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WELDERS' FAVOURITE SINCE 1938



Elga has been renowned for being the most demanding welders' choice ever since the very beginning. Starting as a family company in Gothenburg, Sweden, we have grown into a major supplier of

consumables for the toughest and most challenging end-use welding areas. Today, we support welders across the globe with reliable consumables, equipment and know-how. As part of the global ITW group, we have the expertise and resources to continuously improve welding quality as well as productivity.

Welcome to our world!



75 YEARS OF INNOVATION

It all began with the development and manufacture of electric and gas welding equipment for Sweden's engineering industry. Since then, Elga has continuously developed effective products for applications characterised by high demands on both the welder and the filler material.

Innovation has been the main thread through the company's history. One example is the development of cored wire in the mid 1980s, an area in which Elga took the lead from the start and still remains a driving force. The latest development stage is the outstanding Cromacore LDX flux cored wire for LDX steel.

MADE FOR THE ROUGHEST ENVIRONMENTS

From the very beginning, we have supplied the most demanding industries with forefront welding technology. That is why you will find welds from

Elga consumables in constructions exposed to extreme conditions. Close collaboration with our customers has always been an integral part of the development process. This has given us deep insights into the professional welders' world for a great variety of end-use areas such as heavy vehicles and equipment, shipbuilding and offshore, steel structures and energy, paper and pulp, process piping, etc.

Steel structures on- and offshore, heavy equipment, power plants and process piping are typical end-use areas.



CROMAROD
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CROMAMIG
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CROMASTRIP
CROMAFLUX





IMPROVING YOUR WELDING PERFORMANCE

By developing products and methods that provide maximum uptime and weld quality, we contribute actively to improve your welding economy.

Whether you need advice to find the right consumable for a specific material or on-site training to introduce new methods, contact our technical expertise. Our welding engineers have deep knowledge of welding technology and broad practical experience from the welder's everyday work. The support team is ready to assist you with consultancy, training and problem solving at your premises.

Profitability Tracker is our tool to optimize your welding productivity by tracking key factors and finding weak

spots. We make a thorough analysis from joint preparation and joint angles to fillet throat thickness, wire feed and postweld dressing. The outcome is a proposed action plan comprising aims, product recommendations, training programmes, etc. The Profitability Tracker has helped many large and small companies to reduce their total costs and improve both productivity and working environment.

Qualified personal support and training on-site, by phone and online.



A TIGPAC FOR EVERY NEED

TIGPAC 500

Minimize the risk of mixing steel alloy grades with our colour coded 500 mm TIG rods. They come in the convenient TigPac 500 package with transparent sleeves of four in four kg boxes.

500 mm length ensures good rod manipulation and welding access. By using Elga's colour coded TIG rods you will live up to the demands of colour coding in the offshore standard Norsok M-601, Welding and inspection of piping.

TIGPAC 1000

The new TigPac 1000 is a practical, convenient tube for 1000 mm TIG rods. It contains your rods for welding of aluminium, stainless and carbon steel.



THE ROBOT'S BEST FRIEND

When shifting to ProPac in your robotised or mechanised welding downtime for spool changes can be reduced by up to 90 % (250 kg ProPac compared to 15 kg standard spool). Time you can convert into increased arc time factor and improved productivity. ProPac also extends the wire feed unit's lifetime. The force needed to pull out the wire from ProPac is considerably less than rotating a standard spool, thus causing less strain on the wire feed unit and drive motor.

Significantly reduced spool changes also improve the quality thanks to fewer rejects associated with welding process interruptions. The physical properties of the coiled wire in ProPac means that it always exits the welding torch straight, providing excellent, reliable seam tracking. Unlike

spools, the wire in ProPac is always fully protected from moisture, dirt, dust, etc., which can cause welding problems.

And last but not least, ProPac is fully recyclable and can be folded for easy disposal and recycling.



DRY ELECTRODES IN ANY WEATHER

With DryPac you can rest assured that the electrodes are dry when you need them. They are vacuum packed in factory dry conditions and come in a moisture controlled paper tray. The package is resealable with a new kind of tape that provides extra protection for electrodes left in an opened DryPac.

The outer pack is made of corrugated cardboard and the opening on top is easy to fold back, which contributes to easy storage and handling. All DryPac packaging components are of course fully recyclable.



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Solid wires for maintenance and repair

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| Elgatic 148K | 636 W 46 6 W2Ni2 | A5.28 ER80S-Ni2 | 181 |
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| Cromatig 318Si | 14343 W 19 12 3 Nb Si | A5.9 –ER318 | 200 |
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| Cromatig 2507 | 14343 W 25 9 4 LN | | 209 |
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| Cromatig 82 | 18274 SNi6082 (NiCr20Mn3Nb) | A5.14 ERNiCr3 | 211 |
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Wires and fluxes for submerged arc welding of mild, non-alloyed steels

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| Elgasaw 102 | EN ISO 14171-A S2 | A5.17 EM 12 | 222 |
| Elgasaw 102Si | EN ISO 14171-A S2Si | A5.17 EM12K | 222 |
| Elgasaw 103Si | EN ISO 14171-A S3Si | A5.17 EH12K | 222 |
| Elgasaw 104 | EN ISO 14171-A S4 | A5.17 EH14 | 222 |
| Elgaflux 211R | EN ISO 14174-A SA AR 1 76 AC H5 | | 223 |
| Elgaflux 251B | EN ISO 14174-A SA AB 1 87 ACH5 | | 224 |
| Elgaflux 285B | EN ISO 14174-A SA AB 1 67 AC H5 | | 225 |
| Elgaflux 500B | EN ISO 14174-A SA FB 1 55 AC H5 | | 226 |

Wires and fluxes for submerged arc welding of high tensile, low temperature and creep resistant steels

| Product | EN ISO | AWS | Page |
|----------------------|---------------------------------|------------|------------|
| Elgasaw 102Mo | EN ISO 14171-A S2Mo | A5.23 EA2 | 228 |
| Elgasaw 103Mo | EN ISO 14171-A S3Mo | A5.23 EA4 | 228 |
| Elgasaw 104Mo | EN ISO 14171-A S4Mo | A5.23 EA3 | 228 |
| Elgasaw 103Ni1Mo1/4 | EN ISO 14171-A SZ | A5.23 EG | 228 |
| Elgasaw 103Ni1Mo | EN ISO 14171-A S3Ni1Mo | A5.23 EG | 228 |
| Elgasaw 103NiCrMo2,5 | EN ISO 14171-A SZ | A5.23 EG | 228 |
| Elgasaw 102Ni1 | EN ISO 14171-A S2Ni1 | A5.23 EN1 | 228 |
| Elgasaw 102Ni2 | EN ISO 14171-A S2Ni2 | A5.23 EN2 | 228 |
| Elgasaw EB2R | EN ISO 24598-A SCrMo1 | A5.23 EB2R | 228 |
| Elgasaw EB3R | EN ISO 24598-A SCrMo2 | A5.23 EB3R | 228 |
| Elgaflux 285B | EN ISO 14174-A SA AB 1 67 AC H5 | | 229 |
| Elgaflux 500B | EN ISO 14174-A SA FB 1 55 AC H5 | | 230 |
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Wires and fluxes for submerged arc welding of stainless steels & Ni-base alloys

| Product | EN ISO | AWS | Page |
|-----------------|-------------------------------|------------------|------------|
| Cromasaw 308L | 14343-A S 19 9 L | A5.9 ER 308L | 239 |
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| Cromasaw 347 | 14343 S 19 9 Nb | A5.9 ER 347 | 239 |
| Cromasaw 316L | 14343 S 19 12 3 L | A5.9 ER 316L | 239 |
| Cromasaw 317L | 14343 S 19 13 4L | A5.9 ER 317L | 239 |
| Cromasaw 318 | 14343 S 19 12 3 Nb | A5.9 ER 318 | 239 |
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| Cromasaw 309MoL | 14343 S 23 12 2 L | (A5.9 ER 309MoL) | 239 |
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| Cromasaw 2507 | 14343 S 25 9 4 NL | A5.9 ER 2594 | 239 |
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| Cromaflux 300B | EN ISO 14174-A S A FB 2 DC H5 | | 236 |
| Cromaflux 380 | EN ISO 14174-A S F CS 2 DC H5 | | 237 |

Strips and fluxes for electroslag strip cladding with stainless and Ni-base alloys

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|----------------------|--------------------------|------------------|------------|
| Cromastrip 308L | 14343-A B 19 9 L | A5.9 EQ 308L | 240 |
| Cromastrip 347L | 14343-A B 19 9 Nb | A5.9 EQ 347 | 240 |
| Cromastrip 316L | 14343-A B 19 9 12 3 L | A5.9 EQ 316L | 240 |
| Cromastrip 317L | 14343-A B 19 13 4L | A5.9 EQ 317L | 240 |
| Cromastrip 309L | 14343-A B 23 12 L | A5.9 EQ 309L | 240 |
| Cromastrip 309LNb | 14343-A B 23 12 Nb | A5.9 (EQ 309LNb) | 240 |
| Cromastrip 21.11.L | 14343-A B 22 12 L | A5.9 (EQ 309L) | 240 |
| Cromastrip 21.11.LNb | 14343-A B 22 12 LNb | A5.9 (EQ 347L) | 240 |
| Cromastrip 21.13.3L | 14343-A (B 23 12 2 L) | A5.9 (EQ 309LMo) | 240 |
| Cromastrip 82 | | A5.9 EQNiCr3 | 240 |
| Cromastrip 625 | | A5.9 EQNiCrMo-3 | 240 |
| Cromaflux 480 ESC | 14174 ES A FB 2B 5644 DC | | 241 |
| Cromaflux 450 ESC | 14174 ES A FB 2B 5644 DC | | 241 |
| Cromaflux 650 ESC | 14174 ES A FB 2B 5644 DC | | 241 |

Rutile coated electrodes for welding mild and medium tensile steels

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|-----------------|----|
| P 43 | 22 |
| P 45S | 23 |
| Maxeta 5 | 24 |
| Maxeta 10 | 25 |
| Maxeta 11 | 26 |
| Maxeta 16 | 27 |

**P 43****Classification:**

AWS A5.1

E 6013

EN ISO 2560-A

E 42 0 R 12

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.

Coating type:

Rutile

Metal recovery:

95%

Welding positions:**Welding current:**DC+/-, AC OCV \geq 50 V

For root passes: DC-

Redrying temperature:

90 °C, 2h

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,4 | 0,5 |

Mechanical properties**Typical**

| | |
|-----------------------|-------------|
| Yield strength, Re: | 480 MPa |
| Tensile Strength, Rm: | 550 MPa |
| Elongation, A5 | 24% |
| Impact energy, CV: | 0 °C • 50 J |

Approvals:

LR
CE
DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71432500 | 55-100 | 23 | 0,62 | 81 | 0,8 |
| 3,2 | 450 | 71433200 | 75-140 | 23 | 0,67 | 36 | 1,2 |
| 3,2 | 350 | 71433235 | 75-140 | 23 | 0,67 | 48 | 1,2 |
| 4,0 | 450 | 71434000 | 110-190 | 25 | 0,64 | 26 | 1,7 |
| 5,0 | 450 | 71435000 | 140-265 | 29 | 0,65 | 16 | 2,7 |



P 45S

Classification:

EN ISO 2560-A

AWS A5.1

E 42 0 RC 11

E 6013

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.

Coating type:

Rutile-cellulosic

Metal recovery:

90%

Welding positions:



Welding current:

DC+/-, AC OCV \geq 50 V

For root passes: DC-

Redrying temperature:

90 °C, 2h

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,4 | 0,5 |

Mechanical properties

Typical

Yield strength, Re: 470 MPa

Tensile Strength, Rm: 550 MPa

Elongation, A5 24%

Impact energy, CV: 0 °C • 50 J

Approvals:

CE

BV

LR

MRS

ABS

DNV

GL

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 71452000 | 40-80 | 24 | 0,7 | 139 | 0,4 |
| 2,5 | 350 | 71452500 | 70-100 | 25 | 0,7 | 78 | 0,8 |
| 3,2 | 350 | 71453200 | 90-145 | 25 | 0,7 | 48 | 1,2 |
| 4,0 | 350 | 71454000 | 120-195 | 25 | 0,7 | 33 | 1,7 |
| 5,0 | 450 | 71455000 | 180-270 | 26 | 0,75 | 21 | 2,3 |



Maxeta 5

Classification:

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

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.

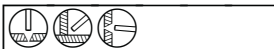
Coating type:

Acid-rutile

Metal recovery:

160%

Welding positions:



Welding current:

DC+/-, AC OCV > 65 V

Redrying temperature:

90 °C, 2h

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,2 | 0,9 |

Mechanical properties

Typical

Yield strength, Re: 480 MPa
Tensile Strength, Rm: 540 MPa
Elongation, A5 24%
Impact energy, CV: -20 °C • 70 J

Approvals:

GL
CE
DNV
LR
TÜV
BV
DB
ABS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 450 | 72013200 | 110-170 | 32 | 0,73 | 22 | 1,9 |
| 4,0 | 450 | 72014000 | 150-240 | 35 | 0,71 | 15 | 2,9 |
| 5,0 | 450 | 72015000 | 200-360 | 37 | 0,71 | 9 | 4,8 |
| 5,0 | 700 | 72015070 | 200-330 | 37 | 0,73 | 6 | 5,0 |
| 6,0 | 450 | 72016000 | 280-440 | 37 | 0,71 | 7 | 5,5 |



Maxeta 10

Classification:

AWS A5.1

E 7024

EN ISO 2560-A

E 42 0 RR 53

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.

Coating type:

Rutile

Metal recovery:

135%

Welding positions:



Welding current:

DC+/-, AC OCV \geq 65 V

Redrying temperature:

90 °C, 2h

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,7 | 0,6 |

Mechanical properties

Typical

Yield strength, Re: 470 MPa

Tensile Strength, Rm: 570 MPa

Elongation, A5 24%

Impact energy, CV: 0 °C • 50 J

Approvals:

GL

CE

ABS

BV

DNV

LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 72022500 | 90-125 | 28 | 0,7 | 45 | 1,6 |
| 3,2 | 450 | 72023200 | 130-160 | 29 | 0,73 | 23 | 2,2 |
| 4,0 | 450 | 72024000 | 140-220 | 30 | 0,65 | 17 | 2,6 |
| 4,5 | 600 | 72024560 | 160-230 | 29 | 0,70 | 10 | 2,9 |
| 5,0 | 450 | 72025000 | 190-310 | 31 | 0,66 | 11 | 3,7 |



Maxeta 11

Classification:

EN ISO 2560-A

AWS A5.1

E 42 0 RR 73

E 7024

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.

Coating type:

Rutile

Metal recovery:

190%

Welding positions:



Welding current:

AC OCV > 50V, DC +/-

Redrying temperature:

90 °C, 2h

Chemical composition, wt. %

| C | Si | Mn |
|------|-----|-----|
| 0,08 | 0,6 | 0,9 |

Mechanical properties

Typical

Yield strength, Re: 500 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5 24%

Impact energy, CV: 0 °C • 50 J

Approvals:

CE

DNV

GL

LR

MRS

RINA

BV

ABS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 450 | 72043200 | 130-170 | 28 | 0,72 | 20 | 2,5 |
| 4,0 | 450 | 72044000 | 150-260 | 31 | 0,73 | 13 | 3,3 |
| 4,5 | 450 | 72044500 | 170-335 | 34 | 0,73 | 11 | 5,3 |
| 4,5 | 600 | 72044560 | 170-250 | 30 | 0,73 | 8 | 4,2 |
| 5,0 | 450 | 72045000 | 200-390 | 35 | 0,72 | 8 | 6,7 |
| 5,0 | 600 | 72045060 | 200-300 | 34 | 0,72 | 7 | 5,3 |
| 5,0 | 700 | 72045070 | 200-290 | 33 | 0,72 | 5 | 5,4 |
| 6,0 | 450 | 72046000 | 300-450 | 35 | 0,72 | 6 | 7,7 |
| 6,0 | 600 | 72046060 | 300-390 | 35 | 0,73 | 4 | 7,2 |
| 6,0 | 700 | 72046070 | 300-380 | 35 | 0,73 | 4 | 7,2 |



Maxeta 16

Classification:

AWS A5.1

E 7024

EN ISO 2560-A

E 42 0 RR 73

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.

Coating type:

Rutile

Metal recovery:

160%

Welding positions:



Welding current:

DC+/-, AC OCV>50 V

Redrying temperature:

90 °C, 2h

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,5 | 0,7 |

Mechanical properties

Typical

Yield strength, Re: 470 MPa
 Tensile Strength, Rm: 560 MPa
 Elongation, A5: 24%
 Impact energy, CV: 0 °C • 50 J

Approvals:

DNV
 ABS
 GL
 CE
 LR
 BV
 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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 450 | 72053200 | 130-160 | 28 | 0,72 | 21 | 2,2 |
| 4,0 | 450 | 72054000 | 150-235 | 31 | 0,71 | 14 | 3 |
| 5,0 | 450 | 72055000 | 200-320 | 31 | 0,71 | 9 | 4,1 |

Basic coated electrodes for welding mild and medium tensile steels

| | |
|-----------------|----|
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| P 47D | 31 |
| P 48M | 32 |
| P 48S | 33 |
| P 48P | 34 |
| P 51 | 35 |
| P 52T | 36 |
| P 54 | 37 |
| Maxeta 20 | 38 |
| Maxeta 21 | 39 |
| Maxeta 22 | 40 |



P 47

Classification:

EN ISO 2560-A

E 46 4 B 12 H5

AWS A5.1

E 7016-1

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.

Coating type:

Basic;

Metal recovery:

105%

Welding positions:



Welding current:

DC+/-, AC OCV ≥ 60 V

For root passes: DC-

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|-----|-------|-------|
| 0,06 | 0,5 | 1,1 | 0,015 | 0,005 |

Mechanical properties

Typical

Yield strength, Re: 490 MPa

Tensile Strength, Rm: 570 MPa

Elongation, A5 26%

Impact energy, CV: -46 °C • 70 J

Hydrogen content / 100 g weld metal

≤ 5 ml;

Approvals:

CE

BV

DNV

GL

LR

ABS

MRS

NAKS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71472533 | 60-90 | 24 | 0,64 | 80 | 0,9 |
| 3,2 | 350 | 71473233 | 80-160 | 26 | 0,66 | 44 | 1,2 |
| 4,0 | 350 | 71474033 | 110-210 | 25 | 0,66 | 29 | 1,7 |
| 4,0 | 450 | 71474045 | 110-200 | 24 | 0,67 | 22 | 1,7 |



P 47D

Classification:

EN ISO 2560-A
AWS A5.1

E 42 2 B 12 H10
E 7016

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.

Coating type:

Basic

Metal recovery:

98%

Welding positions:



Welding current:

DC+, AC OCV \geq 55 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|-----|-------|-------|
| 0,07 | 0,7 | 0,9 | 0,015 | 0,015 |

Mechanical properties

Typical

Yield strength, Re: 465 MPa
Tensile Strength, Rm: 550 MPa
Elongation, A5 26%
Impact energy, CV: -20 °C • 60 J

Hydrogen content / 100 g weld metal

\leq 10 ml

Approvals:

DB
TÜV
DNV
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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71492500 | 60-90 | 25 | 0,65 | 77 | 0,8 |
| 3,2 | 450 | 71493200 | 80-140 | 25 | 0,67 | 36 | 1,3 |
| 3,2 | 350 | 71493235 | 80-140 | 25 | 0,67 | 45 | 1,3 |
| 4,0 | 450 | 71494000 | 130-200 | 25 | 0,69 | 22 | 1,7 |



P 48M

Classification:

EN ISO 2560-A

AWS A5.1

E 42 5 B 42 H5

E 7018-1 H4R*

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.

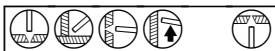
Coating type:

Basic

Metal recovery:

120%

Welding positions:



Welding current:

DC+/-)

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|-----|-------|-------|
| 0,05 | 0,5 | 1,4 | 0,015 | 0,010 |

Mechanical properties

Typical

Yield strength, Re: 480 MPa

Tensile Strength, Rm: 560 MPa

Elongation, A5 28%

Impact energy, CV: -40 °C • 80 J

-46 °C • 70 J

-50 °C • 60 J

Hydrogen content / 100 g weld metal

≤ 4 ml

Approvals:

CE

DNV

LR

GL

RINA

MRS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 71552000 | 40-80 | 23 | 0,64 | 112 | 0,7 |
| 2,5 | 350 | 71552500 | 70-110 | 23 | 0,69 | 62 | 0,9 |
| 3,2 | 450 | 71553200 | 80-145 | 24 | 0,71 | 30 | 1,3 |
| 4,0 | 450 | 71554000 | 120-210 | 25 | 0,73 | 20 | 1,8 |
| 5,0 | 450 | 71555000 | 200-285 | 25 | 0,75 | 13 | 2,7 |

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

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.

Coating type:

Basic

Metal recovery:

120%

Welding positions:

Welding current:

DC+/(-)

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|------|------|-------|------|
| 0,05 | 0,60 | 1,40 | 0,015 | 0,01 |

Mechanical properties
Typical

| | |
|-----------------------|--------------------------------|
| Yield strength, Re: | 530 MPa |
| Tensile Strength, Rm: | 600 MPa |
| Elongation, A5 | 26% |
| Impact energy, CV: | -40 °C • 60 J -46 °C • 40 J |

Hydrogen content / 100 g weld metal

≤ 4 ml

Approvals:

 CE
 TÜV
 BV
 GL
 ABS
 DB
 DNV
 MRS
 LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 1,6 | 300 | 71481620 | 30-60 | 23 | 0,65 | 170 | 0,5 |
| 2,0 | 300 | 71482020 | 40-80 | 23 | 0,64 | 115 | 0,7 |
| 2,5 | 350 | 71482520 | 80-110 | 23 | 0,71 | 60 | 1,0 |
| 3,2 | 450 | 71483220 | 110-155 | 24 | 0,72 | 28 | 1,6 |
| 3,2 | 350 | 71483520 | 110-165 | 24 | 0,72 | 36 | 1,6 |
| 4,0 | 450 | 71484020 | 140-205 | 25 | 0,74 | 19 | 2,1 |
| 5,0 | 450 | 71485020 | 200-285 | 25 | 0,75 | 13 | 2,9 |



P 48P

Classification:

EN ISO 2560-A

E 46 2 B 12 H5

AWS A5.1

E 7018-H8

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.

Coating type:

Basic

Metal recovery:

105%

Welding positions:



Welding current:

DC+/-, AC OCV > 70 V

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|------|------|-------|-------|
| 0,06 | 0,60 | 1,20 | 0,015 | 0,010 |

Mechanical properties

Typical

Yield strength, Re: 530 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A5 25 %

Impact energy, CV: -20 °C • 80 J

-30 °C • 70 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE

ABS

LR

GL

TÜV

DNV

BV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 71592000 | 45-65 | 20 | 0,61 | 155 | 0,6 |
| 2,5 | 350 | 71592500 | 60-85 | 22 | 0,62 | 80 | 0,6 |
| 3,2 | 450 | 71593200 | 70-130 | 23 | 0,75 | 30 | 1,1 |
| 3,2 | 350 | 71593235 | 70-130 | 23 | 0,75 | 42 | 1 |
| 4,0 | 450 | 71594000 | 120-190 | 24 | 0,73 | 23 | 1,7 |

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.

Coating type:

Basic

Metal recovery:

120%

Welding positions:

Welding current:

 DC(+)-, AC OCV ≥ 70 V

For root passes: DC -

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|------|------|------|
| 0,05 | 0,5 | 1,35 | 0,01 | 0,01 |

Mechanical properties
Typical

Yield strength, Re: 560 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5: 25%

Impact energy, CV: -46 °C • 30 J

-40 °C • 60 J

Hydrogen content / 100 g weld metal
 ≤ 5 ml

Approvals:

CE

TÜV

GL

DB

LR

BV

DNV

ABS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71512500 | 70-110 | 23 | 0,68 | 60 | 1,0 |
| 3,2 | 450 | 71513200 | 110-150 | 24 | 0,68 | 30 | 1,3 |
| 3,2 | 350 | 71513235 | 110-150 | 24 | 0,68 | 38 | 1,3 |
| 4,0 | 450 | 71514000 | 140-200 | 24 | 0,72 | 19 | 1,8 |
| 4,0 | 350 | 71514035 | 140-200 | 24 | 0,72 | 25 | 1,8 |
| 5,0 | 450 | 71515000 | 200-270 | 24 | 0,72 | 13 | 2,6 |



P 54

Classification:

EN ISO 2560-A

AWS A5.1

E 46 2 B 35 H5

E 7048-H4

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.

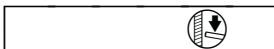
Coating type:

Basic

Metal recovery:

110%

Welding positions:



Welding current:

AC OCV ≤ 65 V, (DC +)

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|-----|-------|------|
| 0,06 | 0,5 | 0,9 | 0,015 | 0,01 |

Mechanical properties

Typical

Yield strength, Re:

530 MPa

Tensile Strength, Rm:

590 MPa

Elongation, A5

25%

Impact energy, CV:

-20 °C • 90 J

-40 °C • 40 J

Hydrogen content / 100 g weld metal

≤ 4 ml

Approvals:

CE

GL

LR

DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 450 | 71543200 | 110-150 | 23 | 0,78 | 32 | 1,7 |
| 4,0 | 450 | 71544000 | 150-200 | 24 | 0,76 | 22 | 2,1 |
| 5,0 | 450 | 71545000 | 200-280 | 25 | 0,75 | 14 | 2,9 |



Maxeta 20

Classification:

EN ISO 2560-A

AWS A5.1

E 42 2 RB 53 H10

E 7028

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.

Coating type:

Basic-rutile

Metal recovery:

150%

Welding positions:



Welding current:

DC+/-, AC OCV > 65 V

Redrying temperature:

300 °C, 2h

Mechanical properties

Typical

Yield strength, Re: 480 MPa

Tensile Strength, Rm: 550 MPa

Elongation, A5 27%

Impact energy, CV: -20 °C • 90 J

Hydrogen content / 100 g weld metal

≤ 10 ml

Approvals:

CE

DNV

LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 450 | 72083200 | 140-170 | 29 | 0,60 | 24 | 1,6 |
| 4,0 | 450 | 72084000 | 180-220 | 30 | 0,62 | 18 | 2,1 |
| 5,0 | 450 | 72085000 | 250-320 | 32 | 0,64 | 11 | 3,6 |

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.

Coating type:

Zircon-basic

Metal recovery:

170%

Welding positions:

Welding current:

DC+/-, AC OCV > 70 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|------|------|------|
| 0,06 | 0,4 | 1,25 | 0,01 | 0,01 |

Mechanical properties
Typical

| | |
|-----------------------|---------------------------------|
| Yield strength, Re: | 460 MPa |
| Tensile Strength, Rm: | 560 MPa |
| Elongation, A5 | 24% |
| Impact energy, CV: | -20 °C • 150 J -40 °C • 70 J |

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

 CE
 LR
 DNV
 GL

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 4,0 | 450 | 72064000 | 170-240 | 30 | 0,72 | 14 | 3,0 |
| 5,0 | 450 | 72065000 | 225-355 | 33 | 0,71 | 9 | 4,6 |



Maxeta 22

Classification:

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

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.

Coating type:

Zircon-basic

Metal recovery:

240%

Welding positions:



Welding current:

DC+/-, AC OCV > 65 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S |
|------|-----|-----|------|------|
| 0,05 | 0,5 | 1,0 | 0,01 | 0,01 |

Mechanical properties

Typical

Yield strength, Re: 450 MPa
 Tensile Strength, Rm: 560 MPa
 Elongation, A5 26%
 Impact energy, CV: -20 °C • 110 J
 -40 °C • 50J

Hydrogen content / 100 g weld metal

≤ 10 ml

Approvals:

CE
 DNV
 GL
 LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 4,0 | 450 | 72074000 | 190-240 | 33 | 0,74 | 11,0 | 4,9 |
| 5,0 | 450 | 72075000 | 240-360 | 34 | 0,76 | 6,0 | 8,0 |
| 5,0 | 600 | 72075060 | 240-340 | 34 | 0,75 | 5,0 | 7,5 |
| 6,0 | 450 | 72076000 | 300-470 | 39 | 0,75 | 4,0 | 10,8 |
| 6,0 | 600 | 72076060 | 300-450 | 39 | 0,75 | 3,0 | 10,3 |



Basic coated low alloy electrodes for welding high tensile, low temperature and creep resisting steels

| | |
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P 62MR

Classification:

EN ISO 2560-A

AWS A5.5

~E 46 5 1Ni B 32 H5

E7018-G / (E 8018-G)**

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.

Coating type:

Basic

Metal recovery:

110-120%

Welding positions:



Welding current:

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

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt. %

| C | Si | Mn | P | S | Ni |
|------|-----|-----|------|-------|-----|
| 0,06 | 0,3 | 1,3 | 0,01 | 0,005 | 0,9 |

Mechanical properties

Typical

Yield strength, Re: 530 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5 25%

Impact energy, CV: -60 °C • 60 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE

BV

LR

NAKS

MRS

ABS

DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71622500 | 60-110 | 22 | 0,73 | 71 | 0,8 |
| 3,2 tc | 350 | 71623250 | 80-155 | 23 | 0,72 | 42 | 1,3 |
| 3,2 | 350 | 71623235 | 80-150 | 24 | 0,71 | 37 | 1,4 |
| 3,2 | 450 | 71623200 | 80-150 | 24 | 0,71 | 28 | 1,4 |
| 4,0 | 450 | 71624000 | 140-200 | 24 | 0,72 | 19 | 1,9 |
| 5,0 | 450 | 71625000 | 200-270 | 24 | 0,72 | 13 | 2,6 |

EN: slight deviation in Mn

** Meet also 8018-G in diameter up to 4,0 mm



P 63MR

Classification:

EN ISO 2560-A
AWS A5.5

E 46 5 1Ni B 32 H5
E7018-C3L / ~E8018-C3

Description:

P 63MR 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.

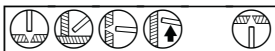
Coating type:

Basic

Metal recovery:

110-120%

Welding positions:



Welding current:

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

Redrying temperature:

375-400 °C, 2h

Mechanical properties

Typical

Yield strength, Re: 530 MPa
Tensile Strength, Rm: 610 MPa
Elongation, A5 25%
Impact energy, CV: -60 °C • 60 J

Hydrogen content / 100 g weld metal

≤ 5 ml

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71642500 | 60-110 | 22 | 0,73 | 71 | 0,8 |
| 3,2 | 350 | 71643200 | 80-150 | 24 | 0,71 | 37 | 1,4 |
| 4,0 | 350 | 71644000 | 140-200 | 24 | 0,72 | 25 | 1,9 |



P 65MR

Classification:

| | |
|---------------|------------------------|
| EN ISO 18275 | 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 |

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 °C. 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.

Coating type:

Basic

Metal recovery:

110-120%

Welding positions:



Welding current:

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

Redrying temperature:

375-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni | Mo |
|------|-----|-----|------|-------|-----|------|
| 0,06 | 0,4 | 1,6 | 0,01 | 0,005 | 0,8 | 0,15 |

Mechanical properties

Typical

| | |
|-----------------------|---------------|
| Yield strength, Re: | 610 MPa |
| Tensile Strength, Rm: | 650 MPa |
| Elongation, A5 | 22% |
| Impact energy, CV: | -60 °C • 60 J |

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE
DNV
LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71652500 | 60-110 | 22 | 0,71 | 71 | 0,8 |
| 3,2 tc | 350 | 71653250 | 80-155 | 23 | 0,74 | 42 | 1,3 |
| 3,2 | 350 | 71653235 | 80-150 | 24 | 0,68 | 37 | 1,4 |
| 3,2 | 450 | 71653200 | 80-150 | 24 | 0,68 | 31 | 1,5 |
| 4,0 | 450 | 71654000 | 140-200 | 24 | 0,72 | 20 | 1,9 |
| 5,0 | 450 | 71655000 | 200-270 | 24 | | 13 | 2,6 |



P 48K

Classification:

EN ISO 2560-A
AWS A5.5

E 46 6 2Ni B 32 H5
E8018-C1

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

Coating type:

Basic

Metal recovery:

120%

Welding positions:



Welding current:

DC+/-, AC OCV ≥ 70 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni |
|------|-----|-----|------|-------|-----|
| 0,05 | 0,5 | 0,8 | 0,01 | 0,005 | 2,4 |

Mechanical properties

Typical

Yield strength, Re: 530 MPa
Tensile Strength, Rm: 620 MPa
Elongation, A5: 25%
Impact energy, CV: -60 °C • 90 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE
LR
ABS
BV
DNV
MRS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71582500 | 80-110 | 24 | 0,64 | 63 | 0,9 |
| 3,2 | 450 | 71583200 | 110-150 | 25 | 0,67 | 33 | 1,3 |
| 4,0 | 450 | 71584000 | 140-200 | 27 | 0,7 | 22 | 1,9 |
| 5,0 | 450 | 71585000 | 200-270 | 27 | 0,71 | 13 | 2,6 |

**P 58K****Classification:**

AWS A5.5

E 7018-C2L

Description:

3,5% Ni, low hydrogen, low carbon electrode for applications requiring high toughness at low temperatures down to -101 C. Weld metal toughness is increased by PWHT at 610°C, 2 hours.

Coating type:

basic

Metal recovery:

120 %

Welding positions:**Welding current:**DC+, AC OCV \geq 70 V**Redrying temperature:**

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni |
|------|------|------|-------|-------|-----|
| 0,04 | 0,30 | 0,60 | 0,007 | 0,006 | 3,3 |

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 350 | 71873235 | 80-150 | 23 | 0,71 | 37 | 1,4 |
| 3,2 | 450 | 71873200 | 80-150 | 23 | 0,71 | 30 | 1,4 |
| 4,0 | 350 | 71874035 | 140-200 | 24 | 0,72 | 25 | 1,9 |
| 4,0 | 450 | 71874000 | 140-200 | 24 | 0,72 | 20 | 1,9 |
| 5,0 | 450 | 71875000 | 200-270 | 27 | 0,73 | 13 | 2,6 |

Mechanical propertiesTypical

Yield strength, Rp0.2%: 500 MPa**

Tensile Strength, Rm: 580 MPa**

Elongation, A5 27 %**

Impact energy, CV: -101 °C • 40 J**

-70 °C • 100 J**

Hydrogen content / 100 g weld metal \leq 5 ml

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 preasure mud pipes.

Coating type:

Basic

Metal recovery:

120%

Welding positions:

Welding current:

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

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni | Mo |
|------|------|------|------|------|-----|-----|
| 0,07 | 0,60 | 1,80 | 0,01 | 0,01 | 0,8 | 0,4 |

Mechanical properties
Typical

| | |
|-----------------------|-----------------------------------|
| Yield strength, Re: | 730 MPa** |
| Tensile Strength, Rm: | 770 MPa** |
| Elongation, A5 | 21%** |
| Impact energy, CV: | -20°C • 100 J** -40°C • 75 J** |

Hydrogen content / 100 g weld metal

≤ 5 ml

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71632500 | 50-95 | 23 | 0,69 | 72 | 0,7 |
| 3,2 | 450 | 71633200 | 100-150 | 23 | 0,71 | 28 | 1,4 |
| 4,0 | 450 | 71634000 | 140-200 | 23 | 0,71 | 20 | 1,8 |
| 5,0 | 450 | 71635000 | 200-270 | 24 | 0,70 | 13 | 2,6 |



P 110MR

Classification:

EN ISO 18275

~E 69 6 Mn2NiCrMo B 32

H5

AWS A5.5

E 11018-G

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.

Coating type:

Basic

Metal recovery:

120%

Welding positions:



Welding current:

DC+(-), AC OCV ≥ 70 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Cu |
|------|------|------|------|-----|------|------|
| 0,05 | 0,40 | 1,70 | 0,35 | 2,2 | 0,25 | 0,60 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 740 MPa

Tensile Strength, Rm: 790 MPa

Elongation, A5 24%

Impact energy, CV: -40 °C • 80 J

-60 °C • 70 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE

LR

ABS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71602500 | 70-110 | 22 | 0,7 | 66 | 0,9 |
| 3,2 | 450 | 71603200 | 100-150 | 24 | 0,7 | 29 | 1,4 |
| 3,2 | 350 | 71603235 | 100-150 | 24 | 0,7 | 35 | 1,4 |
| 4,0 | 450 | 71604000 | 135-200 | 24 | 0,72 | 19 | 1,9 |



Maxeta 24

Classification:

EN ISO 2560-A
AWS A5.5

E 46 5 1Ni B 53 H5
~E7018-G

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.

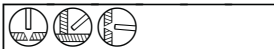
Coating type:

Zircon-basic

Metal recovery:

160%

Welding positions:



Welding current:

DC+/-, AC OCV ≥ 70 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni |
|------|-----|-----|------|------|-----|
| 0,05 | 0,3 | 1,1 | 0,01 | 0,01 | 0,8 |

Mechanical properties

Typical

Yield strength, Re: 510 MPa
Tensile Strength, Rm: 600 MPa
Elongation, A5: 25%
Impact energy, CV: -50°C • 70 J

Hydrogen content / 100 g weld metal

≤ 5 ml

CE
DNV
ABS
LR

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 4,0 | 450 | 72094000 | 170-240 | 29 | 0,74 | 14 | 3,0 |
| 5,0 | 450 | 72095000 | 225-355 | 33 | 0,71 | 10 | 4,6 |



Maxeta 110

Classification:

EN ISO 18275

AWS A5.5

~E 69 5 Mn 2NiMo B 73 H5

~E 11018-G

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, T1, 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.

