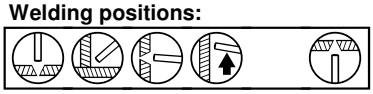
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 19

Description:
Cromarod 310 is a rutile coated electrode primarily intended for welding the 25%Cr / 20%Ni, type 310, fully austenitic stainless steels, used for corrosion and oxidation resistance at elevated temperatures. Cromarod 310 can also be used to join difficult-to-weld steels such as armour plate and ferritic stainless steels, as well as dissimilar steels. Although the weld metal is fully austenitic the composition has been carefully balanced to give good resistance to hot cracking.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 0 (WRC-92)

Corrosion resistance
Cromarod 310 is designed for high temperature oxidation applications and its resistance to wet corrosion is limited.

Scaling temperature:
Approx. 1150 °C in air. Reducing combustion gas, free of sulphur 1080 °C, maximum 2g S/m3 1040 °C.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,06	0,5	2,0			25,0	20,0
Typical	0,10	0,65	2,3	0,02	0,02	26,0	21,0
Max	0,20	0,75	2,5	0,030	0,025	27,0	22,0

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	410 MPa
Tensile Strength, Rm:	≥ 560 MPa	600 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		-60 °C • 60 J

Classification:

EN 1600	E 25 20 R 12
AWS A5.4	E 310-17
ISO 3581-A	E 25 20 R 12

Approvals:
CE

Note
Core wire:
P ≤ 0.030%
S ≤ 0.030%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74362500	50-70	23	0,67	79	0,7	58
3,2	350	74363200	70-110	23	0,67	40	1,1	74
4,0	350	74364000	110-155	25	0,67	27	1,5	78

Cromarod 312

SMAW - (Stick) - MMA

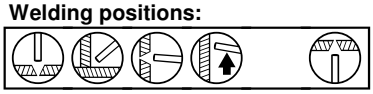
Stainless Steel

Date: 2009-02-27
Revision: 19

Description:
Cromarod 312 is a rutile flux coated electrode which deposits a 29%Cr / 9%Ni austenitic/ferritic stainless steel weld metal with a ferrite content of approximately FN 50. The weld metal exhibits excellent tolerance to dilution from dissimilar and difficult-to-weld materials without hot cracking.

Applications:
– Difficult-to-weld steels e.g. high carbon hardenable tool, die and spring steels, 13% Mn steels, free-cutting steels, high temperature steels (non-structural).
– Dissimilar joints between stainless and high carbon steels.
– Surfacing of metal-to-metal wear areas, hot working tools, furnace components.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 50 (WRC-92)

Corrosion resistance
Good resistance to sulphurous gases at high temperature. Good resistance to wet corrosion up to approximately 300 °C.

Scaling temperature:
Approx. 1100 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			28,0	8,0
Typical	0,10	1,2	0,8	0,02	0,02	29,0	9,0
Max	0,15	1,3	2,0	0,035	0,025	31,0	10,5

	Mo	Cu	V	Nb
Min				
Typical	0,2			
Max	0,5	0,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 450 MPa	590 MPa
Tensile Strength, Rm:	≥ 660 MPa	760 MPa
Elongation, A5	≥ 22%	25%

Classification:

EN 1600	E 29 9 R 32
AWS A5.4	~E 312-17
ISO 3581-A	E 29 9 R 32

Approvals:
CE

Note
All classifications: slight deviation in Si.
Core wire:
P ≤ 0.030%
S ≤ 0.030%
N ≤ 0.080%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74382500	40-80	25	0,64	90	1,1	34
3,2	350	74383200	80-120	26	0,64	47	1,5	44
4,0	350	74384000	100-160	27	0,65	31	2,1	55

Cromarod 253

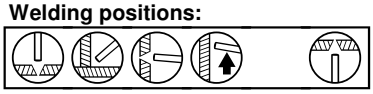
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 16

Description:
Cromarod 253 is a special rutile flux coated electrode designed for high temperature stainless steels of similar composition used at temperatures up to 1150 °C. The electrode is made on a fully alloyed core wire and deposits a 0.06%C / 22%Cr / 10.5%Ni / 0.17%N weld metal, microalloyed with the rare earth metal cerium to give stable high temperature mechanical and oxidation properties. Cromarod 253 runs with a low spatter arc to produce a smooth weld bead finish, easy slag detachability and particularly good vertical-up operability.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 4 (WRC-92)

Corrosion resistance
Designed for high temperature oxidation applications. Its resistance to wet corrosion is limited.

Scaling temperature:
Approx. 1150 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		1,2	0,4			21,5	9,5
Typical	0,06	1,5	0,5	0,02	0,005	22,0	10,5
Max	0,08	2,0	1,0	0,030	0,015	23,5	11,0

	Mo	Cu	V	Nb	N
Min					0,14
Typical					0,17
Max	0,3	0,3	0,1	0,1	0,20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	540 MPa
Tensile Strength, Rm:	≥ 550 MPa	700 MPa
Elongation, A5	≥ 25	35%
Impact energy, CV:		20 °C • 55 J
		-60 °C • 38 J

Classification:

Approvals:
CE

Note
Core wire:
P ≤ 0.025%
S ≤ 0.015%
0.14% ≤ N ≤ 0.20%
Ce ~0.05%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74552500	40-80	22	0,65	89	0,7	59
3,2	350	74553200	70-110	23	0,65	46	1,1	63
4,0	350	74554000	100-140	24	0,65	30	1,6	66

Cromarod Duplex

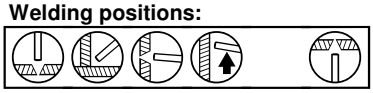
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 22

Description:
Cromarod Duplex is a rutile flux coated electrode which deposits a 24%Cr / 10%Ni / 3%Mo / 0.15%N austenitic-ferritic duplex stainless steel weld metal having a ferrite content of about FN 35. The electrode is easy to use and produces a smooth weld bead finish and good slag detachability. Cromarod Duplex is designed for welding similar composition duplex stainless steels which offer an excellent combination of high strength and very good resistance to chloride induced pitting and stress corrosion cracking. A heat input range of 0.5-2.5 KJ/mm is recommended to maintain a favourable phase balance. Applications include offshore platform pipework, pipelines transporting chloride bearing products or sour gas and process vessels for chloride environments. Where higher fracture toughness at -46 ℃ is required, use Cromarod Duplex B.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 35 (WRC-92)

Corrosion resistance
Very good resistance to pitting corrosion and stress corrosion cracking in chloride and H2S environments. Good resistance to intergranular corrosion.
Pitting resistance equivalent, PRE = 36
Critical pitting temp. CPT = 30 ℃ (ASTM G48).

Scaling temperature:
Approx. 850 ℃ in air.

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,6	0,5			21,0	7,5
Typical	0,02	0,9	0,7	0,02	0,02	23,5	9,5
Max	0,040	1,0	2,0	0,030	0,025	24,0	10,5

	Mo	Cu	V	Nb	N
Min	2,5				0,13
Typical	3,0				0,16
Max	4,0	0,5	0,1	0,1	0,20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 480 MPa	670 MPa
Tensile Strength, Rm:	≥ 690 MPa	840 MPa
Elongation, A5	≥ 22%	25%
Impact energy, CV:	-46 ℃ • ≥ 27 J	-46 ℃ • 34 J

Classification:

EN 1600	E 22 9 3 N L R 12
AWS A5.4	~E 2209-17
ISO 3581-A	E 22 9 3 N L R 12

Approvals:
LR
GL
TÜV
DNV
BV
CE

Note

AWS: Slight difference in Cr.

Core wire:
P ≤ 0.020%
S ≤ 0.010%
0.14% ≤ N ≤ 0.17%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74522500	60-90	24	0,62	92	1,1	33
3,2	350	74523200	80-120	25	0,64	45	1,4	50
4,0	350	74524000	130-170	26	0,64	30	2,0	54
5,0	450	74525000	160-220	30	0,64	14	2,7	87

Cromarod Duplex LP

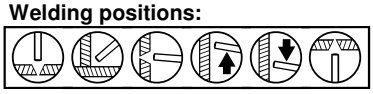
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 13

Description:
Cromarod Duplex LP is a fully positional rutile flux coated electrode designed specially for pipe-welding. It has a thin coating and fast-frezing slag, making it ideal for root runs. The electrode is intended for welding similar composition duplex stainless steels, e.g. 1.4462, UNS 31803. With thicker walled pipe it can be advantageous to use Cromarod Duplex LP for the root plus first passes and then continue with ordinary Cromarod Duplex.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 35 (WRC-92)

Corrosion resistance
Typical value: PRE 35
CPT 30°C (ASTM G48)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,6	0,5			21,0	7,5
Typical	0,02	1,0	0,8	0,02	0,02	23,2	9,2
Max	0,040	1,2	2,0	0,030	0,025	24,0	10,5

	Mo	Cu	V	Nb	N
Min	2,5				0,13
Typical	3,0				0,16
Max	4,0	0,5	0,1	0,1	0,20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 480 MPa	680 MPa
Tensile Strength, Rm:	≥ 690 MPa	800 MPa
Elongation, A5	≥ 24%	25%
Impact energy, CV:	-46 °C • ≥ 27 J	-46 °C • 32 J

Classification:

EN 1600	E 22 9 3 N L R 12
AWS A5.4	~E 2209-17
ISO 3581-A	E 22 9 3 N L R 12

Approvals:
CE

Note

AWS: Slight difference in Cr and Si.

Core wire:
P ≤ 0.020%
S ≤ 0.010%
0.14% ≤ N ≤ 0.17%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,0	300	74592000	20-45	21	0,67	145	0,7	40
2,5	300	74592500	35-85	22	0,75	80	1,0	38
3,2	350	74593200	50-110	22	0,71	44	1,2	62

Cromarod Duplex-140

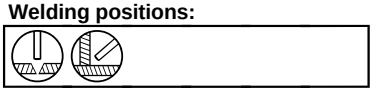
SMAW - (Stick) - MMA

Stainless Steel

Date: 2007-10-19
Revision: 17

Description:
Cromarod Duplex-140 is a rutile flux coated high deposition electrode with 140% recovery. It complements the normal recovery electrode Cromarod Duplex and is primarily intended for welding medium to heavy sections of duplex type stainless steels, e.g. W. 1.4462, SAF 2205, Uranus 45N. It can also be used for the lower alloyed duplex types W. 1.4362, SAF 2304 and Uranus 35N. The electrode is easy to use and produces smooth weld beads, slightly concave profile fillets and easy-releasing slag. A heat input range or 0.5-2.5 KJ/mm is recommended to maintain a favourable austenite-ferrite phase balance.

Welding positions:



Coating type:
Rutile, high recovery 140%

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 35 (WRC-92)

Corrosion resistance
Very good resistance to pitting corrosion and stress corrosion cracking in chloride and H2S environments. Good resistance to intergranular corrosion. Pitting resistance equivalent, PRE = 36.
CPT 30°C (ASTM G48)

Scaling temperature:
Approx. 850 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,6	0,5			21,0	7,5
Typical	0,02	0,9	0,7	0,02	0,02	23,7	9,8
Max	0,04	1,2	2,0	0,030	0,025	24,0	10,5

	Mo	Cu	V	Nb	N
Min	2,5				0,12
Typical	3,1				0,13
Max	4,0	0,5	0,1	0,1	0,20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 480 MPa	640 MPa
Tensile Strength, Rm:	≥ 690 MPa	810 MPa
Elongation, A5	≥ 20%	24%
Impact energy, CV:		20 °C • 50 J
		-20 °C • 40 J
		-40 °C • 35J

Classification:

EN 1600	E 22 9 3 N L R 53
AWS A5.4	~E 2209-17
ISO 3581-A	E 22 9 3 N L R 53

Approvals:
GL
LR
DNV
CE

Note
AWS: Deviation in Si and Cr

Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.008%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
3,2	350	74513200	110-130	31	0,62	33	1,7	55
4,0	450	74514000	130-170	32	0,63	18	2,4	80
5,0	450	74515000	170-230	33	0,63	11	3,4	90

Cromarod Duplex B

SMAW - (Stick) - MMA

Stainless Steel

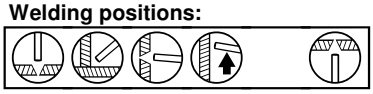
Date: 2009-02-27
Revision: 9

Description:
Cromarod Duplex B is a basic flux coated electrode intended for welding similar composition duplex stainless steels e.g. 1.4462, UNS 31803. The basic coating design produces a very low micro-oxide level in the deposit, giving excellent fracture toughness at temperatures down to -46 °C. Duplex stainless steels offer an excellent combination of high strength and very good resistance to chloride induced pitting and stress corrosion cracking.

A heat input range of 0,5-2,5 kJ/mm is recommended to maintain a favourable ferrite/austenite phase balance in the weld metal.

Applications:
Offshore, platform, pipework, pipelines transporting chloride bearing products, or sour gas and process vessels for chloride environments.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Ferrite content:
FN 35 (WRC-92)

Corrosion resistance
Typical value: PRE 36
CPT 30°C (ASTM G48)

Metal recovery:
110%

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,3	0,5			22,5	8,5
Typical	0,03	0,6	0,9	0,020	0,010	23,0	9,0
Max	0,04	0,90	2,0	0,030	0,020	23,5	10,0

	Mo	Cu	V	Nb	N
Min	3,0				0,15
Typical	3,2				0,17
Max	3,5	0,3	0,1	0,1	0,20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 450 MPa	630 MPa
Tensile Strength, Rm:	≥ 690 MPa	790 MPa
Elongation, A5	≥ 20%	27%
Impact energy, CV:	-50 °C • ≥ 47 J	-40 °C • 65 J
		-50 °C • 60 J

Classification:

EN 1600	E 22 9 3 NL B 42
AWS A5.4	E 2209-15
ISO 3581-A	E 22 9 3 NL B 42

Approvals:
CE

Note

Core wire:
P ≤ 0.020%
S ≤ 0.010%
0.14% ≤ N ≤ 0.17%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74622500	50-80	24	0,65	87	0,8	44
3,2	350	74623200	75-120	25	0,68	43	1,4	54
4,0	350	74624000	120-175	27	0,68	28	1,9	59

Cromarod 2507R

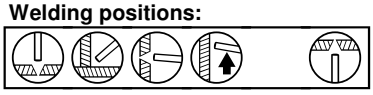
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-03-30
Revision: 14

Description:
Cromarod 2507R is a rutile flux coated electrode which deposits a 25%Cr/ 9.0%Ni / 4.0%Mo / 0.25%N super dupex type stainless steel weld metal with a ferrite content of approximately FN 57. The electrode is designed for welding similar composition steels e.g. SAF 2507, Uranus 52N, Zeron 100, which offer even higher strength and corrosion resistance levels than the ordinary duplex grades. A heat input range of 0.4-1.5 KJ/mm is recommended to maintain a favourable phase balance in the weld metal and avoid unfavourable precipitation effects in the plate. Applications include offshore platform pipework for seawater cooling systems and firefighting water, as well as pumps, valves and risers. Where good fracture toughness at temperatures down to -40 ℃ is required, use Cromarod 2507B.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 57 (WRC-92)

Corrosion resistance
Very good resistance to pitting corrosion and stress corrosion cracking in chloride and H2S environments. Good resistance to intergranular corrosion.
Pitting resistance equivalent, PRE = 42.
Critical pitting temperature CPT = 40℃ (ASTM G48).