Coating type:

Zircon-basic

Metal recovery:

160%

Welding positions:



Welding current:

DC+/-, AC OCV ≥ 70 V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Ni | Mo |
|------|-----|-----|-------|-------|-----|-----|
| 0,05 | 0,4 | 1,2 | 0,015 | 0,015 | 2,8 | 0,5 |

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 |
|----------|-----------|--------------|-----------|-----------|-----------------------------|---------------------------------|-----------------------------|
| 4,0 | 450 | 72114000 | 170-240 | 28 | 0,74 | 14 | 3 |
| 5,0 | 450 | 72115000 | 225-355 | 30 | 0,74 | 9 | 4,9 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 720 MPa

Tensile Strength, Rm: 780 MPa

Elongation, A5 20%

Impact energy, CV: -40°C • 75 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

CE

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.

Coating type:

Basic

Metal recovery:

110%

Welding positions:

Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Mo |
|------|-----|------|------|------|------|
| 0,07 | 0,4 | 0,80 | 0,01 | 0,01 | 0,55 |

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71812500 | 65-100 | 22 | 0,72 | 71 | 0,8 |
| 3,2 | 350 | 71813200 | 95-150 | 23 | 0,73 | 37 | 1,4 |
| 4,0 | 350 | 71814000 | 130-200 | 24 | 0,73 | 19 | 1,8 |
| 5,0 | 450 | 71815000 | 160-265 | 25 | 0,73 | 12 | 2,6 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 480 MPa**

Tensile Strength, Rm: 590 MPa**

Elongation, A5 24%**

Impact energy, CV: -20 °C • 100 J**

Hydrogen content / 100 g weld metal

≤ 5 ml



P 83CR

Classification:

EN ISO 3580-A
AWS A5.5

E CrMo1 B 42 H5
E 8018-B2

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 °C, 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 °C is recommended. Post-weld heat treat at 690 °C.

Coating type:

Basic

Metal recovery:

110%

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Cr | Mo |
|------|------|-----|------|------|------|-----|
| 0,07 | 0,35 | 0,8 | 0,01 | 0,01 | 1,20 | 0,5 |

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71832500 | 65-100 | 22 | 0,72 | 71 | 0,8 |
| 3,2 | 350 | 71833200 | 95-150 | 23 | 0,73 | 37 | 1,4 |
| 4,0 | 350 | 71834000 | 130-200 | 24 | 0,73 | 19 | 1,8 |
| 5,0 | 450 | 71835000 | 160-265 | 25 | 0,73 | 12 | 2,6 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 700 MPa**

Tensile Strength, Rm: 750 MPa**

Elongation, A5: 21 %**

Impact energy, CV: 20 °C • 130 J**

Hydrogen content / 100 g weld metal

≤ 5 ml



P 84CR

Classification:

EN ISO 3580-A

E CrMo2 B 42 H5

AWS A5.5

E 9018-B3

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.

Coating type:

Basic

Metal recovery:

110-120%

Welding positions:



Welding current:

DC+

Redrying temperature:

350-400 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | P | S | Cr | Mo |
|------|------|------|-------|-------|-----|-----|
| 0,07 | 0,30 | 0,70 | 0,010 | 0,010 | 2,3 | 1,0 |

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 350 | 71842500 | 65-100 | 22 | 0,72 | 71 | 0,8 |
| 3,2 | 350 | 71843200 | 90-150 | 23 | 0,73 | 37 | 1,4 |
| 4,0 | 350 | 71845000 | 130-200 | 24 | 0,73 | 19 | 1,8 |
| 5,0 | 450 | 71845000 | 160-265 | 25 | 0,73 | 12 | 2,6 |

Mechanical properties

Typical

Yield strength, Rp0.2%: N/A**

Tensile Strength, Rm: N/A**

Elongation, A5: N/A**

Impact energy, CV: N/A**

Hydrogen content / 100 g weld metal

≤ 5 ml

Electrodes for MMA welding of stainless steels and Ni-base alloys

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Cromarod 308L

Classification:

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

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 3.2 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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0,02 | 0,8 | 0,7 | 20,0 | 10,0 |

Mechanical properties

Typical

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

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.

Approvals:

CE
 DB
 TÜV
 DNV
 ABS
 GL

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 74302000 | 35-60 | 28 | 0,62 | 143 | 0,7 |
| 2,5 | 300 | 74302500 | 40-80 | 28 | 0,62 | 91 | 1,0 |
| 3,2 | 350 | 74303200 | 80-120 | 29 | 0,64 | 45 | 1,5 |
| 4,0 | 350 | 74304000 | 100-160 | 30 | 0,64 | 31 | 2,0 |
| 5,0 | 450 | 74305000 | 140-220 | 30 | 0,62 | 15 | 2,8 |

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.

Coating type:

Rutile

Welding positions:

Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0,02 | 0,7 | 0,6 | 19,7 | 9,5 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 450 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5 40%

Impact energy, CV: 0 °C • 60 J

-60 °C • 50 J

Ferrite content:

FN 5 (WRC-92)

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 74292000 | 20-45 | 21 | 0,67 | 148 | 0,7 |
| 2,5 | 300 | 74292500 | 35-85 | 21 | 0,68 | 91 | 0,9 |
| 3,2 | 350 | 74293200 | 40-100 | 23 | 0,73 | 44 | 1,4 |



Cromarod B308L

Classification:

AWS A5.4

E308L-15

EN ISO 3581-A

E 19 9 L B 42

Description:

Basic coated stainless steel electrode for type 304L/304LN steel grades.

Produces weld metal with higher toughness at lower temperatures compared to rutile coated electrodes. The basic coating results in higher resistance to porosity due to improved gas shield, making the electrode highly suitable for on site welding. Cromarod B308L has an easy slag removal even in narrow joint preparations, reducing post-weld cleaning time.

Applications:

Offshore, pipeline, restrained joints.

Coating type:

Basic

Metal recovery:

110%

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|------|
| 0,03 | 0,35 | 1,0 | 19,0 | 10,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 430 MPa

Tensile Strength, Rm: 570 MPa

Elongation, A5 40%

Impact energy, CV: -50 °C • 80 J

-196 °C • 50 J

lat exp 0.6 mm

Ferrite content:

FN 5 (WRC 92)

Approvals:

CE

DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74262500 | 50-80 | 24 | 0,69 | 86 | 0,83 |
| 3,2 | 350 | 74263200 | 75-125 | 25 | 0,69 | 43 | 1,24 |
| 4,0 | 350 | 74264000 | 100-165 | 26 | 0,69 | 28 | 1,94 |



Cromarod 308H

Classification:

AWS A5.4

E308H-17

EN ISO 3581-A

E 19 9 H R 12

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0,05 | 0,7 | 0,8 | 19,5 | 10,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 435 MPa

Tensile Strength, Rm: 585 MPa

Elongation, A5 39%

Impact energy, CV: 20 °C • 75 J

Ferrite content:

FN 4 (WRC-92)

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74282500 | 35-85 | 21 | 0,68 | 95 | 0,9 |
| 3,2 | 350 | 74283200 | 40-100 | 23 | 0,73 | 46 | 1,4 |
| 4,0 | 350 | 74284000 | 100-160 | 24 | 0,65 | 30 | 1,6 |



Cromarod 347

Classification:

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

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Nb |
|------|-----|-----|------|------|-----|
| 0,03 | 0,9 | 0,7 | 20,0 | 10,0 | 0,4 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74482500 | 50-80 | 21 | 0,62 | 90 | 1,0 |
| 3,2 | 350 | 74483200 | 80-110 | 22 | 0,64 | 46 | 1,3 |
| 4,0 | 350 | 74484000 | 130-170 | 22 | 0,63 | 31 | 1,9 |
| 4,0 | 450 | 74484045 | 110-135 | 22 | 0,65 | 23 | 1,6 |
| 5,0 | 450 | 74485000 | 160-220 | 22 | 0,65 | 15 | 2,8 |

Description:

Cromarod B347 is a niobium stabilised, basic 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 B347 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.

Cromarod B347 has an easy slag removal even in narrow joint preparations, reducing post-weld cleaning time. The basic coating results in higher resistance to porosity due to improved gas shield, making the electrode highly suitable for on site welding. Basic coated stainless electrodes produces weld metal with higher toughness at lower temperatures compared to rutile coated electrodes due to less weld metal oxygen. The basic coating results in a lower weld metal Si content making B347 less sensitive to hot cracking caused by Nb additions, compared to rutile types. Furthermore this permits a lower weld metal ferrite content compared to rutile types.

Applications:

pipe welding, restrained joints, cladding

Coating type:

Basic

Metal recovery:

110%

Welding positions:

Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Nb |
|------|------|-----|------|------|-----|
| 0,04 | 0,40 | 1,3 | 19,5 | 10,2 | 0,5 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 500 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A5 37%

Impact energy, CV: -50 °C • 70 J

Ferrite content:

5

Corrosion resistance

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

Scaling temperature:

Approx. 850 °C in air.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74612500 | 50-80 | 24 | 0,69 | 86 | 0,83 |
| 3,2 | 350 | 74613200 | 75-125 | 25 | 0,69 | 43 | 1,24 |
| 4,0 | 350 | 74614000 | 100-165 | 26 | 0,69 | 28 | 1,94 |
| 4,0 | 450 | 74614045 | 100-150 | 26 | 0,69 | 22 | 1,94 |
| 5,0 | 450 | 74615000 | 150-210 | 28 | 0,68 | 15 | 2,82 |



Cromarod 316L

Classification:

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

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,8 | 0,7 | 18,5 | 12,0 | 2,7 |

Mechanical properties

Typical

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

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.

Approvals:

CE
 ABS
 DB
 GL
 LR
 BV
 DNV
 TÜV
 NAKS

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 1,6 | 300 | 74401600 | 25-45 | 29 | 0,53 | 233 | 0,5 |
| 2,0 | 300 | 74402000 | 35-60 | 29 | 0,63 | 137 | 0,7 |
| 2,5 | 300 | 74402500 | 40-80 | 29 | 0,64 | 85 | 1,1 |
| 3,2 | 350 | 74403200 | 80-120 | 29 | 0,64 | 44 | 1,5 |
| 4,0 | 350 | 74404000 | 100-160 | 30 | 0,65 | 30 | 2,1 |
| 4,0 | 450 | 74404045 | 100-160 | 30 | 0,65 | 23 | 2,1 |
| 5,0 | 450 | 74405000 | 170-230 | 30 | 0,65 | 14 | 2,8 |



Cromarod 316LP

Classification:

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

Description:

Cromarod 316LP is a 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 striking 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 butt welds in general fabrication of molybdenum alloyed stainless steels in all material thicknesses.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,7 | 0,8 | 18,3 | 12,2 | 2,7 |

Mechanical properties

Typical

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

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.

Approvals:

CE
 DNV
 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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 1,6 | 250 | 74431625 | 18-35 | 20 | 0,68 | 267 | 0,5 |
| 2,0 | 300 | 74432000 | 20-45 | 21 | 0,67 | 145 | 0,7 |
| 2,0 | 250 | 74432025 | 20-45 | 21 | 0,67 | 178 | 0,6 |
| 2,5 | 300 | 74432500 | 40-85 | 23 | 0,68 | 91 | 0,9 |
| 3,2 | 350 | 74433200 | 40-100 | 23 | 0,73 | 44 | 1,4 |



Cromarod 316LV

Classification:

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

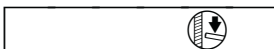
Description:

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,7 | 0,8 | 18,1 | 11,8 | 2,7 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74412500 | 55-80 | 24 | 0,70 | 96 | 1,0 |
| 3,2 | 350 | 74413200 | 80-115 | 25 | 0,71 | 50 | 1,5 |



Cromarod 316L-140

Classification:

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

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.

Coating type:

Rutile, high recovery 140%

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,8 | 0,8 | 18,4 | 11,8 | 2,7 |

Mechanical properties

Typical

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

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.

Approvals:

CE
DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74422500 | 60-90 | 32 | 0,67 | 61,0 | 1,4 |
| 3,2 | 350 | 74423200 | 110-130 | 34 | 0,77 | 27 | 2,2 |
| 4,0 | 450 | 74424000 | 130-170 | 38 | 0,77 | 14 | 3 |
| 5,0 | 450 | 74425000 | 170-230 | 40 | 0,77 | 9 | 4,3 |



Cromarod B316L

Classification:

AWS A5.4
EN ISO 3581-A

E316L-15
E 19 12 3 L B 42

Description:

Basic coated stainless steel electrode for type 316L steel grades. Produces weld metal with higher toughness at lower temperatures compared to rutile coated electrodes. The basic coating results in higher resistance to porosity due to improved gas shield, making the electrode highly suitable for on site welding. Cromarod B316L has an easy slag removal even in narrow joint preparations, reducing the post weld cleaning time.

Applications:

Offshore, pipeline, restrained joints.

Coating type:

Basic

Metal recovery:

110%

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|------|-----|------|------|-----|
| 0,03 | 0,35 | 1,0 | 18,5 | 12,0 | 2,7 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 470 MPa
Tensile Strength, Rm: 575 MPa
Elongation, A5: 35%
Impact energy, CV: -50 °C • 80 J
-196 °C • 45 J
lat exp 0.5 mm

Ferrite content:

FN 5 (WRC 92)

Approvals:

CE
DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74492500 | 50-80 | 24 | 0,69 | 86 | 0,83 |
| 3,2 | 350 | 74493200 | 75-125 | 25 | 0,69 | 43 | 1,24 |
| 4,0 | 350 | 74494000 | 100-165 | 26 | 0,69 | 28 | 1,94 |



Cromarod 318

Classification:

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

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 and can also be used for 316 material grades used at elevated temperatures.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb |
|------|-----|-----|------|------|-----|-----|
| 0,02 | 0,9 | 0,7 | 18,0 | 12,0 | 2,7 | 0,4 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74462500 | 50-80 | 21 | 0,61 | 90 | 1,0 |
| 3,2 | 350 | 74463200 | 80-120 | 22 | 0,63 | 46 | 1,4 |
| 4,0 | 350 | 74464000 | 130-170 | 22 | 0,63 | 30 | 1,8 |
| 5,0 | 450 | 74465000 | 160-220 | 22 | 0,65 | 14 | 2,8 |



Cromarod 309L

Classification:

AWS A5.4

E 309L-17

EN ISO 3581-A

E 23 12 L R 12

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.

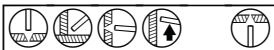
Applications:

- 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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0,02 | 0,8 | 0,8 | 23,0 | 13,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 470 MPa

Tensile Strength, Rm: 560 MPa

Elongation, A5 34%

Impact energy, CV: -20 °C • 48 J

-60 °C • 45 J

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.

Approvals:

LR
 DNV
 CE
 BV
 ABS
 GL

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74392500 | 40-80 | 27 | 0,67 | 83 | 0,9 |
| 3,2 | 350 | 74393200 | 80-120 | 28 | 0,67 | 42 | 1,4 |
| 4,0 | 350 | 74394000 | 100-160 | 29 | 0,67 | 28 | 1,9 |
| 4,0 | 450 | 74394045 | 100-160 | 29 | 0,67 | 21 | 1,9 |
| 5,0 | 450 | 74395000 | 170-230 | 30 | 0,65 | 14 | 2,8 |



Cromarod B309L

Classification:

AWS A5.4 E309L-15
EN ISO 3581-A E 23 12 L B 42

Description:

Basic coated electrode type 309L for dissimilar joint welding, buffer layers and surfacing applications.

Coating type:

Basic

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|-------|------|-----|------|------|
| 0,030 | 0,40 | 1,0 | 23,0 | 12,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 470 MPa
Tensile Strength, Rm: 580 MPa
Elongation, A5 35%
Impact energy, CV: -50 °C • 60 J

Ferrite content:

FN 10 (WRC 92)

Corrosion resistance

As Cromarod B309L 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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74662500 | 50-80 | 23 | 0,67 | 83 | 0,80 |
| 3,2 | 350 | 74663200 | 80-120 | 24 | 0,67 | 41 | 1,15 |
| 4,0 | 350 | 74664000 | 100-160 | 25 | 0,67 | 27 | 1,85 |
| 4,0 | 450 | 74664045 | 100-150 | 25 | 0,67 | 21 | 1,85 |



Cromarod B309LNb Classification:

AWS A5.4

~E309Nb-15

EN ISO 3581-A

E 23 12 Nb B 42

Description:

Cromarod B309LNb is a basic flux coated electrode primarily intended for depositing the first buffer layer on mild or low alloyed steels, prior to overlaying with Cromarod 347 or Cromarod B347. The over-alloyed deposit compensates the effect of dilution with the base material, enabling a full 347 type overlay to be achieved in the second layer.

Coating type:

Basic

Ferrite content:

FN 13 (WRC 92)

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Nb |
|-------|------|-----|------|------|-----|
| 0,035 | 0,45 | 1,0 | 23,0 | 12,0 | 0,8 |

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 350 | 74693200 | 80-120 | 24 | 0,67 | 40 | 1,1 |
| 4,0 | 350 | 74694000 | 100-160 | 25 | 0,67 | 27 | 1,8 |
| 5,0 | 450 | 74695000 | 180-220 | 26 | 0,68 | 19 | 2,8 |

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..

Coating type:

Rutile

Welding positions:

Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,8 | 0,8 | 22,8 | 12,8 | 2,4 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 555 MPa
 Tensile Strength, Rm: 680 MPa
 Elongation, A5 33%
 Impact energy, CV: -20 °C • 50 J

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.

Approvals:

CE
 ABS
 DNV
 LR
 DB
 RINA
 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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 74342000 | 35-60 | 26 | 0,63 | 135 | 0,7 |
| 2,5 | 300 | 74342500 | 40-80 | 27 | 0,64 | 84 | 1,1 |
| 3,2 | 350 | 74343200 | 80-120 | 28 | 0,65 | 43 | 1,5 |
| 4,0 | 350 | 74344000 | 100-160 | 29 | 0,65 | 29 | 2,1 |
| 4,0 | 450 | 74344045 | 100-160 | 29 | 0,65 | 23 | 2,1 |
| 5,0 | 450 | 74345000 | 150-220 | 30 | 0,67 | 13 | 3,1 |



Cromarod 309MoLP Classification:

AWS A5.4

E 309MoL-17

EN ISO 3581-A

E 23 12 2 L R 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 carbon steels.
- Joining of medium carbon hardenable steels, e.g. armour plate.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0,02 | 0,7 | 1,0 | 23,2 | 13,0 | 2,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 550 MPa

Tensile Strength, Rm: 720 MPa

Elongation, A5 33%

Impact energy, CV: -20 °C • 50 J

Ferrite content:

FN 20 (WRC-92)

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74332500 | 35-80 | 23 | 0,66 | 98 | 0,9 |
| 3,2 | 350 | 74333200 | 40-100 | 23 | 0,73 | 41 | 1,4 |



Cromarod 310

Classification:

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

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|------|
| 0,10 | 0,65 | 2,5 | 26,0 | 21,0 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74362500 | 50-70 | 23 | 0,67 | 79 | 0,7 |
| 3,2 | 350 | 74363200 | 70-110 | 23 | 0,67 | 40 | 1,1 |
| 4,0 | 350 | 74364000 | 110-155 | 25 | 0,67 | 27 | 1,5 |



Cromarod 312

Classification:

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

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0,10 | 1,2 | 0,8 | 29,0 | 9,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 590 MPa
 Tensile Strength, Rm: 760 MPa
 Elongation, A5 25%

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74382500 | 40-80 | 25 | 0,64 | 90 | 1,1 |
| 3,2 | 350 | 74383200 | 80-120 | 26 | 0,64 | 47 | 1,5 |
| 4,0 | 350 | 74384000 | 100-160 | 27 | 0,65 | 31 | 2,1 |



Cromarod 253

Classification:

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | N |
|------|-----|-----|------|------|------|
| 0,06 | 1,5 | 0,5 | 22,0 | 10,5 | 0,17 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74552500 | 40-80 | 22 | 0,65 | 89 | 0,7 |
| 3,2 | 350 | 74553200 | 70-110 | 23 | 0,65 | 46 | 1,1 |
| 4,0 | 350 | 74554000 | 100-140 | 24 | 0,65 | 30 | 1,6 |

**Description:**

Cromarod LDX is a rutile coated "Lean Duplex" type electrode for welding stainless steels such as LDX 2101, ASTM S32101. The weld metal is low in Mo, making it the preferred choice for applications where the corrosive media requires this for corrosion resistance, eg. alkaline corrosive environments. Cromarod LDX could also be used to weld other duplex stainless steels such as ASTM S32304 and S32003 but it has to be verified that corrosion resistance of the weld metal is sufficient for the specified application.

Coating type:

Rutile

Welding positions:**Welding current:**

DC +, AC 0CV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,03 | 0,8 | 0,9 | 24,5 | 8,5 | 0,1 | 0,14 |

Mechanical properties**Typical**

Yield strength, Rp0.2%: 630 MPa

Tensile Strength, Rm: 770 MPa

Elongation, A5 24%

Impact energy, CV: -20 °C • 40 J

-40 °C • 35 J

Ferrite content:

35

Corrosion resistance

Good general corrosion resistance.

Good SCC resistance due to the duplex micro structure.

Low Mo weld metal for alkaline and oxidizing environments.

PRE=27

Scaling temperature:

Approx. 850 °C in air.

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74672500 | 60-85 | 24 | 0,67 | 81 | 0,9 |
| 3,2 | 350 | 74673200 | 80-120 | 24 | 0,68 | 42 | 1,3 |
| 4,0 | 350 | 74674000 | 125-165 | 24 | 0,69 | 27 | 1,8 |

*This composition is not yet included in ISO 3581.

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 °C is required, use Cromarod Duplex B.

Coating type:

Rutile

Welding positions:

Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,02 | 0,9 | 0,7 | 23,5 | 9,5 | 3,0 | 0,16 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 670 MPa

Tensile Strength, Rm: 840 MPa

Elongation, A5 25%

Impact energy, CV: -46 °C • 34 J

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 °C (ASTM G48).

Scaling temperature:

Approx. 850 °C in air.

Approvals:

 LR
 GL
 TÜV
 DNV
 BV
 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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74522500 | 60-90 | 24 | 0,62 | 92 | 1,1 |
| 3,2 | 350 | 74523200 | 80-120 | 25 | 0,64 | 45 | 1,4 |
| 4,0 | 350 | 74524000 | 130-170 | 26 | 0,64 | 30 | 2,0 |
| 5,0 | 450 | 74525000 | 160-220 | 30 | 0,64 | 14 | 2,7 |



Cromarod Duplex LP

Classification:

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

Description:

Cromarod Duplex LP is a fully positional rutile flux coated electrode designed specially for pipe-welding. It has a thin coating and fast-freezing 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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,02 | 1,0 | 0,8 | 23,2 | 9,2 | 3,0 | 0,16 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 680 MPa
Tensile Strength, Rm: 800 MPa
Elongation, A5 25%
Impact energy, CV: -46 °C • 32 J

Ferrite content:

FN 35 (WRC-92)

Corrosion resistance

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

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 74592000 | 20-45 | 21 | 0,67 | 145 | 0,7 |
| 2,5 | 300 | 74592500 | 35-85 | 22 | 0,75 | 80 | 1,0 |
| 3,2 | 350 | 74593200 | 50-110 | 22 | 0,71 | 44 | 1,2 |



Cromarod Duplex-140

Classification:

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

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 of 0.5-2.5 KJ/mm is recommended to maintain a favourable austenite-ferrite phase balance.

Coating type:

Rutile, high recovery 140%

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,02 | 0,9 | 0,7 | 23,7 | 9,8 | 3,1 | 0,13 |

Mechanical properties

Typical

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

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 3,2 | 350 | 74513200 | 110-130 | 31 | 0,62 | 33 | 1,7 |
| 4,0 | 450 | 74514000 | 130-170 | 32 | 0,63 | 18 | 2,4 |
| 5,0 | 450 | 74515000 | 170-230 | 33 | 0,63 | 11 | 3,4 |



Cromarod Duplex B

Classification:

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

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.

Coating type:

Basic

Metal recovery:

110%

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,03 | 0,6 | 0,9 | 23,0 | 9,0 | 3,2 | 0,17 |

Mechanical properties

Typical

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

Ferrite content:

FN 35 (WRC-92)

Corrosion resistance

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

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74622500 | 50-80 | 24 | 0,65 | 87 | 0,8 |
| 3,2 | 350 | 74623200 | 75-120 | 25 | 0,68 | 43 | 1,4 |
| 4,0 | 350 | 74624000 | 120-175 | 27 | 0,68 | 28 | 1,9 |

Description:

Cromarod 2507R is a rutile flux coated electrode which deposits a 25%Cr/ 9.0%Ni / 4.0%Mo / 0.25%N super duplex 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 °C is required, use Cromarod 2507B.

Coating type:

Rutile

Welding positions:

Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0,02 | 0,8 | 0,7 | 25,0 | 9,0 | 4,0 | 0,23 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 700 MPa

Tensile Strength, Rm: 900 MPa

Elongation, A5 22%

Impact energy, CV: 20 °C • 35 J

Ferrite content:

FN 50-55 (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 °C (ASTM G48).

Scaling temperature:

Approx. 850 °C in air.

Approvals:

CE

DNV

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,50 | 300 | 74532500 | 60-90 | 22 | 0,50 | 110 | 1,1 |
| 3,25 | 350 | 74533200 | 80-120 | 23 | 0,55 | 53 | 1,5 |
| 4,00 | 350 | 74534000 | 130-170 | 24 | 0,55 | 35 | 2,3 |



Cromarod 2507B

Classification:

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

Description:

Cromarod 2507B is a basic flux coated electrode which deposits a 25%Cr / 9.0%Ni / 4.0%Mo / 0.25%N super duplex 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.

Coating type:

Basic

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|------|------|-----|-----|------|
| 0,03 | 0,4 | 0,85 | 25,0 | 8,5 | 3,7 | 0,23 |

Mechanical properties

Typical

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

Ferrite content:

FN 50-55 (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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74572500 | 60-90 | 23 | 0,71 | 79 | 1,0 |
| 3,2 | 350 | 74573200 | 80-120 | 24 | 0,71 | 41 | 1,4 |
| 4,0 | 350 | 74574000 | 130-170 | 26 | 0,73 | 26 | 2,0 |

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.

Coating type:

Rutile

Welding positions:

Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Cu |
|-------|-----|-----|------|------|-----|-----|
| 0,025 | 1,0 | 1,0 | 27,5 | 31,5 | 3,8 | 1,0 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 55 J

Ferrite content:

FN 0 (WRC-92)

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,0 | 300 | 74642000 | 25-50 | 21 | 0,64 | 140 | 0,50 |
| 2,5 | 300 | 74642500 | 45-75 | 21 | 0,60 | 88 | 0,6 |
| 3,2 | 350 | 74643200 | 70-110 | 22 | 0,63 | 44 | 1,0 |
| 4,0 | 350 | 74644000 | 30-170 | 25 | 0,64 | 29 | 1,9 |



Cromarod 385

Classification:

AWS A5.4

~E 385-17

EN ISO 3581-A

E 20 25 5 Cu N L R 12

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC OCV > 39V

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Cu |
|------|-----|-----|------|------|-----|-----|
| 0,02 | 0,8 | 1,1 | 20,5 | 25,5 | 4,2 | 1,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5: 35%

Impact energy, CV: 20 °C • 55 J

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.

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74502500 | 40-80 | 24 | 0,53 | 101 | 1,1 |
| 3,2 | 350 | 74503200 | 80-120 | 25 | 0,58 | 50 | 1,5 |
| 4,0 | 350 | 74504000 | 130-170 | 26 | 0,58 | 33 | 2,3 |



Cromarod 82

Classification:

EN ISO 14172
AWS A5.11

E Ni 6182
E NiCrFe-3

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 °C and is suitable for welding 5% and 9% nickel steels for cryogenic applications.

Coating type:

Basic

Welding positions:



Welding current:

DC+

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Nb |
|------|-----|-----|------|------|-----|
| 0,03 | 0,3 | 7,0 | 16,0 | bal. | 2,2 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa
Tensile Strength, Rm: 630 MPa
Elongation, A5 39%
Impact energy, CV: -196 °C • 80 J

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 1100 °C

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74542500 | 45-70 | 25-27 | | | |
| 3,2 | 350 | 74543200 | 70-110 | 25-27 | | | |



Cromarod 625

Classification:

EN ISO 14172

E Ni 6625

AWS A5.11

E NiCrMo-3

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 °C and is suitable for welding 5% and 9% nickel steels for cryogenic applications.

Coating type:

Basic

Welding positions:



Welding current:

DC +

Redrying temperature:

350 °C, 2h

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb |
|------|-----|-----|------|------|-----|-----|
| 0,03 | 0,4 | 0,6 | 22,0 | bal. | 9,0 | 3,4 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 530 MPa

Tensile Strength, Rm: 770 MPa

Elongation, A5 36%

Impact energy, CV: 20 °C • 60 J

-196 °C • 43 J

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 °C. Very high tensile strength and yield strength up to approx. 850 °C (Rp 0.2% ~400 MPa).

Approvals:

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 |
|----------|-----------|--------------|-----------|-----------|------------------------------|----------------------------------|------------------------------|
| 2,5 | 300 | 74562500 | 45-70 | 25 | 0,67 | 80 | 0,9 |
| 3,2 | 300 | 74563200 | 60-105 | 26 | 0,71 | 49 | 1,4 |
| 4,0 | 350 | 74564000 | 85-130 | 27 | 0,71 | 26 | 1,7 |
| 5,0 | 450 | 74565000 | 130-190 | 28 | 0,70 | 13 | 2,6 |

Electrodes for MMA welding for maintenance and repair

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Elgaloy Hard 30

Classification:

EN 14700

E Fe1

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.

Coating type:

Basic

Welding positions:



Welding current:

DC+, AC

Chemical composition, wt. %

| C | Mn | Cr |
|------|-----|-----|
| 0,13 | 0,8 | 2,8 |

Mechanical properties

Typical

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

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 3,2x450 | 70303210 | 100-140 |



Elgaloy Hard 60

Classification:

EN 14700

E Z Fe2

Description:

Elgaloy Hard 60 produces a martensitic weld metal with a hardness of about 57-60 HRC. The crack-free deposit has good wear resistance under conditions of abrasion and friction coupled with moderate impact. Also available as a self-shielded flux cored wire, Elgaloy Hard R 60.

Applications:

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

Coating type:

Basic

Welding positions:



Welding current:

DC+, AC

Chemical composition, wt.%

| C | Si | Mn | Cr | Mo | V |
|-----|-----|-----|-----|-----|-----|
| 0,7 | 0,8 | 0,8 | 8,0 | 0,5 | 0,4 |

Mechanical properties

Typical

Hardness as welded: 57 - 60 HRC,
640 - 690 HV 10

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 3,2x450 | 70313210 | 110-150 |
| 4,0x450 | 70314010 | 150-190 |



Elgaloy Hard 100

Classification:

EN 14700

E Fe14

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, agriculture implements, rolling mill guides sinter plant.

Coating type:

Special

Welding positions:



Welding current:

DC+, (AC)

Chemical composition, wt. %

| C | Cr |
|-----|----|
| 3,5 | 30 |

Mechanical properties

Typical

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

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 3,2x350 | 70343210 | 115-140 |
| 4,0x450 | 70344010 | 140-190 |



Elgaloy Mix 18

Classification:

EN ISO 3581-A

AWS A5.4

E 18 8 Mn R 53

~E 307-26

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.

Coating type:

Rutile

Welding positions:



Welding current:

DC+, AC

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|-----|------|
| 0,05 | 0,6 | 3,6 | 18,0 | 9,5 | <0,3 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 475 MPa

Tensile Strength, Rm: 660 MPa

Elongation, A5 40 %

Hardness:

Hardness as welded: 200 HV

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 2,5x350 | 70402510 | 70-115 |
| 3,2x350 | 70403210 | 90-155 |
| 4,0x450 | 70404010 | 130-210 |
| 5,0x450 | 70405010 | 160-260 |



Elgaly Mix 18B

Classification:

EN ISO 3581-A

AWS A5.4

E 18 8 Mn B 12

~E 307-15

Description:

Elgaly 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 Elgaly 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

Welding current:

DC+

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|-----|-----|
| 0,09 | 0,5 | 5,5 | 18,5 | 9,3 | 0,1 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 440N/mm²

Tensile Strength, Rm: 650N/mm²

Elongation, A5 40%

Hardness as welded: 200 HV

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 3,2x350 | 70413210 | 80-110 |
| 4,0x350 | 70414010 | 110-150 |



Elgaloy Cast-Ni

Classification:

EN-ISO 1071

AWS A5.15

E C Ni-CI 3

E Ni-CI

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.

Coating type:

Special

Welding positions:



Welding current:

DC+ / (-), AC

Chemical composition, wt. %

| C | Ni | Fe |
|-----|----|-----|
| 0,5 | 94 | 2,5 |

Mechanical properties

Typical

Tensile Strength, Rm: 240-290 MPa

Elongation, A5 8%

Hardness as welded: 150-170 HV

Product data:

| Diam. mm | Product code | Current A |
|----------|--------------|-----------|
| 2,5x300 | 70512510 | 50-90 |
| 3,2x350 | 70513210 | 80-120 |



Elgoy Cast-NiFe

Classification:

EN-ISO 1071
AWS A5.15-90

E C NiFe-1 3
E NiFe-CI

Description:

Elgoy 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. Elgoy 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.

Coating type:

Special

Welding positions:



Welding current:

DC+/-, AC

Chemical composition, wt.%

| C | Ni | Fe |
|-----|----|------|
| 1,0 | 54 | bal. |

Mechanical properties

Typical

Yield strength, Rp0.2%: 320-360 MPa
Tensile Strength, Rm: 400-450 MPa
Elongation, A5: 8%
Hardness as welded: 180-200 HV

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 2,5x300 | 70522510 | 50-90 |
| 3,2x350 | 70523210 | 80-120 |

Cored wires for welding of ferritic steels; Unalloyed

Rutile

| | |
|------------------------|-----|
| Elgacore DWA 50 | 96 |
| Elgacore DWX 50 | 97 |
| Elgacore DWA 52F | 98 |
| Elgacore DWA 55E | 99 |
| Elgacore DW 588 | 100 |

Basic

| | |
|------------------------|-----|
| Elgacore DWA 51B | 101 |
|------------------------|-----|

Metal Core

| | |
|--------------------------|-----|
| Elgacore MXA 100 | 102 |
| Elgacore MXX 100 | 103 |
| Elgacore MXA 100LF | 104 |
| Elgacore MXA 100XP | 105 |
| Elgacore MX 100T | 106 |



Elgacore DWA 50

Classification:

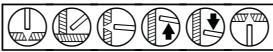
AWS A5.20
EN ISO 17632-A

E 71T-1M
T 42 2 P M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0.06 | 0.4 | 1.2 |

Mechanical properties

Typical

Yield strength, Re: 520 MPa
 Tensile Strength, Rm: 590 MPa
 Elongation, A5: 28%
 Impact energy, CV: -20°C • 75 J

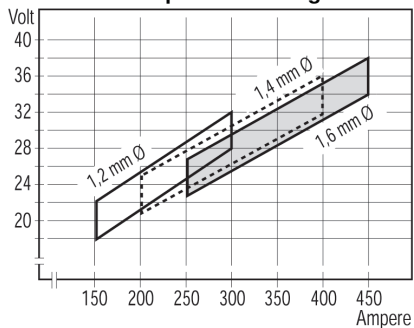
Hydrogen content / 100 g weld metal

≤ 5 ml

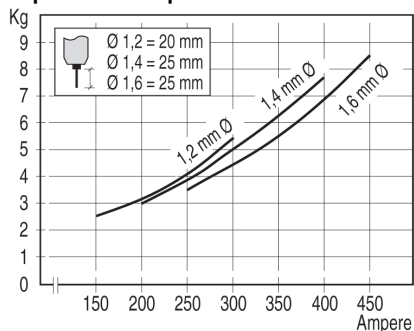
Approvals:

ABS
 DNV
 LR
 DB
 MRS
 TÜV
 GL
 RINA
 BV
 CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|---------------|
| 1,2 | 95601012 | 15 kg BS300 |
| 1,2 | 95602112 | 5 kg D200 |
| 1,2 | 95602212 | 250 kg ProPac |
| 1,6 | 95602016 | 12,5 kg D300 |

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:

M21, 80% Ar+20% CO₂, 22-25 l/min
 C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn |
|------|-----|-----|
| 0.06 | 0.5 | 1.4 |

Mechanical properties
Typical

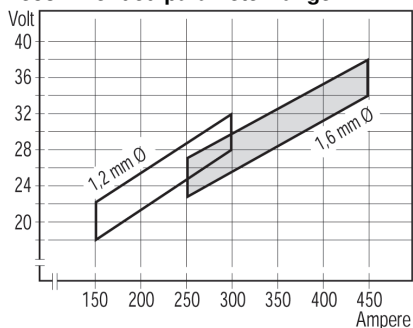
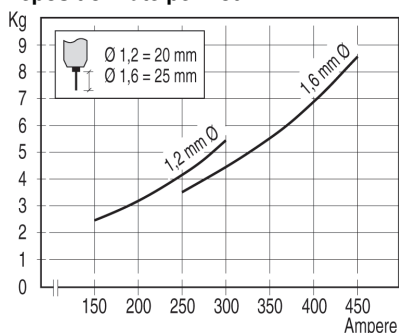
Yield strength, Re: 540 MPa
 Tensile Strength, Rm: 600 MPa
 Elongation, A5: 28%
 Impact energy, CV: -20 °C • 75 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:

ABS
 GL
 DNV
 LR
 RINA
 MRS
 CE

Recommended parameter range:

Deposition rate per hour:

Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95872112 | 5 kg D200 |
| 1,2 | 95871012 | 15 kg BS300 |
| 1,2 | 95871112 | 5 kg BS200 |
| 1,6 | 95871016 | 15 kg BS300 |



Elgacore DWA 52F

Classification:

AWS A5.20
EN ISO 17632-A

E71T-1M
T 42 2 R M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min.

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn |
|------|------|------|
| 0.05 | 0.54 | 1.35 |

Mechanical properties

Typical

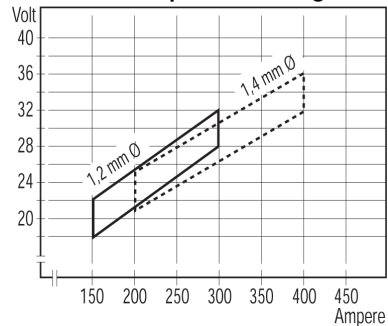
Yield strength, Re: 500 MPa
 Tensile Strength, Rm: 590 MPa
 Elongation, A5: 30%
 Impact energy, CV: -20 °C • 65J

Hydrogen content / 100 g weld metal

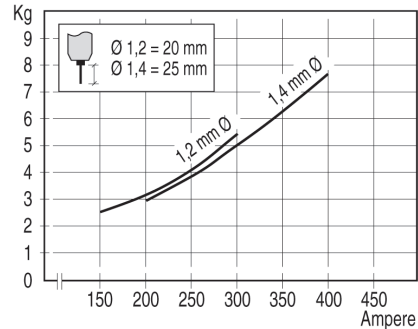
≤ 5 ml

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95502012 | 15 kg D300 |
| 1,4 | 95502014 | 15 kg D300 |



Elgacore DWA 55E

Classification:

AWS A5.20
EN ISO 17632-A

E 71T-9MJ
T 42 4 P M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Ni |
|------|-----|-----|-----|
| 0.05 | 0.5 | 1.3 | 0.4 |

Mechanical properties

Typical

Yield strength, Re: 570 MPa
 Tensile Strength, Rm: 630 MPa
 Elongation, A5: 27%
 Impact energy, CV: -40°C • 80 J

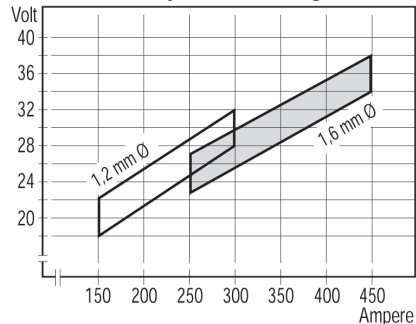
Hydrogen content / 100 g weld metal

≤ 5 ml

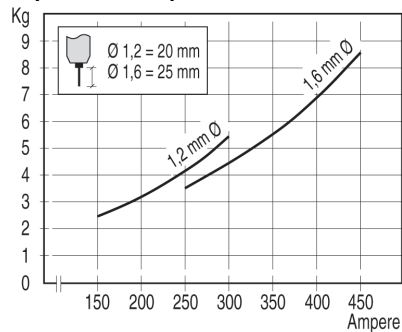
Approvals:

ABS
 LR
 DNV
 DB
 TÜV
 MRS
 BV
 GL
 NAKS
 CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95641012 | 15 kg BS300 |
| 1,2 | 95642112 | 5 kg D200 |
| 1,6 | 95641016 | 15 kg BS300 |



Elgacore DW 588

Classification:

EN ISO 17632-A

T 50 2 Z P C 1 H10

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:

C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Cu |
|------|-----|-----|-----|-----|-----|
| 0.04 | 0.6 | 1.2 | 0.5 | 0.5 | 0.4 |

Mechanical properties

Typical

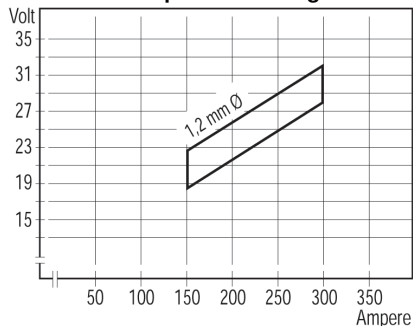
Yield strength, Re: 530 MPa
 Tensile Strength, Rm: 610 MPa
 Elongation, A5: 26%
 Impact energy, CV: -30 °C • 50 J

Hydrogen content / 100 g weld metal

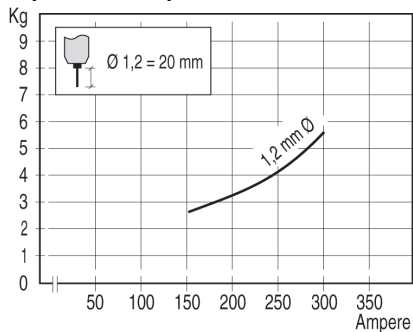
≤ 5 ml

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95582012 | 15 kg D300 |

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0.08 | 0.5 | 1.5 |

Mechanical properties

Typical

Yield strength, Re: 490 MPa
Tensile Strength, Rm: 600 MPa
Elongation, A5: 30%
Impact energy, CV:
-20 °C • 100 J
-40 °C • 65 J

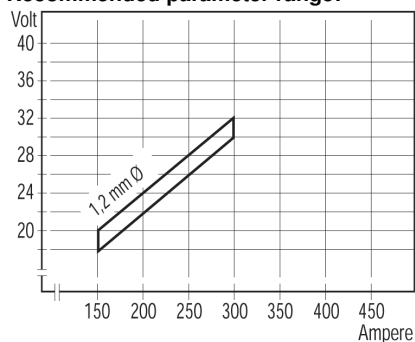
Hydrogen content / 100 g weld metal

≤ 5 ml

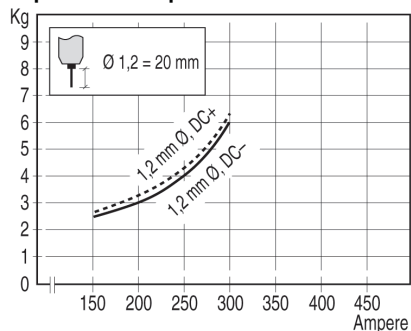
Approvals:

TÜV
DB
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95572012 | 15 kg D300 |



Elgacore MXA 100

Classification:

AWS A5.18
EN ISO 17632-A

E 70C-6M
T 42 4 M M 3 H5

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 Elgacore 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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn |
|------|------|------|
| 0.05 | 0.75 | 1.55 |

Mechanical properties

Typical

Yield strength, Re: 460 MPa
 Tensile Strength, Rm: 555 MPa
 Elongation, A5: 30%
 Impact energy, CV: -40°C • 80 J

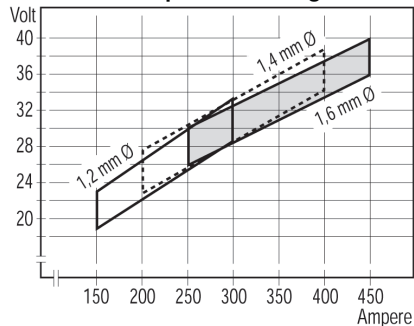
Hydrogen content / 100 g weld metal

≤ 5 ml

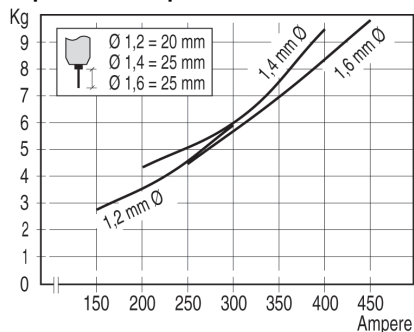
Approvals:

TÜV
 GL
 ABS
 DB
 LR
 MRS
 CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|---------------|
| 1,2 | 95621012 | 15 kg BS300 |
| 1,2 | 95622112 | 5 kg D200 |
| 1,2 | 95622212 | 250 kg ProPac |
| 1,4 | 95621014 | 15 kg BS300 |
| 1,4 | 95622214 | 250 kg ProPac |



Elgacore MXX 100

Classification:

AWS A5.18
EN ISO 17632-A

E 70C-6M/-6C
T 42 2 M C/M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,5 | 1,5 |

Mechanical properties

Typical

Yield strength, Re: 450 MPa
Tensile Strength, Rm: 570 MPa
Elongation, A5: 29%
Impact energy, CV: -20 °C • 100 J
-30 °C • 75 J

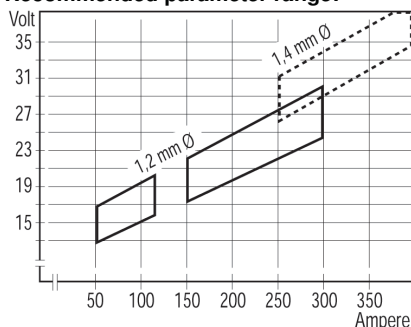
Hydrogen content / 100 g weld metal

≤ 5 ml

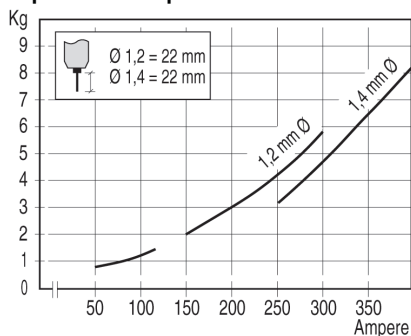
Approvals:

DNV
GL
LR
DB
TÜV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|---------------|
| 1,2 | 95551012 | 15 kg BS300 |
| 1,2 | 95552112 | 5 kg D200 |
| 1,2 | 95552212 | 250 kg ProPac |
| 1,4 | 95551014 | 15 kg BS300 |
| 1,4 | 95552214 | 250 kg ProPac |



Elgacore MXA 100LF

Classification:

AWS A5.18
ISO 17632-A

E 70C-6M
T 42 2 M M 1 H5

Description:

Elgacore MXA 100LF is a fully positional metal cored wire for use with Ar/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 fume and offering good resistance to porosity. Elgacore MXA 100LF combines ease of use, high productivity and good mechanical properties down to -20°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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | P | S |
|------|-----|-----|-------|-------|
| 0,07 | 0,5 | 1,5 | 0,015 | 0,014 |

Mechanical properties

Typical

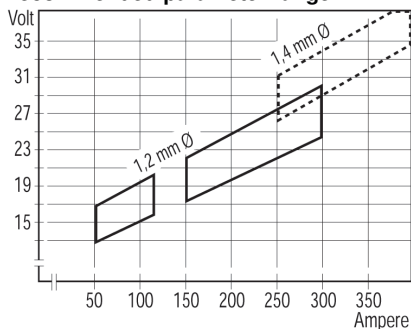
Yield strength, Re: 445 MPa
Tensile Strength, Rm: 552 MPa
Elongation, A5: 31%
Impact energy, CV: -20°C • 87 J

Hydrogen content / 100 g weld metal

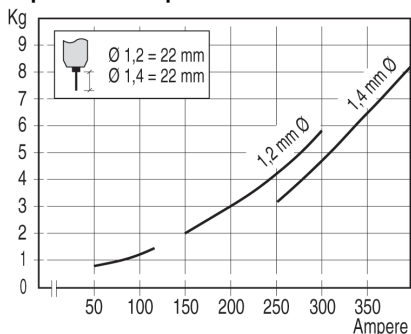
≤ 5 ml

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|---------------|
| 1,2 | 95561012 | 15 kg BS300 |
| 1,4 | 95561014 | 15 kg BS300 |
| 1,2 | 95562212 | 250 kg ProPac |
| 1,4 | 95562214 | 250 kg ProPac |



Elgacore MXA 100XP

Classification:

AWS A5.18
EN ISO 17632-A

E 70C-6M
T 46 4 M M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | P | S |
|------|------|------|-------|-------|
| 0.07 | 0.45 | 1.45 | 0.010 | 0.010 |

Mechanical properties

Typical

Yield strength, Re: 485 MPa
Tensile Strength, Rm: 580 MPa
Elongation, A5: 27%
Impact energy, CV: –40 °C • 110J

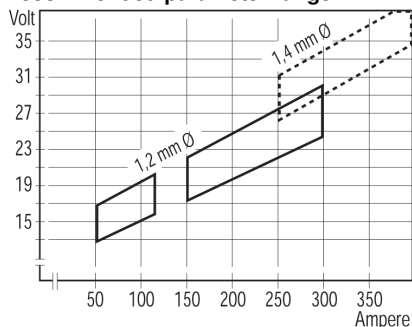
Hydrogen content / 100 g weld metal

≤ 5 ml

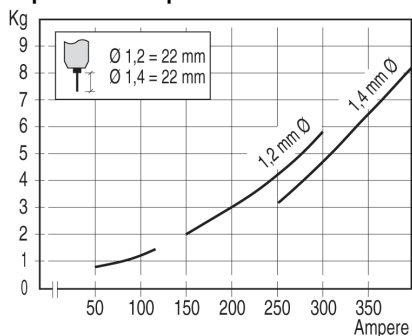
Approvals:

DNV
LR
GL
TÜV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|---------------|
| 1,2 | 95671012 | 15 kg BS300 |
| 1,2 | 95671112 | 5 kg BS200 |
| 1,2 | 95672112 | 5 kg D200 |
| 1,2 | 95672212 | 250 kg ProPac |
| 1,4 | 95671014 | 15 kg BS300 |
| 1,4 | 95672214 | 250 kg ProPac |



Elgacore MX 100T

Classification:

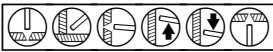
AWS A5.18
EN ISO 17632-A

E 70C-6M/-6C
T 42 2 M C/M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,07 | 0,5 | 1,5 |

Mechanical properties

Typical

Yield strength, Re: 450 MPa
Tensile Strength, Rm: 570 MPa
Elongation, A5: 29%
Impact energy, CV: -20°C • 100 J
-30°C • 75 J

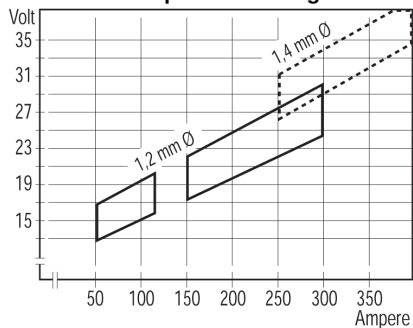
Hydrogen content / 100 g weld metal

≤ 5 ml

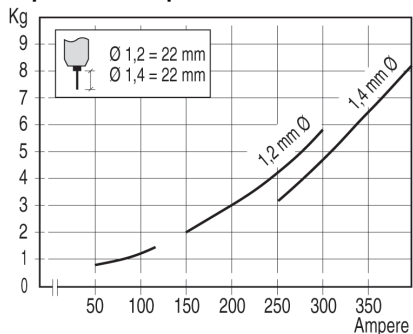
Approvals:

GL
LR
MRS
DNV
DB
TÜV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95651012 | 15 kg BS300 |
| 1,2 | 95651112 | 5 kg BS200 |

Cored wires for welding of ferritic steels; Low alloyed

Rutile

| | |
|---------------------------|-----|
| Elgacore DWA 55Ni1 | 108 |
| Elgacore DWA 55L | 109 |
| Elgacore DWA 55LSR | 110 |
| Elgacore DWA 65L | 111 |
| Elgacore DWA 65Ni1Mo..... | 113 |
| Elgacore R690..... | 114 |

Metal Core

| | |
|------------------------|-----|
| Elgacore MXA 55T | 112 |
| Elgacore M690..... | 115 |



Elgacore DWA 55Ni1

Classification:

AWS A5.29
EN ISO 17632-A

E81T1-Ni1MJ
T 46 6 1Ni P M 2 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Ni |
|------|-----|------|------|
| 0.05 | 0.3 | 1.25 | 0.95 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 550 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5: 28%

Impact energy, CV: -60 °C • 75 J

Hydrogen content / 100 g weld metal

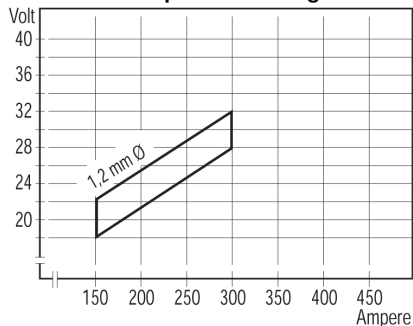
≤ 5 ml

Approvals:

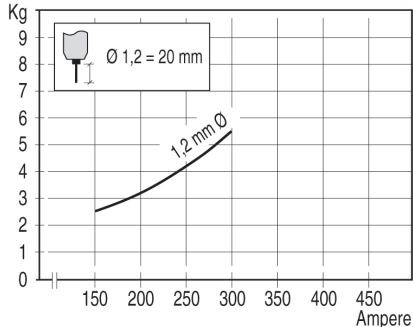
DNV

LR

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95592012 | 15 kg D300 |
| 1,2 | 95592112 | 5 kg D200 |



Elgacore DWA 55L Classification:

AWS A5.29
EN ISO 17632-A

E 81T1-K2M
T 46 6 1,5 Ni P M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Ni |
|------|-----|-----|-----|
| 0.04 | 0.3 | 1.4 | 1.5 |

Mechanical properties

Typical

Yield strength, Re: 550 MPa
 Tensile Strength, Rm: 620 MPa
 Elongation, A5: 27%
 Impact energy, CV: $-60^{\circ}\text{C} \cdot 75 \text{ J}$

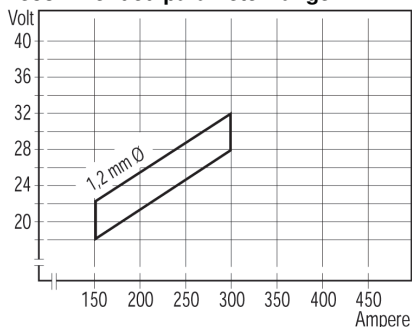
Hydrogen content / 100 g weld metal

$\leq 5 \text{ ml}$

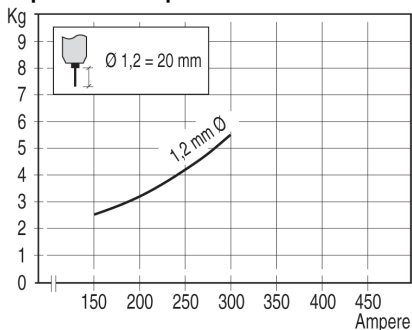
Approvals:

LR
 ABS
 GL
 DNV
 MRS
 TUV
 DB
 BV
 NAKS
 CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,0 | 95612010 | 12,5 kg D300 |
| 1,2 | 95611012 | 15 kg BS300 |
| 1,2 | 95612012 | 15 kg D300 |
| 1,2 | 95612112 | 5 kg D200 |



Elgacore DWA 55LSR

Classification:

AWS A5.29
EN ISO 17632-A

E 81 T1-Ni1M
T 46 6 Z P M 1 H5

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+

Chemical composition, wt. %

| C | Si | Mn | Ni |
|------|-----|-----|-----|
| 0,06 | 0,3 | 1,3 | 0,9 |

Mechanical properties

Typical

Yield strength, Re: 500 MPa
Tensile Strength, Rm: 570 MPa
Elongation, A5: 30%
Impact energy, CV: $-60^{\circ}\text{C} \bullet 80 \text{ J}$

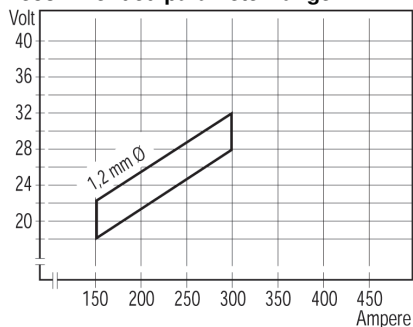
Hydrogen content / 100 g weld metal

$\leq 5 \text{ ml}$

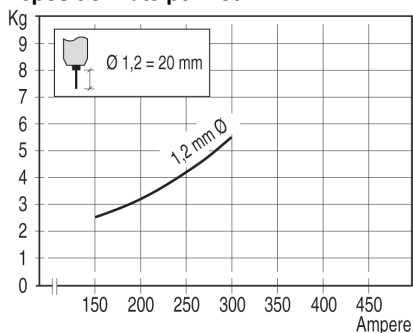
Approvals:

DNV
ABS
BV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95522012 | 12,5 kg D300 |
| 1,2 | 95522112 | 5 kg D200 |

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

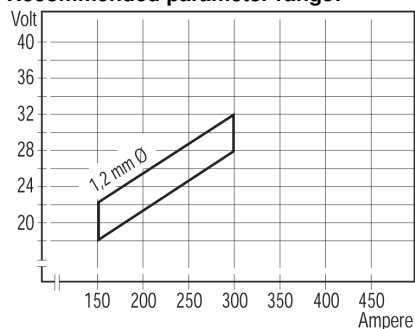
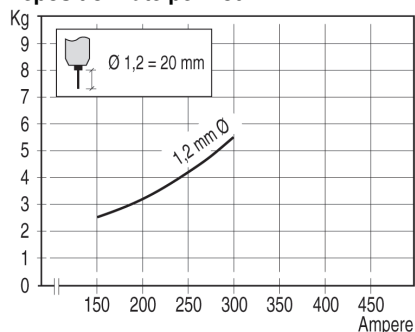
| C | Si | Mn | Ni | Mo |
|------|------|-----|-----|-----|
| 0,05 | 0,35 | 1,3 | 1,7 | 0,1 |

Mechanical properties
Typical

Yield strength, Re: 620 MPa
 Tensile Strength, Rm: 690 MPa
 Elongation, A5: 25%
 Impact energy, CV: -40°C • 80 J

Hydrogen content / 100 g weld metal

≤ 5 ml

Approvals:
Recommended parameter range:

Deposition rate per hour:

Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95882012 | 15 kg D300 |



Elgacore MXA 55T

Classification:

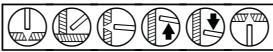
AWS A5.28
EN ISO 17632-A

E80C-G
T 46 6 1,5Ni M M 1 H5

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Ni |
|------|-----|-----|-----|
| 0.06 | 0.4 | 1.4 | 1.7 |

Mechanical properties

Typical

Yield strength, Re: 500 MPa
 Tensile Strength, Rm: 580 MPa
 Elongation, A5: 29%
 Impact energy, CV: -60°C • 55 J

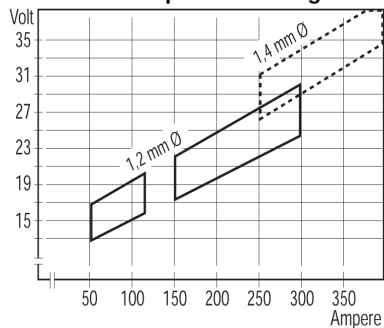
Hydrogen content / 100 g weld metal

≤ 5 ml

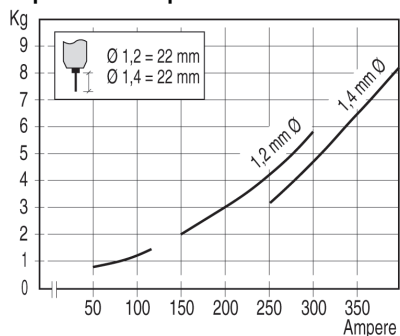
Approvals:

DNV
 LR
 ABS
 BV
 CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95662012 | 15 kg D300 |
| 1,2 | 95662112 | 5 kg D200 |



Elgacore DWA 65Ni1Mo

Classification:

EN 12535 T 62 5 Mn1NiMo P M 2 H5
 AWS A5.29 E101T1-GM
 ISO 18276-A T 62 5 Mn1NiMo P M 2 H5

Description:

Elgacore DWA-65Ni1Mo is a high strength rutile flux cored wire for all position use with an Ar/CO₂ gas shield. It deposits a 0,9%Ni - 0,5%Mo alloyed weld metal that conforms to NACE MR0175 in combination with excellent fracture toughness down to -50 °C.

Applications:

Elgacore DWA-65Ni1Mo is primarily intended for structural-, offshore constructions and circumferential pipe welding.

Welding positions:



Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-20mm

Chemical composition, wt. %

| C | Si | Mn | Ni | Mo |
|------|------|------|------|------|
| 0,05 | 0,36 | 1,90 | 0,97 | 0,46 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 663 MPa

Tensile Strength, Rm: 739 MPa

Elongation, A5 21%

Impact energy, CV: -40 °C • 87 J

-50 °C • 72 J

-60 °C • 60 J

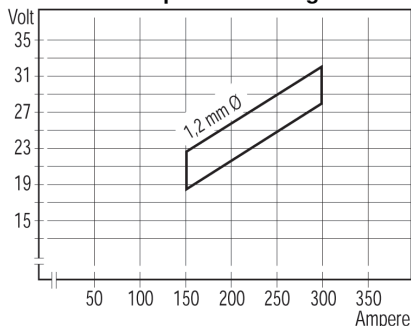
Hydrogen content / 100 g weld metal

≤ 5 ml

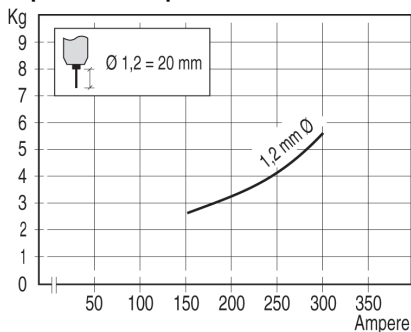
Approvals:

N/A

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95532012 | 15 kg D300 |



Elgacore R690

Classification:

AWS A5.29
ISO 18276-A

E111T1-GM-H4
T 69 4 Z P M 2 H5

Description:

Elgacore R690 is a all-positional rutile flux cored wire suitable for welding high-strength low-alloy steels with a minimum yield strength of 700 MPa. The wire operates with a stable arc to produce good weld bead appearance, easy slag removal and excellent fracture toughness at temperatures down to -40°C .

Applications:

Jack-up rigs, truck chassis, cranes, earthmoving machines, extended excavator booms, bridges, flood gates and penstocks.

Welding positions:



Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Ni | Mo |
|------|------|------|------|------|
| 0,07 | 0,31 | 1,86 | 2,49 | 0,16 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 764

Tensile Strength, Rm: 813

Elongation, A5: 21

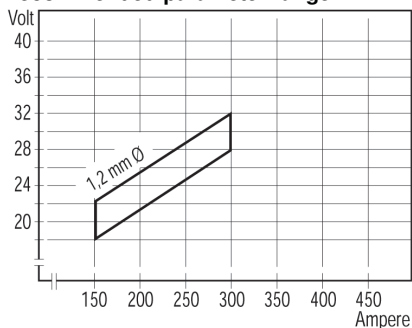
Impact energy, CV: -40°C • 90 J

Hydrogen content / 100 g weld metal

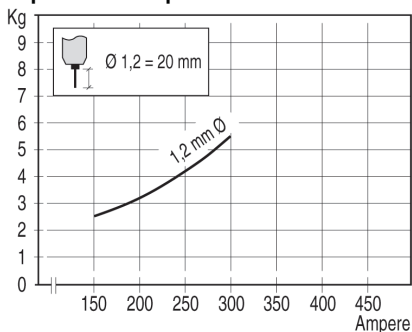
≤ 5 ml

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95542012 | 15 kg BS300 |



Elgacore M690

Classification:

EN ISO 18276

AWS A5.28

T 69 6 Mn2,5Ni M M 3 H5

E110C-G-H4

Description:

Elgacore M690 is a metal cored wire suitable for welding high-strength low-alloy steels with a minimum yield strength of 700 MPa. It operates with Ar/CO2 shielding gas, and produces a stable arc with the typical deep and wide penetration that is found on metal cored products. The wire is CTOD tested.

Applications:

Jack-up rigs, truck chassis, cranes, earthmoving machines, extended excavator booms, bridges, flood gates and penstocks.

Welding positions:



Welding current:

DC+

Deposition efficiency:

95%

Shielding gas:

M21, 80% Ar + 20% CO2, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Ni | Mo |
|------|------|------|------|------|
| 0,06 | 0,48 | 1,87 | 2,37 | 0,09 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 720 MPa

Tensile Strength, Rm: 791 MPa

Elongation, A5: 24%

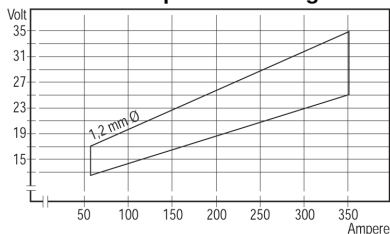
Impact energy, CV: -60°C • 121 J

Hydrogen content / 100 g weld metal

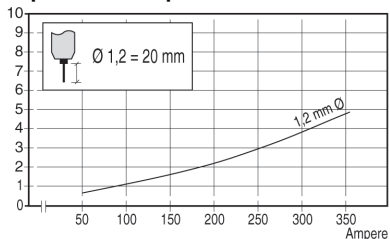
≤ 5 ml

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95682012 | 15 kg BS300 |

Cored wires for welding of stainless steels

| | |
|---------------------------------|-----|
| Cromacore DW 308L | 118 |
| Cromacore DW 308LP | 119 |
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| Cromacore DW 316L | 121 |
| Cromacore DW 316LP | 122 |
| Cromacore DW 309L | 123 |
| Cromacore DW 309MoL | 124 |
| Cromacore DW 309LP | 125 |
| Cromacore DW 309MoLP | 126 |
| Cromacore DW 309LNb | 127 |
| Cromacore LDX P | 128 |
| Cromacore DW 329A Duplex | 129 |
| Cromacore DW 329AP Duplex | 130 |
| Cromacore 2507 | 131 |
| Cromacore 625 P | 132 |



Cromacore DW 308L

Classification:

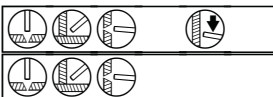
AWS A5.22
EN ISO 17633-A

E 308LT0-4/-1
T 19 9 L R M/C 3

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0.03 | 0.6 | 1.8 | 19.3 | 10.0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 570 MPa
Elongation, A5: 42%
Impact energy, CV: -20°C • 43 J

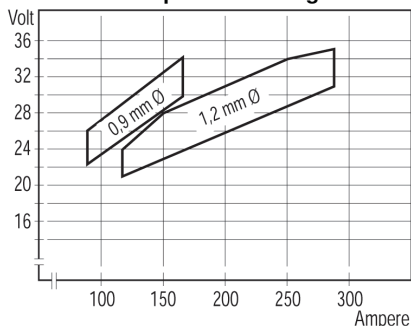
Ferrite content:

FN 6

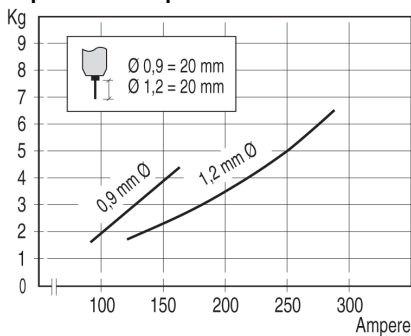
Approvals:

TÜV
DNV
GL
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 0,9 | 95702009 | 12,5 kg D300 |
| 1,2 | 95701012 | 15 kg BS300 |
| 1,2 | 95701112 | 5 kg BS200 |



Cromacore DW 308LP

Classification:

AWS A5.22
EN ISO 17633-A

E 308LT1-4/-1
T 19 9 L P M/C 1

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0.03 | 0.7 | 1.5 | 19.6 | 9.9 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5: 41%

Impact energy, CV: -20 °C • 40 J

Ferrite content:

FN 9

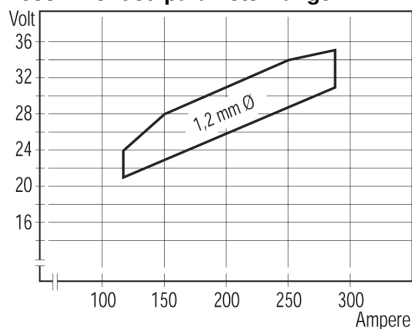
Approvals:

TUV

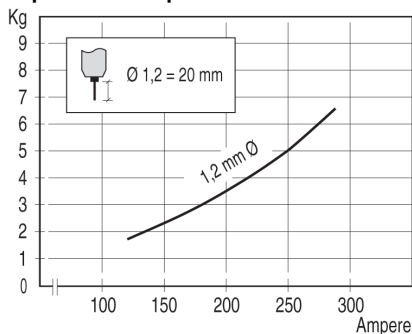
GL

CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95771012 | 15 kg BS300 |
| 1,2 | 95771112 | 5 kg BS200 |



Cromacore DW 347 Classification:

AWS A5.22
EN ISO 17633-A

E347T0-4/-1
T 19 9 Nb R M/C 3

Description:

Cromacore DW 347 is a rutile flux cored wire for welding the Nb or Ti stabilised stainless steel grades 347 and 321. It is also suitable for the unstabilised grades 304 and 304L. For welding the controlled carbon material grades 321H and 347 H, used for structural applications at temperatures above 400°C, Cromacore DW 308H is recommended because of its superior creep strength. The wire is mainly used for the horizontal and horizontal-vertical positions.

Cromacore DW 347 is Blsmuth free (<0,002 wt%).

Welding positions:



Welding current:

DC +

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min.

100% CO₂, 22-25 l/min.