Scaling temperature:
Approx. 850℃ in air.

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,50			24,0	8,0
Typical	0,02	0,8	0,7	0,02	0,01	25,0	9,0
Max	0,04	1,0	2,5	0,030	0,025	27,0	10,0

	Mo	Cu	V	Nb	N
Min	3,3				0,20
Typical	4,0				0,23
Max	4,5	0,5	0,1	0,1	0,30

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 550 MPa	700 MPa
Tensile Strength, Rm:	≥ 760 MPa	900 MPa
Elongation, A5	≥ 18%	22%
Impact energy, CV:		20 ℃ • 35 J

Classification:

EN 1600	E 25 9 4 N L R 12
AWS A5.4	E2594-17
ISO 3581-A	E 25 9 4 N L R 12

Approvals:
CE
DNV

Note
Typical value: PRE 42, CPT 40℃ (ASTM G48)

Core wire: P ≤ 0.015%, S ≤ 0.001%, 0.14% ≤ N ≤ 0.16%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,50	300	74532500	60-90	22	0,50	110	1,1	31
3,25	350	74533200	80-120	23	0,55	53	1,5	47
4,00	350	74534000	130-170	24	0,55	35	2,3	46

Cromarod 2507B

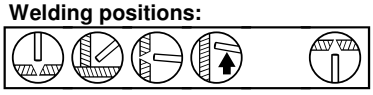
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 18

Description:
Cromarod 2507B is a basic flux coated electrode which deposits a 25%Cr / 9.0%Ni / 4.0%Mo / 0.25%N super dupex type stainless steel weld with a ferrite content of approximately FN 40. It is designed to give very good fracture toughness at temperatures down to -40 °C. The electrode is intended for welding similar composition steels e.g. SAF 2507, Uranus 52N, Zeron 100, which offer even higher strength and corrosion resistance levels than the ordinary duplex grades. A heat input range of 0.4-1.5 KJ/mm is recommended to maintain a favourable phase balance in the weld metal and avoid unfavourable precipitation effects in the plate. Applications include offshore platform pipework for seawater cooling systems and firefighting water, as well as pumps, valves and risers.

Welding positions:



Coating type:
Basic

Welding current:
DC+

Ferrite content:
FN 40 (WRC -92)

Corrosion resistance
Very good resistance to pitting corrosion and stress corrosion cracking in chloride and H2S environments. Good resistance to intergranular corrosion.
Pitting resistance equivalent, PRE = 41.
Critical pitting temperature CPT = 40°C (ASTM G48).

Scaling temperature:
Approx. 850°C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,7			24,0	8,0
Typical	0,03	0,4	0,85	0,02	0,02	25,0	8,5
Max	0,04	0,6	1,0	0,030	0,025	27,0	10.0

	Mo	Cu	V	Nb	N
Min	3,5				0,20
Typical	3,7				0,23
Max	4,5	0,5	0,1	0,1	0,30

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 550 MPa	750 MPa
Tensile Strength, Rm:	≥ 760 MPa	900 MPa
Elongation, A5	≥ 18%	24%
Impact energy, CV:		-40 °C • 55 J

Classification:

EN 1600	E 25 9 4 N L B 12
AWS A5.4	E2594-15
ISO 3581-A	E 25 9 4 N L B 12

Approvals:
CE

Note

Core wire:
P ≤ 0.020%
S ≤ 0.010%
0.14% ≤ N ≤ 0.17%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74572500	60-90	23	0,71	79	1,0	39
3,2	350	74573200	80-120	24	0,71	41	1,4	55
4,0	350	74574000	130-170	26	0,73	26	2,0	60

Cromarod 383

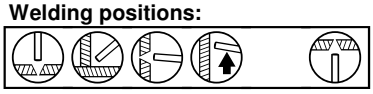
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-05-05
Revision: 11

Description:
Cromarod 383 is a rutile flux coated electrode specially designed for high alloyed fully austenitic stainless steels of similar composition e.g. Sandvik Sanicro 28. It deposits a 27%Cr / 31%Ni / 3.5%Mo / 1%Cu weld metal with exceptionally good corrosion resistance in non-oxidising acid environments, e.g. sulphuric and phosphoric. With a PRE of approximately 40, the electrode has even higher resistance to pitting corrosion than Cromarod 385.

Welding positions:



Coating type:
Rutile

Welding current:
DC+, AC OCV > 39V

Ferrite content:
FN 0 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,5			26,0	30,0
Typical	0,025	1,0	1,0	0,01	0,01	27,5	31,5
Max	0,035	1,1	2,5	0,02	0,02	29,0	33,0

	Mo	Cu	V	Nb
Min	3,2	0,6		
Typical	3,8	1,0		
Max	4,5	1,5	0,1	0,1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	400 MPa
Tensile Strength, Rm:	≥ 520 MPa	600 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		20 °C • 55 J

Classification:

EN 1600	E 27 31 4 Cu L R 12
AWS A5.4	~E383-17
ISO 3581-A	E 27 31 4 Cu L R 12

Approvals:
CE

Note

AWS: Slight deviation in C and Si
Core wire:
P ≤ 0.015%
S ≤ 0.010%
N ≤ 0.08%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,0	300	74642000	25-50	21	0,64	140	0,50	42
2,5	300	74642500	45-75	21	0,60	88	0,6	56
3,2	350	74643200	70-110	22	0,63	44	1,0	71
4,0	350	74644000	30-170	25	0,64	29	1,9	56

Cromarod 385

SMAW - (Stick) - MMA

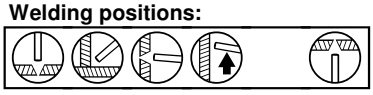
Stainless Steel

Date: 2009-02-27
Revision: 16

Description:
Cromarod 385 is a rutile flux coated electrode designed for welding the fully austenitic stainless steels of the 20%Cr / 25%Ni / 4.5%Mo / Cu type, used for their very high resistance to corrosion in severe, non-oxidising environments e.g. sulphuric acid. The low carbon, high alloy content of Cromarod 385 weld metal gives excellent resistance to intergranular corrosion and stress corrosion cracking, combined with superior resistance to crevice and pitting corrosion. Use no preheat, avoid high heat-input and maintain an interpass temperature of maximum 150 °C.

For very severe corrosion environments a special variant of this electrode, with a Mo content of 6%, is available to order.

Welding positions:



Coating type:
Rutile

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 0 (WRC-92)

Corrosion resistance
Very good resistance to general and intergranular corrosion in non-oxidising acid environments e.g. sulphuric (up to 90%), phosphoric and organic acids. Good resistance to stress corrosion in chloride bearing environments.

Scaling temperature:
Approx. 1000 °C in air.

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			1,0			19,0	24,0
Typical	0,02	0,8	1,1	0,02	0,02	20,5	25,5
Max	0,030	1,0	2,5	0,030	0,025	22,0	27,0

	Mo	Cu	V	Nb	N
Min	4,0	1,0			
Typical	4,2	1,5			
Max	7,0	2,0	0,1	0,1	0,250

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 350 MPa	380 MPa
Tensile Strength, Rm:	≥ 560 MPa	580 MPa
Elongation, A5	≥ 30%	35%
Impact energy, CV:		20 °C • 55 J

Classification:

EN 1600	E 20 25 5 Cu N L R 12
AWS A5.4	~E 385-17
ISO 3581-A	E 20 25 5 Cu N L R 12

Approvals:
CE

Note
AWS: Slight deviation in Si
Core wire:
P ≤ 0.020%
S ≤ 0.015%
N ≤ 0.08%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74502500	40-80	24	0,53	101	1,1	33
3,2	350	74503200	80-120	25	0,58	50	1,5	48
4,0	350	74504000	130-170	26	0,58	33	2,3	48

Cromarod 82

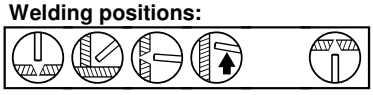
SMAW - (Stick) - MMA

Stainless Steel

Date: 2008-12-19
Revision: 16

Description:
Cromarod 82 is a basic flux coated nickel-base electrode intended for welding Inconel 600 and similar composition alloys. The deposit tolerates high dilution levels and is very resistant to hot cracking. It is not susceptible to sigma phase embrittlement or carbon migration and is therefore ideal for service at elevated temperatures.
Cromarod 82 is highly suitable for a wide range of dissimilar joint combinations between nickel-base alloys, Monels, mild and low alloy steels and austenitic stainless steels. It can also be used to clad carbon steels with an Inconel type surface. The weld metal exhibits very good fracture toughness at temperatures down to -196 ℃ and is suitable for welding 5% and 9% nickel steels for cryogenic applications.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Ferrite content:
FN 0 (WRC-92)

Corrosion resistance
Very good resistance to general and intergranular corrosion. Very good resistance to stress corrosion cracking.

High temperature properties:
The weld metal is resistant to oxidation
– in air up to 1150 ℃
– in sulphur dioxide up to 800 ℃
– in hydrogen sulphide up to 550 ℃
Yield strength at 800℃ is approx. 190 MPa.

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,2	4,0			18,0	63,0
Typical	0,03	0,4	5,5	0,005	0,005	18,5	bal.
Max	0,10	0,60	6,0	0,020	0,015	22,0	

	Mo	Cu	Nb	Fe
Min			1,5	
Typical	1,1		2,2	3,5
Max	2,0	0,5	3,0	4,0

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 380 MPa	400 MPa
Tensile Strength, Rm:	≥ 620 MPa	650 MPa
Elongation, A5	≥ 35%	40%
Impact energy, CV:	20 ℃ • ≥ 80 J	-196 ℃ • 60 J

Classification:

EN ISO 14172	E Ni 6082
AWS A5.11	E NiCrFe-3(mod.)

Approvals:
TÜV
CE

Note
AWS: Slight deviation in Cr compared to E NiCrFe-3

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74542500	50-70	25-27	0,60	100	0,8	46
3,2	300	74543200	70-95	25-27	0,62	58	1,1	59

Cromarod 625

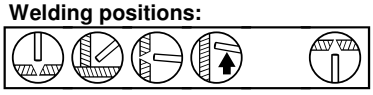
SMAW - (Stick) - MMA

Stainless Steel

Date: 2009-02-27
Revision: 17

Description:
Cromarod 625 is a basic flux coated nickel-base electrode intended for welding Inconel 625 and similar composition alloys which are primarily used for their excellent corrosion and oxidation resistance. They exhibit an exceptionally high resistance to pitting corrosion and chloride induced stress corrosion cracking. The electrode is very suitable for a wide range of dissimilar joint combinations between nickel-base alloys, mild and low alloy steels and stainless steels, especially where high temperature service conditions prevail. It can also be used to clad carbon steels with a high strength, highly corrosion resistant surface. Cromarod 625 weld metal gives good fracture toughness at temperatures down to -196 ℃ and is suitable for welding 5% and 9% nickel steels for cryogenic applications.

Welding positions:



Coating type:
Basic

Welding current:
DC +

Ferrite content:
FN 0 (WRC-92)

Corrosion resistance
Very good resistance to general and intergranular corrosion. Maximum resistance (practically immune) to pitting corrosion, crevice corrosion and stress corrosion cracking in chloride bearing environments.

High temperature properties:
Non-scaling in air up to 1150 ℃. Very high tensile strength and yield strength up to approx. 850 ℃ (Rp 0.2% ~400 MPa.

Redrying temperature:
350 ℃, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0,3	0,5			21,0	58,0
Typical	0,03	0,4	0,6	0,005	0,005	22,0	bal.
Max	0,05	0,7	1,5	0,020	0,015	23,0	

	Mo	Cu	Nb	Fe
Min	8,0		3,15	
Typical	9,0		3,4	2,0
Max	10,0	0,3	4,0	6,0

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 450 MPa	530 MPa
Tensile Strength, Rm:	≥ 720 MPa	770 MPa
Elongation, A5	≥ 30%	36%
Impact energy, CV:	20 ℃ • ≥ 50 J	20 ℃ • 60 J
		-196 ℃ • 43 J

Classification:

EN ISO 14172	E Ni 6625
AWS A5.11	E NiCrMo-3

Approvals:
CE

Note
Core wire:
P ≤ 0.010%
S ≤ 0.005%

Produkt data:

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/ kg electrodes	No. of electrodes/ kg weld metal	Kg weld metal/ hour arc time	Burn-off time/ electrode (sec.)
2,5	300	74562500	45-70	25-27	0,67	80	0,9	47
3,2	300	74563200	60-105	25-27	0,71	49	1,4	49
4,0	350	74564000	85-130	25-27	0,71	26	1,7	70

Cromarod 625-170

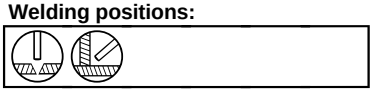
SMAW - (Stick) - MMA
Stainless Steel

Date: 2007-10-19
Revision: 11

Description:
Cromarod 625-170 is a rutile-basic flux coated, high deposition nickel-base electrode of type Inconel 625 type, with 170% recovery. The weld metal provides very high resistance to pitting, crevice and stress corrosion and is suitable for a wide range of applications from -80 °C temperature up to +550 °C. Cromarod 625-170 runs with a stable arc to produce a smooth weld bead finish and easy slag detachability. It is practically suitable for high productivity fillet welding and surfacing applications.

Applications:
For welding of high alloyed austenitic steels and nickel base alloys.
Material no. 1.4529, 1.4539, 2.4618, 2.4619, 2.4856.
Welding of dissimilar joint combinations of mild and low alloy steels to stainless steels, especially where high temperature conditions prevail.