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0.03 | 0.4 | 1.1 | 18.5 | 9.5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 415 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5: 43

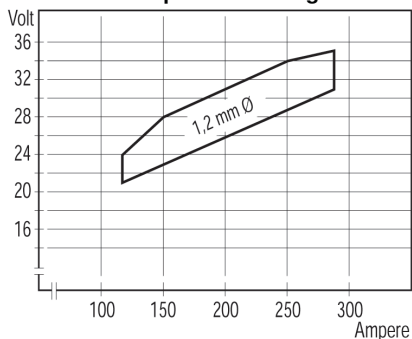
Impact energy, CV: 0°C • 49 J

Ferrite content:

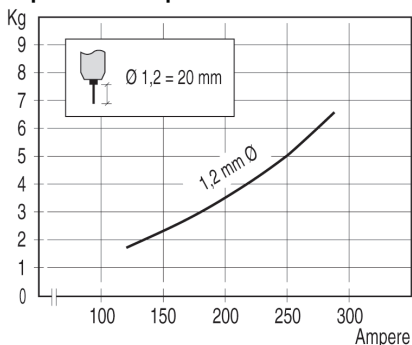
FN 5

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95791012 | 15 kg BS300 |



Cromacore DW 316L

Classification:

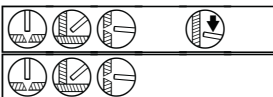
AWS A5.22
EN ISO 17633-A

E 316LT0-4/-1
T 19 12 3 L R M/C 3

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.03 | 0.7 | 1.2 | 18.3 | 12.1 | 2.8 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 410 MPa
Tensile Strength, Rm: 570 MPa
Elongation, A5: 44%
Impact energy, CV: -20 °C • 40 J

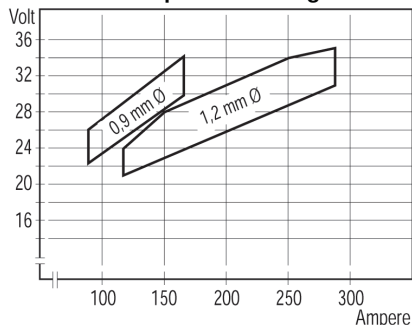
Ferrite content:

FN 9

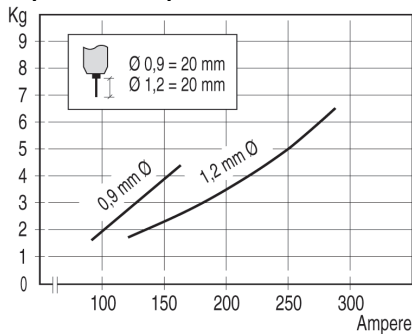
Approvals:

LR
DNV
TÜV
DB
GL
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 0,9 | 95712009 | 12,5 kg D300 |
| 1,2 | 95711012 | 15 kg BS300 |
| 1,2 | 95711112 | 5 kg BS200 |



Cromacore DW 316LP

Classification:

AWS A5.22
EN ISO 17633-A

E 316LT1-4/-1
T 19 12 3 L P M/C 1

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.03 | 0.8 | 1.5 | 18.6 | 12.4 | 2.9 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 430 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5: 36%

Impact energy, CV: -20 °C • 40 J

Ferrite content:

FN 9

Approvals:

GL

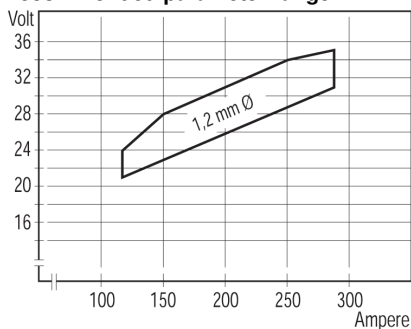
LR

TÜV

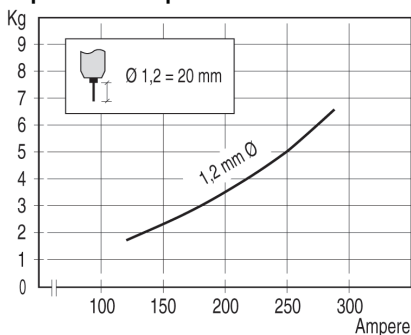
DNV

CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95741012 | 15 kg BS300 |
| 1,2 | 95741112 | 5 kg BS200 |



Cromacore DW 309L

Classification:

AWS A5.22
EN ISO 17633-A

E 309LT0-4/-1
T 23 12L R M/C 3

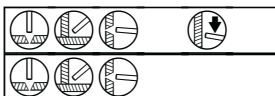
Description:

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0.03 | 0.7 | 1.4 | 24.0 | 12.7 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 460 MPa
Tensile Strength, Rm: 590 MPa
Elongation, A5: 36%
Impact energy, CV: -20°C • 38 J

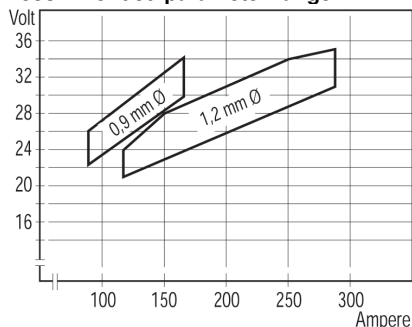
Ferrite content:

FN 14

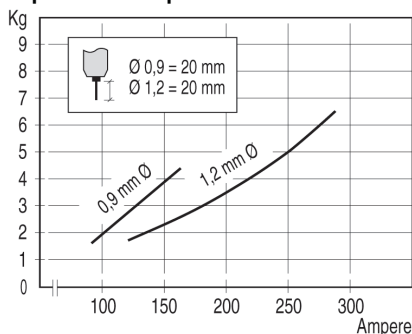
Approvals:

GL
LR
TÜV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 0,9 | 95722009 | 12,5 kg D300 |
| 1,2 | 95721012 | 15 kg BS300 |
| 1,2 | 95721112 | 5 kg BS200 |



Cromacore DW 309MoL

Classification:

AWS A5.22
EN ISO 17633-A

E 309LMoT0-4/-1
T 23 12 2 L R M/C 3

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.02 | 0.7 | 1.3 | 23.0 | 12.9 | 2.4 |

Mechanical properties

Typical

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

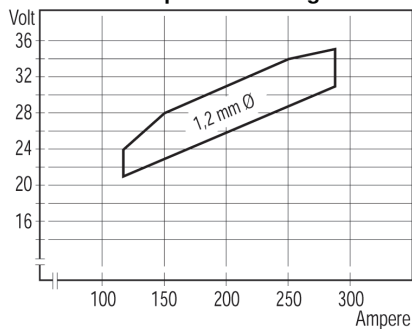
Ferrite content:

FN 22

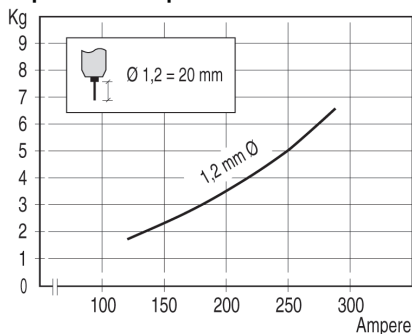
Approvals:

DNV
GL
TÜV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95731012 | 15 kg BS300 |
| 1,2 | 95731112 | 5 kg BS200 |



Cromacore DW 309LP

Classification:

AWS A5.22
EN ISO 17633-A

E 309LT1-4/-1
T 23 12 L P M/C 1

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 alloy 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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0.03 | 0.7 | 1.3 | 23.9 | 12.5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 460 MPa
Tensile Strength, Rm: 590 MPa
Elongation, A5: 36%
Impact energy, CV: -20°C • 50 J

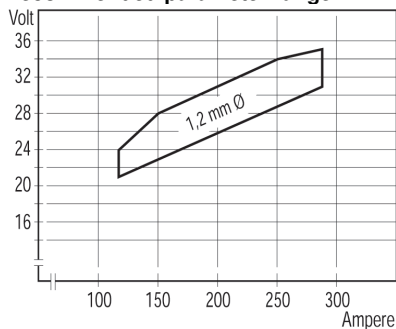
Ferrite content:

FN 14

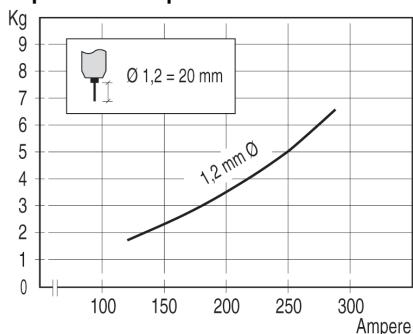
Approvals:

LR
DNV
GL
TÜV
RINA
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95751012 | 15 kg BS300 |
| 1,2 | 95751112 | 5 kg BS200 |



Cromacore DW 309MoLP

Classification:

AWS A5.22
EN ISO 17633-A

E 309LMoT1-4/-1
T 23 12 2 L P M/C 1

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|-----|
| 0.02 | 0.7 | 1.3 | 23.0 | 12.9 | 2.4 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 540 MPa
Tensile Strength, Rm: 710 MPa
Elongation, A5: 30%
Impact energy, CV: -20°C • 48 J

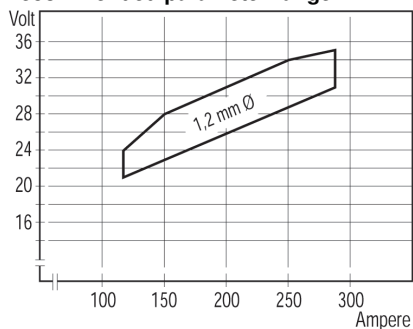
Ferrite content:

FN 22

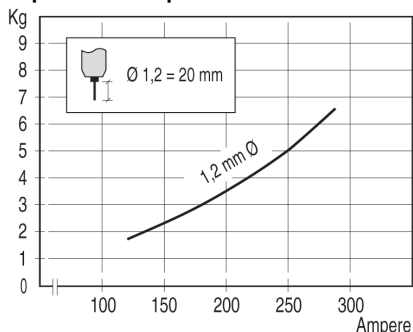
Approvals:

DNV
LR

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95851012 | 15 kg BS300 |
| 1,2 | 95851112 | 5 kg BS200 |



Cromacore DW 309LNb

Classification:

AWS A5.22

E309LCbT1-1/4

Description:

Cromacore DW 309LNb is a rutile flux cored wire which deposits a low carbon, Nb-stabilised 24% Cr / 13% Ni stainless steel weld metal with a ferrite level of FN ~18. The wire operates with a very stable, spatter free arc producing a bright, smooth weld bead surface and self-releasing slag. Cromacore DW 309LNb is used mainly for overlay welding of 2.25Cr-1Mo steels

Applications:

Overlay welding of low alloy steels.
Buffer layer on clad steel joints.

Welding positions:



Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min.
C1, 100% CO₂, 22-25 l/min.

Stick-out:

15-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Nb | N |
|-------|------|------|-------|-------|------|-------|
| 0.030 | 0.34 | 1.27 | 23.46 | 12.81 | 0.75 | 0.019 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 427 MPa

Tensile Strength, Rm: 579 MPa

Elongation, A5: 36%

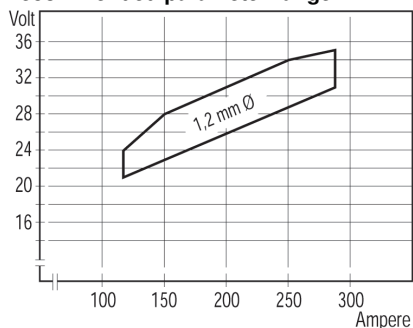
Impact energy, CV: 0 °C•50 J

Ferrite content:

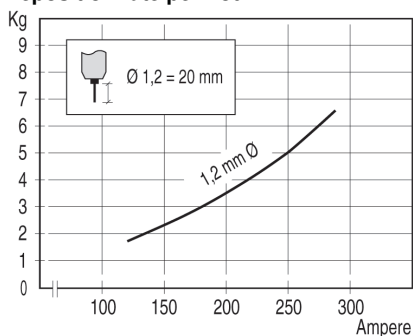
FN ~18

Approvals:

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95951012 | 15 kg BS300 |

Description:

Cromacore LDX P is a fully positional flux cored wire which deposits a low carbon 25% Cr / 9% Ni / N for welding lean duplex materials. The product ensures a weld metal with a high strength and medium corrosion resistance, compatible with the base material. It also provides a smooth bead appearance with minimal spatter and a slag easy to remove

Applications:

For applications with EN 1.4162 (ASTM S32101) or EN 1.4362 (ASTM S32304) base materials. The steels are mainly used in civil engineering, storage tanks, containers etc.

Welding positions:

Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

 M21, 80% Ar + 20% CO₂, 22-25 l/min.

 C1, 100% CO₂, 22-25%

Stick-out:

20-25 mm

Chemical composition, wt. %

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|------|------|------|-----|-------|------|
| 0,026 | 0,45 | 1,26 | 24,6 | 7,9 | 0,025 | 0,15 |

Mechanical properties
Typical

Yield strength, Rp0.2%: 571 MPa

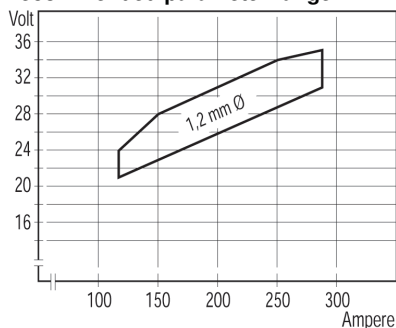
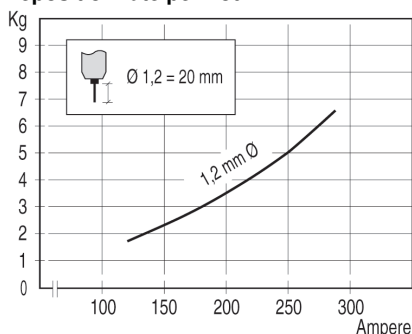
Tensile Strength, Rm: 750 MPa

Elongation, A5: 29%

 Impact energy, CV: 0 °C • 58 J
 -40 °C • 45 J

Ferrite content:

FN 41

Approvals:
Recommended parameter range:

Deposition rate per hour:

Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95961012P | 15 kg |
| 1,2 | 95962112P | 5 kg |



Cromacore DW 329A Duplex

Classification:

AWS A5.22
EN ISO 17633-A

E 2209T0-4/-1
T 22 9 3 N L R M/C 3

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0.02 | 0.8 | 1.3 | 22.9 | 9.2 | 3.0 | 0.10 |

Mechanical properties

Typical

Yield strength, R_{p0.2%}: 610 MPa
Tensile Strength, R_m: 800 MPa
Elongation, A₅: 32%
Impact energy, CV: -20 °C • 40 J

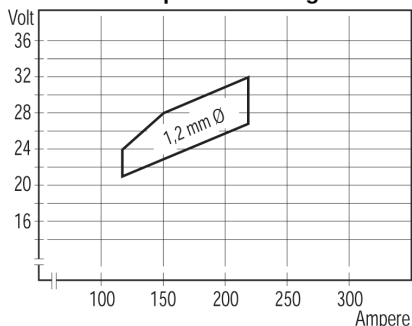
Ferrite content:

FN 40

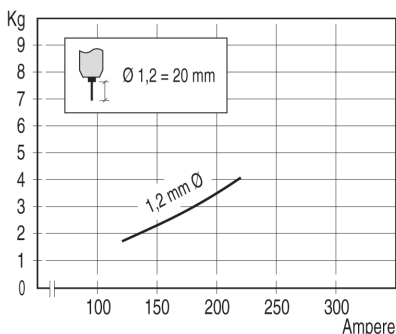
Approvals:

DNV
GL
LR
TÜV
BV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95761012 | 15 kg BS300 |
| 1,2 | 95762112 | 5 kg D200 |



Cromacore DW 329AP Duplex

Classification:

AWS A5.22
EN ISO 17633-A

E 2209T1-4/-1
T 22 9 3 N L P M/C 1

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:

M21, 80% Ar + 20% CO₂, 22-25 l/min
C1, 100% CO₂, 22-25 l/min

Stick-out:

15-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|-----|-----|------|-----|-----|------|
| 0.02 | 0.8 | 1.3 | 22.9 | 9.2 | 3.0 | 0.10 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 610 MPa
Tensile Strength, Rm: 800 MPa
Elongation, A5: 32%
Impact energy, CV: -46°C • 42 J

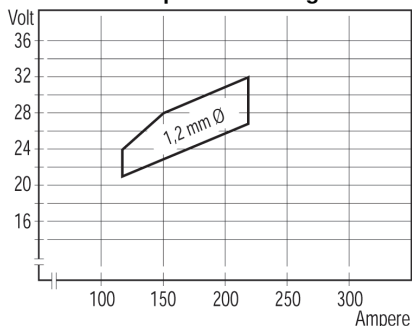
Ferrite content:

FN 40

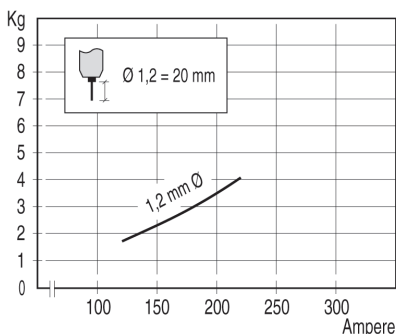
Approvals:

GL
LR
DNV
CE

Recommended parameter range:



Deposition rate per hour:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95781012 | 15 kg BS300 |
| 1,2 | 95782112 | 5 kg D200 |



Cromacore 2507

Classification:

AWS A5.22
ISO 17633-A

E2594T1-4/-1
N/A

Description:

Cromacore 2507 is a rutile flux cored wire which deposits a 25%Cr/10%Ni/4%Mo/0.25%N super duplex type weld metal with a ferrite level of approximately FN 50. It 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. Cromacore 2507 may also be used for welding standard duplex steels when higher corrosion resistance in the weld metal is required. A heat input range of 0.5-2.5 KJ/mm is recommended to maintain a favourable phase balance in the weld metal and avoid deleterious precipitation effects in the plate. The weld metal has excellent fracture toughness at temperatures down to -40°C.

Applications:

Applications include offshore platform pipework for seawater cooling systems and firefighting water, as well as pumps, valves and risers.

Welding positions:



Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min.

C1, 100% CO₂, 22-25%

Stick-out:

20-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|------|------|------|------|-----|------|------|
| 0,03 | 0,50 | 1,20 | 25,9 | 9,7 | 3,79 | 0,25 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 701 MPa

Tensile Strength, Rm: 906 MPa

Elongation, A5 27%

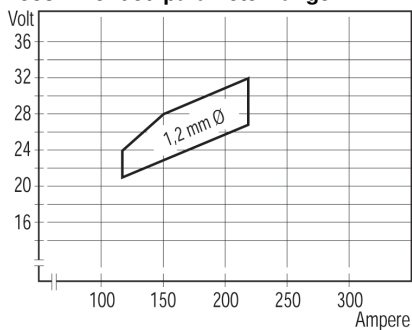
Impact energy, CV: 20°C • 59 J
-40°C • 39 J

Ferrite content:

FN 48

Approvals:

Recommended parameter range:



Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95972012 | 12,5kg D300 |
| 1,2 | 95972112 | 5kg D200 |

Description:

Cromacore 625 P is a fully positional rutile flux cored wire primarily intended for welding Inconel 625 and similar composition nickel base alloys which are used for their excellent corrosion and oxidation resistance combined with an exceptionally high resistance to pitting corrosion and chloride induced stress corrosion cracking. 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.

Can be used to clad carbon steels with a high strength, highly corrosion resistant surface.

Suitable for welding 9% nickel steels for cryogenic applications.

Applications:

Suitable for welding the nickel base alloys 625 and 825 but also 6 Mo steels (ASTM S31254) and 9% Ni steels.

Overlay welding of carbon or low alloy steels and dissimilar joints.

Welding positions:

Welding current:

DC+

Deposition efficiency:

87%

Shielding gas:

M21, 80% Ar + 20% CO₂, 22-25 l/min.

C1, 100% CO₂, 22-25%

Stick-out:

20-25 mm

Chemical composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb ² |
|------|------|------|------|------|-----|-----------------|
| 0,03 | 0,21 | 0,02 | 21,1 | 64,2 | 8,8 | 3,23 |

² Nb + Ta

Mechanical properties
Typical

Yield strength, Rp0.2%: 479 MPa

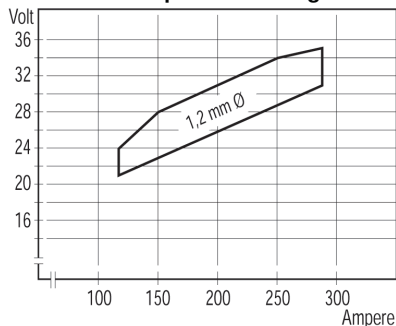
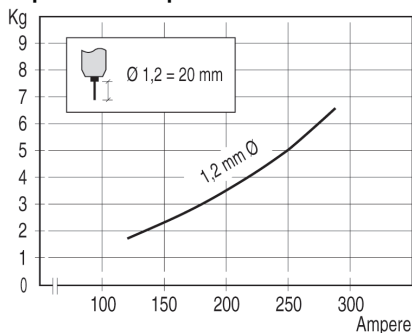
Tensile Strength, Rm: 743 MPa

Elongation, A5: 45%

Impact energy, CV: 0 °C • 84 J

-100 °C • 78 J

-196 °C • 70 J

Approvals:
Recommended parameter range:

Deposition rate per hour:

Product data:

| Diam.mm | Product code | Spool weight |
|---------|--------------|--------------|
| 1,2 | 95991012 | 15 kg |
| 1,2 | 95992112 | 5 kg |

Solid wires for gas shielded welding of ferritic steels

| | |
|--------------------------|-----|
| Elgamic 100 | 134 |
| Elgamic 103 | 135 |
| Elgamic 135 | 136 |
| Elgamic 138 | 137 |
| Elgamic 140 | 138 |
| Elgamic 147 | 139 |
| Elgamic 148K..... | 140 |
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| Elgamic 181CR..... | 142 |
| Elgamic 183CR..... | 143 |
| Elgamic 183B2..... | 144 |
| Elgamic 184CR..... | 145 |
| Hardsurfacing | |
| Elgaloy Hard M60..... | 146 |



Elgamatic 100

Classification:

EN ISO 14341-A

AWS A5.18

G 42 2 (C) M G3Si1

ER70S-6

Description:

Elgamatic 100 is a copper coated, manganese-silicon double deoxidised mild steel wire for use with a CO₂ or Ar/CO₂ gas shield. The carefully controlled wire metallurgy and surface finish ensure high quality welds and reliable wire feed for mechanised welding systems. Elgamatic 100 is suitable for all general engineering and structural steels.

Welding current:

DC+

Shielding gas:C1, CO₂, 7-12 l/minM21, 80% Ar + 20% CO₂, 7-12 l/min**Mechanical properties**Typical

Yield strength, Re: 470 MPa

Tensile Strength, Rm: 550 MPa

Elongation, A5 26%

Impact energy, CV: -20°C • 85 J

-29°C • 50 J

Wire composition, wt.%

| C | Si | Mn |
|------|------|------|
| 0,08 | 0,85 | 1,45 |

Approvals:

TÜV

DB

MRS

DNV

GL

LR

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V | | | | | | | | | | | | | | | | | | | | | | |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|-----|---------|---------|---------|-------|---------|-------|----------|----------|-----|---------|---------|---------|-------|---------|-------|----------|----------|-----|---------|---------|---------|
| 0,8 | Contact | Contact | 50-90 | 16-18 | 120-160 | 22-26 | | | | | | | | | | | | | | | | | | | | | | |
| | Elga/ITW | Elga/ITW | | | | | 1,0 | Contact | Contact | 80-150 | 17-20 | 180-230 | 24-30 | Elga/ITW | Elga/ITW | 1,2 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | Elga/ITW | Elga/ITW | 1,6 | Contact | Contact | 110-180 |
| 1,0 | Contact | Contact | 80-150 | 17-20 | 180-230 | 24-30 | | | | | | | | | | | | | | | | | | | | | | |
| | Elga/ITW | Elga/ITW | | | | | 1,2 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | Elga/ITW | Elga/ITW | 1,6 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | Elga/ITW | Elga/ITW | | | | |
| 1,2 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | | | | | | | | | | | | | | | | | | | | | | |
| | Elga/ITW | Elga/ITW | | | | | 1,6 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | Elga/ITW | Elga/ITW | | | | | | | | | | | | | |
| 1,6 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 | | | | | | | | | | | | | | | | | | | | | | |
| | Elga/ITW | Elga/ITW | | | | | | | | | | | | | | | | | | | | | | | | | | |



Elgomatic 103

Classification:

EN ISO 14341-A

AWS A5.18

G 46 2 (C) M G4Si1

ER70S-6

Description:

Rev. 10 still valid.

Elgomatic 103 is a copper coated, manganese-silicon double deoxidised wire of the SG3 type, for use with a CO₂ or Ar/CO₂ gas shield. The increased Mn content produces a higher weld metal strength level and better notch toughness compared to SG2 type wire. Elgomatic 103 is suitable for all general engineering and structural steels.

Welding current:

DC+

Shielding gas:100% CO₂, 7-12 l/min80% Ar + 20% CO₂, 7-12 l/min**Mechanical properties**Typical

Yield strength, Re: 510 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5 24%

Impact energy, CV: -20°C • 90 J

-40°C • 60 J

Wire composition, wt. %

| C | Si | Mn |
|------|-----|-----|
| 0,09 | 0,9 | 1,7 |

TÜV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | Contact | Contact | 50-90 | 16-18 | 120-160 | 22-26 |
| | Elga/ITW | Elga/ITW | | | | |
| 1,0 | Contact | Contact | 80-150 | 17-20 | 180-230 | 24-30 |
| | Elga/ITW | Elga/ITW | | | | |
| 1,2 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 |
| | Elga/ITW | Elga/ITW | | | | |
| 1,6 | Contact | Contact | 110-180 | 18-22 | 240-300 | 26-33 |
| | Elga/ITW | Elga/ITW | | | | |



Elgomatic 135

Classification:

EN ISO 16834

AWS A5.28

G 69 4 Mn3Ni1CrMo

ER100S-G

Description:

Elgomatic 135 is a copper coated wire for use with the MIG/MAG process, which deposits a 1.5% Ni / 0.3% Mo / 0.2% Cr weld metal. It is intended for welding the high tensile quenched and tempered steels such as Weldox 700, BSC RQT 701, N-A-XTRA 70 and USS T1. Elgomatic 135 can be welded with either an Ar/20% CO₂ or CO₂ gas shield, but the Ar mixture gives better fracture toughness at low temperature and higher strength levels.

Welding current:

DC+

Shielding gas:

C1, CO₂, 7-12 l/min

M21, 80% Ar + 20% CO₂, 7-12 l/min

Mechanical properties

Typical

Yield strength, Re: 725 MPa

Tensile Strength, Rm: 810 MPa

Elongation, A5 20%

Impact energy, CV: -40 °C • 55 J

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo | V |
|------|------|------|------|------|------|------|
| 0,10 | 0,55 | 1,60 | 0,35 | 1,35 | 0,30 | 0,10 |

Approvals:

DB

TÜV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95372008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 1,0 | 95372010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 95372012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 138

Classification:

EN ISO 16834

AWS A5.28

G Mn4Ni2CrMo

ER120S-G

Description:

Elgomatic 138 is a copper coated wire for use with the MIG/MAG process, which deposits a 2% Ni / 0.6% Mo / 0.3% Cr weld metal. It is intended for welding the very high tensile quenched and tempered steels with a minimum yield strength of 900 MPa, such as Weldox 900, but is also suitable for Weldox 960 when 5-10% undermatching is specified. Elgomatic 138 can be welded with either an Ar/20% CO₂ or CO₂ gas shield, but the Ar mixture gives better fracture toughness at low temperature and higher strength levels.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-10 l/min

M21, 80% Ar+20% CO₂, 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|------|
| 0,09 | 0,80 | 1,90 | 0,30 | 2,20 | 0,55 |

Mechanical properties

Typical

Yield strength, Re: 910 MPa

Tensile Strength, Rm: 960 MPa

Elongation, A5 17%

Impact energy, CV: -20 °C • 80 J

-40 °C • 60 J

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,2 | 95382012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 140

Classification:

AWS A5.28

ER80S-G

Description:

Elgomatic 140 is a copper coated wire for use with the MIG/MAG process, which deposits a 0.8% Ni / 0.4% Cu weld metal having improved corrosion resistance to that of mild steel when exposed to environments containing salt and sulphurous gases. It is primarily intended for welding weather resisting steels such as Cor-Ten, but is also suitable for higher tensile, low temperature use steels.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-12 l/min

M21, 80% Ar + 20% CO₂, 7-12 l/min

Mechanical properties

Typical

Yield strength, Re: 560 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A5 25%

Impact energy, CV: -20 °C • 60 J

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Cu |
|------|-----|-----|------|-----|-----|
| 0,09 | 0,7 | 1,4 | 0,22 | 0,8 | 0,3 |

Approvals:

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95282008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 1,0 | 95282010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 95282012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 147

Classification:

EN ISO 16834

AWS A5.28

G Mn3NiCrMo

ER100S-G

Description:

Elgomatic 147 is a copper coated, low alloyed wire for use with the MIG process and deposits a 0.5% Ni, 0.5% Cr, 0.25% Mo weld metal. It is intended for welding high strength steels and provides an excellent combination of high strength and good fracture toughness at low temperatures. The wire is suitable for steel types N-A-XTRA, RQT, USS T1, BS.4360 Grade 55C etc. Typical applications are the fabrication of heavy machinery and plant for cranes, earth moving and mining equipment.

Welding current:

DC+

Shielding gas:C1, CO₂, 7-12 l/minM21, 80% Ar+20% CO₂, 7-12 l/min**Mechanical properties**Typical

Yield strength, Re: 690 MPa

Tensile Strength, Rm: 750 MPa

Elongation, A5 20%

Impact energy, CV: -20 °C • 70 J

-40 °C • 60 J

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|-----|-----|------|
| 0,08 | 0,7 | 1,4 | 0,5 | 0,5 | 0,25 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 95312010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 95312012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 148K

Classification:

EN ISO 14341-A

AWS A5.28

G 46 6 M G2Ni2

ER80S-Ni2

Description:

Elgomatic 148K is a low-alloyed wire, which deposits a 2,4% Ni weld metal with good tensile strength and impact energy down to -60°C . It is intended for pipe welding of low alloyed steels in the offshore and shipbuilding industries. Can also be used down to -80°C if the appropriate shielding gas is used.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-10 l/min

M21, 80% Ar+20% CO₂, 7-10 l/min

Mechanical properties

Typical

Yield strength, Re: 520 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5 28%

Impact energy, CV: -60°C • 90 J

Wire composition, wt.%

| C | Si | Mn | Ni | Cu |
|------|------|------|------|------|
| 0,10 | 0,60 | 1,10 | 2,40 | 0,15 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 97402008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 1,0 | 97402010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 97402012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 162

Classification:

EN ISO 14341-A

AWS A5.28

G 46 6 M G3Ni1

ER80S-Ni1

Description:

Elgomatic 162 is a copper coated wire depositing a nominal 0.9% Ni weld metal. It has a guaranteed Ni content of 1% maximum, ensuring conformance to NACE requirements for oil and gas production equipment in sour service. The wire is primarily intended for GMAW but is equally suitable for use in mechanised GTAW eg. orbital TIG process (see Elgatig 162 for mechanical properties). Elgomatic 162 gives very good fracture toughness at temperatures down to -60°C and is intended for offshore pipework and similar high integrity applications.

Welding current:

DC+

Shielding gas:C1, 100% CO₂, 7-10 l/minM21, 80% Ar+20% CO₂, 7-10 l/min**Mechanical properties****Typical**

Yield strength, Re: 490 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 26%

Impact energy, CV: $-60^{\circ}\text{C} \bullet 60 \text{ J}$ **Wire composition, wt.%**

| C | Si | Mn | Ni |
|------|------|------|------|
| 0,09 | 0,60 | 1,10 | 0,90 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 97352010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |



Elgomatic 181CR

Classification:

EN ISO 21952-A

AWS A5.28

G MoSi

ER70S-A1

Description:

Elgomatic 181CR is a copper coated wire for use with the MIG/MAG process, 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. DIN 15 Mo3, BS 3059 Grade 243 and ASTM A335 Grade P1. The Mo content confers some resistance to hydrogen attack in chemical process plant applications. Elgomatic 181CR 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. Stress relieve at 620 °C.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-12 l/min

M21, 80% Ar + 20% CO₂, 7-12 l/min

Wire composition, wt. %

| C | Si | Mn | S | Mo |
|------|------|------|------|------|
| 0,10 | 0,60 | 1,10 | 0,01 | 0,50 |

Mechanical properties

Typical

Yield strength, Re: 510 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A₅: 25%

Impact energy, CV: -20 °C • 65 J

20 °C • 100 J

Approvals:

DB

TÜV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 97102008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 1,0 | 97102010 | 15 kg K300 | 80-150 | 18-22 | 180-230 | 24-30 |
| 1,2 | 97102012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 183CR

Classification:

EN ISO 21952-A

G CrMo1Si

Description:

Elgomatic 183CR is a 1.25% Cr/0,5% Mo alloyed wire intended for welding creep resisting steels of similar composition, used in power generation plant operating at temperatures up to 570 °C, e.g DIN 13 CrMo 44, GS-17 CrMo 55, BS 3604 Grades 620 and 621 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 °C is recommended. Post-weld heat treat at 690 °C.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-12 l/min

M21, 80% Ar + 20% CO₂, 7-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|------|------|------|
| 0,11 | 0,65 | 1,00 | 1,20 | 0,50 |

Approvals:

TÜV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|-------------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 97152008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 1,0 | 97152010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 97152012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 183B2

Classification:

AWS A5.28

ER80S-B2

Description:

Elgomatic 183B2 is a 1.25% Cr/0.5% Mo alloyed wire intended for MIG/MAG welding creep resisting steels of similar composition, used in power generation plant operating at temperatures up to 570 °C, e.g. DIN 13 CrMo 44, GS-17 CrMo 55, BS 3604 Grades 620 and 621 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 °C is recommended. Post-weld heat treat at 690 °C. The wire analysis conforms to the AWS 80S-B2 classification.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-10 l/min

M21, 80% Ar + 20% CO₂, 7-10 l/min

Mechanical properties

Typical

Yield strength, Re: 500 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5: 20%

Impact energy, CV: 20 °C • 80 J

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo | Cu |
|------|------|------|------|------|------|------|
| 0,07 | 0,55 | 0,60 | 1,35 | 0,05 | 0,55 | 0,15 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 97162008 | 15 kg K300 | 50-90 | 16-18 | 120-160 | 22-26 |
| 0,9 | 97162009 | 15 kg K300 | 60-100 | 17-19 | 130-170 | 23-27 |
| 1,0 | 97162010 | 15 kg K300 | 80-150 | 18-22 | 180-230 | 24-30 |
| 1,2 | 97162012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgomatic 184CR

Classification:

AWS A5.28

ER90S-B3

Description:

Elgomatic 184CR is a copper coated wire for use with the MIG/MAG process, which deposits a 2.4% 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. DIN 10 CrMo 9 10, GS-18 CrMo 9 10, GS-17 CrMo V 5 11, BS 3604 Grades 622 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 200-250 °C is recommended. Post-weld heat treat at 700 °C.

Welding current:

DC+

Shielding gas:

C1, 100% CO₂, 7-12 l/min

M21, 80% Ar + 20% CO₂, 7-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|------|------|-----|
| 0,08 | 0,60 | 0,60 | 2,50 | 1,0 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 97202010 | 15 kg K300 | 80-150 | 17-20 | 180-230 | 24-30 |
| 1,2 | 97202012 | 15 kg K300 | 110-180 | 18-22 | 240-300 | 26-33 |



Elgoy Hard M60

Classification:

EN 14700

S Fe8

Description:

Elgoy Hard M60 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.

Welding current:

DC+

Mechanical properties

Typical

Hardness as welded: 55-60 HRC

Product data:

| Diam.mm | Product code | Current A |
|---------|--------------|-----------|
| 1,00 | 7031-1040 | 180-240 |
| 1,20 | 7031-1240 | 220-320 |
| 1,60 | 7031-1640 | 282-460 |

Wire composition, wt.%

| C | Si | Mn | P | S | Cr |
|------|------|------|-------|-------|------|
| 0,45 | 2,95 | 0,35 | 0,025 | 0,002 | 9,20 |

Solid wires for gas shielded welding of stainless steels and Ni-base alloys

| | |
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Cromamig 308LSi

Classification:

EN ISO 14343

AWS A5.9

G 19 9 LSi

ER308LSi

Description:

Cromamig 308LSi is primarily intended for welding the low carbon 18% Cr / 10% Ni type 304 L austenitic stainless steels. Suitable also for welding normal carbon grade 304 and Nb or Ti stabilised steels (347, 321) provided service temperatures are below 400°C. The higher silicon content gives better arc stability and weld metal flow which improves bead appearance, particularly when dip transfer welding.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0,02 | 0,80 | 1,75 | 20,0 | 10,0 |

Approvals:

DB

TÜV

CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 120 J

-196 °C • 50 J

Ferrite content:

FN 9

Corrosion resistance

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|-------------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98022008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98022010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98022012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |
| 1,0 | 98024010 | 220 kg AUTOPAC | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98024012 | 220 kg AUTOPAC | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 308H

Classification:

EN ISO 14343

AWS A5.9

G 19 9 H

ER308H

Description:

Cromamig 308H 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 their creep strength and oxidation resistance at temperatures up to 800 °C. Cromamig 308H is also recommended for welding the controlled carbon stabilised grades 321H and 347H, used for structural applications at temperatures above 400 °C.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0,05 | 0,4 | 1,8 | 20,0 | 9,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 75 J

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98012010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98012012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 347Si

Classification:

EN ISO 14343
AWS A5.9

G 19 9 Nb Si
ER347Si

Description:

Cromamig 347Si is primarily intended 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. For structural applications at temperatures above 400°C, Cromamig 308H is recommended because of its superior strength at elevated temperatures. The higher silicon content gives better arc stability and weld metal flow which improves bead appearance, particularly when dip transfer welding.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min
M13, Ar + 1.3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Nb |
|------|-----|-----|------|-----|----|
| 0,04 | 0,8 | 1,3 | 19,5 | 9,7 | |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 620 MPa
Elongation, A5 30%
Impact energy, CV: 20 °C • 110 J
-196 °C • 30 J

Ferrite content:

FN 8

Corrosion resistance

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98222008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98222010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98222012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 316L

Classification:

EN ISO 14343

AWS A5.9

G 19 12 3 L

ER316 L

Description:

Cromamig 316L is primarily intended for welding the low carbon, molybdenum alloyed, acid resisting 316L austenitic stainless steels of similar composition. Suitable also for welding normal carbon 316 grades and Nb or Ti stabilised steels provided service temperatures are below 400°C.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|-----|-----|------|------|-----|
| 0,015 | 0,4 | 1,7 | 18,5 | 12,0 | 2,6 |

Approvals:

CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 420 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 100 J

-196 °C • 50 J

Ferrite content:

FN 5

Corrosion resistance

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98112008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98112010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98112012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 316LSi

Classification:

EN ISO 14343

AWS A5.9

G 19 12 3 LSi

ER316LSi

Description:

Cromamig 316LSi is primarily intended for welding the low carbon, molybdenum alloyed, acid resisting 316L austenitic stainless steels of similar composition. Suitable also for welding 304L type steels as well as normal carbon 316 grades and Nb or Ti stabilised steels provided service temperatures are below 400 °C. The higher silicon content gives better arc stability and weld metal flow which improves bead appearance, particularly when dip transfer welding.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|------|------|------|-----|
| 0,015 | 0,85 | 1,75 | 18,5 | 12,0 | 2,7 |

Approvals:

DB

TÜV

CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 120 J

-196 °C • 50 J

Ferrite content:

FN 8

Corrosion resistance

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|-------------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98102008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98102010 | 15 kg S300 | 75-140 | 18-21 | 150-170 | 26-28 |
| 1,2 | 98102012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |
| 0,6 | 98103006 | 5 kg D200 | 50-80 | 18-21 | 140-170 | 24-26 |
| 0,8 | 98103008 | 5 kg D200 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98103010 | 5 kg D200 | 75-140 | 18-21 | 150-170 | 26-28 |
| 1,0 | 98104010 | 220 kg AUTOPAC | 75-140 | 18-21 | 150-170 | 26-28 |
| 1,2 | 98104012 | 220 kg AUTOPAC | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 317L

Classification:

EN ISO 14343

AWS A5.9

G 19 13 4 L

ER317L

Description:

Cromamig 317L is intended for welding the 19% Cr / 13% Ni / 3.5% Mo, type 317L, austenitic stainless steels. The higher Mo content provides better resistance to both acid and pitting corrosion, compared to grade 316L material. The wire is also recommended for welding 316L and 316LN grades when it is necessary to ensure enhanced Mo level in the weld metal.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|-----|-----|------|------|-----|
| 0,015 | 0,5 | 1,8 | 18,5 | 14,5 | 3,8 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 390 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 100 J

-105 °C • 45 J

Ferrite content:

FN 6

Corrosion resistance

Good resistance to general and intergranular corrosion in most inorganic and organic acids e.g. sulphuric and sulphurous acids. Very good resistance to crevice and pitting corrosion in chloride containing solutions.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98122010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98122012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 318Si

Classification:

EN ISO 14343
AWS A5.9

G 19 12 3 Nb Si
~ER318

Description:

Cromamig 318Si is designed for welding the Nb or Ti stabilised 18% Cr/12% Ni/3% Mo austenitic stainless steel grades 316Cb and 316Ti. It is primarily intended for use at service temperatures above 400°C, but for structural applications at elevated temperatures the creep strength of the weld metal should always be considered.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min
M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb |
|------|------|-----|------|------|-----|-----|
| 0,04 | 0,80 | 1,8 | 19,5 | 11,5 | 2,7 | 0,5 |

Approvals:

TÜV
DB
CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 610 MPa
Elongation, A5: 34%
Impact energy, CV: 20°C • 90 J
-120°C • 40 J

Ferrite content:

FN 9

Corrosion resistance

Good resistance to general and intergranular corrosion in dilute hot acids. Good resistance to chloride pitting corrosion as well as oxidation and corrosion at elevated temperatures.

Scaling temperature:

Approx. 850°C in air.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98132008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98132010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98132012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 309LSi

Classification:

EN ISO 14343

AWS A5.9

G 23 12 LSi

ER309LSi

Description:

Cromamig 309LSi deposits a 23% Cr / 13% Ni austenitic stainless steel weld metal with a ferrite content of about FN 11. The high alloy level and high ferrite content enables the weld metal to tolerate dilution from carbon and low alloy steels without hot cracking. The higher silicon content gives better arc stability and weld metal flow which improves bead appearance, particularly when dip transfer welding.

APPLICATIONS:

- Buffer layers on mild and low alloy steels prior to overlaying with MIG/TIG 308L.
- Joining of clad steels and dissimilar joints between stainless and mild or low alloy steels.
- Welding of similar composition, 309L type, stainless steels.
- Joining of ferritic-martensitic stainless steels.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|------|
| 0,02 | 0,8 | 1,8 | 23,5 | 13,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 450 MPa

Tensile Strength, Rm: 650 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 130 J

–120 °C • 60 J

Ferrite content:

FN 11

Approvals:

TüV

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98052008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98052010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98052012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 309MoL

Classification:

EN ISO 14343

AWS A5.9

G 23 12 2

~ER309MoL

Description:

Cromamig 309MoL 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.

APPLICATIONS:

- Buffer layers on mild and low alloy steels prior to overlaying with Cromarod 316L.
- Joining of 316L clad steels and dissimilar joints between stainless and mild or medium carbon steels.
- Joining of medium carbon hardenable steels.

Welding current:

DC+

Shielding gas:

M12, Ar+2% CO₂

M13, Ar+1-3% O₂

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|-----|------|------|-----|
| 0,015 | 0,50 | 1,5 | 22,0 | 14,5 | 2,6 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 470 MPa

Tensile Strength, Rm: 680 MPa

Elongation, A5: 30%

Impact energy, CV: 20 °C • 80 J

Ferrite content:

FN 12

Corrosion resistance

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98262008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98262010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98262012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 310

Classification:

EN ISO 14343

AWS A5.9

G 25 20

ER310

Description:

Cromamig 310 is primarily intended for welding the 25% Cr / 20% Ni, type 310, fully austenitic stainless steels, used for corrosion and oxidation resistance at elevated temperatures. Suitable also for joining difficult-to-weld steels such as armour plate and ferritic stainless steels as well as dissimilar steels.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

M13, Ar + 1-3% O₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|------|
| 0,11 | 0,40 | 1,6 | 25,5 | 20,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 390 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 170 J

-196 °C • 60 J

Corrosion resistance

Designed for high temperature oxidation applications and its resistance to wet corrosion is limited.

Scaling temperature:

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

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98062010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98062012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 312

Classification:

EN ISO 14343

G 29 9

AWS A5.9

ER312

Description:

Cromamig 312 deposits a 29% Cr / 9% Ni austenitic/ferritic stainless steel weld metal with a ferrite content of about FN 40. The weld metal exhibits excellent tolerance to dilution from dissimilar and difficult-to-weld base materials without hot cracking, together with high strength and very good heat and oxidation resistance.

APPLICATIONS:

- Difficult-to-weld steels e.g. high carbon hardenable tool, die and spring steels, 13% Mn steels, free-cutting steels, high temperature steels.
- Dissimilar joints between stainless and high carbon steels.
- Surfacing of metal-to-metal wear areas, hot working tools, furnace components.
- Buffer layers prior to hard facing with high chromium carbide deposits.

Welding current:

DC+

Shielding gas:M12, Ar, 2% CO₂, 16-21 l/minM13, Ar + 1-3% O₂, 16-21 l/min**Wire composition, wt.%**

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|-----|
| 0,10 | 0,50 | 1,9 | 30,5 | 9,2 |

Mechanical properties**Typical**

Yield strength, Rp0.2%: 600 MPa

Tensile Strength, Rm: 750 MPa

Elongation, A5 25%

Impact energy, CV: 20 °C • 50 J

Ferrite content:

FN 40

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.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98082010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98082012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 307Si

Classification:

EN ISO 14343

AWS A5.9

G 18 8 Mn

~ER307

Description:

Cromamig 307Si produces a tough, ductile, 19% Cr / 9% Ni / 7% Mn austenitic stainless weld metal which is highly crack resistant. 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 Cromamig 307Si can be PWHT without risk of sigma-phase formation and consequent loss of ductility. The deposit work hardens from 200 HV to 450 HV.

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.

Welding current:

DC+

Shielding gas:

M12, Ar + 1-3% O₂, 16-21 l/min

M13, Ar + 2% CO₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|-----|
| 0,08 | 0,85 | 7,0 | 19,0 | 9,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 100 J

Approvals:

DB

TÜV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98242008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98242010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98242012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |

**Description:**

Cromamig LDX is designated for MIG welding of all lean duplex materials, i.e. molybdenum free duplex grades such as 4062, 4162 and 4362.

The product ensures a weld metal with a high strength and medium corrosion resistance, compatible with the base material. It also provides a smooth bead appearance with minimal spatter and a slag easy to remove.

Applications:

For applications with EN 1.4062, EN 1.4162 (ASTM S32101) or EN 1.4362 (ASTM S32304) base materials. The steels are mainly used in civil engineering, storage tanks, containers etc.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

I3, Ar + <30% He, 20-25 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|------|------|-------|------|------|------|
| 0,015 | 0,56 | 0,84 | 23,40 | 7,40 | 0,35 | 0,15 |

Approvals:

N/A

Mechanical properties**Typical**

Yield strength, Rp0.2%: 570 MPa

Tensile Strength, Rm: 770 MPa

Elongation, A5 25 %

Impact energy, CV: 20 °C • 170 J

-46 °C • 110 J

Ferrite content:

35-70%

Corrosion resistance

General corrosion

Thanks to its high Cr content (> 23%) the Cromamig LDX allows welds with a general corrosion resistance at least equal to the one of the plates on which it is used for welding, in particular the 4062 grade with 22% Cr and the 4162 grade with 21% Cr.

Pitting corrosion

For the 6%FeCl₃ medium (ASTM G48A standardised test), the critical pitting temperature of the above-described welded joint is determined, by calculation, to 16 °C, i.e. 10 °C above the level measured for a base metal of the 304L/1.4307 type and at the same level as that of a base metal of the 1.4362 type.

Intergranular corrosion

As all the low C Duplex grades, in the as-solidified condition, the Cromamig LDX does not exhibit, on duplex welded joint, any intergranular precipitation likely to cause intergranular corrosion phenomena.

Product data:

| Diam. mm | Product code | Spool weight |
|----------|--------------|--------------|
| 1,2 | 98152012 | 15 |



Cromamig Duplex

Classification:

EN ISO 14343

AWS A5.9

G 22 9 3 N L

ER2209

Description:

Cromamig Duplex deposits a 23% Cr / 9% Ni / 3% Mo / N austenitic/ferritic duplex stainless steel weld metal with a ferrite content of about FN 35.

It is intended for welding similar composition duplex stainless steels which offer an excellent combination of much higher strength and very good resistance to pitting and stress corrosion cracking, compared to standard austenitic stainless steels.

Welding current:

DC+

Shielding gas:

M12, Ar + 2% CO₂, 16-21 l/min

I3, Ar + <30% He, 20-25 l/min

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|------|-----|------|-----|-----|------|
| 0,015 | 0,40 | 1,8 | 22,5 | 9,0 | 3,0 | 0,18 |

Approvals:

TÜV

DNV

DB

CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 620 MPa

Tensile Strength, Rm: 800 MPa

Elongation, A5 30%

Impact energy, CV: 20 °C • 120 J

-60 ° • 65 J

Ferrite content:

FN 35

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 = 35.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98162008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98162010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98162012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 2507

Classification:

EN ISO 14343

AWS A5.9

G 25 9 4 N L

ER2594

Description:

Cromamig 2507 deposits a 25%Cr/10%Ni/4%Mo/0.25% N super duplex type weld metal with a ferrite level of approximately FN 55. It 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. Cromamig 2507 may also be used for welding standard duplex steels when higher corrosion resistance in the weld metal is required. 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 deleterious precipitation effects in the plate. Applications include offshore platform pipework for seawater cooling systems and firefighting water, as well as pumps, valves and risers. The weld metal has excellent fracture toughness at temperatures down to -40°C.

Welding current:

DC+

Shielding gas:M11, Ar + 1-3% O₂, 16-21 l/min**Wire composition, wt.%**

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|-----|-----|------|-----|-----|------|
| 0,020 | 0,3 | 0,4 | 25,0 | 9,5 | 4,0 | 0,25 |

Mechanical propertiesTypical

Yield strength, Rp0.2%: 640 MPa

Tensile Strength, Rm: 850 MPa

Elongation, A₅: 25%

Impact energy, CV: 20 °C • 135 J

-40 °C • 60 J

Ferrite content:

FN 55

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 °C (ASTM G48).

Scaling temperature:

Approx. 850 °C in air.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98172008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98172010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98172012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 385

Classification:

EN ISO 14343

AWS A5.9

G 20 25 5 Cu LN

ER385

Description:

Cromamig 385 is intended for welding the 20% Cr / 25% Ni / 4.5% Mo / Cu fully austenitic stainless steels, used for their very high resistance to corrosion in severe, non-oxidising environments e.g. sulphuric acid. The low carbon, high alloy content of the weld metal gives excellent resistance to intergranular corrosion and stress corrosion cracking, combined with superior resistance to crevice and pitting corrosion compared to standard 304L and 316L materials.

Welding current:

DC+

Shielding gas:

M11, Ar + 1-3% O₂, 16-21 l/min

M12, Ar + 2% CO₂, 16-21 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Cu |
|-------|------|-----|------|------|-----|-----|
| 0,015 | 0,40 | 2,0 | 19,5 | 25,0 | 4,5 | 1,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5 33%

Impact energy, CV: 20 °C • 120 J

-196 °C • 50 J

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 cracking and crevice and pitting corrosion in chloride bearing environments.

Scaling temperature:

Approx. 1000 °C in air.

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98142010 | 15 kg S300 | 80-120 | 15-17 | 180-250 | 26-29 |
| 1,2 | 98142012 | 15 kg S300 | 100-150 | 17-19 | 200-290 | 26-29 |



Cromamig 82

Classification:

EN ISO 18274

AWS A5.14

S Ni 6082 (NiCr20Mn3Nb)

ERNiCr-3

Description:

Cromamig 82 is intended for welding Inconel 600, Incoloy 800 and similar composition nickel base alloys particularly where these are used for high temperature service. Highly suitable for a wide range of dissimilar joint combinations between nickel base alloys, Monels, mild and low alloy steels and austenitic stainless steels. Can be used to clad carbon steels with an Inconel type surface. Suitable for welding 5% and 9% nickel steels for cryogenic applications.

Welding current:

DC+

Shielding gas:

I1, Ar 99.99%, 16-21 l/min

I3, Ar + 30% He, 20-25 l/min

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Fe | Nb ² |
|------|------|-----|------|------|-----|-----------------|
| 0,01 | 0,10 | 3,0 | 20,0 | 73,0 | 0,5 | 2,5 |

² Nb + Ta

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 660 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 150 J

-196 °C • 80 J

Corrosion resistance

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

Scaling temperature:

The weld metal is resistant to oxidation

- in air up to 1150 °C

- in sulphur dioxide up to 800 °C

- in hydrogen sulphide up to 550 °C

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 1,0 | 98182010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98182012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |



Cromamig 625

Classification:

EN ISO 18274

AWS A5.14

S Ni 6625 (NiCr22Mo9Nb)

ERNiCrMo-3

Description:

Cromamig 625 is primarily intended for welding Inconel 625 and similar composition nickel base alloys which are used for their excellent corrosion and oxidation resistance combined with an exceptionally high resistance to pitting corrosion and chloride induced stress corrosion cracking. 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.

Applications:

Suitable for welding the nickel base alloys 625 and 825 but also 6 Mo steels (ASTM S31254) and 9% Ni steels for cryogenic applications.
Overlay welding of carbon or low alloy steels and dissimilar joints.

Welding current:

DC+

Shielding gas:

I3, Ar + <30% He, 20-25 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb ² |
|------|------|------|------|------|-----|-----------------|
| 0,01 | 0,10 | 0,05 | 22,0 | 64,0 | 9,0 | 3,6 |

² Nb + Ta

Approvals:

TüV
CE

Mechanical properties

Typical

Yield strength, Rp0.2%: 480 MPa

Tensile Strength, Rm: 780 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 110 J
-196 °C • 60 J

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.

Scaling temperature:

The weld metal is resistant to oxidation in air up to 1150 °C. (Very high tensile strength and yield strength up to approx. 850 °C. Rp 0.2%=300 MPa, Rm=400 MPa)

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 98202008 | 15 kg S300 | 60-100 | 18-21 | 150-170 | 24-26 |
| 1,0 | 98202010 | 15 kg S300 | 75-140 | 18-21 | 170-200 | 26-28 |
| 1,2 | 98202012 | 15 kg S300 | 130-160 | 18-21 | 175-250 | 26-28 |

Wires for gas shielded welding of aluminium alloys

| | |
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Alumig 99.5

Classification:

EN ISO 18273

S Al 1450 (Al99.5Ti)

Description:

Pure aluminium MIG wire for welding similar composition material. The weld metal has excellent ductility, corrosion resistance and electrical conductivity. Good colour match with material to be anodised. Melting range 630-640 °C.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical properties

Typical

Yield strength, Rp0.2%: 30 MPa

Tensile Strength, Rm: 100 MPa

Elongation, A5 37%

Wire composition, wt.%

| Si | Mn | Al | Ti | Zn | Fe |
|------|------|------|------|------|------|
| 0,04 | 0,01 | bal. | 0,15 | 0,01 | 0,06 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95012008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95012010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95012012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95012016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |



Alumig Si5

Classification:

EN ISO 18273

AWS A5.10

S Al 4043A (AlSi5)

ER 4043

Description:

Aluminium MIG wire containing 5% Silicon for welding Al / Si and Al / Mg / Si material. The medium strength weld metal has excellent resistance to hot cracking. Not suitable where good colour match is required after anodising. Melting range 570-630 °C.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical propertiesTypical

Yield strength, Rp0.2%: 55 MPa

Tensile Strength, Rm: 140 MPa

Elongation, A5 10%

Wire composition, wt.%

| Si | Mn | Al | Zn | Fe |
|-----|------|------|------|-----|
| 5,0 | 0,01 | bal. | 0,01 | 0,2 |

Approvals:

TÜV

DB

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|------------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95052008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95052010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95052012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95052016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |
| 0,8 | 95052508 | 2 kg D200 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95052510 | 2 kg D200 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95052512 | 2 kg D200 | N/A | N/A | 140-210 | 19-25 |
| 1,0 | 95054010 | 80 kg AUTOPAC | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95054012 | 80 kg AUTOPAC | N/A | N/A | 140-210 | 19-25 |



Alumig Si12

Classification:

EN ISO 18273

AWS A5.10

S Al 4047 (AlSi12(A))

ER 4047

Description:

Aluminium MIG wire containing 12% Silicon for welding Al / Si and Al / Mg / Si material. The medium strength weld metal has excellent resistance to hot cracking. Not suitable where good colour match is required after anodising. Melting range 575-585 °C.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical properties

Typical

Yield strength, Re: 80 MPa

Tensile Strength, Rm: 170 MPa

Elongation, A5 6%

Wire composition, wt.%

| Si | Mn | Al | Zn | Fe |
|------|------|------|------|------|
| 12,0 | 0,01 | bal. | 0,01 | 0,30 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95082008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95082010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95082012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95082016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |



Alumig Mg3

Classification:

EN ISO 18273

AWS A5.10

S AI 5754 (AlMg3)

ER 5754

Description:

Aluminium MIG wire containing 3,2% Magnesium for welding similar composition materials. The medium strength weld metal has good corrosion resistance in marine environments. Excellent colour match with material to be anodised. Melting range 590-650 C.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium, 16-20 l/min

Mechanical propertiesTypical

Yield strength, Rp0.2%: 120 MPa

Tensile Strength, Rm: 230 MPa

Elongation, A5 22%

Wire composition, wt.%

| Si | Mn | Al | Zn | Mg | Fe |
|------|------|------|------|-----|------|
| 0,15 | 0,30 | bal. | 0,10 | 3,2 | 0,25 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95092008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95092010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95092012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95092016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |



Alumig Mg5

Classification:

EN ISO 18273

AWS A5.10

S Al 5356 (AlMg5Cr)

ER 5356

Description:

Aluminium MIG wire containing 5% Magnesium for welding similar composition Al-Mg and Al-Mg-Si materials. The high strength weld metal has very good corrosion resistance in marine environments. Excellent colour match with material to be anodised. The most versatile and universally used aluminium filler material. Melting range 560-630°C.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical propertiesTypical

Yield strength, Rp0.2%: 125 MPa

Tensile Strength, Rm: 255 MPa

Elongation, A5 24%

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|------|------|-----|------|
| 0,05 | 0,15 | bal. | 5,0 | 0,15 |

Approvals:

TÜV

DNV

DB

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|------------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95042008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95042010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95042012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95042016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |
| 0,8 | 95042508 | 2 kg D200 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95042510 | 2 kg D200 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95042512 | 2 kg D200 | N/A | N/A | 140-210 | 19-25 |
| 1,0 | 95044010 | 80 kg AUTOPAC | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95044012 | 80 kg AUTOPAC | N/A | N/A | 140-210 | 19-25 |



Alumig Mg4.5 Mn

Classification:

EN ISO 18273

AWS A5.10

S Al 5183 (AlMg4.5Mn)

ER 5183

Description:

Aluminium MIG wire containing a nominal 4.9% Magnesium and 0.8% Manganese to produce a higher strength weld metal than the standard 5% Mg alloy.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical properties

Typical

Yield strength, Rp0.2%: 145 MPa

Tensile Strength, Rm: 275 MPa

Elongation, A5 24%

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|-----|------|-----|-----|
| 0,08 | 0,7 | bal. | 4,9 | 0,2 |

Approvals:

DB

GL

TÜV

DNV

CE

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|------------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95062008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95062010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95062012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95062016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |
| 0,8 | 95062508 | 2 kg D200 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95062510 | 2 kg D200 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95062512 | 2 kg D200 | N/A | N/A | 140-210 | 19-25 |
| 1,0 | 95064010 | 80 kg AUTOPAC | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95064012 | 80 KG AUTOPAC | N/A | N/A | 140-210 | 19-25 |



Alumig Mg5 Mn

Classification:

EN ISO 18273

AWS A5.10

S Al 5556A (5556

AlMg5Mn)

ER 5556

Description:

Aluminium MIG wire containing a nominal 5.3% Magnesium and 0.8% Manganese to produce a higher strength weld metal than the standard 5% Mg alloy. It is designed to weld the widely used structural alloy 5083 when full matching strength is required.

Welding current:

DC+

Shielding gas:

I1, Argon 16-20 l/min

I2, Helium 16-20 l/min

I3, Argon/Helium 16-20 l/min

Mechanical propertiesTypical

Yield strength, Rp0.2%: 135 MPa

Tensile Strength, Rm: 275 MPa

Elongation, A5 15%

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|-----|------|-----|------|
| 0,05 | 0,8 | bal. | 5,3 | 0,15 |

Product data:

| Diam. mm | Product code | Spool weight | Dip Current A | Dip Voltage V | Spray Current A | Spray Voltage V |
|----------|--------------|--------------|---------------|---------------|-----------------|-----------------|
| 0,8 | 95072008 | 5 kg D300 | N/A | N/A | 70-110 | 18-22 |
| 1,0 | 95072010 | 6 kg D300 | N/A | N/A | 100-150 | 18-22 |
| 1,2 | 95072012 | 6 kg D300 | N/A | N/A | 140-210 | 19-25 |
| 1,6 | 95072016 | 6 kg D300 | N/A | N/A | 170-320 | 20-26 |

| | |
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Elgatic 100

Classification:

EN ISO 636-A

AWS A5.18

W 46 2 W3Si1

ER70S-6

Description:

Elgatic 100 is a silicon, manganese double deoxidised welding wire suitable for high integrity TIG welding of mild and medium tensile steels. It is recommended for Si-killed materials.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F ER70S-6

Mechanical properties**Typical**

Yield strength, Re: 500 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A5 26%

Impact energy, CV: -20 °C • 100 J

-46 °C • >60 J

Wire composition, wt.%

| C | Si | Mn |
|------|------|------|
| 0,08 | 0,90 | 1,50 |

Approvals:

DB

TÜV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 95261016 |
| 2,0 x 1000 | 5 kg | 95261020 |
| 2,4 x 1000 | 5 kg | 95261024 |
| 3,0 x 1000 | 5 kg | 95261030 |



Elgatic 101

Classification:

EN ISO 636-A

AWS A5.18

W 42 2 W2Si

ER70S-3

Description:

Elgatic 101 is a silicon , manganese double deoxidised welding wire suitable for high integrity TIG welding of mild and medium tensile steels. It is recommended for Si-killed materials. It has lower levels of Si and Mn than Elgatic 100.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 7-10 l/min

Stamping

F ER70S-3

Mechanical properties**Typical**

Yield strength, Re: 460 MPa

Tensile Strength, Rm: 560 MPa

Elongation, A5 26%

Impact energy, CV: -20 °C • 100 J

Approvals:

CE

Wire composition, wt.%

| C | Si | Mn |
|------|------|------|
| 0,09 | 0,65 | 1,10 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 95271016 |
| 2,0 x 1000 | 5 kg | 95271020 |
| 2,4 x 1000 | 5 kg | 95271024 |
| 3,0 x 1000 | 5 kg | 95271030 |



Elgatic 115

Classification:

EN ISO 636

AWS A5.18

W 42 2 W2Ti

ER70S-2

Description:

Elgatic 115 is a triple deoxidised (silicon, manganese, aluminium) copper-coated TIG welding wire. It is recommended for high quality pipe welding of mild and medium tensile steels and is ideal for root passes in thick walled material.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F ER70S-2

Mechanical properties

Typical

Yield strength, Re: 460 MPa

Tensile Strength, Rm: 540 MPa

Elongation, A5: 26%

Impact energy, CV: -20 °C • 80 J

Wire composition, wt.%

| C | Si | Mn |
|------|-----|-----|
| 0,05 | 0,6 | 1,2 |

Approvals:

TÜV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 95221016 |
| 2,0 x 1000 | 5 kg | 95221020 |
| 2,4 x 1000 | 5 kg | 95221024 |
| 3,0 x 1000 | 5 kg | 95221030 |



Elgatic 135

Classification:

EN ISO 16834

AWS A5.28

W 69 4 Mn3Ni1CrMo

ER100S-G

Description:

Elgatic 135 is a 1.5% Ni / 0.5% Mo / 0.2% Cr alloyed wire intended for TIG welding the high tensile quenched and tempered steels such as Weldox 700, BSC RQT 701, N-A-XTRA 70 and USST1. The weld deposit has good fracture toughness at temperatures down to -40°C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|------|
| 0,10 | 0,55 | 1,65 | 0,35 | 1,35 | 0,25 |

Mechanical properties

Typical

Yield strength, Re: 700 MPa

Tensile Strength, Rm: 790 MPa

Elongation, A5 20%

Impact energy, CV: -40°C • 55 J

Approvals:

DNV

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 95371016 |
| 2,4 x 1000 | 5 kg | 95371024 |



Elgatig 162

Classification:

EN ISO 636-A

AWS A5.28

W 46 6 W3Ni1

ER80S-Ni1

Description:

Elgatig 162 is a low alloy TIG rod depositing a nominal 0.9% Ni weld metal. It has a guaranteed Ni content of 1% maximum ensuring conformance to NACE requirements for oil and gas production equipment in sour service. Elgatig 162 has very good fracture toughness at temperatures down to -60°C and is designed for offshore pipework and similar high integrity applications.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F ER80S-Ni1

Mechanical propertiesTypical

Yield strength, Re: 490 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 28%

Impact energy, CV: -46°C • 90 J

-60°C • 80 J

Wire composition, wt.%

| C | Si | Mn | P | S | Ni |
|------|------|------|------|------|------|
| 0,09 | 0,60 | 1,10 | 0,01 | 0,01 | 0,90 |

Approvals:

MRS

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97351016 |
| 2,0 x 1000 | 5 kg | 97351020 |
| 2,4 x 1000 | 5 kg | 97351024 |



Elgatic 148K

Classification:

EN 1668

AWS A5.28

W 46 6 W2Ni2

ER80S-Ni2

Description:

Elgatic 148K is a low-alloyed TIG-wire, which deposits a 2.4% Ni weld metal with good tensile strength and impact energy down to -60°C . It is intended for pipe welding of low alloyed steels in the offshore and shipbuilding industries.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F Ni 2,5

Mechanical properties

Typical

Yield strength, Re: 520 MPa

Tensile Strength, Rm: 610 MPa

Elongation, A5 28%

Impact energy, CV: $-60^{\circ}\text{C} \bullet 90\text{ J}$

Approvals:

CE

Wire composition, wt.%

| C | Si | Mn | Ni | Cu |
|------|-----|------|-----|------|
| 0,10 | 0,6 | 1,10 | 2,4 | 0,15 |

Product data:

| $\varnothing \times$ Length mm | Packet weight | Product code |
|--------------------------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97401016 |
| 2,0 x 1000 | 5 kg | 97401020 |
| 2,4 x 1000 | 5 kg | 97401024 |



Elgagig 181CR

Classification:

EN ISO 21952-A
AWS A5.28

W MoSi
ER70S-A1

Description:

Elgagig 181CR is a 0.5% Mo alloyed wire intended for TIG welding similar composition steels, used where creep rupture strength and ductility at service temperatures up to 550°C are required, e.g. DIN 15 Mo3, BS 3059 Grade 243 and ASTM A335 Grade P1. The Mo content confers some resistance to hydrogen attack in chemical process plant applications. Elgagig 181CR 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. Stress relieve at 620°C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F SG Mo

Approvals:

DB
TÜV
CE

Wire composition, wt.%

| C | Si | Mn | Mo |
|------|------|------|------|
| 0,10 | 0,60 | 1,10 | 0,50 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97101016 |
| 2,0 x 1000 | 5 kg | 97101020 |
| 2,4 x 1000 | 5 kg | 97101024 |
| 3,0 x 1000 | 5 kg | 97101030 |



Elgatic 181D2

Classification:

AWS A5.28

ER80S-D2

Description:

Elgatic 181D2 is a TIG-rod 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. DIN 15 Mo3, BS 3059 Grade 243 and ASTM A335 Grade P1. The Mo content confers some resistance to hydrogen attack in chemical process plant applications. Elgatic 181D2 is also suitable for ordinary C-Mn steels when higher tensile strength weld metal is required. The Mn content fulfils the AWS classification D2. Preheat and interpass temperature of 100-150 °C is recommended. Stress relieve at 620 °C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Mo |
|------|------|------|------|
| 0,09 | 0,65 | 1,85 | 0,55 |

Mechanical properties

Typical

| | |
|-----------------------|---------------|
| Yield strength, Re: | 510 MPa |
| Tensile Strength, Rm: | 610 MPa |
| Elongation, A5 | 22% |
| Impact energy, CV: | -29 °C • 45 J |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97111016 |
| 2,0 x 1000 | 5 kg | 97111020 |
| 2,4 x 1000 | 5 kg | 97111024 |
| 3,0 x 1000 | 5 kg | 97111030 |



Elgatih 183CR

Classification:

EN 12070

AWS A5.28

WCrMo1Si

ER 80 S-G

Description:

Elgatih 183CR is a 1.25% Cr/0.5% Mo alloyed wire intended for TIG welding creep resisting steels of similar composition, used in power generation plant operating at temperatures up to 570 °C, e.g. DIN 13 CrMo 44, GS-17 CrMo 55, BS 3604 Grades 620 and 621 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 °C is recommended. Post-weld heat treat at 690 °C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F CrMo1

Wire composition, wt. %

| C | Si | Mn | Cr | Mo |
|------|------|------|------|------|
| 0,11 | 0,65 | 1,00 | 1,20 | 0,50 |

Mechanical properties

Typical

Yield strength, Re: 520 MPa

Tensile Strength, Rm: 620 MPa

Elongation, A5 22%

Impact energy, CV: 20 °C • 80 J

Approvals:

TÜV

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 | 1000 | 9715-1016 |
| 2,0 | 1000 | 9715-1020 |
| 2,4 | 1000 | 9715-1024 |



Elgatic 183B2

Classification:

AWS A5.28

ER80S-B2

Description:

Elgatic 183B2 is a 1.25% Cr/0.5% Mo alloyed wire intended for TIG welding creep resisting steels of similar composition, used in power generation plant operating at temperatures up to 570 °C, e.g. DIN 13 CrMo 44, GS-17 CrMo 55, BS 3604 Grades 620 and 621 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. The Mn content fulfils the AWS classification B2. Preheat and interpass temperature of 150-200 °C is recommended. Post-weld heat treat at 690 °C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|------|------|------|
| 0,08 | 0,55 | 0,60 | 1,35 | 0,55 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97161016 |
| 2,0 x 1000 | 5 kg | 97161020 |
| 2,4 x 1000 | 5 kg | 97161024 |
| 3,0 x 1000 | 5 kg | 97161030 |



Elgatic 184CR

Classification:

EN ISO 21952

AWS A5.28

W CrMo2Si

ER90S-G

Description:

Elgatic 184CR is a 2.4% Cr/1.0% Mo alloyed wire intended for TIG welding creep resisting steels of similar composition, used in steam generation plant operating at temperatures up to 600 °C, e.g. DIN 10 CrMo 9 10, GS-18 CrMo 9 10, GS-17 CrMo V 5 11, BS 3604 Grades 622 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 200-250 °C is recommended. Post-weld heat treat at 700 °C.

Welding current:

DC-

Shielding gas:

I1, Argon, 7-10 l/min

Stamping

F CrMo2

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|-----|-----|------|
| 0,08 | 0,60 | 1,0 | 2,4 | 1,00 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97201016 |
| 2,0 x 1000 | 5 kg | 97201020 |
| 2,4 x 1000 | 5 kg | 97201024 |
| 3,0 x 1000 | 5 kg | 97201030 |



Elgatic 184B3

Classification:

AWS A5.28

ER90S-B3

Description:

Elgatic 184B3 is a 2.4% Cr/1.0% Mo alloyed wire intended for TIG welding creep resisting steels of similar composition, used in steam generation plant operating at temperatures up to 600°C, e.g. DIN 10 CrMo 9 10, GS-18 CrMo 9 10, GS-17 CrMo V 5 11, BS 3604 Grades 622 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. The Mn content fulfils the AWS classification B3. Preheat and interpass temperature of 200-250°C is recommended. Post-weld heat treat at 700°C.

Welding current:

DC-

Shielding gas:

I1, Argon 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|------|------|------|
| 0,09 | 0,55 | 0,60 | 2,45 | 1,05 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97211016 |
| 2,0 x 1000 | 5 kg | 97211020 |
| 2,4 x 1000 | 5 kg | 97211024 |
| 3,0 x 1000 | 5 kg | 97211030 |



Elgatih 185CR

Classification:

EN ISO 21952

W CrMo5Si

Description:

Elgatih 185CR is a 5.8% Cr/0.5% Mo alloyed wire intended for TIG 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 650°C, e.g. DIN 12 CrMo 19 5, BS 3604 Grades HFS 625 and CFS 625, ASTM A155 Grade 5Cr etc. To avoid hydrogen cracking, preheat and interpass temperature of 250-300°C must be carefully controlled. Maintain preheat for some time after completion of welding. Post-weld heat treat at 750°C.

Welding current:

DC-

Shielding gas:

Argon, 7-10 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Mo |
|------|------|------|-----|------|
| 0,07 | 0,35 | 0,60 | 5,8 | 0,55 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 2,4 x 1000 | 5 kg | 97251024 |



Elgag CuNi70-30

Classification:

AWS A5.7-84
DIN 1733
ISO 24373

Er CuNi
SG-CuNi30Fe
CuNi30 Cu7158

Description:

Elgag CuNi70-30 is a 70% Cu / 30% Ni wire intended for TIG welding the 70/30 and 90/10 cupronickel alloys. These materials have excellent corrosion resistance in sea-water and are used in shipbuilding, offshore construction and salt water processing systems.