Welding positions:



Coating type:
Basic high recovery, 170%

Welding current:
DC +, AC 0CV > 39V

Ferrite content:
FN 0 (WRC-92)

Redrying temperature:
350 °C, 2h

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0,3			20,0	56,0
Typical	0,04	0,6	0,7	0,01	0,01	21,0	bal
Max	0,10	0,75	1,0	0,020	0,015	23,0	

	Mo	Cu	Nb	Fe
Min	8,0		3,15	
Typical	9,0		3,4	2,0
Max	10,0	0,5	4,15	7,0

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 420 MPa	460 MPa
Tensile Strength, Rm:	≥ 700 MPa	730 MPa
Elongation, A5	≥ 25%	33%
Impact energy, CV:	20 °C • ≥ 40 J	20 °C • 45 J
	-80 °C • ≥ 32 J	-80 °C • 35 J

Classification:

EN ISO 14172	E Ni 6625
AWS A5.11	E NiCrMo-3

Approvals:
TÜV
CE

Note
Core wire:
P ≤ 0.005%
S ≤ 0.005%

Product data

Diam.mm	Length mm	Product code	Current A	Voltage V	Kg weld metal/kg electrodes	No. of electrodes/kg weld metal	Kg weld metal/hour arc time	Burn-off time/electrode (sec.)
2,5	350	74842500	80-120	23	0,67	42	1,1	73
3,2	350	74843200	120-160	23	0,70	26	1,5	78
4,0	350	74844000	180-220	23	0,73	18	2,3	79

Elgaloy Hard 30

REPAIR & MAINTENANCE

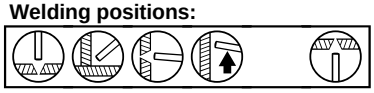
Other

Date: 2007-10-19
Revision: 12

Description:
Elgaloy Hard 30 deposits a martensitic type weld metal with a hardness of around 35 HRC. Suitable as a build-up material or buffer layer under a harder weld metal. The deposit has moderate abrasion resistance, very good impact resistance and is machinable. Also available as a self-shielded flux cored wire, Elgaloy Hard R 30.

Applications:
Rails, roller guides, mill rolls, track wheels, tractor rolls and idler wheels etc.

Welding positions:



Shielding gas:

Coating type:
Basic

Metal recovery:
120%

Hardness as welded:
360 - 430 HB, 380 - 450 HV 10

Welding current:
DC +, AC

Chemical composition, wt.%

	C	Si	Mn	Cr
Min	0,11	0,4	0,6	2,3
Typical	0,13	0,6	0,8	2,8
Max	0,15	0,8	1,0	3,3

Classification:
DIN 8555-83 E1-UM-350

Approvals:

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
3,2	70303210	100-140		

Elgaloy Hard 60 M

REPAIR & MAINTENANCE

Other

Date:	2002-04-12
Revision:	1

Description:
Elgaloy Hard 60 M is a solid wire producing a martensitic weld metal with a hardness of 55-60 HRC. The deposit exhibits a good wear resistance under conditions of abrasion and friction coupled with moderate impact and can be shaped by grinding.

Applications:
Excavator teeth, bulldozer blades, swing hammers, crusher jaws, scrapers etc.

Wire composition, wt.%

	C	Si	Mn	P	S	Cr
Min						
Typical	0,45	2,95	0,35	0,025	0,002	9,20
Max						

Shielding gas:
acc. to EN 439-94
M21, Ar + 15-25% CO2, 7-12 l/min.

Hardness as welded:
55-60 HRC

Welding current:
DC +

Chemical composition, wt.%

Classification:

DIN 8555	MSG6-60GZ
Werkstoff no.	1.4718

Approvals:

Note

With shielding gas M21.
Machineability: grinding only.

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
1,00	7031-1040	180-240	24-28	K-300 Spool type
1,20	7031-1240	220-320	26-32	K-300 Spool type
1,60	7031-1640	282-460	28-38	K-300 Spool type

Elgaloy Hard 100

REPAIR & MAINTENANCE

Other

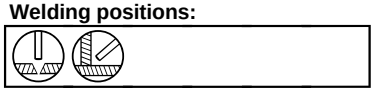
Date: 2007-10-19
Revision: 13

Description:
Elgaloy Hard 100 is a high recovery electrode, producing a weld metal deposit extremely rich in chromium carbides which is highly resistant to abrasion but exhibits limited impact resistance. Ideal for hardsurfacing components used in the mining and quarrying industries. Good wear and corrosion resistance at elevated temperatures. Surface cracking is normal and can be reduced by preheating to 250-450°C. A buffer layer of Elgaloy Mix 18 is recommended for heavy build-ups or surfacing 13% Mn steels to prevent crack propagation into base material. Deposits are not machinable but can be ground. Also available as a self-shielded flux cored wire, Elgaloy Hard R 100 and as a flux coated tubular electrode, Elgaloy Tube 100, designed to give high deposition rates at very low welding currents.

Guide for usage:
The electrode is preferably to be used with DC+, to create a thick build up also AC is possible to use.

Applications:
Excavator teeth, dredger bucket lips, sizing screens, rollers, screw conveyors, scraper and mixer blades, crusher jaws and hammers, chutes, agricultureimplements, rolling mill guides sinter plant.

Welding positions:



Shielding gas:

Coating type:
Special

Metal recovery:
175 %

Hardness as welded:
58-61 HRC, 700 - 740 HV10

Welding current:
DC + (AC)

Chemical composition, wt.%

	C	Cr	Mo	V
Min	3,0	29,0	0,45	0,30
Typical	3,5	30	0,5	0,4
Max	4,5	32,0	0,6	0,50

Classification:
DIN 8555-83 E10-UM-65-Z

Approvals:

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
3,2	70343210	115-140		
4,0	70344010	140-190		

Elgaloy Mix 18

REPAIR & MAINTENANCE

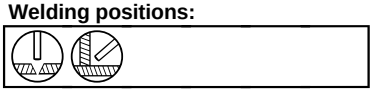
Other

Date:	2007-10-19
Revision:	13

Description:
Elgaloy Mix 18 is a rutile-coated, 160% recovery electrode of the 307 type, intended for joining and building up 13% Mn steels and welding armour plate and difficult-to-weld steels, without the need for preheat. It is also recommended for dissimilar joints between stainless and mild or medium carbon steels. In contrast to Elgaloy Mix 29, welds produced with Elgaloy Mix 18 can be stress-relieved without risk of sigma-phase formation and consequent loss of ductility. The deposit work hardens from 200 HV to 450 HV. Also available as a self-shielded flux cored wire, Elgaloy Mix 18 R.

Applications:
Buffer layer on 13% Mn steels used in rock crushing and earth moving equipment prior to surfacing with Elgaloy 100, and also rails, rail crossings, frogs etc. without preheat.

Welding positions:



Shielding gas:

Coating type:
Rutile

Metal recovery:
160%

Hardness:

Hardness as welded:
200 HV

Hardness work hardened:
450 HV

Welding current:
DC +, AC

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,040	0,40	3,30			17,0	9,0
Typical	0,05	0,6	3,6			18,0	9,5
Max	0,14	0,90	4,80	0,035	0,025	20,0	10,0

	Mo
Min	
Typical	<0,3
Max	

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		475 N/mm²
Tensile Strength, Rm:		660 N/mm²
Elongation, A5		40 %

Classification:

EN 1600	~E 18 8 Mn R 53
AWS A5.4	~E 307-26

Approvals:

Note

AWS: Nearest classification
EN: Deviation in Mn

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
2,5	70402510	70-115		
3,2	70403210	90-155		
4,0	70404010	130-210		
5,0	70405010	160-260		

Elgaloy Mix 18B

REPAIR & MAINTENANCE

Other

Date: 2008-07-07
Revision: 5

Description:

Elgaoly Mix 18B is an all positional basic-coated electrode which deposits a 19% Cr / 9% Ni / 6% Mn fully austenitic stainless steel weld metal with excellent toughness and crack resistance. It is intended for joining hardenable steels, armour plate, 13% Mn steels and difficult-to-weld steels, without the need for preheat. It is also recommended for dissimilar joints between stainless and mild or medium carbon steels. Welds produced with Elgaloy Mix 18B can be PWHT without risk of sigma-phase formation and consequent loss of ductility. The deposit work hardens from 200 HV to 450HV.

Applications:

Buffer layers on 13% Mn steels used in rock crushing and earth moving equipment, prior to hardfacing. Reclaiming 13% Mn steels. Surfacing of rails, rail crossings, frogs etc. Buffer layers in highly restrained repair work.

Coating type:
Basic

Metal recovery:
110%

Redrying temperature:
200 ℃, 1h

Hardness as welded:
200 HV

Hardness work hardened:
450HV

Ferrite content:
0

Welding current:
DC+

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			4,5			17,0	7,0
Typical	0,09	0,5	5,5	0,02	0,02	18,5	9,3
Max	0,14	0,9	7,5	0,035	0,035	20,0	10,0

	Mo
Min	
Typical	0,1
Max	0,5

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	>350N/mm2	440N/mm2
Tensile Strength, Rm:	>590N/mm2	650N/mm2
Elongation, A5	>30%	40%
Impact energy, CV:		20C 80J

Classification:

EN 1600-97	E 18 8 Mn B 12
AWS A5.4	~E 307-15

Approvals:

Note

AWS A 5.4: Mn 3,3-4,75%; Mo 0,5-1,5%

Product data:

Dim.mm	Product code	Current A	Voltage V	
3,2x350	70413210	80-110	24	
4,0x350	70414010	110-150	25	

Elgaloy Cast-Ni

REPAIR & MAINTENANCE

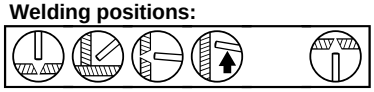
Other

Date: 2007-10-19
Revision: 20

Description:
Elgaloy Cast-Ni is a pure nickel electrode for general purpose welding of all types of cast iron. It is suitable for the joining and repair of grey and malleable cast irons and dissimilar joints between these and steel, monel and stainless steels. The electrode will tolerate dirty and contaminated surfaces. No preheat is required for small castings and thin sections up to 15 mm. Above this, preheat up to about 150°C is recommended.
Joint surfaces should be prepared by gouging with Elgaloy Cut or grinding. Select smallest diameter electrode practical, deposit short thin stepped layers and lightly peen the weld beads during welding to reduce shrinkage strains. Avoid arc striking on the base metal. On completion allow the work piece to cool slowly. The deposit is soft and fully machinable.

Applications:
Grey and malleable cast irons, machine bases, engine blocks and gear housings.

Welding positions:



Shielding gas:

Coating type:
Special

Hardness as welded:
150-170 HV

Welding current:
DC + / (-), AC

Chemical composition, wt.%

	C	Ni	Fe
Min	0,3	92	0,5
Typical	0,5	94	2,5
Max	2,0	96	5,0

Mechanical properties

	Specified	Typical
Tensile Strength, Rm:		240-290 N/mm²
Elongation, A5		8%

Classification:

EN-ISO 1071	E Ni-CI 3
AWS A5.15-90	E Ni-CI

Approvals:

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
2,5	70512510	50-90		
3,2	70513210	80-120		

Elgaloy Cast-NiFe

REPAIR & MAINTENANCE

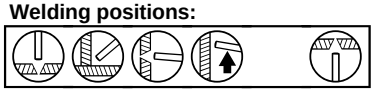
Other

Date: 2007-10-19
Revision: 15

Description:
Elgaloy Cast-NiFe is designed to produce a higher, matching strength weld metal for joining malleable, nodular and S.G. irons. It is also suitable for joining these to mild, low alloy and stainless steels.
Elgaloy Cast-NiFe is less sensitive to hot cracking sometimes caused by impurities in castings, compared to pure nickel type electrodes. Thin sections can be welded cold, but thicker sections may require preheat of approx. 150-300°C. When welding without preheat, use low heat input method. Lightly peen weld beads during welding of thicker sections. On completion allow the workpiece to cool slowly. The deposit is fully machinable.

Applications:
Spheroidal graphite, nodular and ductile cast irons e.g, machine bases, transmission housings, gear boxes, engine blocks and pump bodies.

Welding positions:



Shielding gas:

Coating type:
Special

Hardness as welded:
180-200 HV

Welding current:
DC +/-, AC

Chemical composition, wt.%

	C	Ni	Fe
Min	0,9	52	
Typical	1,0	54	bal.
Max	2,0	56	

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		320-360
Tensile Strength, Rm:		400-450 N/mm²
Elongation, A5		8%

Classification:

EN-ISO 1071	E NiFe-1 3
AWS A5.15-90	E NiFe-CI

Approvals:

Product data

Diam.mm	Product code	Current A	Voltage V	Delivery form
2,5	70522510	50-90		
3,2	70523210	80-120		

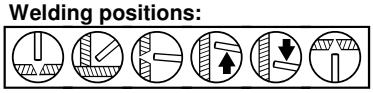
Elgacore DWA 50

FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	14

Description:
Elgacore DWA 50 is a rutile flux cored wire for use with an Ar/CO2 gas shield. The wire is all-positional and runs with a very stable, soft arc producing excellent weld bead shape and finish with negligible spatter. The slag is easily detachable and fume emission is very low. It is suitable for welding mild and medium strength carbon manganese structural steels and produces excellent root beads on ceramic backing. Ease of use and high productivity, in combination with good mechanical properties and a weld metal hydrogen content less than 5 ml/100g, make Elgacore DWA 50 an extremely versatile general purpose cored wire.