Welding current:

DC-

Shielding gas:

Argon, 7-10 l/min

Mechanical properties

Typical

Tensile Strength, Rm: 440 MPa
Elongation, A5 6-10%

Wire composition, wt.%

| Mn | Ni | Cu | Ti | Fe |
|-----|------|-------|-----|-----|
| 0,5 | 30,0 | rest. | 0,4 | 0,5 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 97551016 |
| 2,0 x 1000 | 5 kg | 97551020 |
| 2,4 x 1000 | 5 kg | 97551024 |

TIG rods for welding of stainless steels and Ni-base alloys

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Cromatig 308L

Classification:

EN ISO 14343

AWS A5.9

W 19 9 L

ER308L

Description:

Cromatig 308L is primarily intended for welding the low carbon 18% Cr / 10% Ni, type 304L, austenitic stainless steels. It is also suitable for stainless steel grade 304 material and the Nb or Ti stabilised grades 347 and 321, provided service temperatures for structural applications are below 400 °C.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt. %

| C | Si | Mn | Cr | Ni |
|-------|------|-----|------|------|
| 0,015 | 0,40 | 1,7 | 20,5 | 10,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 120 J

-196 °C • 60 J

Ferrite content:

FN 9

Corrosion resistance

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

Approvals:

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98031012 |
| 1,6 x 1000 | 5 kg | 98031016 |
| 2,0 x 1000 | 5 kg | 98031020 |
| 2,4 x 1000 | 5 kg | 98031024 |
| 3,2 x 1000 | 5 kg | 98031032 |



Cromatig 308LSi

Classification:

EN ISO 14343

AWS A5.9

W 19 9 LSi

ER308LSi

Description:

Cromatig 308LSi is primarily intended for welding the low carbon 18% Cr / 10% Ni, type 304L, austenitic stainless steels. It is also suitable for stainless steel grade 304 material and the Nb or Ti stabilised grades 347 and 321, provided service temperatures for structural work are below 400 °C. The higher silicon content provides a more fluid weld pool which may be preferred for certain welding applications.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|------|------|------|
| 0,02 | 0,8 | 1,75 | 20,0 | 10,0 |

Mechanical properties**Typical**

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 120 J

-196 °C • 50 J

Ferrite content:

FN 9

Corrosion resistance

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

Approvals:

DB

TÜV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98021012 |
| 1,6 x 1000 | 5 kg | 98021016 |
| 2,0 x 1000 | 5 kg | 98021020 |
| 2,4 x 1000 | 5 kg | 98021024 |
| 3,2 x 1000 | 5 kg | 98021032 |



Cromatig 308H

Classification:

EN ISO 14343

AWS A5.9

W 19 9 H

ER308H

Description:

Cromatig 308H 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 their creep strength and oxidation resistance at temperatures up to 800 °C. Cromatig 308H is also recommended for welding the controlled carbon stabilised grades 321H and 347H, used for structural applications at temperatures above 400 °C.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0,05 | 0,4 | 1,8 | 20,0 | 9,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 380 MPa

Tensile Strength, Rm: 580 MPa

Elongation, A5: 35%

Impact energy, CV: 20 °C • 75 J

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98011012 |
| 1,6 x 1000 | 5 kg | 98011016 |
| 2,0 x 1000 | 5 kg | 98011020 |
| 2,4 x 1000 | 5 kg | 98011024 |



Cromatig 347Si

Classification:

EN ISO 14343
AWS A5.9

W 19 9 Nb Si
ER347Si

Description:

Cromatig 347Si is primarily intended 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 of 304 and 304L. For structural applications at temperatures above 400°C, grade 308H is recommended because of its superior creep strength at elevated temperatures. The higher silicon content provides a more fluid weld pool which may be preferred for certain welding applications.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|-----|-----|------|-----|
| 0,04 | 0,8 | 1,8 | 19,5 | 9,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 620 MPa
Elongation, A5 35%
Impact energy, CV: 20°C • 130 J
-196°C • 40 J

Ferrite content:

FN 7

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98221016 |
| 2,0 x 1000 | 5 kg | 98221020 |
| 2,4 x 1000 | 5 kg | 98221024 |
| 3,2 x 1000 | 5 kg | 98221032 |



Cromatig 316L

Classification:

EN ISO 14343

AWS A5.9

W 19 12 3 L

ER316L

Description:

Cromatig 316L is primarily intended for welding the low carbon, molybdenum alloyed, acid resisting 316L austenitic stainless steels of similar composition. Suitable also for welding 316 grades as well as Nb or Ti stabilised steels provided service temperatures for structural work are below 400 °C.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|-----|------|------|-----|
| 0,015 | 0,40 | 1,7 | 18,5 | 12,0 | 2,6 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 150 J

-196 °C • 60 J

Ferrite content:

FN 6

Corrosion resistance

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

Approvals:

DNV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98111012 |
| 1,6 x 1000 | 5 kg | 98111016 |
| 2,0 x 1000 | 5 kg | 98111020 |
| 2,4 x 1000 | 5 kg | 98111024 |
| 3,2 x 1000 | 5 kg | 98111032 |



Cromatig 316LSi

Classification:

EN ISO 14343

AWS A5.9

W 19 12 3 LSi

ER316LSi

Description:

Cromatig 316LSi is primarily intended for welding the low carbon, molybdenum alloyed, acid resisting 316L austenitic stainless steels of similar composition. It is also suitable for grade 316 material and the Nb or Ti stabilised grades 347 and 321, provided service temperatures for structural work are below 350°C. The higher silicon content provides a more fluid weld pool which may be preferred for certain welding applications.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|------|------|------|-----|
| 0,015 | 0,85 | 1,75 | 18,5 | 12,0 | 2,7 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20°C • 120 J

-196°C • 50 J

Ferrite content:

FN 8

Corrosion resistance

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

Approvals:

DB

TÜV

DNV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,0 x 1000 | 5 kg | 98101010 |
| 1,2 x 1000 | 5 kg | 98101012 |
| 1,6 x 1000 | 5 kg | 98101016 |
| 2,0 x 1000 | 5 kg | 98101020 |
| 2,4 x 1000 | 5 kg | 98101024 |
| 3,2 x 1000 | 5 kg | 98101032 |



Cromatig 316H

Classification:

EN ISO 14343

AWS A5.9

W 19 12 3 H

ER316H

Description:

Cromatig 316H is intended for welding 316H grade stainless steel with controlled carbon content (0.04%-0.08%). It is designed to weld similar composition steels, used for their creep strength and oxidation resistance at temperatures up to 800 °C. Cromatig 316H is also recommended for welding the controlled carbon stabilised grades 321H and 347H, used for structural applications at temperatures above 400 °C.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|------|
| 0,06 | 0,50 | 1,75 | 18,5 | 12,0 | 2,70 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 30%

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98091016 |
| 2,0 x 1000 | 5 kg | 98091020 |
| 2,4 x 1000 | 5 kg | 98091024 |
| 3,2 x 1000 | 5 kg | 98091032 |



Cromatig 317L

Classification:

EN ISO 14343

AWS A5.9

W 19 13 4 L

ER317L

Description:

Cromatig 317L is intended for welding the 19% Cr / 13% Ni / 3.5% Mo, type 317L, austenitic stainless steels. The higher Mo content provides better resistance to both acid and pitting corrosion, compared to grade 316L material. The wire is also recommended for welding 316L and 316LN grades when it is necessary to ensure enhanced Mo level in the weld metal.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|-----|-----|------|------|-----|
| 0,015 | 0,5 | 1,8 | 19,0 | 14,5 | 3,8 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 390 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 100 J

-105 °C • 50 J

Ferrite content:

FN 6

Corrosion resistance

Good resistance to general and intergranular corrosion in most inorganic acids e.g. sulphuric and sulphurous acids. Very good resistance to crevice and pitting corrosion in chloride containing solutions.

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98121016 |
| 2,0 x 1000 | 5 kg | 98121020 |
| 2,4 x 1000 | 5 kg | 98121024 |



Cromatig 318Si

Classification:

EN ISO 14343
AWS A5.9

W 19 12 3 Nb Si
~ER318

Description:

Cromatig 318Si is designed for welding the Nb or Ti stabilised 18% Cr/12% Ni/3% Mo austenitic stainless steel grades 316 Cb and 316 Ti. It is primarily intended for use at service temperatures above 400°C, but for structural applications at elevated temperatures the creep strength of the weld metal should always be considered.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Nb |
|------|------|-----|------|------|-----|-----|
| 0,04 | 0,80 | 1,8 | 19,5 | 11,5 | 2,7 | 0,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 610 MPa
Elongation, A5: 34%
Impact energy, CV: 20°C • 90 J
-120°C • 40 J

Ferrite content:

FN 9

Corrosion resistance

Good resistance to general and intergranular corrosion in dilute hot acids. Good resistance to chloride pitting corrosion as well as oxidation and corrosion at elevated temperatures.

Scaling temperature:

Approx. 850°C in air.

Approvals:

TÜV
DB
CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98131016 |
| 2,0 x 1000 | 5 kg | 98131020 |
| 2,4 x 1000 | 5 kg | 98131024 |
| 3,2 x 1000 | 5 kg | 98131032 |



Cromatig 309L

Classification:

EN ISO 14343

AWS A5.9

W 23 12 L

ER309 L

Description:

Cromatig 309L deposits a 24% Cr / 13% Ni austenitic stainless steel weld metal with a ferrite content of about FN 11. The high alloy level and high ferrite content enables the weld metal to tolerate dilution from carbon and low alloy steels without hot cracking.

APPLICATIONS:

- Buffer layers on mild and low alloy steels prior to overlaying with MIG/TIG 308L.
- Joining of clad steels and dissimilar joints between stainless and mild or low alloy steels.
- Welding of similar composition, 309L type, stainless steels.
- Joining of ferritic-martensitic stainless steels.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|-------|------|-----|------|------|
| 0,015 | 0,40 | 1,8 | 23,5 | 13,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 450 MPa

Tensile Strength, Rm: 650 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 130 J

Ferrite content:

FN 10

Corrosion resistance

As Cromatig 309 L 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.

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98041012 |
| 1,6 x 1000 | 5 kg | 98041016 |
| 2,0 x 1000 | 5 kg | 98041020 |
| 2,4 x 1000 | 5 kg | 98041024 |
| 3,2 x 1000 | 5 kg | 98041032 |



Cromatig 309LSi

Classification:

EN ISO 14343

AWS A5.9

W 23 12 LSi

ER309LSi

Description:

Cromatig 309LSi deposits a 24% Cr / 13% Ni austenitic stainless steel weld metal with a nominal ferrite content of FN 10. The relatively high alloy and ferrite levels enable the weld metal to tolerate dilution from mild or low alloyed steels without hot cracking. The higher silicon content provides a more fluid weld pool which may be preferred for certain welding applications.

Applications:

- Buffer layers on mild and low alloy steels prior to overlaying with MIG/TIG 308L.
- Joining of clad steels and dissimilar joints between stainless and mild or low alloy steels.
- Welding of similar composition, 309L type, stainless steels.
- Joining of ferritic-martensitic stainless steels.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|------|-----|-----|------|------|------|
| 0,02 | 0,8 | 1,8 | 23,5 | 13,5 | 0,10 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 450 MPa

Tensile Strength, Rm: 650 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 130 J
-120 °C • 65 J

Ferrite content:

FN 11

Approvals:

TüV

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98051012 |
| 1,6 x 1000 | 5 kg | 98051016 |
| 2,0 x 1000 | 5 kg | 98051020 |
| 2,4 x 1000 | 5 kg | 98051024 |
| 3,2 x 1000 | 5 kg | 98051032 |



Cromatig 309MoL

Classification:

EN ISO 14343

AWS A5.9

W 23 12 2 L

~ER309LMo

Description:

Cromatig 309MoL 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.

APPLICATIONS:

- Buffer layers on mild and low alloy steels prior to overlaying with Cromarod 316L.
- Joining of 316L clad steels and dissimilar joints between stainless and mild or medium carbon steels.
- Joining of medium carbon hardenable steels.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo |
|-------|-----|-----|------|------|-----|
| 0,015 | 0,4 | 1,5 | 21,5 | 14,5 | 2,6 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 400 MPa
Tensile Strength, Rm: 600 MPa
Elongation, A5 40%
Impact energy, CV: 20 °C • 140 J

Ferrite content:

FN 12

Corrosion resistance

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

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,2 x 1000 | 5 kg | 98261012 |
| 1,6 x 1000 | 5 kg | 98261016 |
| 2,0 x 1000 | 5 kg | 98261020 |
| 2,4 x 1000 | 5 kg | 98261024 |
| 3,2 x 1000 | 5 kg | 98261032 |



Cromatig 310

Classification:

EN ISO 14343

AWS A5.9

W 25 20

ER310

Description:

Cromatig 310 is primarily intended for welding the 25% Cr / 20% Ni type 310 fully austenitic stainless steels, used for corrosion and oxidation resistance at elevated temperatures. Suitable also for joining difficult-to-weld steels such as armour plate and ferritic stainless steels as well as dissimilar steels.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|------|
| 0,11 | 0,40 | 1,6 | 25,5 | 20,5 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 390 MPa

Tensile Strength, Rm: 590 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 170 J

-196 °C • 60 J

Corrosion resistance

Designed for high temperature oxidation applications and its resistance to wet corrosion is limited.

Scaling temperature:

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

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98061016 |
| 2,0 x 1000 | 5 kg | 98061020 |
| 2,4 x 1000 | 5 kg | 98061024 |
| 3,2 x 1000 | 5 kg | 98061032 |



Cromatig 312

Classification:

EN ISO 14343

AWS A5.9

W 29 9

ER312

Description:

Cromatig 312 deposits a 29% Cr / 9% Ni austenitic/ferritic stainless steel weld metal with a ferrite content of about FN 40. The weld metal exhibits excellent tolerance to dilution from dissimilar and difficult-to-weld base materials without hot cracking, together with high strength and very good heat and oxidation resistance.

APPLICATIONS:

- Difficult-to-weld steels e.g. high carbon hardenable tool, die and spring steels, 13% Mn steels, free-cutting steels, high temperature steels.
- Dissimilar joints between stainless and high carbon steels.
- Surfacing of metal-to-metal wear areas, hot working tools, furnace components.
- Buffer layers prior to hard facing with high chromium carbide deposits.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Wire composition, wt. %

| C | Si | Mn | Cr | Ni |
|------|------|------|------|-----|
| 0,10 | 0,50 | 1,90 | 30,5 | 9,2 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 600 MPa

Tensile Strength, Rm: 750 MPa

Elongation, A5 25%

Impact energy, CV: 20 °C • 50 J

Ferrite content:

FN 40

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.

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98081016 |
| 2,0 x 1000 | 5 kg | 98081020 |
| 2,4 x 1000 | 5 kg | 98081024 |
| 3,2 x 1000 | 5 kg | 98081032 |



Cromatig 307Si

Classification:

EN ISO 14343

AWS A5.9

W 18 8 Mn

~ER307

Description:

Cromatig 307Si produces a tough, ductile, 19% Cr / 9% Ni / 7% Mn austenitic stainless weld metal which is highly crack resistant. 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 Cromatig 307Si can be PWHT without risk of sigma-phase formation and consequent loss of ductility. The deposit work hardens from 200 HV to 450 HV.

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.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Mechanical properties

Typical

Yield strength, Rp0.2%: 450 MPa

Tensile Strength, Rm: 650 MPa

Elongation, A5 42%

Impact energy, CV: 20 °C • 120 J

-80 °C • 60 J

Wire composition, wt.%

| C | Si | Mn | Cr | Ni |
|------|------|-----|------|-----|
| 0,08 | 0,85 | 7,0 | 19,0 | 9,0 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98241016 |
| 2,0 x 1000 | 5 kg | 98241020 |
| 2,4 x 1000 | 5 kg | 98241024 |

**Description:**

Cromatig LDX is designated for MIG welding of all lean duplex materials, i.e. molybdenum free duplex grades such as 4062, 4162 and 4362.

The product ensures a weld metal with a high strength and medium corrosion resistance, compatible with the base material.

Applications:

For applications with EN 1.4062, EN 1.4162 (ASTM S32101) or EN 1.4362 (ASTM S32304) base materials. The steels are mainly used in civil engineering, storage tanks, containers etc.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|------|------|------|------|------|------|
| 0,015 | 0,56 | 0,84 | 23,4 | 7,40 | 0,35 | 0,15 |

Mechanical propertiesTypical

Yield strength, Rp0.2%: 570 MPa

Tensile Strength, Rm: 770 MPa

Elongation, A5 25%

Impact energy, CV: 20 °C • 170 J

-46 °C • 110 J

Ferrite content:

35-70%

Corrosion resistance

General corrosion

Thanks to its high Cr content (> 23%) the Cromatig LDX allows welds with a general corrosion resistance at least equal to the one of the plates on which it is used for welding, in particular the 4062 grade with 22% Cr and the 4162 grade with 21% Cr.

Pitting corrosion

For the 6%FeCl3 medium (ASTM G48A standardised test), the critical pitting temperature of the above-described welded joint is determined, by calculation, to 16 °C, i.e. 10 °C above the level measured for a base metal of the 304L/1.4307 type and at the same level as that of a base metal of the 1.4362 type.

Intergranular corrosion

As all the low C Duplex grades, in the as-solidified condition, the Cromatig LDX does not exhibit, on duplex welded joint, any intergranular precipitation likely to cause intergranular corrosion phenomena.

Approvals:

N/A

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 2,4 x 1000 | 5kg | 98151024 |



Cromatig Duplex

Classification:

EN ISO 14343

AWS A5.9

W 22 9 3 N L

ER2209

Description:

Cromatig Duplex deposits a 23% Cr / 9% Ni / 3% Mo / N austenitic/ferritic duplex stainless steel weld metal with a ferrite content of about FN 35. It is intended for welding similar composition Duplex stainless steels which offer an excellent combination of much higher strength and very good resistance to pitting and stress corrosion cracking, compared to standard austenitic stainless steels.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|-----|-----|------|-----|-----|------|
| 0,015 | 0,4 | 1,8 | 22,5 | 9,0 | 3,0 | 0,18 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 620 MPa

Tensile Strength, Rm: 800 MPa

Elongation, A5 30%

Impact energy, CV: -46°C • 100 J

-60°C • 85 J

Ferrite content:

FN 35

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 = 35.

Approvals:

DNV

DB

TÜV

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98161016 |
| 2,0 x 1000 | 5 kg | 98161020 |
| 2,4 x 1000 | 5 kg | 98161024 |



Cromatig 2507

Classification:

EN ISO 14343

AWS A5.9

W 25 9 4 N L

ER2594

Description:

Cromatig 2507 deposits a 25%Cr/10%Ni/4%Mo/0.25% N super duplex type weld metal with a ferrite level of approximately FN 55. It 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. Cromatig 2507 may also be used for welding standard duplex steels when higher corrosion resistance in the weld metal is required. 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 deleterious precipitation effects in the plate. Applications include offshore platform pipework for seawater cooling systems and firefighting water, as well as pumps, valves and risers. The weld metal has excellent fracture toughness at temperatures down to -40°C.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | N |
|-------|-----|-----|----|-----|-----|------|
| 0,015 | 0,3 | 0,4 | 25 | 9,5 | 4,0 | 0,25 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 640 MPa

Tensile Strength, Rm: 850 MPa

Elongation, A5 25%

Impact energy, CV: 20°C • 135 J

-40°C • 60 J

Ferrite content:

FN 55

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°C (ASTM G48).

Scaling temperature:

Approx. 850°C in air.

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98171016 |
| 2,0 x 1000 | 5 kg | 98171020 |
| 2,4 x 1000 | 5 kg | 98171024 |



Cromatig 385

Classification:

EN ISO 14343

AWS A5.9

W 20 25 5 Cu L

~ER385

Description:

Cromatig 385 is intended for welding the 20% Cr / 25% Ni / 4.5% Mo / Cu fully austenitic stainless steels, used for their very high resistance to corrosion in severe, non-oxidising environments e.g. sulphuric acid. The low carbon, high alloy content of the weld metal gives excellent resistance to intergranular corrosion and stress corrosion cracking, combined with superior resistance to crevice and pitting corrosion compared to standard 304 L and 316 L materials.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Mo | Cu |
|-------|------|-----|------|------|-----|-----|
| 0,015 | 0,40 | 1,6 | 19,5 | 25,0 | 4,5 | 1,5 |

Mechanical properties**Typical**

Yield strength, Rp0.2%: 400 MPa

Tensile Strength, Rm: 600 MPa

Elongation, A5 35%

Impact energy, CV: 20 °C • 130 J

-196 °C • 60 J

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 cracking and crevice and pitting corrosion in chloride bearing environments.

Scaling temperature:

Approx. 1000 °C in air.

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98141016 |
| 2,0 x 1000 | 5 kg | 98141020 |
| 2,4 x 1000 | 5 kg | 98141024 |



Cromatig 82

Classification:

EN ISO 18274

AWS A5.14

S Ni 6082 (NiCr20Mn3Nb)

ERNiCr-3

Description:

Cromatig 82 is intended for welding Inconel 600, Incoloy 800 and similar composition nickel base alloys particularly where these are used for high temperature service. Highly suitable for a wide range of dissimilar joint combinations between nickel base alloys, Monels, mild and low alloy steels and austenitic stainless steels. Can be used to clad carbon steels with an Inconel type surface. Suitable for welding 5% and 9% nickel steels for cryogenic applications.

Welding current:

DC-

Shielding gas:

I1, Ar 99.99%, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt.%

| C | Si | Mn | Cr | Ni | Fe | Nb ² |
|------|------|-----|------|------|-----|-----------------|
| 0,01 | 0,10 | 3,0 | 20,0 | 73,0 | 0,5 | 2,5 |

² Nb + Ta

Mechanical properties

Typical

Yield strength, Rp0.2%: 420 MPa

Tensile Strength, Rm: 670 MPa

Elongation, A5 40%

Impact energy, CV: 20 °C • 160 J

-196 °C • 100 J

Corrosion resistance

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

Scaling temperature:

The weld metal is resistant to oxidation

– in air up to 1150 °C

– in sulphur dioxide up to 800 °C

– in hydrogen sulphide up to 550 °C

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98181016 |
| 2,0 x 1000 | 5 kg | 98181020 |
| 2,4 x 1000 | 5 kg | 98181024 |



Cromatig 625

Classification:

EN ISO 18274

AWS A5.14

S Ni 6625 (NiCr22Mo9Nb)

ERNiCrMo-3

Description:

Cromatig 625 is primarily intended for welding Inconel 625 and similar composition nickel base alloys which are used for their excellent corrosion and oxidation resistance combined with an exceptionally high resistance to pitting corrosion and chloride induced stress corrosion cracking. 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. Can be used to clad carbon steels with a high strength, highly corrosion resistant surface.

Applications:

Suitable for welding the nickel base alloys 625 and 825 but also 6 Mo steels (ASTM S31254) and 9% Ni steels for cryogenic applications..

Overlay welding of carbon or low alloy steels and dissimilar joints.

Welding current:

DC-

Shielding gas:

I1, 99.99% Ar, 6-12 l/min

Stamping

Elga, AWS, Wst, EN, Batch

Wire composition, wt. %

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|-----|
| 0,01 | 0,10 | 0,05 | 22,0 | 64,5 | 9,0 |

Mechanical properties

Typical

Yield strength, Rp0.2%: 480 MPa

Tensile Strength, Rm: 780 MPa

Elongation, A5 35%

Impact energy, CV: -196°C • 80 J

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.

Scaling temperature:

The weld metal is resistant to oxidation in air up to 1150°C. (Very high tensile strength and yield strength up to approx. 850°C. Rp 0.2%=300 MPa, Rm=400 MPa)

Approvals:

CE

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 5 kg | 98201016 |
| 2,0 x 1000 | 5 kg | 98201020 |
| 2,4 x 1000 | 5 kg | 98201024 |

TIG rods for welding of aluminium alloys

| | |
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| Alutig Mg4.5 Mn | 219 |
| Alutig Mg3 | 220 |



Alutig 99.5

Classification:

EN ISO 18273

S Al 1450 (Al99.5Ti)

Description:

Pure aluminium TIG wire for welding similar composition material. The weld metal has excellent ductility, corrosion resistance and electrical conductivity. Good colour match with material to be anodised. Melting range 630-640 °C.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium, 5-10 l/min

Mechanical properties

Typical

Yield strength, Rp0.2%: 30 MPa

Tensile Strength, Rm: 100 MPa

Elongation, A5 37%

Stamping

99.5

Wire composition, wt.%

| Si | Mn | Al | Ti | Zn | Fe |
|------|-------|------|------|------|------|
| 0,04 | 0,001 | bal. | 0,15 | 0,01 | 0,06 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95011016 |
| 2,0 x 1000 | 2,5 kg | 95011020 |
| 2,4 x 1000 | 2,5 kg | 95011024 |
| 3,2 x 1000 | 2,5 kg | 95011032 |
| 4,0 x 1000 | 2,5 kg | 95011040 |



Alutig Si5

Classification:

EN ISO 18273

AWS A5.10

S Al 4043A (AlSi5)

ER 4043

Description:

Aluminium TIG wire containing 5% Silicon for welding Al / Si and Al / Mg / Si material. The medium strength weld metal has excellent resistance to hot cracking. Not suitable where good colour match is required after anodising. Melting range 570-630 °C.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Stamping

Si5

Mechanical properties

Typical

Yield strength, Rp0.2%: 55 MPa

Tensile Strength, Rm: 140 MPa

Elongation, A5 10%

Approvals:

DB

CE

Wire composition, wt.%

| Si | Mn | Al | Zn | Fe |
|-----|------|------|------|-----|
| 5,0 | 0,01 | bal. | 0,01 | 0,2 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95051016 |
| 2,0 x 1000 | 2,5 kg | 95051020 |
| 2,4 x 1000 | 2,5 kg | 95051024 |
| 3,2 x 1000 | 2,5 kg | 95051032 |
| 4,0 x 1000 | 2,5 kg | 95051040 |



Alutig Si12

Classification:

EN ISO 18273
AWS A5.10

S Al 4047 (AlSi12(A))
ER 4047

Description:

Aluminium TIG wire containing 12% Silicon for welding Al / Si and Al / Mg / Si material. The medium strength weld metal has excellent resistance to hot cracking. Not suitable where good colour match is required after anodising. Melting range 575-585 °C.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Mechanical properties

Typical

Yield strength, Re: 80 MPa

Tensile Strength, Rm: 170 MPa

Elongation, A5 6%

Stamping

Si12

Wire composition, wt.%

| Si | Mn | Al | Zn | Fe |
|------|------|------|------|------|
| 12,0 | 0,01 | bal. | 0,01 | 0,30 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95081016 |
| 2,0 x 1000 | 2,5 kg | 95081020 |
| 2,4 x 1000 | 2,5 kg | 95081024 |
| 3,2 x 1000 | 2,5 kg | 95081032 |
| 4,0 x 1000 | 2,5 kg | 95081040 |
| 5,0 x 1000 | 2,5 kg | 95081050 |



Alutig Mg3

Classification:

EN ISO 18273
AWS A5.10

S Al 5754 (AlMg3)
ER 5754

Description:

Aluminium TIG wire containing 3.2% Magnesium for welding similar composition materials. The medium strength weld metal has good composition resistance in marine environments. Excellent colour match with material to be anodised. Melting range 590-650 C.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Mechanical properties

Typical

Yield strength, Rp0.2%: 120 MPa

Tensile Strength, Rm: 230 MPa

Elongation, A5 22%

Stamping

Mg3

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|------|------|-----|------|
| 0,15 | 0,20 | bal. | 3,2 | 0,25 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95091016 |
| 2,0 x 1000 | 2,5 kg | 95091020 |
| 2,4 x 1000 | 2,5 kg | 95091024 |
| 3,2 x 1000 | 2,5 kg | 95091032 |
| 4,0 x 1000 | 2,5 kg | 95091040 |



Alutig Mg5

Classification:

EN ISO 18273

AWS A5.10

S Al 5356 (AlMg5Cr)

ER 5356

Description:

Aluminium TIG wire containing 5% Magnesium for welding similar composition Al / Mg and Al / Mg / Si materials. The high strength weld metal has very good corrosion resistance in marine environments. Excellent colour match with material to be anodised. The most versatile and universally used aluminium filler material. Melting range 560-630°C.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Stamping

Mg5

Mechanical properties

Typical

Yield strength, Rp0.2%: 125 MPa

Tensile Strength, Rm: 255 MPa

Elongation, A5 24%

Approvals:

DB

TÜV

CE

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|------|------|-----|------|
| 0,05 | 0,15 | bal. | 5,0 | 0,15 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95041016 |
| 2,0 x 1000 | 2,5 kg | 95041020 |
| 2,4 x 1000 | 2,5 kg | 95041024 |
| 3,2 x 1000 | 2,5 kg | 95041032 |
| 4,0 x 1000 | 2,5 kg | 95041040 |
| 5,0 x 1000 | 2,5 kg | 95041050 |



Alutig Mg4.5 Mn

Classification:

EN ISO 18273
AWS A5.10

S Al 5183 (AlMg4.5Mn)
ER 5183

Description:

Aluminium TIG wire containing a nominal 4.9% Magnesium and 0.8% Manganese to produce a higher strength weld metal than the standard 5% Mg alloy.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Stamping

Mg4.5Mn

Mechanical properties

Typical

Yield strength, Rp0.2%: 145 MPa

Tensile Strength, Rm: 275 MPa

Elongation, A5 24%

Approvals:

DB

TÜV

GL

CE

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|-----|------|-----|------|
| 0,08 | 0,7 | bal. | 4,9 | 0,20 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95061016 |
| 2,0 x 1000 | 2,5 kg | 95061020 |
| 2,4 x 1000 | 2,5 kg | 95061024 |
| 3,2 x 1000 | 2,5 kg | 95061032 |
| 4,0 x 1000 | 2,5 kg | 95061040 |



Alutig Mg5 Mn

Classification:

EN ISO 18273

AWS A5.10

S Al 5556A (5556

AlMg5Mn)

ER 5556

Description:

Aluminium TIG wire containing nominal 5.3% Magnesium and 0.8% Manganese to produce a higher strength weld metal than the standard 5% Mg alloy. It is designed to weld the widely used structural alloy 5083 when full matching strength is required.

Welding current:

AC

Shielding gas:

I1, Argon 5-10 l/min

I2, Helium 8-16 l/min

I3, Argon/Helium 5-10 l/min

Mechanical properties**Typical**

Yield strength, Rp0.2%: 135 MPa

Tensile Strength, Rm: 275 MPa

Elongation, A5 15%

Stamping

Mg5Mn

Wire composition, wt.%

| Si | Mn | Al | Mg | Fe |
|------|-----|------|-----|------|
| 0,05 | 0,8 | bal. | 5,3 | 0,15 |

Product data:

| Ø x Length mm | Packet weight | Product code |
|---------------|---------------|--------------|
| 1,6 x 1000 | 2,5 kg | 95071016 |
| 2,0 x 1000 | 2,5 kg | 95071020 |
| 2,4 x 1000 | 2,5 kg | 95071024 |
| 3,2 x 1000 | 2,5 kg | 95071032 |
| 4,0 x 1000 | 2,5 kg | 95071040 |

Wires and fluxes for submerged arc welding of mild, non-alloyed steels

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Elgasaw wires for submerged arc welding of mild, non-alloyed steels

Description:

A range of copper-coated wires available in the most commonly used sizes in a wide range of spool, drum and bobbin types. The wires can be combined with the appropriate Elgaflux products to fulfil specific application requirements for both welding characteristics and weld metal mechanical properties. For wire and flux combination details, please refer to the individual Elgaflux product information. For wires outside the standard programme, contact Business Unit Wire.

Typical wire composition, wt%:

Classification:

| Elgasaw | C | Si | Mn | Mo | Ni | EN ISO 14171-A | AWS/SFA A5.17 |
|---------|------|------|------|----|----|----------------|---------------|
| 101 | 0.07 | 0.06 | 0.5 | | | S1 | EL12 |
| 102 | 0.1 | 0.10 | 1.0 | | | S2 | EM12 |
| 102Si | 0.1 | 0.2 | 1.0 | | | S2Si | EM12K |
| 103Si | 0.1 | 0.3 | 1.65 | | | S3Si | EH12K |
| 104 | 0.1 | 0.1 | 1.9 | | | S4 | EH14 |



Elgaflux 211R

Flux for submerged arc welding

Classification
EN ISO 14171-A S AAR 1 76 AC H5

Description:

Elgaflux 211R is an agglomerated acid flux of the aluminate-rutile type. It is primarily designed for high speed fillet welding with the single or twin-arc process where it exhibits an exceptional self-detaching slag and smooth, bright bead appearance. It is also suitable for butt welding thin and medium thick sections, providing excellent slag detachment even in narrow joints and root passes. Elgaflux 211R is Si and Mn alloying and intended for use in combination with wires Elgasaw 101, 102 and 102Si, for welding mild and medium tensile steels where fracture toughness at low temperatures is not required. It is relatively insensitive to porosity caused by rust and primers and can be welded on AC and DC using single and multi-wire processes, with up to 1100 A on a single wire. Elgaflux 211R is suitable for general fabrication, two-run spiral pipe manufacture, box beams, fin-tube walls and shipbuilding.

Flux type: Aluminate-rutile

Approvals: Contact Business Unit Wire

Basicity index: 0.6

Grain size: EN 760 2-16

Flux density: 1.0kg/dm³

Product data:

Welding current: AC, DC

| Product code | Packing |
|--------------|-------------------|
| 9801-0001 | 25 kg plastic bag |
| 9801-0002 | 600 kg BigPac |

Redrying temperature: 300-350°C, 2h

Typical all-weld metal chemical composition, wt. %:

Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | AWS/SFA A5.17 | EN ISO 14171-A |
|---------------|------|-----|-----|----|----|-----------------|----------------|
| Elgasaw 101 | 0.07 | 0.6 | 1.0 | | | F7AZ/F7PZ-EL12 | S 42 AAR S1 |
| Elgasaw 102 | 0.07 | 0.6 | 1.2 | | | F7A0/F7P0-EM12 | S 42 AAR S2 |
| Elgasaw 102Si | 0.07 | 0.7 | 1.3 | | | F7AZ/F7PZ-EM12K | S 46 AAR S2Si |

Typical all-weld metal mechanical properties:

| Wire: Elgasaw | 101 | 102 | 102Si |
|---------------------------|------------|------------|--------------|
| Yield strength, Re, MPa | 450 | 480 | 500 |
| Tensile strength, Rm, MPa | 540 | 580 | 600 |
| Elongation A5, % | 26 | 25 | 24 |
| Impact energy CV, J: | 101 | 102 | 102Si |
| +20°C | 70 | 70 | 60 |
| 0°C | 50 | 60 | 50 |
| -20°C | 30 | 40 | 30 |



Elgasaw 251B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A AB 1 87 AC H5

Description:

Elgasaw 251B is an agglomerated, aluminate-basic flux providing an optimum combination of excellent operating characteristics and good fracture toughness properties down to -40°C. It is designed for butt and fillet welding using single and multi-wire processes in mild, C-Mn and higher tensile steels. The slag is self-detaching even in narrow joints, leaving a smooth, clean weld bead and the flux is highly suitable for fillet welding using the twin-arc process. Elgasaw 251B can be used on AC and DC, with up to 1000A on a single wire and is suitable for general fabrication, box girders, shipbuilding, pressure vessels and line pipe manufacture.

Flux type: Aluminate-basic

Basicity index: 1.4

Flux density: 1.1kg/dm³

Welding current: AC, DC

Redrying temperature: 300-350°C, 2h

Approvals:

Elgasaw 102 LR TUV DB GL DNV MRS
Elgasaw 102Mo DNV

Grain size: EN 760 2-16

Product data:

| Product code | Packaging |
|--------------|-------------------|
| 9802-0001 | 25 kg plastic bag |
| 9802-0002 | 600 kg BigPac |

Typical all-weld metal chemical composition, wt. %: Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | AWS/SFA A5.17 | EN ISO 14171-A |
|---------------|------|-----|-----|-----|----|----------------------|----------------|
| Elgasaw 101 | 0.05 | 0.5 | 1.0 | | | F6A2/F6P2-EL12 | S 35 3 AB S1 |
| Elgasaw 102 | 0.05 | 0.5 | 1.4 | | | F7A4/F6P4-EM12 | S 38 4 AB S2 |
| Elgasaw 102Si | 0.05 | 0.5 | 1.4 | | | F7A4/F6P4-EM12K | S 38 4 AB S2Si |
| Elgasaw 103Si | 0.05 | 0.6 | 1.7 | | | F7A5/F7P5-EH12K | S 42 4 AB S3Si |
| | | | | | | AWS/SFA A5.23 | |
| Elgasaw 102Mo | 0.05 | 0.5 | 1.4 | 0.5 | | F8A2/F7P0-EA2-A2 | S 46 2 AB S2Mo |

Typical all-weld metal mechanical properties:

| Wire: Elgasaw | 101 | 102 | 102Si | 103Si | 102Mo |
|---------------------------|------------|------------|--------------|--------------|--------------|
| Yield strength, Re, MPa | 360 | 420 | 440 | 480 | 540 |
| Tensile strength, Rm, MPa | 480 | 520 | 535 | 570 | 590 |
| Elongation A5, % | 29 | 30 | 28 | 28 | 26 |
| Impact energy CV, J: | 101 | 102 | 102Si | 103Si | 102Mo |
| 0°C | 80 | 110 | 100 | 120 | 90 |
| -20°C | 60 | 70 | 80 | 90 | 60 |
| -40°C | 40 | 50 | 50 | 60 | 30 |



Elgaflux 285B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A AB 1 67 AC H5

Description:

Elgaflux 285B is an agglomerated, slightly Si and Mn alloying, aluminate-basic flux. It combines very good operability (slag removal, bead shape, bead finish) with low micro-oxide levels, enabling it to produce good impact toughness down to -40°C / -60°C . It is suitable for butt and fillet welding using single, twin-arc and multi-wire processes. Together with the appropriate Elgasaw wires, Elgaflux 285B is designed for C-Mn and low alloy steels for low temperature and high strength applications. Elgaflux 285B can be used on AC and DC, with up to 1000A on a single wire and is especially suitable for line pipe fabrication, pipeline production, pressure vessels, offshore structures and wind turbine tower manufacture.

Flux type: Aluminate-basic

Basicity index: 1.7

Flux density: 1.1kg/dm³

Welding current: AC, DC

Redrying temperature: 300-350°C, 2h

Approvals:

Elgasaw 102, 103Si, TÜV
Elgasaw 102, 103Si; MRS

Grain size: EN 760 2-20

Product data:

| Product code | Packaging |
|--------------|-------------------|
| 9804-0001 | 25 kg plastic bag |
| 9804-0002 | 600 kg BigPac |



Elgaflux 500B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A FB 1 55 AC H5

Elgaflux 500B is a high basicity agglomerated, fluoride-basic flux designed for use where optimal low temperature impact energy and CTOD fracture toughness properties are required. It produces low oxygen (O) weld metal, approximately 300ppm, resulting in excellent impact toughness down to -60°C and below, together with very low hydrogen levels. Elgaflux 500B exhibits very good slag detachability, even in narrow gaps, along with smooth bead finish and tie-in. The flux is non-alloying with respect to Si and Mn and mechanical properties can be controlled by choice of suitably alloyed Elgasaw wires. It is suitable for multi-pass butt welding of medium and high tensile steels and also low alloyed steels using single and multiple wire systems. Elgaflux 500B can be used on AC and DC, with up to 1000A on a single wire and is highly suitable for stringent fabrication sectors such as offshore, pressure vessels, high strength line pipe, petrochemical, cryogenic and nuclear components.

Fluoride-basic

3.1

EN 760 2-20

1.1kg/dm³

AC, DC

300-350°C, 2h

Elgasaw 103Si; TÜV

| | |
|--------------|-------------------|
| Product code | Packaging |
| 9805-0001 | 25 kg plastic bag |

Typical all-weld metal chemical composition, wt. %:

Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | Cr | AWS/SFA A5.17 | EN ISO 14171-A |
|---------------|------|------|------|----|----|----|-----------------|----------------|
| Elgasaw 103Si | 0.06 | 0.35 | 1.35 | | | | F7A8/F6P8-EH12K | S 42 6 FB S3Si |
| Elgasaw 104 | 0.07 | 0.20 | 1.6 | | | | F7A8/F7P8-EH14 | S 46 6 FB S4 |

Typical all-weld metal mechanical properties:

| Wire: Elgasaw | 103Si | 104 |
|---------------------------|--------------|------------|
| Yield strength, Re, MPa | 470 | 490 |
| Tensile strength, Rm, MPa | 525 | 550 |
| Elongation A5, % | 29 | 27 |
| Impact energy CV, J: | 103Si | 104 |
| | -20°C | 180 |
| | -40°C | 155 |
| | -51°C | 140 |
| | -60°C | 110 |
| | -62°C | 100 |

Wires and fluxes for submerged arc welding of high tensile, low temperature and creep resistant steels

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Elgasaw wires for submerged arc welding of high tensile, low temperature and creep resistant steels

Description:

This range of low alloyed, copper-coated wires can be combined with the appropriate Elgasaw products to fulfil specific application requirements for both welding characteristics and weld metal mechanical properties. For wire and flux combination details, please refer to the individual Elgasaw product information. For wires outside the standard programme, contact Business Unit Wire.