Welding positions:



Welding current:
DC +

Deposition efficiency:
88%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.06	0.4	1.2	0.015	0.007		
Max	0.18	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	520 MPa
Tensile Strength, Rm:	500-640 MPa	590 MPa
Elongation, A5	≥ 22%	28%
Impact energy, CV:	–20 °C •> 47 J	–20 °C • 75 J

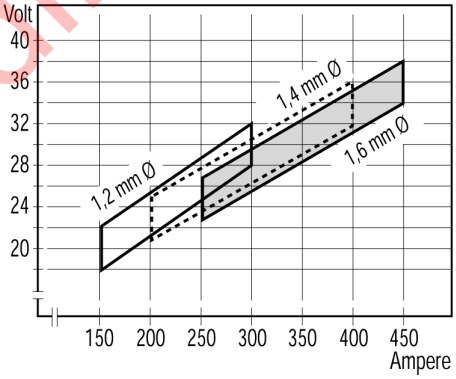
Classification:

EN 758	T 42 2 P M 1 H5
EN ISO 17632	T 42 2 P M 1 H5
AWS A5.20	E 71T-1M

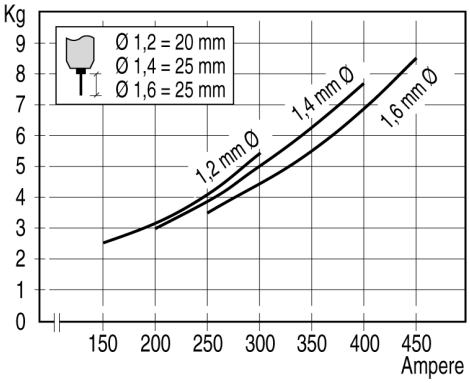
Approvals:

ABS	3YSA H5
RINA	3 YS
DNV	III YMS H5
BV	SA3YM HHH
LR	3S, 3YS H5
DB	42.042.09
MRS	3Y40MS HHH
TÜV	07375.01
GL	3 YH5S
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95601012	15 kg WBS
1,2	95602012	15 kg PSP
1,2	95602112	5 kg PSP
1,2	95602212	250 kg AutoPac
1,4	95602014	15 kg PSP
1,4	95602214	250 kg AutoPac
1,6	95602016	12,5 kg PSP
1,6	95602316	200 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

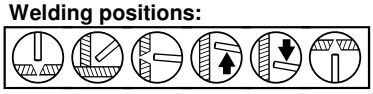
Elgacore DWX 50

FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	8

Description:
Elgacore DWX 50 is a rutile flux cored wire for use with an Ar/CO2 or straight CO2 gas shield. Elgacore DWX 50 is mainly developed for welding on thinner materials where low current and small fillets are required. The wire is all-positional and runs with a very stable, soft arc producing excellent weld bead shape and finish with negligible spatter. The slag is easily detachable and fume emission is very low. It is suitable for welding mild and medium strength carbon manganese structural steels and produces excellent root beads on ceramic backing. Ease of use and high productivity, in combination with good mechanical properties and a weld metal hydrogen content less than 5 ml/100g, makes Elgacore DWX 50 an extremely versatile cored wire for material thicknesses down to 5mm.

Welding positions:



Welding current:
DC +

Deposition efficiency:
88%

Shielding gas:
100% CO2, 22-25 l/min
80% Ar+20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.06	0.5	1.4	0.015	0.007		
Max	0.18	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	540 MPa
Tensile Strength, Rm:	500-640 MPa	600 MPa
Elongation, A5	≥ 22%	28%
Impact energy, CV:	–20°C • >47 J	–20°C • >75 J

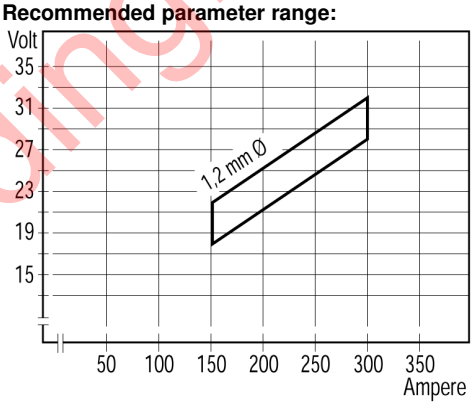
Classification:

EN 758	T 42 2 P C/M 1 H5
EN ISO 17632	T 42 2 P C/M 1 H5
AWS A5.20	E 71T-1/-1M

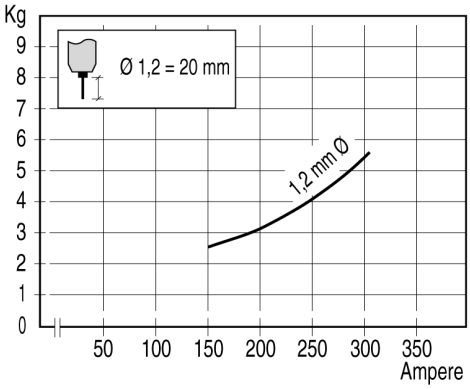
Approvals:

ABS	3YSA H5
GL	3YH5S
DNV	III YMS H5
LR	3S, 3YS H5
RINA	3YS
MRS	3Y40MS HHH
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95872112	5 kg PSP
1,2	95871012	15 kg WBS
1,2	95872012	15 KG PSP

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

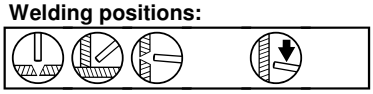
Elgacore DWA 52F

FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	7

Description:
Elgacore DWA 52F is a rutile flux cored wire especially designed for welding standing fillets (2F/PB), and produces a mitre bead profile and exceptionally smooth bead surface. This wire operates with a soft but deep penetrating arc which produces negligible spatter loss combined with easy slag removal.

Welding positions:



Welding current:
DC +

Deposition efficiency:
90%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min.

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.05	0.54	1.35	0.012	0.007		
Max	0.18	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	500 MPa
Tensile Strength, Rm:	500-640 MPa	590 MPa
Elongation, A5	≥ 22%	30%
Impact energy, CV:	–20°C • >47J	–20°C • 65J

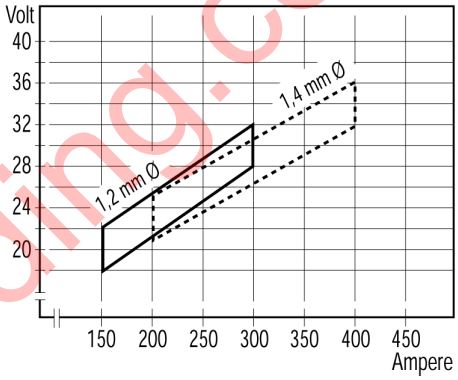
Classification:

EN 758	T 42 2 R M 1 H5
EN ISO 17632	T 42 2 R M 1 H5
AWS A5.20	E71T-1M

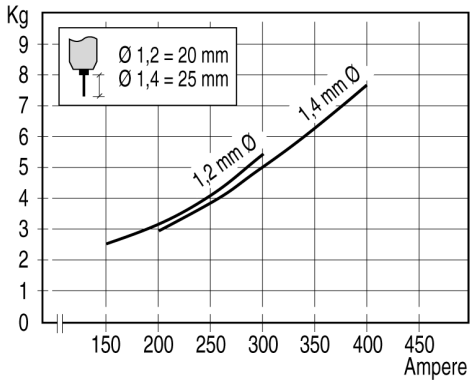
Approvals:

GL	3Y40H5S
LR	3Y40S H5
DNV	IIIY 40S H5

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95501012	15 kg WBS
1,2	95502012	15 kg PSP
1,4	95502014	15 kg PSP
1,4	95502214	250 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

Elgacore DWA 51B

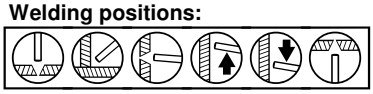
FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	13

Description:
Elgacore DWA 51B is a basic flux cored wire with excellent operating characteristics and is suitable for steels with a tensile strength up to 600 N/mm2. It produces weld metal with superior crack resistance under difficult conditions of high restraint and exhibits good low temperature fracture toughness. Weld deposit hydrogen levels are typically 3 ml/100 g. Elgacore DWA 51B welds with a stable arc and gives high deposition rates with low spatter levels in the flat and horizontal-vertical positions.

Applications:
Recommended for multipass welding of medium and thick section carbon-manganese steels used for shipbuilding, bridge construction and heavy machinery and plant.

Welding positions:



Welding current:
DC -/+

Deposition efficiency:
86%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.08	0.5	1.5	0.015	0.008		
Max	0.18	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥ 420 MPa	490 MPa	420 MPa
Tensile Strength, Rm:	500-640 MPa	600 MPa	530 MPa
Elongation, A5	≥ 22%	30%	28%
Impact energy, CV:	–20 °C •> 47 J	–20 °C • 100 J	–20 °C • 100 J
	–40 °C •> 27 J	–40 °C • 65 J	

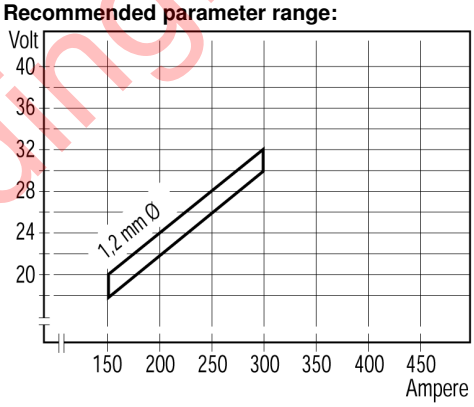
Classification:

EN 758	T 42 2 B M 1 H5
EN ISO 17632	T 42 2 B M 1 H5
AWS A5.20	E 71T-5MJ

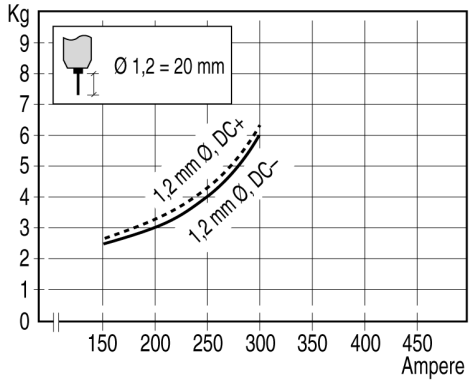
Approvals:

LR	3YS H5
DNV	III YMS H5
TÜV	07658.00
GL	3YH5S
BV	SA3YM HHH
DB	42.042.07
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95571012	15 kg WBS
1,2	95572012	15 kg PSP
1,2	95572112	5 kg PSP
1,2	95572212	250 kg AutoPac
1,6	95572016	12,5 kg PSP

Note

Welding current: DC- is recommended.
PWHT: SR at 580°C, 2h.
Strip:
S ≤ 0.012%
P ≤ 0.015%

N ≤ 0.004%

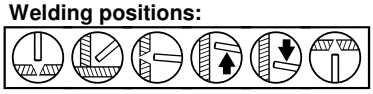
Elgacore DWA 55E

FCAW - Flux cored arc welding
Un-alloyed

Date: 2009-02-19
Revision: 20

Description:
Elgacore DWA 55E is a rutile flux cored wire for use with an Ar/CO2 gas shield and deposits a 0.4% Ni alloyed weld metal designed to meet requirements for very good fracture toughness at temperatures down to –40°C. The wire has excellent welding characteristics in all positions and very low fume emission. With its good weld metal ductility and hydrogen content of around 5 ml/100 g, Elgacore DWA 55E is recommended for high integrity fabrication of medium to heavy sections in structural steelwork, shipbuilding and pipeline construction.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.05	0.5	1.3	0.015	0.008		0.4
Max	0.18	0.90	1.75	0.03	0.03	0.20	0.5

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	570 MPa
Tensile Strength, Rm:	500-640 MPa	630 MPa
Elongation, A5	≥ 20%	27%
Impact energy, CV:	–40°C • >47 J	–40°C • 80 J

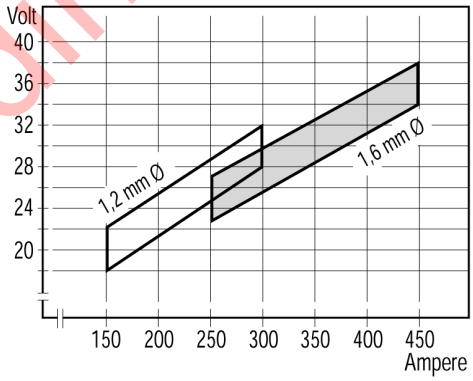
Classification:

EN 758	T 42 4 P M 1 H5
EN ISO 17632	T 42 4 P M 1 H5
AWS A5.20	E 71T-9MJ

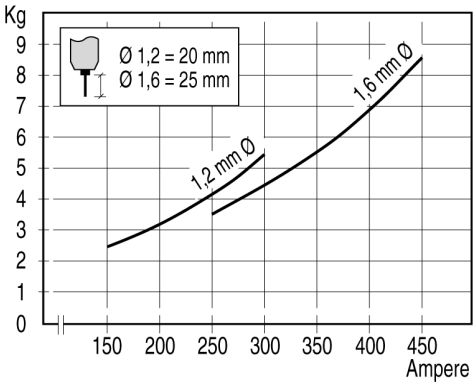
Approvals:

ABS	3YSA
LR	4Y40S H5
DNV	IV YMS H5
DB	42.042.06
TÜV	7124.00
MRS	4Y 42 MS HHH
BV	SA3YM HHH
GL	4Y40H5S
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95641012	15 kg WBS
1,2	95642012	15 kg PSP
1,2	95642112	5 kg PSP
1,2	95642212	250 kg AutoPac
1,6	95642016	12,5 kg PSP

Note

Strip:
S ≤ 0.015%

P ≤ 0.025% N ≤ 0.004%

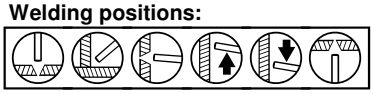
Elgacore DW 588

FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	12

Description:
Elgacore DW 588 is a rutile flux cored wire for use with a CO2 gas shield and deposits a 0.5% Ni / 0.5% Cr / 0.4% Cu weld metal designed for welding weather-resisting steels similar to Cor-Ten. The weld metal also resists preferential corrosion in seawater. Elgacore DW 588 is all-positional and runs with a very stable, smooth arc. The combination of negligible spatter, easily detached slag and smooth bead finish minimises the need for post-weld dressing and contributes to increased productivity.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0.35	0.50			0.45	0.4
Typical	0.04	0.6	1.2	0.014	0.01	0.5	0.5
Max	0.12	0.80	1.30	0.03	0.03	0.70	0.80

	Mo	Cu	V	Nb
Min		0.30		
Typical		0.4		
Max	0.35	0.75	0.05	0.05

Mechanical properties

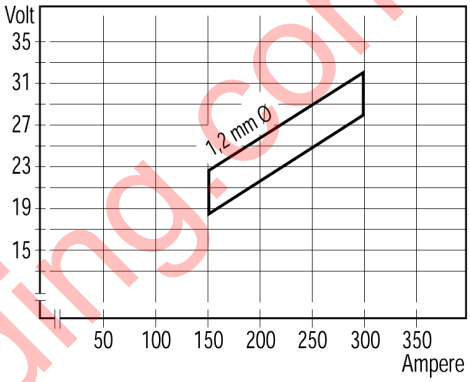
	Specified	Typical
Yield strength, Re:	≥ 500 MPa	530 MPa
Tensile Strength, Rm:	560-690 MPa	610 MPa
Elongation, A5	≥ 19%	26%
Impact energy, CV:	–30°C •> 47 J	–30°C • 50 J

Classification:

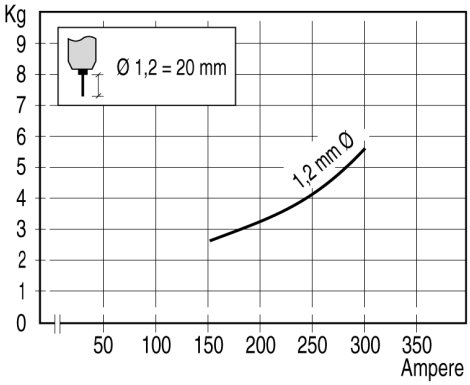
EN 758	T 50 0 Z P C 1 H10
EN ISO 17632	T 50 0 Z P C 1 H10
AWS A5.29	E 81T1-W2

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95582012	15 kg PSP

Note

Strip:
S ≤ 0.012%
P ≤ 0.015%
N ≤ 0.004%

Elgacore MXA 100

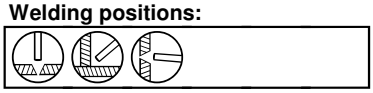
FCAW - Flux cored arc welding

Un-alloyed

Date:	2009-02-19
Revision:	20

Description:
Elgacore MXA 100 is a metal cored wire for use with an Ar/CO2 gas shield, designed for high productivity welding in the horizontal and horizontal-vertical positions. The wire runs with a stable, low spatter and deep penetrating arc. The slag produced is of a very low level, similar to that from a solid wire and inter-run deslagging is not necessary. Combined with a highly reliable arc-start, these characteristics make Elagacore MXA 100 an ideal choice for robotic or mechanised welding. Elgacore MXA 100 produces a very low hydrogen weld metal and good mechanical properties. Suitable for general fabrication and structural steels.

Welding positions:



Welding current:
DC +

Deposition efficiency:
96%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.05	0.75	1.55	0.011	0.009		
Max	0.12	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	460 MPa
Tensile Strength, Rm:	500-640 MPa	555 MPa
Elongation, A5	≥ 22%	30%
Impact energy, CV:	–40 °C • >47 J	–40 °C • 80 J

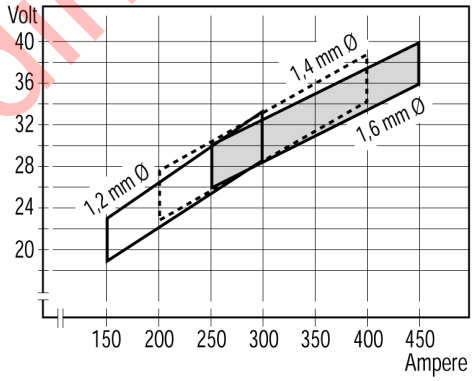
Classification:

EN 758	T 42 4 M M 3 H5
EN ISO 17632	T 42 4 M M 3 H5
AWS A5.18	E 70C-6M

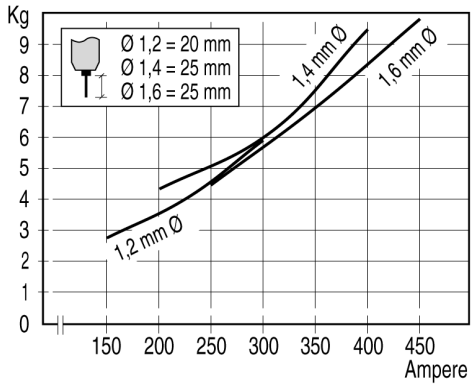
Approvals:

BV	SA4YM HHH
TÜV	07657.01
GL	4YH5S
ABS	3YSA
DB	42.042.10
DNV	IV YMS H5
LR	3S, 4YS H5
MRS	4Y42MSH5
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95621012	15 kg WBS
1,2	95622012	20 kg PSP
1,2	95622112	5 kg PSP
1,2	95622212	250 kg AutoPac
1,4	95621014	15 kg WBS
1,4	95622014	20 kg PSP
1,4	95622214	250 kg AutoPac
1,6	95622016	20 kg PSP
1,6	95622216	250 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

Elgacore MXX 100

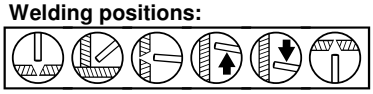
FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	10

Description:
Elgacore MXX 100 is a fully positional metal cored wire for use with Ar/CO2 or CO2 shielding gas. Specially designed for manual or mechanised welding of thinner and medium thick material. Excellent welding characteristics with a spatter-free arc, producing little slag and offering good resistance to porosity. Elgacore MXX 100 combines ease of use, high productivity and good mechanical properties down to -30°C. Superior wire feeding and a weld hydrogen content less than 5 ml/100g. Suitable for welding mild and medium strength carbon manganese structural steels.

Applications:
Applications include general fabrication, structural steelwork, bridge building and shipbuilding.

Welding positions:



Welding current:
DC +

Deposition efficiency:
96%

Shielding gas:
CO2, 22-25 l/min
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0,07	0,5	1,5	0.015	0.014		
Max	0.12	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	450 MPa
Tensile Strength, Rm:	500-640 MPa	570 MPa
Elongation, A5	≥ 22%	29%
Impact energy, CV:	–29°C • >47 J	–29°C • 75 J

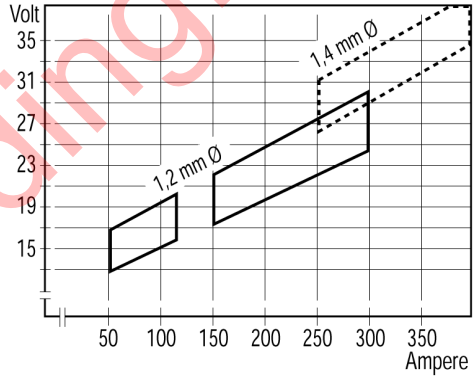
Classification:

EN 758	T 42 2 M C/M 1 H5
EN ISO 17632	T 42 2 M C/M 1 H5
AWS A5.18	E 70C-6M/-6C

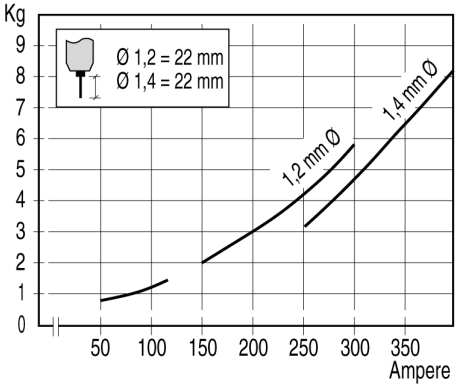
Approvals:

DNV	III YMS H5
GL	3YH5S
LR	3Y,3YS H5
DB	042.42.12
TÜV	09774.00
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95551012	15 kg WBS
1,2	95552012	20 kg PSP
1,2	95552112	5 kg PSP
1,2	95552212	250 kg AutoPac
1,4	95552014	20 kg PSP
1,4	95552214	250 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

Elgacore MXA 100XP

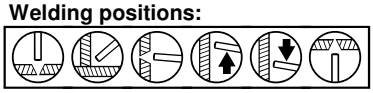
FCAW - Flux cored arc welding

Un-alloyed

Date: 2009-02-19
Revision: 6

Description:
Elgacore MXA 100XP is a highly versatile metal cored wire for use with an Ar/CO2 gas shield, designed for high productivity manual or mechanised welding. It is fully positional, including exceptionally good vertical down operability using negative polarity. For all other positions, apart from vertical down, either DC – or DC + may be employed with equally good stable, low spatter arc characteristics. Elgacore MXA 100XP has good fracture toughness down to –40°C and with its superior wire feeding and weld hydrogen content less than 5 ml/g is ideal for general fabrication, structural steelwork and shipbuilding.

Welding positions:



Welding current:
DC- / DC+

Deposition efficiency:
96%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.07	0.45	1.45	0.010	0.010		
Max	0.12	0.90	1.75	0.030	0.030	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 460 MPa	485 MPa
Tensile Strength, Rm:	530-680 MPa	580 MPa
Elongation, A5	≥ 20%	27%
Impact energy, CV:	–40°C • >47 J	–40°C • 80 J

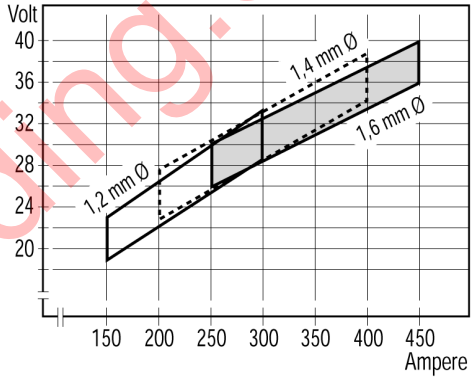
Classification:

EN 758	T 46 4 M M 1 H5
EN ISO 17632	T 46 4 M M 1 H5
AWS A5.18	E 70C-6M

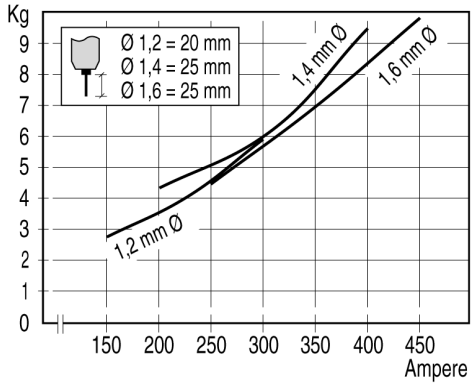
Approvals:

DnV	IV Y42 H5
LR	4Y42 H5
GL	4Y 40 H5S
TÜV	10770.00
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95671012	15 kg WBS
1,2	95672012	15 kg PSP
1,2	95671112	5 kg WBS
1,2	95672112	5 kg PSP

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

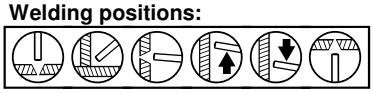
Elgacore MX 100T

FCAW - Flux cored arc welding
Un-alloyed

Date:	2009-02-19
Revision:	17

Description:
Elgacore MX 100T is a metal cored wire for use with a CO2 or Ar/CO2 gas shield, specially designed for single-sided welding of thinner section material. The wire is all-positional and runs with a very stable, spatter-free arc even under dip transfer conditions at welding currents as low as 50 A. Root passes normally made with the TIG or MMA process can be carried out with Elgacore MX 100T to give significantly increased productivity, making the wire particularly suitable for pipe welding. Elgacore MX 100T has good notch toughness properties down to –30°C and is recommended for general fabrication and structural steel work.

Welding positions:



Welding current:
DC +

Deposition efficiency:
96%

Shielding gas:
CO2, 22-25 l/min
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min							
Typical	0.07	0,5	1,5	0.015	0,014		
Max	0.12	0.90	1.75	0.03	0.03	0.20	0.50

	Mo	Cu	V	Nb
Min				
Typical				
Max	0.20	0.30	0.08	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 420 MPa	450 MPa
Tensile Strength, Rm:	500-640 MPa	570 MPa
Elongation, A5	≥ 22%	29%
Impact energy, CV:	–29°C • >47 J	–20°C • 60 J

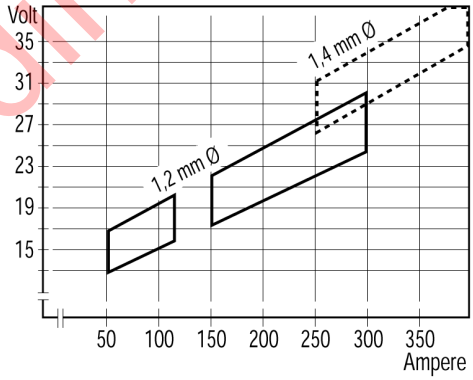
Classification:

EN 758	T 42 2 M C/M 1 H5
EN ISO 17632	T 42 2 M C/M 1 H5
AWS A5.18	E 70C-6M/-6C

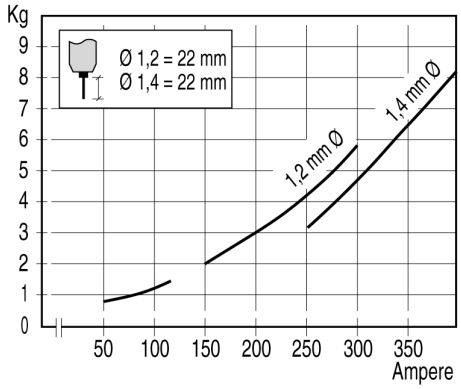
Approvals:

GL	3YH5S
ABS	3YSA H5
LR	3S, 3YS H5
MRS	3Y40MS HHH
DNV	III YMS H5
BV	SA3YM HHH
DB	042.42.11
TÜV	07701.00
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95651012	15 kg WBS
1,2	95652012	20 kg PSP
1,2	95652112	5 kg PSP
1,2	95652212	250 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%

N ≤ 0.004%

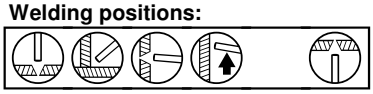
Elgacore DWA 55Ni1

FCAW - Flux cored arc welding
Low-alloyed

Date: 2009-02-19
Revision: 4

Description:
Elgacore DWA 55Ni1 is a rutile flux cored wire producing a nominal 0.9%Ni, micro-alloyed weld metal, for use in severely demanding applications such as offshore fabrication.The wire runs with a smooth but forceful arc and exhibits exceptional all-positional operability combined with high productivity. Elgacore DWA 55Ni1 offers a universal flux cored wire to a broad range of users requiring NACE conformity, very good fracture toughness in both the as-welded and stress relieved condition, and reliable CTOD values.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0.02	1.05				0.8
Typical	0.05	0.3	1.25	0.007	0.007	0.015	0.95
Max	0.12	0.80	1.40	0.03	0.03	0.15	1.0

	Mo	Cu	V	Nb
Min				
Typical	0.01	0.004	0.015	0.016
Max	0.20	0.30	0.05	0.05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Rp0.2%:	> 470 N/mm2	550 N/mm²	510 N/mm²
Tensile Strength, Rm:	550-680 N/mm2	610 N/mm²	570 N/mm²
Elongation, A5	> 20%	28%	29%
Impact energy, CV:	–60°C • >47 J	–60°C • 75 J	–40°C • 75 J

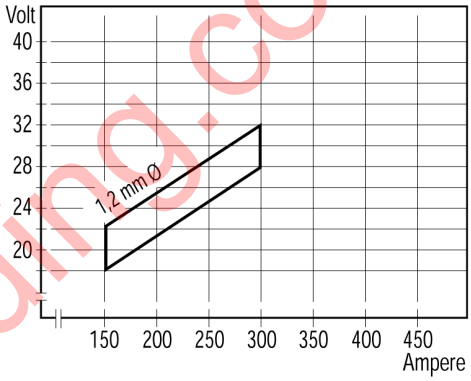
Classification:

EN 758	T 46 6 1Ni P M 2 H5
EN ISO 17632	T 46 6 1Ni P M 2 H5
AWS A5.29	E81T1-Ni1MJ

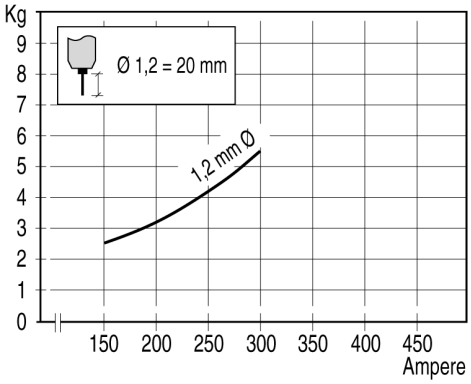
Approvals:

DNV	V Y42MS H5
LR	5 Y42S H5

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95592012	15 kg PSP
1,2	95591012	5 kg PSP

Note

Strip:
S ≤ 0.012%
P ≤ 0.015%
N ≤ 0.004%
PWHT:580°C +/– 10°C, 2 h.