Typical wire composition, wt%:

Classification:

| Elgasaw | C | Si | Mn | Mo | Ni | Cr | EN ISO 14171-A | AWS/SFA A5.23 |
|--------------|------|------|-----|-------|-----|-----|-----------------|---------------|
| 102Mo | 0.1 | 0.15 | 1.0 | 0.5 | | | S2Mo | EA2 |
| 103Mo | 0.1 | 0.15 | 1.5 | 0.5 | | | S3Mo | EA4 |
| 104Mo | 0.1 | 0.10 | 1.9 | 0.5 | | | S4Mo | EA3 |
| 103NiMo1/4 | 0.1 | 0.2 | 1.4 | 0.2 | 1.0 | | S3Ni1Mo0.2 | ENi5 |
| 103Ni1Mo | 0.1 | 0.2 | 1.5 | 0.5 | 1.0 | | S3Ni1M0 | EF3 |
| 103NiCrMo2.5 | 0.12 | 0.2 | 1.5 | 0.5 | 2.5 | 0.7 | S3Ni2.5CrMo* | ~EM4 |
| 102Ni1 | 0.1 | 0.15 | 1.0 | | 1.0 | | S2Ni1 | ENi1 |
| 102Ni2 | 0.1 | 0.15 | 1.0 | | 2.2 | | S2Ni2 | ENi2 |
| 102Ni1Cu | 0.1 | 0.2 | 1.0 | Cu0.5 | 0.8 | 0.2 | S2Ni1Cu | EG |
| EB2R | 0.1 | 0.15 | 0.8 | 0.5 | | 1.2 | EN12070: SCrMo1 | EB2R |
| EB3R | 0.1 | 0.15 | 0.6 | 1.0 | | 2.6 | EN12070: SCrMo2 | EB3R |

*EN ISO 26304-A



Elgasflux 285B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A AB 1 67 AC H5

Description:

Elgasflux 285B is an agglomerated, slightly Si and Mn alloying, aluminate-basic flux. It combines very good operability (slag removal, bead shape, bead finish) with low micro-oxide levels, enabling it to produce good impact toughness down to -40°C / -60°C . It is suitable for butt and fillet welding using single, twin-arc and multi-wire processes. Together with the appropriate Elgasaw wires, Elgasflux 285B is designed for C-Mn and low alloy steels for low temperature and high strength applications. Elgasflux 285B can be used on AC and DC, with up to 1000A on a single wire and is especially suitable for line pipe fabrication, pipeline production, pressure vessels, offshore structures and wind turbine tower manufacture.

Flux type: Aluminate-basic

Basicity index: 1.7

Flux density: 1.1kg/dm³

Welding current: AC, DC

Redrying temperature: 300-350°C, 2h

Grain size: EN 760 2-20

Approvals: Elgasaw 102Mo; TÜV

Product data:

| Product code | Packaging |
|--------------|-------------------|
| 9804-0001 | 25 kg plastic bag |
| 9804-0002 | 600 kg BigPac |

Typical all-weld metal chemical composition, wt. %:

Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | AWS/SFA A5.23 | EN ISO 14171-A |
|--------------------|------|------|-----|-------|------|--------------------|-----------------------|
| Elgasaw 102Mo | 0.06 | 0.35 | 1.3 | 0.5 | | F8A4/F8P2-EA2-A2 | S 46 3 AB S2Mo |
| Elgasaw 103Mo | 0.06 | 0.35 | 1.6 | 0.5 | | F8A6/F8P5-EA4-A4 | S 50 4 AB S3M0 |
| Elgasaw 104Mo | 0.06 | 0.3 | 1.8 | 0.5 | | F9A5/F8P4-EA3-A3 | S 50 5 AB S4MO |
| Elgasaw 103NiMo1/4 | 0.05 | 0.4 | 1.5 | 0.2 | 0.9 | F8A5/F8P4-ENi5-Ni5 | S 46 4 AB S3Ni1Mo 0.2 |
| Elgasaw103Ni1Mo | 0.05 | 0.4 | 1.7 | 0.5 | 0.9 | F9A4/F9P2-EF3-F3 | S 50 3 AB S3Ni1Mo |
| Elgasaw 102Ni1 | 0.05 | 0.3 | 1.3 | | 0.9 | F7A6/F7P8-ENi1-Ni1 | S 46 5 AB S2Ni1 |
| Elgasaw 102Ni2 | 0.05 | 0.3 | 1.3 | | 2.1 | F8A8/F7P8-ENi2-Ni2 | S 46 6 AB S2Ni2 |
| Elgasaw 102Ni1Cu | 0.08 | 0.4 | 1.4 | Cu0.5 | 0.75 | F8A4-EG-G | S 46 3 AB S2Ni1Cu |

Typical all-weld metal mechanical properties:

| Wire: Elgasaw | 102Mo | 103Mo | 104Mo | 103NiMo1/4 | 103Ni1Mo | 102Ni1 | 102Ni2 | 102Ni1Cu |
|---------------------------|--------------|--------------|--------------|-------------------|-----------------|---------------|---------------|-----------------|
| Yield strength, Re, MPa | 560 | 590 | 600 | 530 | 650 | 500 | 525 | 480 |
| Tensile strength, Rm, MPa | 600 | 650 | 670 | 590 | 700 | 550 | 580 | 590 |
| Elongation A5, % | 26 | 26 | 25 | 26 | 24 | 27 | 26 | 27 |
| Impact energy CV,J: | 102Mo | 103Mo | 104Mo | 103NiMo1/4 | 103Ni1Mo | 102Ni1 | 102Ni2 | 102Ni1Cu |
| 0°C | 110 | 120 | 140 | 130 | 100 | | | 185 |
| -20°C | 90 | 100 | 125 | 110 | 80 | 130 | 150 | 80 |
| -40°C | 45 | 70 | 85 | 65 | 50 | 90 | 120 | 50 |
| -46°C | | 55 | 65 | 50 | 40 | | | |
| -51°C | | | | | | 60 | 90 | |
| -62°C | | | | | | | 65 | |



Elgaflux 500B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A FB 1 55 AC H5

Description:

Elgaflux 500B is a high basicity agglomerated, fluoride-basic flux designed for use where optimal low temperature impact energy and CTOD fracture toughness properties are required. It produces low oxygen (O) weld metal, approximately 300ppm, resulting in excellent impact toughness down to -60°C and below, together with very low hydrogen levels. Elgaflux 500B exhibits very good slag detachability, even in narrow gaps, along with smooth bead finish and tie-in. The flux is non-alloying with respect to Si and Mn and mechanical properties can be controlled by choice of suitably alloyed Elgasaw wires. It is suitable for multi-pass butt welding of medium and high tensile steels and also low alloyed steels using single and multiple wire systems. Elgaflux 500B can be used on AC and DC, with up to 1000A on a single wire and is highly suitable for stringent fabrication sectors such as offshore, pressure vessels, high strength line pipe, petrochemical, cryogenic and nuclear components.

Flux type: Fluoride-basic

Basicity index: 3.1

Flux density: 1.1kg/dm³

Welding current: AC, DC

Redrying temperature: 300-350°C, 2h

Approvals: Elgasaw 103NiMo, 102Ni2: TÜV

Grain size: EN 760 2-20

Product data:

| Product code | Packaging |
|--------------|---------------------------------------|
| 9805-0001 | 25 kg hermetically sealed plastic bag |

Typical all-weld metal chemical composition, wt. %:

Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | Cr | AWS/SFA A5.23 | EN ISO 14171-A |
|----------------------|------|------|------|-----|-----|-----|----------------------|---------------------|
| Elgasaw 102Mo | 0.07 | 0.2 | 0.9 | 0.5 | | | F7A6/F7P6-EA2-A2 | S 46 5 FB S2Mo |
| Elgasaw 103Mo | 0.07 | 0.2 | 1.3 | 0.5 | | | F8A6/F8P6-EA4-A4 | S 50 5 FB S3Mo |
| Elgasaw 104Mo | 0.07 | 0.2 | 1.5 | 0.5 | | | F8A8/F8P8-EA3-A3 | S 50 5 FB S4Mo |
| Elgasaw 103NiMo1/4 | 0.06 | 0.25 | 1.1 | 0.2 | 0.9 | | F7A10/F7PIO-ENi5-Ni5 | S 46 7 FB S3NiMo0.2 |
| Elgasaw 103Ni1Mo | 0.06 | 0.25 | 1.3 | 0.5 | 0.9 | | F9A10/F9P6-EF3-F3 | S 50 5 FB S3Ni1Mo |
| Elgasaw 102Ni1 | 0.06 | 0.2 | 1.0 | | 0.9 | | F7A10/F7P10-ENi1-Ni1 | S 42 6 FB S2Ni1 |
| Elgasaw 102Ni2 | 0.06 | 0.2 | 1.0 | | 2.1 | | F7A10/F7P15-ENi2-Ni2 | S 42 8 FB S2Ni2 |
| Elgasaw 103NiCrMo2.5 | 0.07 | 0.3 | 1.25 | 0.5 | 2.5 | 0.6 | F11A8/F11P6-EG-G | S 69 6 FB S3Ni* |

*EN ISO 26304-A

Typical all-weld metal mechanical properties:

| Wire: Elgasaw | 102Mo | 103Mo | 104Mo | 103NiMo1/4 | 103Ni1Mo | 102Ni1 | 102Ni2 | 103NiCrMo2.5 |
|---------------------------------|--------------|--------------|--------------|-------------------|-----------------|---------------|---------------|---------------------|
| Yield strength, Re, MPa | 500 | 560 | 580 | 500 | 600 | 460 | 470 | 760 |
| Tensile strength, Rm MPa | 560 | 600 | 630 | 560 | 670 | 520 | 540 | 830 |
| Elongation A5, % | 25 | 25 | 24 | 27 | 24 | 28 | 28 | 22 |
| Impact energy CV _J : | 102Mo | 103Mo | 104Mo | 103NiMo1/4 | 103Ni1Mo | 102Ni1 | 102Ni2 | 103NiCrMo2.5 |
| 0°C | 190 | 170 | 190 | | | | | 125 |
| -20°C | 170 | 150 | 160 | 190 | 160 | 180 | 190 | 110 |
| -40°C | 120 | 100 | 110 | 170 | 110 | 140 | 170 | 90 |
| -51°C | 90 | 80 | 85 | 150 | 80 | 120 | | 75 |
| -60°C | | 45 | 55 | | | | | 65 |
| -62°C | | | | 130 | 55 | 90 | 140 | 60 |
| -73°C | | | | 70 | | | 120 | |



Elgaflux 400B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A FB 1 55 AC H5

Description:

Elgaflux 400B is a high basicity agglomerated, fluoride-basic flux designed for welding Cr-Mo creep resistant steels. The very low impurity levels in the flux produce an extremely clean weld metal, particularly with respect to P pick-up, and enable high impact strength properties to be achieved, even after step cooling heat treatment.

Elgaflux 400B can be used on both AC and DC, but AC is recommended for optimum impact properties. Elgaflux 400B exhibits very good operability characteristics, including good slag detachability in narrow gap joints. Typical fabrication sectors are pressure vessels, power generation and petrochemical industries.

Flux type: Fluoride-basic

Basicity index: 3.1

Flux density: 1.1kg/dm³

Welding current: AC, DC

Redrying temperature: 300-350°C, 2h

Approvals:

Contact Business Unit Wire

Grain size: EN 760 2-20

Product data:

| Product code | Packaging |
|--------------|--------------------------------------|
| 9806-0001 | 25kg hermetically sealed plastic bag |

Typical all-weld metal chemical composition, wt. %:

Weld metal classification:

| Wire | C | Si | Mn | Mo | Ni | Cr | AWS/SFA A5.23 |
|--------------|------|-----|-----|-----|----|-----|------------------|
| Elgasaw EB2R | 0.08 | 0.2 | 0.8 | 0.5 | | 1.2 | F8P4-EB2R-B2R ** |
| Elgasaw EB3R | 0.08 | 0.2 | 0.6 | 1.0 | | 2.3 | F8P4-EB3R-B3R ** |

** Bruscato factor(X): $100(10P+5Sb+4Sn+As)=12max$

Typical all-weld metal mechanical properties: (*690°C/8h)

| Wire: Elgasaw | EB2R* | EB3R* |
|---------------------------|--------------|--------------|
| Yield strength, Re, MPa | 470 | 500 |
| Tensile strength, Rm, MPa | 570 | 600 |
| Elongation A5, % | 27 | 25 |
| Impact energy CV, J: | EB2R* | EB3R* |
| 0°C | 140 | 180 |
| -20°C | 110 | 160 |
| -30°C | 100 | 130 |
| -40°C | 80 | 100 |

Wires and fluxes for submerged arc welding of stainless steels & Ni-base alloys

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Description:

The Cromasaw wire programme is a range of stainless steel and Ni-base wires for submerged arc welding. They include the most commonly used grades and are available in a size range suitable for a broad scope of applications. These wires can be combined with the appropriate Cromaflex product to satisfy specific application requirements as regards welding characteristics and weld metal properties. For wire and flux combination details, please refer to the individual Cromaflex product information. For wires outside the standard programme, contact Business Unit Wire.

Product:

Product code:

Cromasaw 308L; **9803-5024/32/40**
Intended for austenitic stainless steels of the 304, 304L type. Also suitable for 347 and 321 grades, provided service temperatures are below 400°C.

Cromasaw 308H; **9801-5024/32/40**
Deposits a 20%Cr-10%Ni weld metal with controlled carbon content (0.04%-0.08%). for creep strength and oxidation resistance at temperatures up to 800°C.

Cromasaw 347; **9823-5024/32/40**
Intended for stabilised austenitic stainless steels of the 347 and 321 grades, used for structural applications at temperatures above 400°C. Also suitable for 304 and 304L grades.

Cromasaw 316L; **9811-5024/32/40**
Intended for austenitic stainless steels of the 316, 316L type.

Cromasaw 317L; **9812-5024/32/40**
Intended for austenitic stainless steels of the 317L type, alternatively 316 types where higher Mo specified.

Cromasaw 318; **9813-5024/32/40**
For welding Nb or Ti stabilised variants of 316 stainless steels, used at service temperatures above 400°C.

Cromasaw 309L; **9804-5024/32/40**
Intended for dissimilar joints between stainless and mild or low alloy steels, under conditions of medium restraint and/or moderate dilution. Suitable for buffer layers prior to overlaying with Cromasaw 308L or 316L.

Product:

Product code:

Cromasaw 309MoL; **9826-5024/32/40**
Deposits an over-alloyed austenitic stainless steel enabling the weld metal to tolerate dilution from dissimilar and difficult-to weld steels without hot cracking. Suitable for buffer layers prior to overlaying with Cromasaw 316L/317L

Cromasaw 310; **9806-5024/32/40**
Intended for welding matching, fully austenitic stainless steels, used for corrosion and oxidation resistance at elevated temperatures. Also suitable for difficult-to-weld steels.

Cromasaw Duplex; **9816-5024/32/40**
Intended for duplex stainless steels. Also suitable for joining duplex to mild or low alloy steels, as well as dissimilar joints between stainless and mild or low alloy steels under conditions of high restraint and/or high dilution.

Cromasaw 2507 **9817-5024/32/40**
Intended for super duplex type stainless steels.

Cromasaw 82; **9818-5024/32/40**
Intended for matching and similar composition Ni-base alloys, particularly where used for high temperature service. Suitable for dissimilar joints between Cr-Mo and stainless steels.

Cromasaw 625; **9820-5016/20/24**
Intended for matching and similar composition Ni-base alloys. Highly suitable for welding 9% Ni steels for cryogenic service. Can also be used to weld high Mo content stainless steels.

Typical wire composition, wt. %:

Classification:

| Cromasaw | C | S i | M n | C r | N i | M o | Others | EN ISO 14343-A | AWS/SFA A5.9 |
|----------|-------|-----|-----|------|------|-----|----------------|----------------|----------------------|
| 308L | 0.015 | 0.4 | 1,8 | 20.0 | 10.0 | | | S 19 9 L | ER 308L |
| 308H | 0.06 | 0.4 | 1.8 | 20.0 | 10.0 | | | S 19 9 H | ER 308H |
| 347 | 0.04 | 0.4 | 1.4 | 19.5 | 9.5 | | Nb 0.6 | S 19 9 Nb | ER 347 |
| 316L | 0.015 | 0.4 | 1.8 | 18.7 | 11.5 | 2.8 | | S 19 12 3 L | ER 316L |
| 317L | 0.015 | 0.4 | 1.8 | 20.0 | 14.5 | 3.7 | | S 19 13 4L | ER 317L |
| 318 | 0.06 | 0.4 | 1.8 | 19.0 | 12.5 | 2.5 | Nb 0.6 | S 19 12 3 Nb | ER 318 |
| 309L | 0.015 | 0.4 | 1.8 | 23.5 | 13.5 | | | S 23 12 L | ER 309L |
| 309MoL | 0.015 | 0.4 | 1.8 | 22.0 | 14.5 | 2.8 | | S 23 12 2 L | (ER 309MoL) |
| 310 | 0.10 | 0.4 | 1.8 | 26.0 | 21.0 | | | S 25 20 | ER 310 |
| Duplex | 0.015 | 0.5 | 1.5 | 23.0 | 9.0 | 3.2 | N 0.15 | S 22 9 3 NL | ER 2209 |
| 2507 | 0.015 | 0.3 | 0.8 | 25.0 | 9.5 | 4.0 | N 0.24 | S 25 9 4 NL | ER 2594 |
| | | | | | | | | | AWS/SFA A5.14 |
| 82 | 0.01 | 0.1 | 3.0 | 22.0 | 73.0 | | Nb 2.5, Fe 0.5 | | ER NiCr-3 |
| 625 | 0.01 | 0.1 | 0.2 | 22.0 | bal. | 9.0 | Nb 3.6, Fe 0.4 | | ERNiCrMo-3 |



Cromaflex 300B

Flux for submerged arc welding

Classification
EN ISO 14174-A S A FB 2 DC H5

Description:

Cromaflex 300B is a high basicity, non-alloying agglomerated flux for submerged arc welding of austenitic, duplex and super-duplex stainless steels. Slag detachability is excellent, even in narrow joints and with stabilised deposits, leaving a smooth, bright bead surface finish. Cromaflex 300B is designed for both butt and fillet welding and can be used on DC with up to 900A on a single wire. The high basicity level of Cromaflex 300B gives minimal Cr burn-out losses and also produces a low content of microslag inclusions, ensuring very good low temperature fracture toughness properties.

Flux type: Fluoride-basic

Basicity index: 2.3

Flux density: 1.0kg/dm³

Welding current: DC

Redrying temperature: 300-350°C, 2h

Grain size: EN 760 2-16

Approvals:

Cromasaw 308L, 316L;

TÜV CL

Cromasaw 318, 347;

TÜV

Cromasaw Duplex;

LR TÜV DNV CL

Product data:

| Product code | Packaging |
|--------------|------------------------------|
| 9800-0001 | 25kg plastic-lined paper bag |

Typical all-weld metal chemical composition, wt. %:

| Wire | C | Si | Mn | Cr | Ni | Mo | Others | FN * |
|-----------------|------|-----|-----|------|------|-----|--------|------|
| Cromasaw 308L | 0.02 | 0.6 | 1.4 | 19.5 | 10.0 | | | 7 |
| Cromasaw 308H | 0.05 | 0.6 | 1.4 | 19.5 | 10.0 | | | 4 |
| Cromasaw 347 | 0.04 | 0.6 | 1.0 | 19.1 | 9.3 | | 0.5 Nb | 8 |
| Cromasaw 316L | 0.02 | 0.6 | 1.4 | 18.3 | 11.3 | 2.8 | | 8 |
| Cromasaw 317L | 0.02 | 0.6 | 1.4 | 19.5 | 14.3 | 3.5 | | 6 |
| Cromasaw 318 | 0.05 | 0.6 | 1.4 | 18.6 | 12.3 | 2.5 | 0.5Nb | 4 |
| Cromasaw 309L | 0.02 | 0.6 | 1.4 | 23.0 | 13.3 | | | 10 |
| Cromasaw 309MoL | 0.02 | 0.6 | 1.4 | 21.5 | 14.2 | 2.8 | | 12 |
| Cromasaw 310 | 0.10 | 0.4 | 1.4 | 25.3 | 21.0 | | | 0 |
| Cromasaw 312 | 0.10 | 0.7 | 1.4 | 29 | 9 | | | 60 |
| Cromasaw Duplex | 0.02 | 0.7 | 1.2 | 22.5 | 9.0 | 3.2 | 0,13N | 48 |
| Cromasaw 2507 | 0.02 | 0.5 | 0.5 | 24.6 | 9 | 3.9 | 0.24N | 49 |

* FN WRC-92

Typical all-weld metal mechanical properties:

| Wire: Cromasaw | 308L | 308H | 347 | 316L | 317L | 318 | 309L | 309MoL | 310 | 312 | Duplex | 2507 |
|---------------------------|-------------|-------------|------------|-------------|-------------|------------|-------------|---------------|------------|------------|---------------|-------------|
| Yield strength, Re, MPa | 390 | 390 | 440 | 400 | 420 | 430 | 420 | 470 | 400 | 650 | 620 | 650 |
| Tensile strength, Rm, MPa | 550 | 550 | 620 | 580 | 590 | 600 | 580 | 660 | 600 | 800 | 780 | 840 |
| Elongation A5, % | 36 | 36 | 36 | 36 | 35 | 34 | 38 | 30 | 38 | 24 | 26 | 26 |
| Impact energy CV,J: | 308L | 308H | 347 | 316L | 317L | 318 | 309L | 309MoL | 310 | 312 | Duplex | 2507 |
| +20°C | 120 | 120 | 100 | 100 | 130 | 130 | 100 | 60 | 150 | 40 | 110 | 95 |
| -20°C | | | | | | | | | | | 100 | 85 |
| -40°C | | | | | | | | | | | 95 | 75 |
| -60°C | | | | | | 110 | | | | | 75 | 60 |
| -196°C | 50 | | 40 | 50 | 50 | | 40 | | 50 | | | |



Cromaflux 380

Flux for submerged arc welding

Classification
EN ISO 14174-A S F CS 2 DC H5

Description

Cromaflux 380 is a fused, calcium-silicate flux intended for use with Ni-base wires where it provides excellent slag detachability, even in restricted joints, and clean, bright deposit finish with low bead profile and smooth tie-in. Cromaflux 380 is also suitable for use in combination with austenitic and duplex stainless steel wires for high speed fillet welding, using the single or twin-arc process, or where welding at the lower current range is required, e.g. thinner material. Being non-hygroscopic (fused), it can further be used to weld low alloy-high strength steels where very low hydrogen levels are critical. Cromaflux 380 is for use on DC only and is suitable for butt welding 9% Ni steels in combination with Cromasaw 625, butt welding with alloy 59 and alloy C276 wires, cladding with Ni-base wires, high productivity fillet welding with austenitic and duplex stainless steel wires and power generation fin-tube walls in P91 steel.

Flux type: Calcium-silicate

Basicity index: 1.3

Flux density: 1.5kg/dm³

Welding current: DC

Redrying temperature: 150-250°C, 2h to remove surface moisture for critical use

Approvals:

Contact Business Unit Wire

Grain size: EN 760 1-16

Product data:

| Product code | Packaging |
|--------------|------------------|
| 9798-0001 | 20kg plastic bag |

Typical all-weld metal chemical composition, wt. %:

| Wire | C | Si | Mn | Cr | Ni | Mo | Others | FN * |
|-----------------|------|-----|-----|------|------|-----|----------------|------|
| Cromasaw 82 | 0.02 | 0.3 | 2.3 | 21.3 | bal. | | Nb 2.1, Fe 0.5 | |
| Cromasaw 625 | 0.02 | 0.3 | 0.3 | 21.3 | bal. | 9.0 | Nb 3.2, Fe 0.4 | |
| Cromasaw 316L | 0.02 | 0.7 | 1.3 | 18.2 | 11.3 | 2.6 | | 8 |
| Cromasaw Duplex | 0.02 | 0.8 | 1.3 | 22.0 | 8.6 | 3.0 | N 0.13 | 45 |
| Cromasaw 312 | 0.10 | 0.8 | 1.3 | 29 | 9 | | | 60 |

* FN WRC-92

Typical all-weld metal mechanical properties:

| Wire: Cromasaw | 82 | 625 | 316L | Duplex | 312 |
|---------------------------|-----------|------------|-------------|---------------|------------|
| Yield strength, Re, MPa | 380 | 450 | 390 | 620 | 650 |
| Tensile strength, Rm, MPa | 630 | 720 | 570 | 780 | 800 |
| Elongation A5, % | 45 | 40 | 38 | 28 | 24 |
| Impact energy CV, J: | 82 | 625 | 316L | Duplex | 312 |
| +20°C | 150 | 150 | 95 | 90 | 30 |
| -20°C | | | | 85 | |
| -40°C | | | | 80 | |
| -60°C | | | | 65 | |
| -196°C | 100 | 70 | 40 | | |

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| | |
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| Cromaflux 650 ESC..... | 241 |



Strips for electroslag and submerged arc cladding with stainless and Ni-base alloys

| Cromastrip | C | Si | Mn | Cr | Ni | Mo | Others | EN ISO 14343-A | AWS/SFA A5.9 |
|------------|-------|-----|-----|------|------|-----|---------------|----------------|----------------------|
| 308L | <0.02 | 0.4 | 1.8 | 20.0 | 10.5 | | | B 19 9 L | EQ 308L |
| 347L | <0.02 | 0.4 | 1.8 | 20.0 | 10.5 | | Nb 0.5 | B 19 9 Nb | EQ 347 |
| 316L | <0.02 | 0.4 | 1.8 | 19.0 | 12.5 | 2.8 | | B 19 12 3 L | EQ 316L |
| 317L | <0.02 | 0.4 | 1.6 | 19.0 | 13.5 | 3.5 | | B 19 13 4L | EQ 317L |
| 309L | <0.02 | 0.4 | 1.8 | 24.0 | 13.0 | | | B 23 12 L | EQ 309L |
| 309LNb | <0.02 | 0.3 | 1.8 | 24.0 | 13.0 | | Nb 0.7 | B 23 12 Nb | (EQ 309LNb) |
| 21.11.L | <0.02 | 0.3 | 1.8 | 21.0 | 11.0 | | | B 22 12 L | (EQ 309L) |
| 21.11.LNb | <0.02 | 0.3 | 1.8 | 21.0 | 11.0 | | Nb 0.6 | B 22 12 LNb | (EQ 347L) |
| 21.13.3L | <0.02 | 0.3 | 1.8 | 20.3 | 14.3 | 2.8 | | (B 23 12 2 L) | (EQ 309LMo) |
| | | | | | | | | | AWS/SFA A5.14 |
| 82 | 0.02 | 0.1 | 3.0 | 20.0 | Bal. | | Nb 2.0, Fe0.4 | | EQNiCr3 |
| 625 | 0.02 | 0.1 | 0.2 | 22.0 | Bal. | 9.0 | Nb3.5, Fe0.4 | | EQNiCrMo-3 |

Cromaflux 480 ESC

Cromaflux 480 ESC is a non-alloying agglomerated fluoride-basic flux designed for electroslag strip cladding with stainless steel alloys at standard travel speeds (15-25cm/min.). Slag detachment is excellent, leaving a bright deposit finish with smooth inter-bead tie-in.

Classification: EN ISO 14174 ES A FB 2B 5644 DC

Flux type: Fluoride-basic

Basicity index: 2.6

Flux density: 1.1kg/dm³

Grain size: 2-16

Welding current: DC+

Redrying temperature: 300-350° C/2h

Packaging: 25kg hermetically sealed plastic bags

Cromaflux 450 ESC

Cromaflux 450 ESC is a non-alloying agglomerated fluoride-basic flux designed for electroslag strip cladding with stainless steel alloys at high travel speeds (25-35cm/min.). Suitable for large diameter vessels and flat surfaces. Excellent slag detachment, leaving a bright deposit finish with smooth inter-bead tie-in.

Classification: EN ISO 14174 ES A FB 2B 5644 DC

Flux type: Fluoride-basic

Basicity index: 4.5

Flux density: 1.0kg/dm³

Grain size: 2-16

Welding current: DC+

Redrying temperature: 300-350° C/2h

Packaging: 25kg hermetically sealed plastic bags

Cromaflux 650 ESC

Cromaflux 650 ESC is a non-alloying agglomerated fluoride-basic flux designed for electroslag strip cladding with Ni-base alloys, e.g NiCr3 and NiCrMo-3 types. Slag detachment is excellent, leaving a bright deposit finish with smooth inter-bead tie-in. The flux operates over a wide range of travel speeds and is suitable for both single layer and two layer techniques.

In combination with Cromastrip 625 a single layer deposit of type NiCrMo-3 can be achieved with around 10%Fe. With the same combination a two layer deposit, 6.5-7.0mm total thickness, can be achieved with 5%Fe max. at a depth of 3mm below the top surface.

Classification: EN ISO 14174 ES A FB 2B 5644 DC

Flux type: Fluoride-basic

Basicity index: 4.5

Flux density: 1.1kg/dm³

Grain size: 2-14

Welding current: DC+

Redrying temperature: 300-350° C/2h

Packaging: 25kg hermetically sealed plastic bags



Flux-Strip combination Selection guide

| Deposit Chemistry | No. of layers | Cromaflux | Cromastrip Layer 1 | Cromastrip Layer 2 |
|-------------------|---------------|-----------|--------------------|--------------------|
| 308L | 1 | 450 ESC | 21.11L | 308L |
| | 1 | 450 ESC | 309L | |
| | 2 | 450 ESC | 309L | |
| 316L | 1 | 480 ESC | 21.13.3L | 316L |
| | 2 | 450 ESC | 309L | |
| 317L | 2 | 480 ESC | 21.13.3L | 317L |
| 347 | 1 | 480 ESC | 21.11.LNb | 347L |
| | 2 | 480 ESC | 21.11.LNb | |
| | 1 | 450 ESC | 309LNb | |
| 82 | 2 | 650 ESC | 82 | 82 |
| 625 (10%Fe) | 1 | 650 ESC | 625 | 625 |
| 625 (<5%Fe) | 2 | 650 ESC | 625 | |

For further information, contact Elga.

| | |
|-----------------------------|-----|
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Elga Gouging Electrode

Classification:

Description:

Elga Gouging Electrode is a copper coated carbon-graphite electrode used for air carbon-arc cutting and gouging. The arc is used to progressively melt the base material which is subsequently blown away by high velocity jets of compressed air. Because the process is physical rather than dependent on oxidation it can be used on most metals. The process leaves a clean surface free from slag and further surface preparation is not usually necessary. Applications include weld joint preparation, cutting and perforating and removal of weld and material defects.

Inner carton: 50 pcs

Outer carton: 250 pcs

Welding current:

DC+

Hydrogen content / 100 g weld metal

Product data

| Diam. mm | Length mm | Product code |
|-------------|--------------|--------------|
| 4x305 | | 89693004 |
| 5x305 | | 89693005 |
| 6x305 | | 89693006 |
| 8x305 | | 89693008 |
| 10x30 5 | | 89693010 |
| 13x35 5 | | 89693513 |

Elga Ceramic Backing is used to provide root pass support when welding from one side only and is an extremely effective way to rationalise welding procedures and reduce production costs. Welding of root passes is normally the most critical part of the weld and hence the most costly. By using Elga ceramic backing, you can reduce production costs substantially.

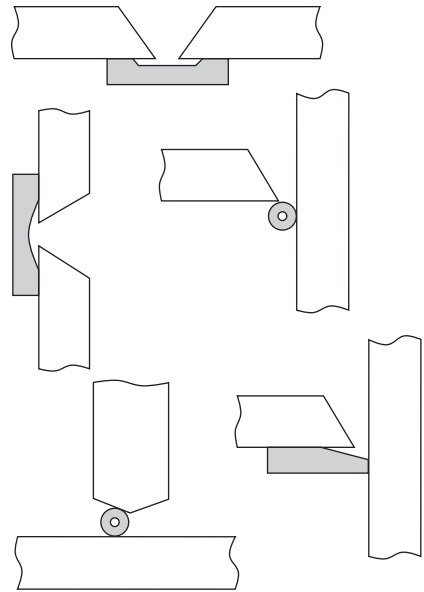
Benefits with Elga Ceramic Backing

Reduced production costs:

- Eliminates the need for back-gouging, grinding and rewelding operations on the reverse side.
- Significant savings in costs associated with turning large and heavy plates or structures in order to weld the second side in the flat position.
- Increased productivity when welding root runs in position 1G/PA, 2G/PC and 3G/PF.
- Simpler joint preparation and reduced set-up time because tolerances for the root gap are greater.
- Use of higher welding currents, which means higher deposition rates and increased productivity.

Quality improvements:

- Smooth, even root bead with slightly convex profile and excellent blend-in with base material.
- The ceramic material does not emit fumes and contains no moisture. Ideal for low-hydrogen applications.
- When welding in enclosed spaces the working environment is not polluted by fumes from arc-air gouging, grinding and rewelding operations.



Typical examples of ceramic backing applications.

Useful tips when using Elga Ceramic Backing

- Use relatively low current/welding speed. For Elgacore < 200A and < 200 mm/min, for Cromacore < 160A.
- Dirt, mill scale, coatings and other contamination to be removed from the joint faces before welding.
- End craters should be fully ground out.
- Maximum 1 m root run at a time, before next pass applied.

Welding economy

The use of ceramic backing offers significant economic advantages. Take a look at a couple of examples based on labour cost and time to complete the job.

Switching from MMA to FCAW with Elga Ceramic Backing

In this example we have used an average welding speed (55 mm/min for MMA and 150 mm/min for FCAW with backing) and a labour cost of 40€/h for the welder.

Using a 2,5 mm electrode:

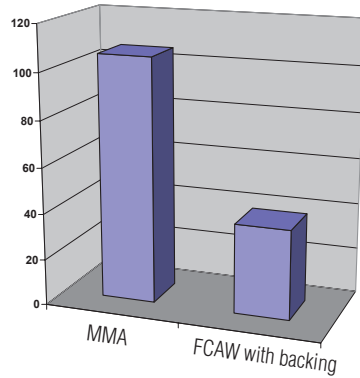
Typical deposition rate is 0,6-0,7 kg/h.

Welding speed 40-70 mm/min.

Characteristic of MMA is a low arcing time factor. With a 2,5 mm electrode, only a 50-70 mm weld length can be achieved between electrode changes.

Flux cored wire and backing (single-sided welding):

Labour cost €/m



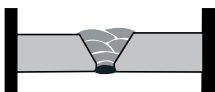
Typical deposition rate is 2,5-3,0 kg/h.

Welding speed 100-200 mm/min.

Characteristic of flux cored wire with backing is a very high arcing time factor. A 1 meter long root pass can be welded non-stop.

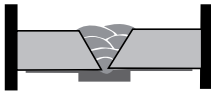
Switching from two-sided welding to single-sided with flux cored wire and ceramic backing

Two-sided welding means additional time for:



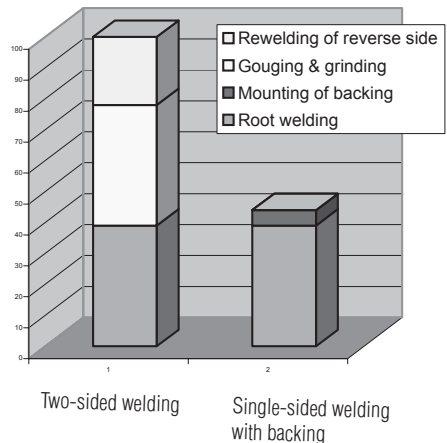
1. Back-gouging
2. Grinding
3. Rewelding on the reverse side, depending on the construction.

Single-sided welding with flux cored wire and backing:



Substantially higher productivity since all "extra work" has been eliminated.