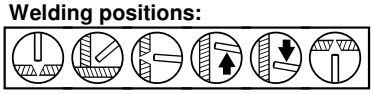
Elgacore DWA 55L

FCAW - Flux cored arc welding
Low-alloyed

Date: 2009-02-19
Revision: 13

Description:
Elgacore DWA 55L is a rutile flux cored wire designed to meet extremely high weld integrity demands in applications such as offshore fabrication. The micro-alloyed design, in combination with the 1.5% Ni alloying level, produces exceptionally good fracture toughness down to –60°C. Impact strength is tolerant to a wide range of heat-input and preheat/interpass conditions. The all-positional wire operates with a smooth but forceful arc to give very good penetration characteristics when welding horizontally, combined with high deposition rates when welding vertically up. Elgacore DWA 55L is extensively CTOD tested from –10°C down to –40°C. Results from 50 & 60mm plate thickness show CTOD values of 0.40 - 0.80mm at –40°C.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.50				1.2
Typical	0.04	0.3	1.4	0.01	0.01		1.5
Max	0.15	0.80	1.60	0.03	0.03	0.15	1.8

	Mo	Cu	V	Ti	B	Nb
Min					0.002	
Typical				0.05	0.004	
Max	0.20	0.30	0.05		0.005	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 470 MPa	550 MPa
Tensile Strength, Rm:	550-680 MPa	620 MPa
Elongation, A5	≥ 20%	27%
Impact energy, CV:	–60°C•>47 J	–60°C•75 J

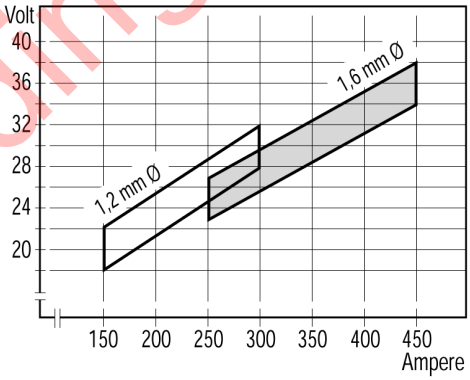
Classification:

EN 758	T 46 6 1,5 Ni P M 1 H5
EN ISO 17632	T 46 6 1,5 Ni P M 1 H5
AWS A5.29	E 81T1-K2M

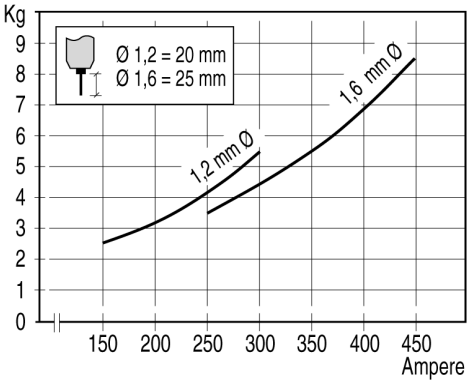
Approvals:

LR	5Y46S H5
ABS	3 YSA
GL	4 YS
DNV	V Y46MS H5
MRS	4YMS HHH
TUV	10072.00
DB	42.042.13
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,0	95612010	12,5 kg PSP
1,2	95611012	15 kg WBS
1,2	95612012	15 kg PSP
1,2	95612112	5 kg PSP
1,6	95612016	12,5 kg PSP

Note

Strip:
S ≤ 0.012%
P ≤ 0.015%

N ≤ 0.004%

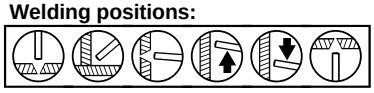
Elgacore DWA 55LSR

FCAW - Flux cored arc welding
Low-alloyed

Date: 2007-05-24
Revision: 9

Description:
Elgacore DWA 55LSR is a rutile flux cored wire producing a nominal 0.9 % Ni weld metal that tolerates PWHT without degradation of mechanical properties. It is designed to give excellent fracture toughness at temperatures down to –60°C, both in the as-welded and stress relieved condition. The wire offers exceptional all-positional operability combined with high productivity and is especially suitable for pipe welding. Elgacore DWA 55LSR fulfils NACE requirements for oil and gas production equipment in sour service and also has excellent CTOD values, making it a natural choice for offshore applications.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min		0.2					0.8
Typical	0.06	0.3	1.3	0.010	0.005	0.015	0.9
Max	0.12	0.8	1.5	0.03	0.03	0.15	1.0

	Mo	Cu	V	Ti	B	Nb
Min					0.002	
Typical	0.01	0.02	0.01	0.05	0.004	0.005
Max	0.20	0.30	0.05		0.005	0.05

Mechanical properties

	Specified	Typical	PWHT Typical
Yield strength, Re:	≥ 420 MPa	500 MPa	450 MPa
Tensile Strength, Rm:	500-640 MPa	570 MPa	540 MPa
Elongation, A5	≥ 20%	30%	32%
Impact energy, CV:	–60°C • >47 J	–60°C • 80 J	–46°C • 85 J

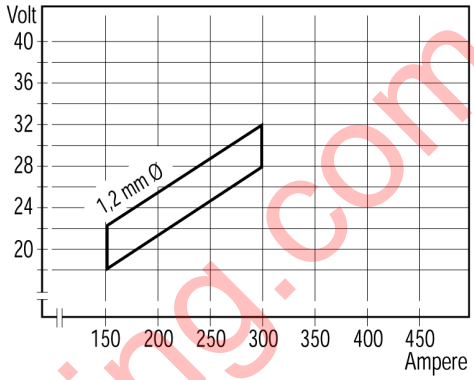
Classification:

EN 758	T 42 6 Z P M 1 H5
AWS A5.29	E 81 T1-Ni1M

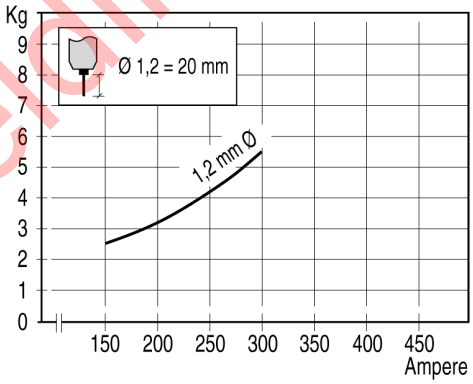
Approvals:

DNV	V Y42MS H5
ABS	5YQ420 SA H5
LR	5Y42 H5
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95522012	15 kg PSP
1,2	95522112	5 kg PSP

Note

PWHT: 610°C +/– 10°C, 2 h.
Strip:
S ≤ 0.012%
P ≤ 0.015%
N ≤ 0.004%

Elgacore DWA 65L

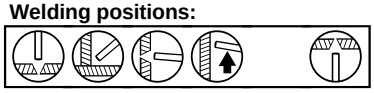
FCAW - Flux cored arc welding
Low-alloyed

Date:	2005-01-25
Revision:	2

Description:
Elgacore DWA 65L is a rutile flux cored wire designed to meet extremely high weld integrity demands in applications such as offshore fabrication. The micro-alloyed design, in combination with the 1.7% Ni, 0,1% Mo alloying level, produces excellent fracture toughness down to –40°C, whilst ensuring a good safety margin of yield strength in 500 MPa steel. Impact strength is tolerant to a wide range of heat-input and preheat/interpass conditions. The all-positional wire operates with a smooth but forceful arc to give very good penetration characteristics when welding horizontally, combined with high deposition rates when welding vertically up. Elgacore DWA 65L is CTOD tested.

Applications:
500 Mpa base material in Offshore constructions

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min	0,03		0,50				1,00
Typical	0,05	0,35	1,3	0,01	0,01		1,7
Max	0,10	0,80	1,75	0,02	0,02	0,15	2,00

	Mo	Cu	V	Nb
Min				
Typical	0,1			
Max	0,20	0,30	0,05	0,05

Mechanical properties

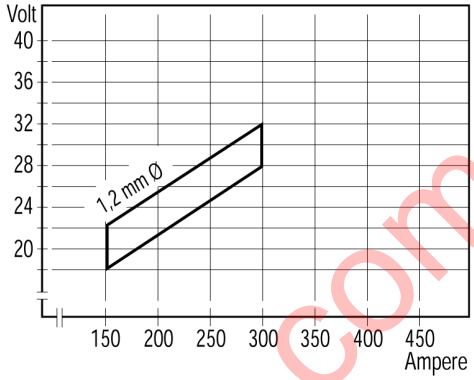
	Specified	Typical
Yield strength, Re:	≥ 550 MPa	620 MPa
Tensile Strength, Rm:	640-760 MPa	690 MPa
Elongation, A5	≥ 18%	25%
Impact energy, CV:	–40°C • >47 J	–40°C • 80 J

Classification:

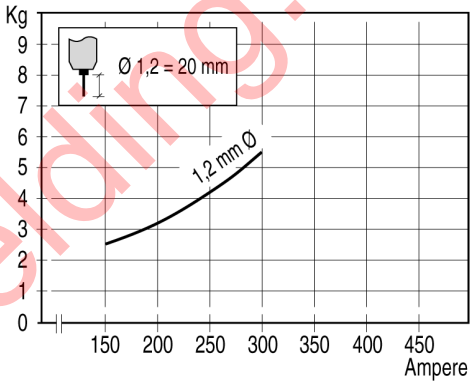
EN 12535	T 55 4 Z P M 2 H5
AWS A5. 29	E91T1-K2MJ

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95882012	15 kg PSP

Note

Strip:
S ≤ 0.012%
P ≤ 0.015%
N ≤ 0.004%

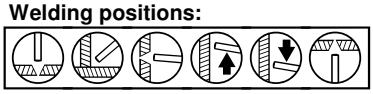
Elgacore MXA 55T

FCAW - Flux cored arc welding
Low-alloyed

Date:	2009-02-19
Revision:	13

Description:
Elgacore MXA 55T is an all-positional metal cored wire producing a 1.7% Ni alloyed weld metal with very good fracture toughness down to –60°C. It is specially designed for single-sided welding, but is equally suitable for multi-pass applications in thick plate, utilising its excellent deep penetration characteristics in the spray transfer current range. Fillet welds have a mitre profile and root runs against ceramic backing leave a smooth bead without risk of slag entrapment. The wire runs with a very stable, spatter-free arc, even under dip transfer conditions at welding currents as low as 50 A. Elgacore MXA 55T is highly suitable for offshore construction. Elgacore MXA 55T is CTOD tested

Welding positions:



Welding current:
DC +

Deposition efficiency:
96%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min

Stick-out:
15-25 mm

Hydrogen content / 100 g weld metal
≤ 5 ml

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.50				1.20
Typical	0.06	0.4	1.4	0.014	0.017		1.7
Max	0.15	0.80	1.60	0.03	0.03	0.15	1.80

	Mo	Cu	V	Ti	B	Nb
Min						
Typical				0.05	0.004	
Max	0.20	0.30	0.05		0.005	0.05

Mechanical properties

	Specified	Typical
Yield strength, Re:	≥ 470 MPa	500 MPa
Tensile Strength, Rm:	550-680 MPa	580 MPa
Elongation, A5	≥ 20%	29%
Impact energy, CV:	–60°C • >47 J	–60°C • 55 J

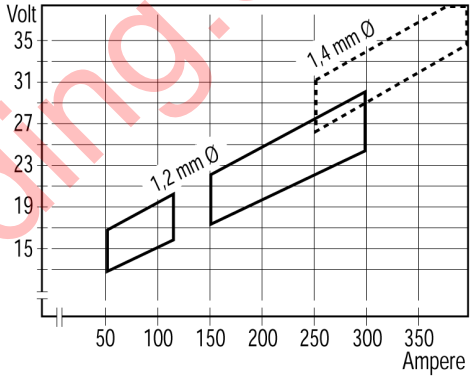
Classification:

EN 758	T 46 6 1,5Ni M M 1 H5
EN ISO 17632	T 46 6 1,5Ni M M 1 H5
AWS A5.28	E 80C-G

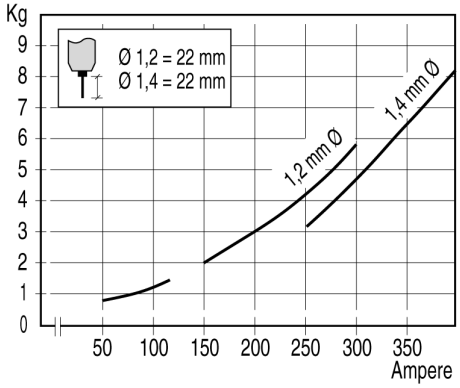
Approvals:

DNV	V YMS H5
LR	5Y42S H5
ABS	3YSA H5
BV	SA 3YM HHH, UP
CE	

Recommended parameter range:



Deposition rate per hour:



Product data:

Diam.mm	Product code	Delivery form
1,2	95661012	15 kg WBS
1,2	95662012	15 kg PSP
1,2	95662112	5 kg PSP
1,4	95662014	15 kg PSP
1,4	95662214	250 kg AutoPac

Note

Strip:
S ≤ 0.015%
P ≤ 0.025%
N ≤ 0.004%

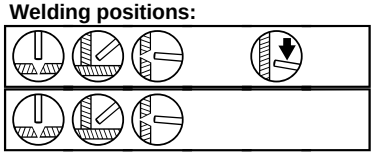
Cromacore DW 308L

FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 12

Description:
Cromacore DW 308L is a rutile flux cored wire designed for welding the 18% Cr / 10% Ni type stainless steels. Suitable also for stabilised grades 347 and 321 if service temperature is below 400°C. The wire operates with a very stable, spatter free arc producing a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 308L is used mainly for downhand and horizontal-vertical welding and is ideal for standing fillets.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 6

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			18.0	9.0
Typical	0.03	0.6	1.8	0.020	0.010	19.3	10.0
Max	0.04	1.0	2.0	0.030	0.025	21.0	11.0

	Mo	Cu	V	Nb
Min				
Typical	0.1	0.09	0.1	0.08
Max	0.5	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		400 MPa
Tensile Strength, Rm:	≥ 520 MPa	570 MPa
Elongation, A5	≥ 35%	42%
Impact energy, CV:		–20°C • 43 J

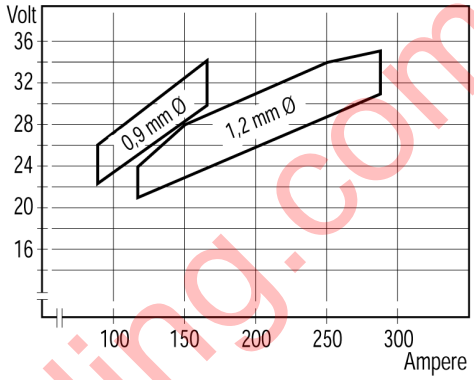
Classification:

AWS A5.22	E 308LT0-4/-1
ISO 17633-A	T 19 9 L R M/C 3
Werkstoff no.	1.4316

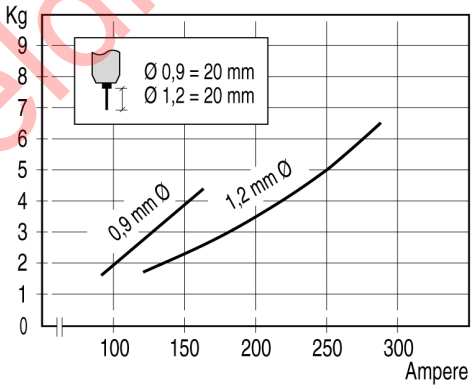
Approvals:

TÜV	07380.02
DNV	308L
GL	4550S
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
0,9	95702009	12,5 kg PSP
1,2	95701012	15 kg WBS
1,2	95701112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

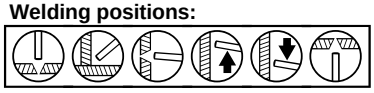
Cromacore DW 308LP

FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 12

Description:
Cromacore DW 308LP is a rutile flux cored wire intended for welding the 18% Cr / 10% Ni type stainless steels. The wire has been specially designed for fully positional welding at high welding currents. Suitable also for stabilised grades 347 and 321 if service temperature is below 400°C. Cromacore DW 308LP operates with a very stable, spatter free arc and produces a bright, smooth weld bead surface and self-releasing slag. Ideal for high productivity welding in the vertical position.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 9

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			18.0	9.0
Typical	0.03	0.7	1.5	0.020	0.010	19.6	9.9
Max	0.04	1.0	2.0	0.030	0.025	21.0	11.0

	Mo	Cu	V	Nb
Min				
Typical	0.1	0.05	0.1	0.08
Max	0.5	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		400 MPa
Tensile Strength, Rm:	≥ 520 MPa	590 MPa
Elongation, A5	≥ 35%	41%
Impact energy, CV:		–20°C • 40 J

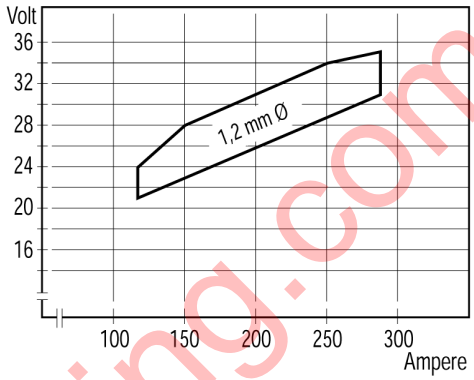
Classification:

AWS A5.22	E 308LT1-4/-1
ISO 17633-A	T 19 9 L P M/C 1

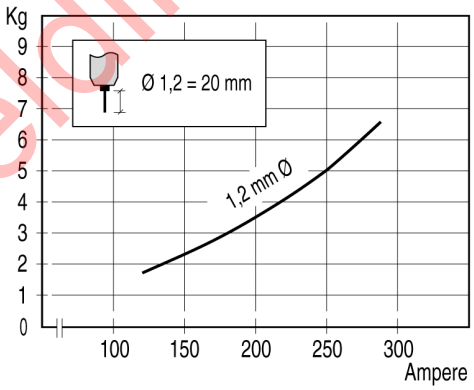
Approvals:

TUV	09140.00
GL	4550S
LR	304L S
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95772012	12,5 kg PSP
1,2	95771012	15 kg WBS
1,2	95771112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

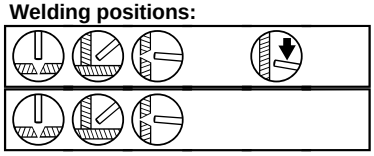
Cromacore DW 316L

FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 13

Description:
Cromacore DW 316L is a rutile flux cored wire designed for welding the 19% Cr / 12% Ni / 3% Mo type stainless steels. Suitable also for related stabilised grades if service temperature is below 400°C. The wire operates with a very stable, spatter free arc producing a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 316L is used mainly for downhand and horizontal-vertical welding and is ideal for standing fillets. Cromacore DW 316L, 0.9 mm is intended for use with material thicknesses less than 3.0 mm.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 9

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			17.0	11.0
Typical	0.03	0.7	1.2	0.025	0.009	18.3	12.1
Max	0.04	1.0	2.0	0.030	0.025	20.0	13.0

	Mo	Cu	V	Nb
Min	2.5			
Typical	2.8	0.11	0.1	0.08
Max	3.0	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		410 MPa
Tensile Strength, Rm:	≥ 510 MPa	570 MPa
Elongation, A5	≥ 30%	44%
Impact energy, CV:		–20°C • 40 J

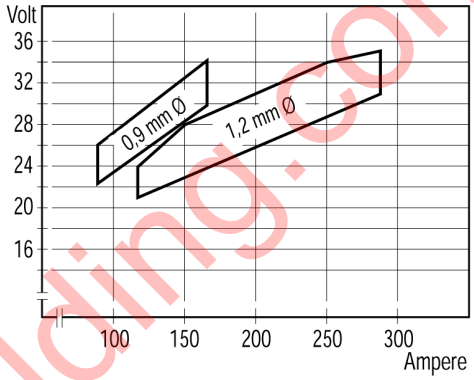
Classification:

AWS A5.22	E 316LT0-4/-1
ISO 17633-A	T 19 12 3 L R M/C 3
Werkstoff no.	1.4430

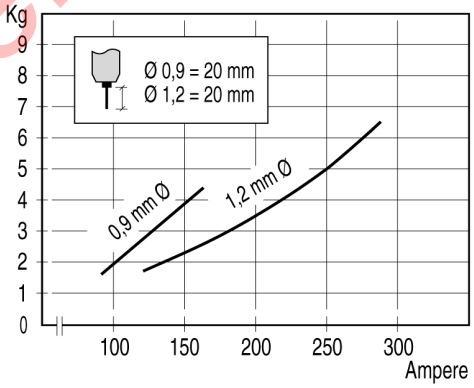
Approvals:

LR	316L S
DNV	316L
TÜV	07382.03
DB	43.042.09
GL	4571S
BV	316L
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
0,9	95712009	12,5 kg PSP
1,2	95711012	15 kg WBS
1,2	95711112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

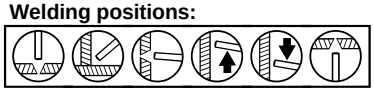
Cromacore DW 316LP

FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 12

Description:
Cromacore DW 316LP is a rutile flux cored wire intended for welding the 19% Cr / 12% Ni / 3% Mo type stainless steels. The wire has been specially designed for fully positional welding at high welding currents. Suitable also for related stabilised grades if service temperature is below 400°C. Cromacore DW 316LP operates with a very stable, spatter free arc and produces a bright, smooth weld bead surface and self-releasing slag. Ideal for high productivity welding in the vertical position.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 9

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			17.0	11.0
Typical	0.03	0.8	1.5	0.022	0.011	18.6	12.4
Max	0.04	1.0	2.0	0.030	0.025	20.0	13.0

	Mo	Cu	V	Nb
Min	2.5			
Typical	2.9	0.067	0.1	0.08
Max	3.0	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		430 MPa
Tensile Strength, Rm:	≥ 510 MPa	600 MPa
Elongation, A5	≥ 30%	36%
Impact energy, CV:		–20°C • 40 J

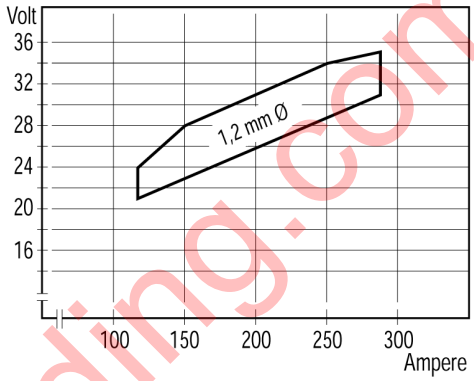
Classification:

AWS A5.22	E 316LT1-4/-1
ISO 17633-A	T 19 12 3 L P M/C 1

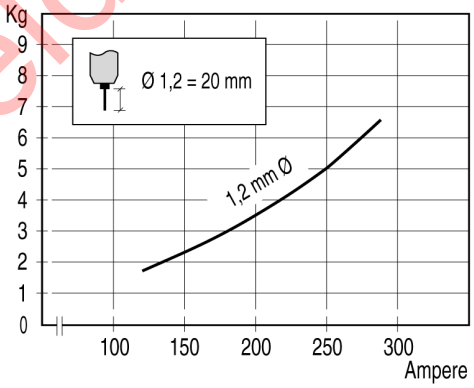
Approvals:

GL	4429S
LR	316L S
TÜV	09142.00
BV	316L
DNV	316L
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95742012	12,5 kg PSP
1,2	95741012	15 kg WBS
1,2	95741112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

Cromacore DW 309L

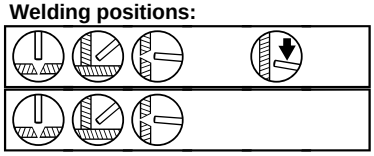
FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 12

Description:
Cromacore DW 309L is a rutile flux cored wire which deposits a low carbon 24% Cr / 13% Ni stainless steel weld metal with a ferrite content of about FN 14. The wire operates with a very stable, spatter free arc producing a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 309L is used mainly for downhand and horizontal-vertical welding and is ideal for standing fillets.

Applications:
Dissimilar joints between stainless and mild or low alloy steels.
Buffer layers on mild and low alloy steels prior to overlaying with Cromacore DW 308L/LP or DW 347.
Interface runs on clad steel joints.
Welding of similar composition, 309 type, stainless steels.
Joining of ferritic-martensitic stainless steels.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 14

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	12.0
Typical	0.03	0.7	1.4	0.025	0.009	24.0	12.7
Max	0.04	1.0	2.5	0.030	0.025	25.0	14.0

	Mo	Cu	V	Nb
Min				
Typical	0.1	0.15	0.1	0.08
Max	0.50	0.50	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		460 MPa
Tensile Strength, Rm:	≥ 520 MPa	590 MPa
Elongation, A5	≥ 30%	36%
Impact energy, CV:		–20°C • 38 J

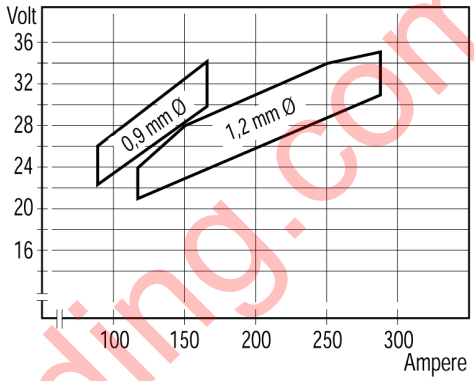
Classification:

AWS A5.22	E 309LT0-4/-1
ISO 17633-A	T 23 12L R M/C 3

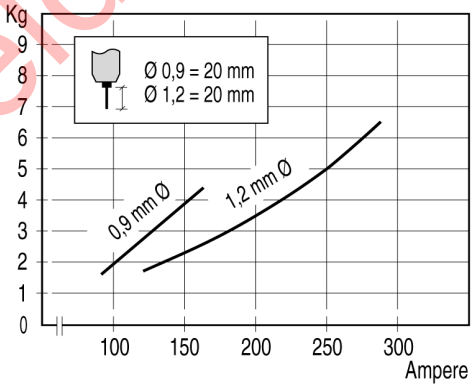
Approvals:

BV	309L
GL	4332S
LR	SS/CMn S, Dup/CMn
DNV	309L
TÜV	07381.02
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
0,9	95722009	12,5 kg PSP
1,2	95721012	15 kg WBS
1,2	95721112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

Cromacore DW 309LP

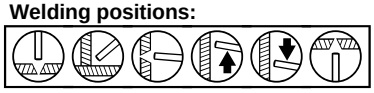
FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 12

Description:
Cromacore DW 309LP is a fully positional rutile flux cored wire which deposits a low carbon 24% Cr / 13% Ni stainless steel weld metal with a ferrite content of about FN 14. Cromacore DW 309LP operates with a very stable, spatter free arc producing a bright, smooth weld bead surface and self-releasing slag. Ideal for high productivity welding in the vertical position.

Applications:
Dissimilar joints between stainless and mild or low alluy steels.
Buffer layers on mild and low alloy steels prior to overlaying with Cromacore 308L/LP or DW 347.
Interface runs on clad steel joints.
Welding of similar composition, 309 type, stainless steels.
Joining of ferritic-martensitic stainless steels.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 14

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	12.0
Typical	0.03	0.7	1.3	0.019	0.010	23.9	12.5
Max	0.04	1.0	2.5	0.030	0.025	25.0	14.0

	Mo	Cu	V	Nb
Min				
Typical	0.1	0.06	0.1	0.08
Max	0.5	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		460 MPa
Tensile Strength, Rm:	≥ 520 MPa	590 MPa
Elongation, A5	≥ 30%	36%
Impact energy, CV:		–20°C • 38 J

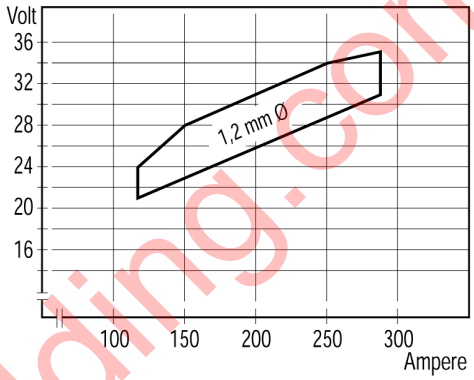
Classification:

AWS A5.22	E 309LT1-4/-1
ISO 17633-A	T 23 12 L P M/C 1

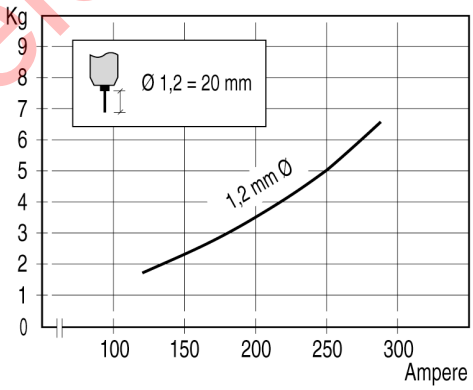
Approvals:

LR	SS/CMn S
BV	309L
DNV	309L
GL	4332S
TÜV	09141.00
RINA	309L S
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95752012	12,5 kg PSP
1,2	95751012	15 kg WBS
1,2	95751112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

Cromacore DW 309MoL

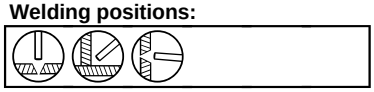
FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 13

Description:
Cromacore DW 309MoL is a rutile flux cored wire which deposits a 23% Cr/13% Ni/ 2,5% Mo stainless steel weld metal with a ferrite content of approximately FN 22. The high alloy content and high ferrite level enable the weld metal to tolerate dilution from dissimilar and difficult-to-weld steels without cracking. The wire operates with a very stable, spatter free arc to produce a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 309MoL is used mainly for downhand and horizontal-vertical welding and is ideal for standing fillets.

Applications:
Dissimilar joints between stainless and mild, low alloy or medium carbon steels.
Buffer layers on mild and low alloy steels prior to overlaying with Cromacore DW 316L/LP.
Interface runs on 316L clad steels.
Joining of medium carbon hardenable steels eg. armour plate.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 22

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	12.0
Typical	0.02	0.7	1.3	0.024	0.009	23.0	12.9
Max	0.04	1.0	2.5	0.030	0.025	25.0	14.0

	Mo	Cu	V	Nb
Min	2.0			
Typical	2.4	0.11	0.1	0.08
Max	3.0	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		540 MPa
Tensile Strength, Rm:	≥ 550 MPa	710 MPa
Elongation, A5	≥ 25%	30%
Impact energy, CV:		0°C • 29 J

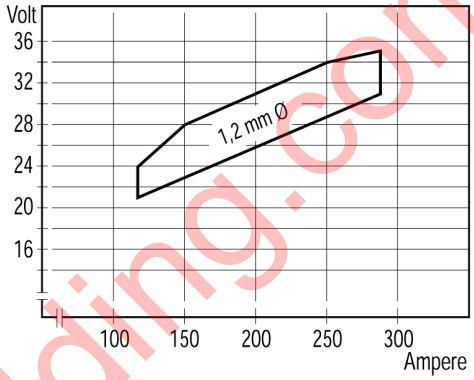
Classification:

AWS A5.22	E 309LMoT0-4/-1
ISO 17633-A	T 23 12 2 L R M/C 3
Werkstoff no.	1.4459

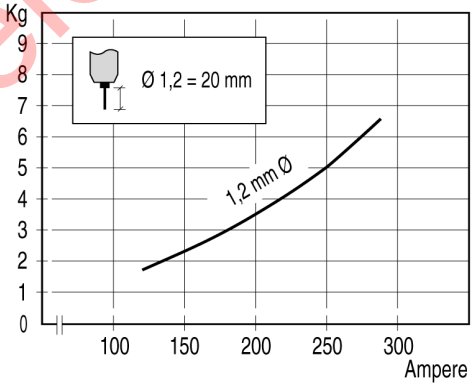
Approvals:

LR	SS/CMn S
DNV	309MoL
GL	4459S
TÜV	07383.04
BV	309MoL
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95732012	12,5 kg PSP
1,2	95731012	15 kg WBS
1,2	95731112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

Cromacore DW 309MoLP

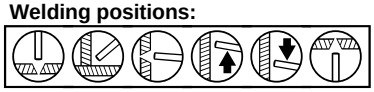
FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 7

Description:
Cromacore DW 309MoLP is a fully positional rutile flux cored wire which deposits a 23% Cr/13% Ni/2.5% Mo stainless steel weld metal with a ferrite content of approximately FN 22. The high alloy content and high ferrite level enable the weld metal to tolerate dilution from dissimilar and difficult-to-weld steels without cracking. The wire operates with a very stable, spatter free arc to produce a bright, smooth weld bead surface and self-releasing slag. Ideal for high productivity welding in the vertical position.

Applications:
Dissimilar joints between stainless and mild, low alloy or medium carbon steels.
Buffer layers on mild and low alloy steels prior to overlaying with Cromacore DW 316L/LP.
Interface runs on 316L clad steels.
Joining of medium carbon hardenable steels eg. armour plate.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 22

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	12.0
Typical	0.02	0.7	1.3	0.024	0.009	23.0	12.9
Max	0.04	1.0	2.5	0.030	0.025	25.0	14.0

	Mo	Cu	V	Nb
Min	2.0			
Typical	2.4	0.11	0.1	0.08
Max	3.0	0.5	0.2	0.1

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:		540 MPa
Tensile Strength, Rm:	≥ 550 MPa	710 MPa
Elongation, A5	≥ 25%	30%
Impact energy, CV:		0°C • 29 J

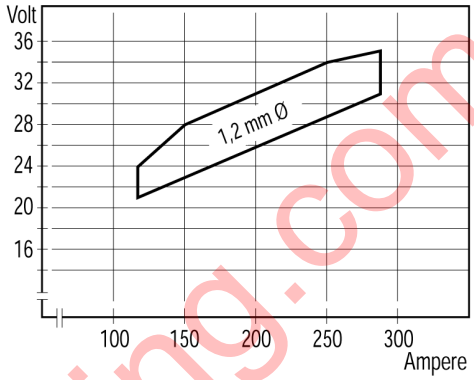
Classification:

AWS A5.22	E 309LMoT1-4/-1
ISO 17633-A	T 23 12 2 L P M/C 1
Werkstoff no.	1.4459

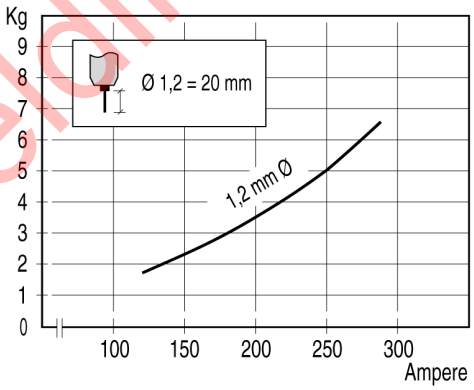
Approvals:

DNV	309MoL
LR	SS/CMn S
BV	309MoL

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95852012	12,5 kg PSP
1,2	95851012	15 kg WBS
1,2	95851112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

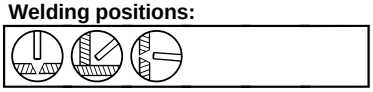
Cromacore DW 329A Duplex

FCAW - Flux cored arc welding
Stainless Steel

Date:	2007-05-25
Revision:	12

Description:
Cromacore DW 329A Duplex is a rutile flux cored wire which deposits a low carbon 23% Cr / 9% Ni / 3% Mo / N duplex stainless steel weld metal with a nominal ferrite level of FN 40. The wire is designed for welding in the flat and horizontal-vertical positions only and is ideal for standing fillets. It is intended for welding similar duplex stainless steels which offer an excellent combination of high strength and very good resistance to chloride induced pitting and stress corrosion cracking. Cromacore 329A Duplex operates with a very stable, spatter-free arc and produces a bright, smooth weld bead surface and self-releasing slag.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO_2, 22-25 l/min
100% CO_2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 40

Corrosion resistance
Pitting resistance equivalent, PRE = 35.
Critical pitting temperature, CPT = 30°C (ASTM G48).

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	8.0
Typical	0.02	0.8	1.3	0.020	0.007	22.9	9.2
Max	0.04	1.0	2.0	0.025	0.020	24.0	10.0

	Mo	Cu	V	Nb	N
Min	2.5				0.08
Typical	3.0	0.02	0.1	0.08	0.10
Max	4.0	0.50	0.2	0.1	0.20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 500 MPa	610 MPa
Tensile Strength, Rm:	≥ 700 MPa	800 MPa
Elongation, A5	≥ 20%	32%
Impact energy, CV:	–20°C •> 27 J	–20°C • 40 J

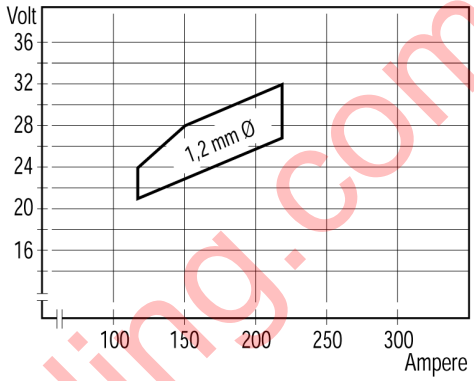
Classification:

AWS A5.22	E 2209T0-4/-1
ISO 17633-A	T 22 9 3 N L R M/C 3

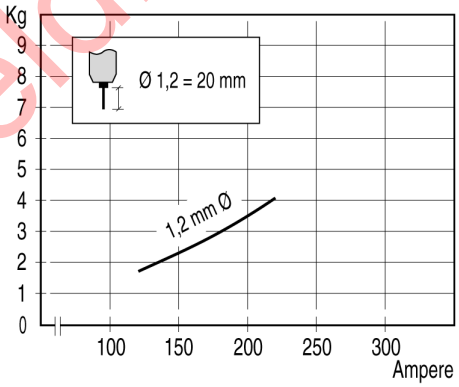
Approvals:

DNV	Duplex
GL	4462S
LR	S 31803 S
TÜV	6028.00
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95762012	12,5 kg PSP
1,2	95761012	15 kg WBS
1,2	95761112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%

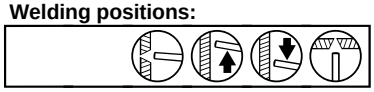
Cromacore DW 329AP Duplex

FCAW - Flux cored arc welding
Stainless Steel

Date: 2007-05-25
Revision: 8

Description:
Cromacore DW 329AP Duplex is a rutile flux cored wire which deposits a low carbon 23% Cr / 9% Ni / 3% Mo / N duplex stainless steel weld metal with a nominal ferrite level of FN 40. The wire is specially designed for positional welding and is not recommended for flat or horizontal-vertical applications. It is intended for welding similar duplex stainless steels which offer an excellent combination of high strength and very good resistance to chloride induced pitting and stress corrosion cracking. The wire operates with a very stable, spatter-free arc and produces a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 329AP Duplex is ideal for high productivity welding in the vertical position.

Welding positions:



Welding current:
DC +

Deposition efficiency:
87%

Shielding gas:
80% Ar + 20% CO2, 22-25 l/min
100% CO2, 22-25 l/min

Stick-out:
15-25 mm

Ferrite content:
FN 40

Corrosion resistance
Pitting resistance equivalent, PRE = 35.
Critical pitting temperature, CPT = 30°C (ASTM G48).

Chemical composition, wt.%

	C	Si	Mn	P	S	Cr	Ni
Min			0.5			22.0	8.0
Typical	0.02	0.8	1.3	0.020	0.007	22.9	9.2
Max	0.04	1.0	2.0	0.025	0.020	24.0	10.0

	Mo	Cu	V	Nb	N
Min	2.5				0.08
Typical	3.0	0.02	0.1	0.08	0.10
Max	4.0	0.50	0.2	0.1	0.20

Mechanical properties

	Specified	Typical
Yield strength, Rp0.2%:	≥ 500 MPa	610 MPa
Tensile Strength, Rm:	≥ 700 MPa	800 MPa
Elongation, A5	≥ 20%	32%
Impact energy, CV:	–46°C •> 27 J	–46°C • 42 J

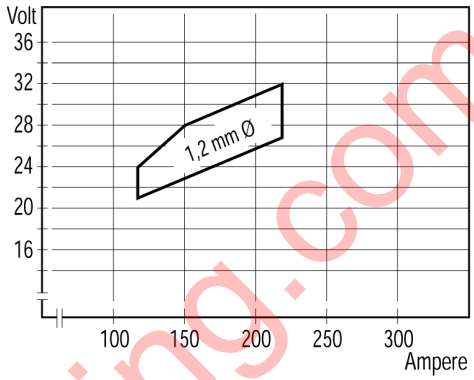
Classification:

AWS A5.22	E 2209T1-4/-1
ISO 17633-A	T 22 9 3 N L P M/C 1

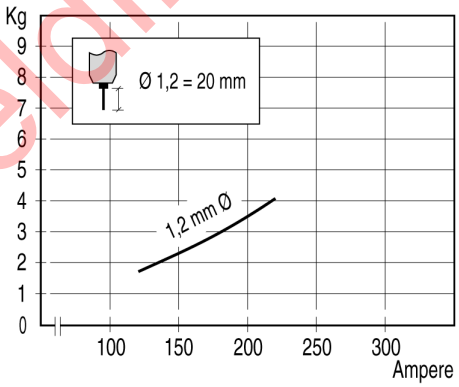
Approvals:

GL	4462S
LR	S 31803 S
DNV	Duplex
CE	

Recommended parameter range:



Deposition rate per hour:



Product data

Diam.mm	Product code	Delivery form
1,2	95782012	12,5 kg PSP
1,2	95781012	15 kg WBS
1,2	95781112	5 kg WBS

Note

Strip:
S ≤ 0.03%
P ≤ 0.04%
N ≤ 0.06%