Total time comparison



Elga ceramic backing





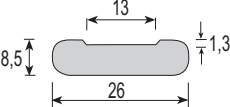
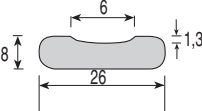
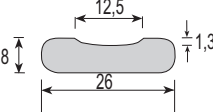
Valid for all ceramic backing from Elga:

Grey ceramic backing on Alu-tape

Welding positions: PA, PC, PF

Base material: stainless and mild or low alloy steels

Length per piece: 600 mm

| | | |
|---|--|---|
|  <p>Length of detail: 30 mm</p> | <p>Art. nr: 86640600 Joint preparation: X and K-joints Welding consumable: Rutile and metal cored wire Root gap: 3-5 mm</p> | <p>Diameter: 6,0 mm Length per individual tile: 30 mm Pieces per box: 40 Pieces per pallet: 4480</p> |
|  <p>Length of detail: 30 mm</p> | <p>Art. nr: 86650600 Joint preparation: X and K-joints Welding consumable: Rutile and metal cored wire Root gap: 4-6 mm</p> | <p>Diameter: 8,0 mm Length per individual tile: 30 mm Pieces per box: 40 Pieces per pallet: 4480</p> |
|  <p>Length of detail: 30 mm</p> | <p>Art. nr: 86660600 Joint preparation: X and K-joints Welding consumable: Rutile and metal cored wire Root gap: 5-7 mm</p> | <p>Diameter: 10 mm Length per individual tile: 30 mm Pieces per box: 40 Pieces per pallet: 4480</p> |
|  <p>Length of detail: 30 mm</p> | <p>Art. nr: 86670600 Joint preparation: X and K-joints Welding consumable: Rutile and metal cored wire Root gap: 7-10 mm</p> | <p>Diameter: 12 mm Length per individual tile: 30 mm Pieces per box: 30 Pieces per pallet: 3360</p> |
|  <p>Length of detail: 25 mm</p> | <p>Art. nr: 86800600 Joint preparation: V-joints Welding consumable: Rutile flux cored wire Root gap: 3-8 mm Tile width: 26 mm</p> | <p>Tile height: 8,5 mm Groove depth: 1,3 mm Groove width: 13 mm Length per individual tile: 25 mm Pieces per box: 30 Pieces per pallet: 3360</p> |
|  <p>Length of detail: 25 mm</p> | <p>Art. nr: 86980600 Joint preparation: V-joints Welding consumable: Metal cored wire and solid wire Root gap: 3-5 mm Tile width: 26 mm</p> | <p>Tile height: 8 mm Groove depth: 1,3 mm Groove width: 6 mm Length per individual tile: 25 mm Pieces per box: 30 Pieces per pallet: 3360</p> |
|  <p>Length of detail: 25 mm</p> | <p>Art. nr: 86990600 Joint preparation: V-joints Welding consumable: Rutile flux cored wire Root gap: 3-7 mm Tile width: 26 mm</p> | <p>Tile height: 8 mm Groove depth: 1,3 mm Groove width: 12,5 mm Length per individual tile: 25 mm Pieces per box: 30 Pieces per pallet: 3360</p> |

Please visit www.elga.se to see our updated range of Elga ceramic backing!

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Storage and handling of welding consumables

Storage and handling of welding consumables consist of the following parts:

- Hydrogen induced cracking
- Coated electrodes
- Flux Cored Wires
- Submerged arc welding fluxes

Hydrogen induced cracking

Hydrogen in welded joints in ferritic materials can give rise to hydrogen induced cracking, also known as cold cracking and delayed cracking

The major factors which influence the risk of this type of cracking are chemical composition of the steel (Carbon Equivalent factor CE), cooling rate and hydrogen content of the weld metal.

The most common sources of hydrogen are:

- Moisture in electrode coatings or SAW flux
- Drawing lubricants on cored wires
- Moisture in the atmosphere or shielding gas
- Condensation, rust, oil, paint or primer in the weld joint area

Moisture, lubricant etc. decomposes in the arc during welding to give hydrogen, (H), which is readily dissolved in the weld pool. On cooling this (H) tries to escape via diffusion because it is less soluble in the solid weld metal compared to the molten weld pool. Any (H) that remains trapped in the joint can cause hydrogen induced cracking. Cracks generally form in the coarse-grained, HAZ of the base material but for very high strength weld metals cracks can also arise in the weld metal itself. By following the recommended storage and handling procedures for welding consumables, moisture levels can be minimised, along with the associated hydrogen induced cracking risk.

Storage and handling of coated electrodes

Coated electrodes always contain a certain amount

of moisture in the coating, even after the final drying operation during manufacture. This moisture decomposes in the arc during welding to give hydrogen, (H), and consequential risk for hydrogen induced cracking.

The moisture is bound in the crystalline structure of some of the minerals in the coating and requires a relatively high temperature to remove it. Basic-coated electrodes are designed to be dried at high temperatures, resulting in a low coating moisture level, and are often referred to as “low hydrogen electrodes”.

Coated electrodes can be divided into:

- 1) Non-alloy C-Mn, rutile or acid-rutile coated electrodes, with $H > 15$ ml/100g weld metal.
- 2) Non-alloy C-Mn and low alloy, basic-coated electrodes, with $H < 10$ or < 5 ml/100g weld metal.
- 3) High alloy austenitic stainless steel electrodes, rutile or basic coated, where hydrogen diffusion does not occur because hydrogen is soluble in the austenitic atomic structure, even at room temperature.

Of the above listed groups, it is only types 1 and 2 which can give rise to hydrogen induced cracking. For steel grades with a yield strength > 355 MPa the use of type 2 electrodes is recommended. Type 3 electrodes are also dried at high temperature, but this is to minimise the risk of porosity, also caused by moisture in the coating.

Unfortunately, electrode coatings are hygroscopic, i.e. they pick up moisture from the surrounding atmosphere if freely exposed to it. Suitable coating formulation design can minimise this effect but not eliminate it. For this reason it is necessary to ensure that electrodes are not able to absorb moisture (by correct choice of packaging, storage and handling) or, alternatively, to re-dry them before use.

Types of packaging

Elga's non-alloy and low alloy electrodes are supplied in two different types of packaging, depending on the required level of resistance to moisture pick-up from the atmosphere in the unopened condition.

A) Cardboard box with shrink plastic wrapping. This is the most common packaging for electrode type 1 and type 2 non-alloy C-Mn electrodes.

B) Hermetically sealed steel can or aluminium-laminated plastic foil vacuum pack (DryPac). This is the most common packaging for type 3 stainless electrodes and type 2 low alloy electrodes.

Of these two packaging forms, it is only for type B that Elga guarantees low moisture content at point of opening. Products delivered in packaging type A are guaranteed to have been tested to comply with low moisture content following final baking in the factory, but no guarantee can be given that they have not subsequently picked up moisture during delivery to, or storage at, the customer. Electrodes in type A packaging must therefore be re-dried before use if low hydrogen weld metal is specified.

Points to consider when handling and storing unopened packaging

Storage

In general, moisture pick-up of electrodes depends on the temperature and humidity of the surrounding atmosphere, which can be measured as the relative humidity (RH) at a given temperature.

However, moisture pick-up occurs relatively slowly with storage under the following conditions:

| | |
|----------|---------|
| 5-15 °C | <60% RH |
| 15-25 °C | <50% RH |
| >25 °C | <40% RH |

Electrodes in **packaging type A** must be stored with the plastic wrapping unbroken in a climatically controlled environment according to the above. If low hydrogen weld metal is specified then electrodes in packaging type A must be re-dried before use, following the instructions in the data sheet or on the label.

Electrodes in **packaging type B** are completely moisture diffusion-proof and do not therefore require any special storage instructions. Electrodes taken directly from newly opened packaging of this type do not require re-drying before use.

To avoid condensation forming on electrodes that have been stored at a lower temperature than ambient, unopened packaging should be allowed to reach ambient temperature before being opened, independent of packaging type.

Type 2 and 3 electrodes from opened packaging can be stored in a storage cabinet held at 105-150 °C without the risk of moisture pick-up. It is important here that these electrodes are not mixed together with type 1 electrodes in the same cabinet, because the latter can transfer moisture to the former.

Handling in the workshop

Elga's type 2 and 3 electrodes are manufactured according to the MR-design concept (Moisture Resistant) which ensures low initial moisture content together with a slow moisture pick-up rate.

For electrodes in type B packaging the following exposure times are valid for conditions of 26.7 °C and 80% RH, in order to guarantee low hydrogen level in the weld metal or sufficiently low moisture content in the coating (stainless electrodes).

| Condition of packaging | Max. storage time |
|---------------------------------------|-------------------|
| Unbroken | Unlimited |
| Opened but electrodes left in packet | 12 h |
| Electrodes exposed outside the packet | 4 h |

For type 2 electrodes in type A packaging the following recommendation is given:

During the working period, keep the electrodes in heated portable canisters at a minimum temperature of 70 °C. After the work period, store the remaining electrodes in a heated storage cabinet. This recommendation is also valid for electrodes in opened package type B, if the electrodes are not likely to be consumed within the times specified above.

Re-drying

Rutile electrodes, type 1, which show any signs of damage from moisture pick-up (poor arc stability, heavy spatter, poor slag detachability) can be re-dried at around 90 °C for 1 h in order to restore welding characteristics.

Basic coated C-Mn and low alloy electrodes (type 2) are normally re-dried at a temperature of around 350 °C for 1-2 h, in order to reach a hydrogen content of the level 4-10ml/100g weld metal as given in the data sheet. The guiding rule is to follow the re-drying instructions in the data sheet or on the label. Re-drying should be limited to 5 cycles.

To obtain an extremely low hydrogen level, i.e. <4ml/100g, it is possible in certain cases to re-dry at higher temperatures than 350 °C. However, under these circumstances Elga must be contacted first for detailed instructions, otherwise there is a risk that the coating can be damaged. Normally this will reduce the maximum allowed number of re-drying cycles.

| | |
|---------|---------|
| 5-15°C | <60% RH |
| 15-25°C | <50% RH |
| > 25°C | <40% RH |

Storage and handling of Elga cored wires.

Storage:

1. Cored wires shall be stored in their original, undamaged packaging under properly maintained climatic conditions of 10-30°C and relative humidity as low as possible, maximum 80%.
2. Packaging shall not be placed directly on the floor, but on a wooden pallet or equivalent, at a distance of at least 10 cm from the ground and outside wall.
3. Transportation to and from the storage place shall be carried out in covered vehicles and direct exposure to rain and snow avoided.

Storage of cored wires outside the original packaging.

When the wire has been taken out of the original packaging, it can be stored in normal heated premises, (workshop etc.), for up to 5 days.

Handling

- If welding is conducted in an environment that is subject to snow, rain, marine conditions or dust, covered wire feed units should be used.
- During outdoor usage, or when used in unheated workshops or premises, the wire should be moved to a dry, heated storage area when not in use for a period of 8 hours or more.
- If the wire is to be put back in storage, the spool shall be protected with its plastic bag, or equivalent.

Scrapping

- If traces of rust/corrosion are found on the wire surface, this indicates that the wire has not been stored or handled correctly. A wire with rust traces should be scrapped.

If there is any suspicion that the wire has not been stored correctly, Elga recommends that the wire be **SCRAPPED**.

Storage and handling of submerged arc welding fluxes

Elgaflux and Cromaflex fluxes are supplied as standard in 25kg moisture resistant plastic bags, 25kg hermetically sealed aluminium-coated plastic bags, 25kg plastic lined moisture resistant paper bags and 600kg coated fabric BigPac bags. All fluxes have a guaranteed low as-manufactured moisture content that can be maintained by observing the following recommendations for storage and handling.

Transport

Flux is normally supplied on plastic shrink wrapped pallets with a net weight of 1000kg or 1200kg. BigPac bags are supplied individually on shrink wrapped pallets. Transportation should be carried out in covered vehicles and direct exposure to rain and snow avoided.

Main storage

Agglomerated and fused fluxes should be stored in their original, undamaged packaging under properly maintained climatic conditions as follows :

- Temperature 15-35°C
- Relative humidity As low as possible, maximum 70%

Stored under these conditions the lifetime for agglomerated fluxes is 3 years and that for fused fluxes 5 years. Stock control should encompass the first-in, first-out principle.

Storage and handling in the workshop

When handled and stored according to conditions described above, flux can normally be used direct from the bag. For non-critical applications, flux may be stored on the shopfloor in unheated flux hoppers, provided these are closed units and protect the flux from open contact with the prevailing atmosphere.

For critical applications, shopfloor storage should be in heated flux hoppers maintained at 120-150°C. Flux in opened bags, not used during an 8 h period, should be placed in a storage cabinet or heated flux hopper, at 120-150°C.

Recycling

Unused flux recovered from the welding area must be cleaned from mill scale, slag, metal particles and other impurities by use of a suitable fine-mesh sieve, before being recycled.

Addition of new flux to that being recycled should be done regularly, in the ratio 1: 3

Redrying

The need for redrying only arises under two circumstances:

1. If the flux has picked up moisture due to unfavourable storage and handling, and needs to be restored to its original condition.

2. For critical applications demanding guaranteed very low weld metal hydrogen levels, redrying of the flux is recommended.

Redrying should be carried out in an appropriate oven with free air circulation or purpose made drier, as follows:

Agglomerated fluxes 300-350°C for 2 h

Fused fluxes 150-250°C for 2 h

The most important factor here is for the complete flux bed to reach the given temperature. Redried flux that is not for immediate use should be stored in a storage cabinet or heated flux hopper, maintained at 120-150°C.

Welding of high yield strength structural steels

The following provides a short summary of important points that should be taken into consideration when welding high strength steels.

The term “high strength” refers to steels with a minimum yield strength of around 460 MPa

This group of structural steels generally obtains its strength level by rapid cooling and is delivered in the quenched and tempered condition, according to EN 10025-6. This manufacturing process enables high strength to be achieved with a relatively low alloy content and thereby low Carbon Equivalent (CE), which in turn gives good weldability. This thermal history also produces a microstructure that gives a combination of high strength and good toughness.

In order to produce weld metal with matching mechanical properties, however, a significantly higher alloying level than that of the steel is required, since control of microstructure via the quenching and tempering operation is not available to the weld deposit. This results in the weld also having a higher CE, with consequential increased risk for hydrogen induced cracking.

As a result, the weld metal is often the controlling factor when calculating the CE, together with the critical minimum cooling time t_{8-5} . The cooling time is determined by the preheat, heat input, joint design and plate thickness.

Practical guidelines

- Always investigate if the specification or component design will permit use of an under-matching weld metal. Many structures can be fabricated so that the welded joints are positioned where stress levels are relatively low, permitting undermatching welds.
- Only use low hydrogen welding consumables.
- Ensure that safe routines are in place for storage and handling of welding consumables in order to minimize risk of exposure to moisture. Coated electrodes packed in a cardboard box with shrink plastic wrapping must always be re-dried before use.
- Tack welds and root passes require special attention, and the needs for preheating should be carefully observed.
- Quenched and tempered steels normally have an increased CE with increased plate thickness and welding parameters may have to be adjusted accordingly if different joint thicknesses arise in the same structure.
- Base welding parameter calculations on the actual chemical composition of plate and do not rely on nominal values.
- Cooling rates can differ significantly depending on whether two-dimensional or three-dimensional cooling is involved, which in turn is determined by joint design and plate thickness. For this reason calculate welding parameter settings according to EN 1011-2.
- Plate manufacturers often offer software to facilitate the above calculations.

Guidelines for the usage of cored wires

In order to obtain optimal welding characteristics (arc stability, penetration, bead appearance, slag removal) as well as optimal mechanical properties in the weld metal, it is very important to use cored wires in the correct manner. The essential welding technique parameters that affect the final result are covered in the following recommendations.

Wire stickout

The wire stickout (electrode extension) is the distance between the contact tip and the work piece surface. The stickout can vary between 15 to 25 mm but should be kept as constant as possible. Each millimeter change of wire stickout affects the welding current by 3-5 A. An increased wire stickout, at constant wire feed rate, gives lower current. A too long wire stickout can result in a cold weld pool and insufficient gas shield, both of which must be avoided.

An increased wire stickout gives:

- Colder weld pool
- Risk of insufficient gas shield
- Reduced penetration
- Less spatter in the gas nozzle
- Decreased bead width
- Increased bead thickness (more convex)

A decreased wire stickout gives:

- Risk of overheating the contact tip
- More spatter

- Risk of insufficient gas shield
- Increased bead width
- Decreased bead thickness

Recommended wire stickout

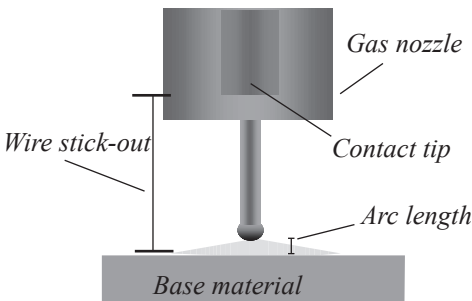
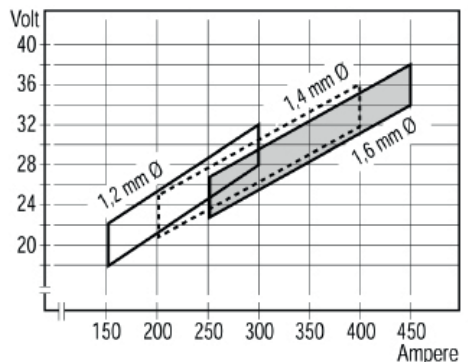
| Welding current | Elgacore | Cromacore |
|-----------------|----------|-----------|
| | 1,2 mm | 1,2 mm |
| 100-200A | 10-20 mm | 15-20 mm |
| 200-300A | 15-25 mm | 20-25 mm |

Parameter box

In order to ensure correct usage of Elga cored wires, it is recommended to work within the applicable parameter box for the product and application. The parameter box gives the recommended amperage and voltage level to be used in order to obtain the correct penetration, to minimize spatter, and to achieve the specified mechanical properties of the weld metal.

Both Elgacore and Cromacore products have a wide parameter box, which makes it easy to set the correct welding parameters. The parameter box can be found on each product data sheet, under "Recommended parameter range"

Recommended parameter range:



Torch angle and manipulation

There are two main techniques of torch orientation when welding cored wires, i.e. backhand, and forehand welding.

Forehand welding

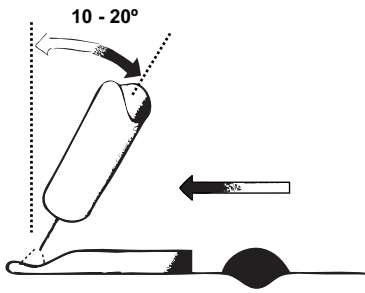
- The weld torch is pointed away from the weld bead.
- Forehand welding gives a smooth weld bead appearance, but reduces penetration.
- Mostly used for standing fillets and is recommended for welding primed plates.(PB fillet welds)

Backhand welding

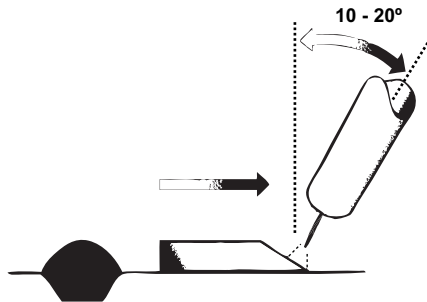
- The weld torch is pointed towards the weld bead.
- Backhand welding gives better penetration and normally produces a slightly more convex weld bead. The risk for lack of penetration and slag inclusions is reduced using backhand welding.
- Backhand welding is recommended for use with rutile flux cored wires when maximum penetration is required.

Recommended torch angle

For both forehand and backhand welding the gun angle should be 10-20 degrees from the vertical. Too large an angle can result in poor penetration, unstable arc, porosity or poor impact toughness.



Forehand welding



Backhand welding

Types of certificates available with Elga welding consumables

Certificates for Elga consumables are available in accordance with EN 10204, "Metallic products – Types of inspection documents"

Test report type 2.2

Shows typical values for chemical analysis and mechanical properties, according to the relevant data sheet. This information is not batch specific and is available free of charge.

Inspection certificate type 3.1

The following are available as standard for different product types.

- Solid wire products
Chemical analysis of the specific wire batch, together with typical mechanical properties based on annual testing statistics.

- Coated electrodes: Low alloyed and stainless steel.


All-weld metal chemical analysis of the specific batch, together with typical mechanical properties based on annual testing.

- Cored wires
All-weld metal chemical analysis and mechanical properties of the specific batch.

Standard inspection documents are free of charge, but must be clearly specified on the order.

Special certificates

In addition to the above inspection documents, it is possible to receive certificates showing extended batch testing according to customer requirements, but these must be clearly specified in advance on the order and will be charged according to current Elga laboratory testing fees.

TEST REPORT 

Test report according to
EN 10204 2.2

| | | | |
|-------------------------------|-------------------|--|-----------------------|
| Order No | ELGA Order No | Specification AWS/ASME SFA 5.1:E 7024 EN-ISO 2560-A:E 42 0 RR 73 | Data sheet rev. 18 |
| Product Maxmeta 11 4,0x450 | Batch No 12421 | Part No 72044000 | |

| All-weld metal chemical composition, wt. % For solid wires; wire analysis | | | | | | | | | | |
|---|------|------|-------|-------|------|------|-------|------|--|--|
| C | Si | Mn | P | S | Cr | Ni | Mo | Cu | | |
| 0,08 | 0,60 | 0,90 | 0,015 | 0,010 | 0,03 | 0,04 | 0,035 | 0,02 | | |

| Mechanical properties - All-weld metal | | | | |
|--|-----------------------|-----------------|-------------------------|---------------|
| Yield Strength, MPa | Tensile Strength, MPa | Elongation, A5% | Impact value average, J | Test temp, °C |
| 500 | 580 | 24 | 90 | 0 |

We hereby certify that the material described above has been tested and complies with the terms of the order contract.

Lisa Eriksson
Lisa Eriksson, QC Manager
DATE: 111025

Packaging

Covered electrodes

Elga's un- and low alloyed electrodes are packed in a carton sealed with shrink-foil. Stainless electrodes are packed in hermitically sealed cans, in order to guarantee low moisture levels. High recovery electrodes are packed in telescopic cartons. Parts of the covered electrode program are delivered in DryPac®, an aluminum foil that is vacuumed during the packaging process, ensuring total control of hydrogen content.

All packaging type is then packed in a card board box for shipment.

TIG-rods

All Elgatig products are 1000mm long, and are delivered in card board boxes. Delivery sizes for stainless, un-, and low-alloyed are 5kg. Aluminum are delivered in 2,5kg boxes.

Flux cored wires

Elga's flux cored wires, Elgacore and Cromacore are delivered on a plastic- or wire basket spool. In addition most products can be delivered in bulk pack as an alternative. All stainless and low alloyed products are delivered in a hermitically sealed Aluminum foil.

Delivery sizes and spool types

| | | |
|------------------|---------------------|-------|
| Un- /low alloyed | 5 kg plastic spool | D-200 |
| | 5 kg basket spool | S-200 |
| | 15 kg plastic spool | D-300 |
| | 15 kg basket spool | S-300 |
| | 20 kg plastic spool | D-300 |

Un-alloyed 250 kg AutoPac/EcoPac/ProPac

| | | |
|-----------|--------------------|-------|
| Stainless | 5 kg basket spool | S-200 |
| | 15 kg basket spool | S-300 |

MIG wires

Elga's MIG wires, Elgamatic and Cromamig are supplied on plastic- or wire basket spools, and can also be delivered as bulk pack, AutoPac/ProPac for stainless, un-, and low alloyed materials.

Delivery sizes and spool types

| | | |
|-------------|--|-------------|
| Un-alloyed | 5 kg plastic spool | D-200 |
| | 15 kg basket spool | S-300 |
| | 18 kg basket spool | S-300 |
| | AutoPac/ProPac 250 kg | |
| Low-alloyed | 15 kg basket spool | S-300 |
| | Can be supplied in 250 kg AutoPac/ProPac | |
| Stainless | 5 kg plastic spool | D-200 |
| | 15 kg basket spool | S-300 |
| Aluminum | 2 kg plastic spool | D-200 |
| | 6 kg plastic spool | D-300/S-300 |
| | 18 kg basket spool | K-400 |
| | (Adapter is needed for K-400) | |

SAW

Elga's wire program for sub-arc welding, Elgasaw wires are available on basket spool, but can also be delivered in several forms of bulk packs.

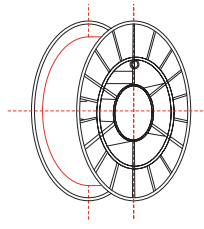
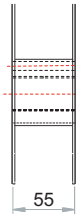
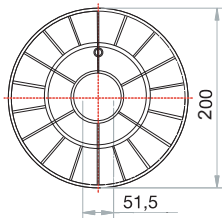
| | | |
|---------------------|------------------------------|-------|
| Un- and low alloyed | 25/27 kg basket spool | K-415 |
| | 100 kg spool | |
| | 300 kg spool | S-760 |
| | AutoPac 350 kg | |
| | Stainless 25 kg basket spool | K-415 |

Fluxes

Elga's flux program is available in 25kg moisture resistant plastic bags, 25 kg plastic lined paper bags, as well as 600 kg BigPac in voved plastic.

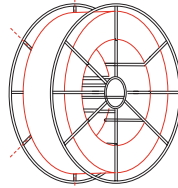
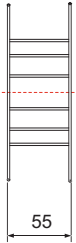
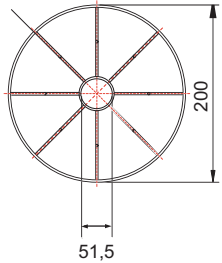
Packaging

Plastic or wire basket spoons



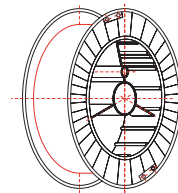
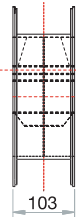
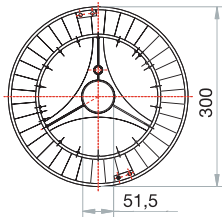
Plastic spoon D 200

Diameter: 200 mm
Width: 55 mm
Suitable for a 50 mm hub



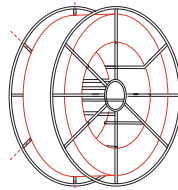
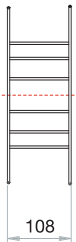
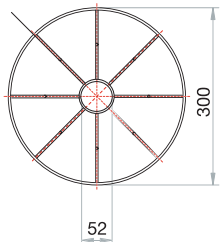
Basket spoon BS 200

Diameter: 200 mm
Width: 55 mm
Suitable for a 50 mm hub



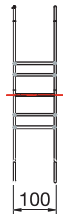
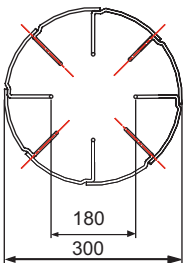
Plastic spoon D 300

Diameter: 300 mm
Width: 103 mm
Suitable for a 50 mm hub



Basket spoon S 300 & BS 300

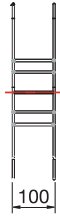
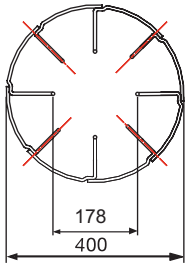
Diameter: 300 mm
Width: 108 mm
Suitable for a 50 mm hub



Basket rim K 300 (B 300)

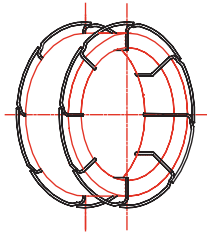
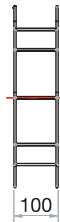
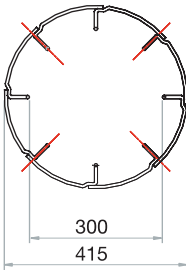
Diameter: 300 mm
Width: 100 mm
Suitable for a 50 mm hub, but an adaptor is needed.

Packaging



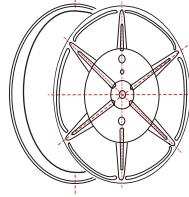
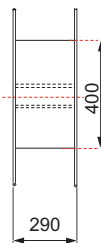
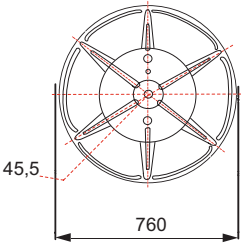
Basket rim K 400

Diameter: 400 mm
Width: 100 mm
Suitable for a 50 mm hub, but an adaptor is needed.



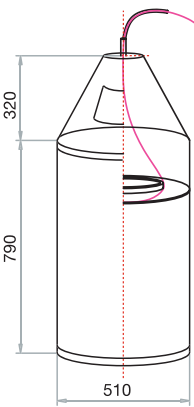
Basket rim K 415

Diameter: 415 mm
Width: 100 mm
Suitable for a 50 mm hub

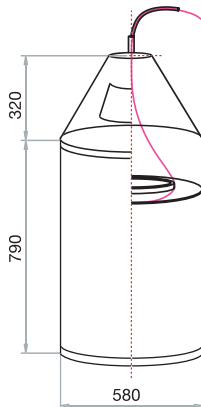


Reel S 760

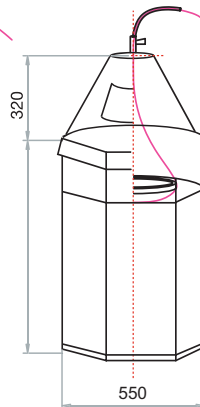
Diameter: 760 mm
Width: 290 mm
Suitable for a 50 mm hub



200-250 kg



350 kg



250 kg

AutoPac

Diameter: 510 or 580 mm

ProPac

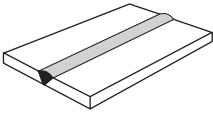
Diameter: 550 mm

Accessories

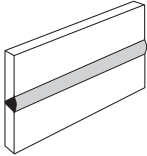
Elga bulk pack options can be supplied with a complete set of wire dispensing equipment, from the drum dolly, wire conduit, quick connectors to drum cones. Please contact Elga for more information.

Welding Positions, ASME and EN Standards

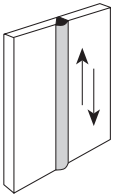
Butt welds



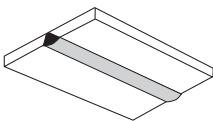
ASME: 1G
EN: PA



ASME: 2G
EN: PC

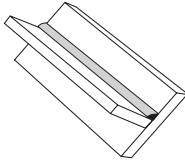


ASME: 3G
EN: PG (down)
PF (up)

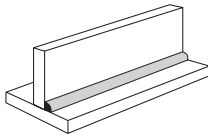


ASME: 4G
EN: PE

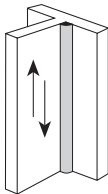
Fillet welds



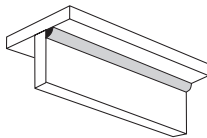
ASME: 1F
EN: PA



ASME: 2F
EN: PB

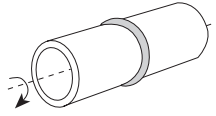


ASME: 3F
EN: PG (down)
PF (up)

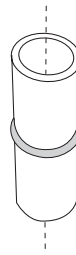


ASME: 4F
EN: PD

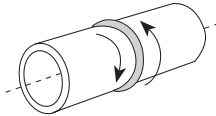
Pipe welds



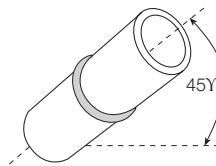
ASME: 1G
EN: PA



ASME: 2G
EN: PC

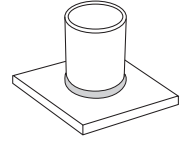


ASME: 5G
EN: PG (down)
PF (up)

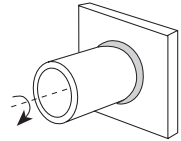


ASME: 6G
EN: J-L045 (down)
H-L045 (up)

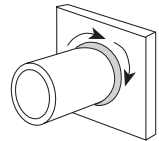
Fillet welds



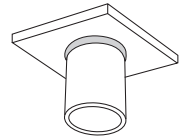
ASME: 2F
EN: PB



ASME: 2F
EN: PB



ASME: 5F
EN: PG (down)
PF (up)



ASME: 4F
EN: PD

Mechanical testing of weld metal

Mechanical properties given in this catalogue refer to typical values for test specimens taken from all-weld metal material. They represent the average obtained from a large number of tests, and for established products they are based on the last five years results from annual approvals check tests.

Test plate preparation and specimen location for all-weld metal testing is shown in the figure below.

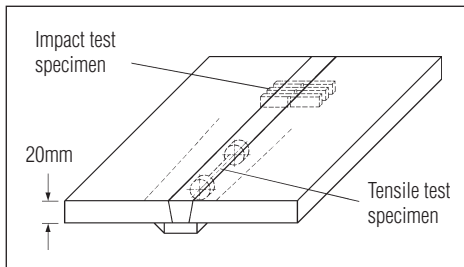
Two types of test specimens are prepared – cylindrical test pieces for tensile testing and square Charpy V-Notch test pieces for impact energy testing.

The tensile test is used to determine:

- Tensile Strength
- Yield Strength
- Elongation

The impact test is used to determine:

- Fracture toughness properties



Yield Strength

The yield strength is the applied stress (load) at which the material under test starts to yield plastically, producing a permanent deformation after the load is removed.

Mild and carbon-manganese weld metals have a clear transition point between elastic and plastic

deformation and the yield strength is indicated with the symbol R_e and measured in units MPa.

Other weld metals e.g. stainless steel, do not show the same well marked transition boundary and in such cases the yield strength is defined as the point when a specified permanent deformation remains in the test specimen after the load is removed. The catalogue values refer to a residual deformation of 0.2% and are designated $R_p 0.2\%$.

Tensile Strength

This is the maximum stress which the material under test can be subjected to before fracture occurs and is designated R_m .

Elongation

This is a measurement of the weld metal's ability to deform before fracture occurs. It is designated A_5 and measured as a percentage of the original test specimen length, which is normally five times the specimen diameter.

Impact energy (fracture toughness)

Impact testing is used to determine weld metal toughness at a given temperature, under impact loading conditions, and is a measurement of the material's resistance to brittle fracture. Impact energy is determined using a V-notch test specimen according to the Charpy-V method and is measured in the unit joule (J). Fracture toughness values are temperature dependant and decrease with decreasing temperature. In general a weld metal is "safe" against brittle fracture down to the temperature which gives a minimum impact energy value of 47 Joule.

Deposition data

Covered electrodes

- Electrode efficiency or metal recovery: The weight of weld metal deposited in relation to the weight of core wire consumed.

An electrode without any iron powder in the coating gives a recovery factor of about 90%. The loss occurs as spatter onto the plate and oxidation losses into the slag covering.

With iron powder added to the coating the metal recovery can be increased. Electrodes with a recovery factor above about 130% are normally termed "high recovery". A common high recovery figure is around 180%, but there are electrodes giving recoveries of up to 250%.

Elga's mild steel high recovery electrodes are called MAXETA.

| | | |
|------|-----------|------|
| e.g. | Maxeta 10 | 135% |
| | Maxeta 11 | 190% |
| | Maxeta 21 | 170% |
| | Maxeta 22 | 240% |

- Deposition Coefficient N: The weight of weld metal deposited in relation to the weight of electrode consumed.

For covered electrodes N is normally around 0.7 i.e. if you weld 1 kg of electrodes you end up with 0.7 kg of weld metal. N is useful when calculating the electrode consumption.

e.g. If 5 kg of weld metal is required to complete a given job, then the actual electrode consumption would be $5 \div 0.7 = 7.1$ kg

- Productivity: The weight of weld metal deposited per hour arc time

The higher the welding current that can be used on any job, the higher is the productivity. All deposition data given in this catalogue have been obtained using the maximum recommended current for the electrode. Use of a larger diameter electrode results in increased productivity as does using electrodes with iron powder in the coating.

| | | | |
|------|-----------|--------|----------------|
| e.g. | P 43 | Ø 3.25 | : H = 1.2 kg/h |
| | P 43 | Ø 5.0 | : H = 2.7 kg/h |
| | Maxeta 11 | Ø 3,25 | : H = 2.5 kg/h |
| | Maxeta 11 | Ø 5.0 | : H = 5.3 kg/h |

Cored Wires

The deposition coefficient for a cored wire varies between 0.85-0.95, depending on the different types i.e. deposition efficiency is between 85-95%. The exact efficiency figure for each cored wire is indicated on the respective product page in the catalogue, together with a deposition productivity diagram.

Solid Wires

The deposition coefficient for a solid wire is about 0.96.

Aluminium and aluminium alloys

Recommended MIG wires and TIG rods

| Parent metal Al. Assoc. | 7020 | 6082 | 6101,6060 6063,6005 | 5083 5056 | 5052 | 5005 | 3103 | 1050A 1445,1200 |
|------------------------------|--|------------------------------|------------------------------|--|------------------------------|------------------------------|------------------------------|------------------------------|
| 1050A 1445 1200 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 Mn | Si 5 Si 5 Si 5 Mg 5 | Si 5 Si 5 Si 5 Mg 5 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 Mn | Si 5 Si 5 Si 5 Mg 5 | Si 5 99.5 99.5 Mg 5 | Si 5 99.5 Si 5 99.5 | Si 5 99.5 Si 5 99.5 |
| 3103 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 Mn | Si 5 Si 5 Si 5 Mg 5 | Si 5 Si 5 Si 5 Mg 5 | Mg 5 Mg 5 Mg 5 – | Si 5 Mg 5 Si 5 Mg 5 | Mg 5 Mg 5 Mg 5 – | Si 5 99.5 Si 5 Si 5 | |
| 5005 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 Mn | Si 5 Si 5 Si 5 Mg 5 | Si 5 Si 5 Si 5 Mg 5 | Mg 5 Mg 5 Mn Mg 5 Mg 5 | Mg 5 Mg 5 Si 5 Mg 5 | Mg 3 Mg 3 Mg 3 Mg 3 | | |
| 5052 | Mg 5 Mn Mg 5 Mg 5 Mg 5 | Mg 5 Mg 5 Mg 5 Mg 5 | Mg 5 Mg 5 Mg 5 Mg 5 | Mg 5 Mn Mg 5 Mg 5 Mg 5 | Mg 5 Mg 3 Mg 5 Mg 5 | | | |
| 5083 5056 | Mg 5 Mn Mg 5 Mn Mg 5 Mg 5 | Mg 5 Mg 5 Mg 5 Mg 5 | Mg 5 Mg 5 Mg 5 Mg 5 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 | | | | |
| 6101 6060 6063 6005 | Mg 5 – Mg 5 Mg 5 | Si 5 Si 5 Si 5 – | Mg 5 Si 5 Si 5 Mg 5 | | | | | |
| 6082 | Mg 5 – Mg 5 Mg 5 | Si 5 Si 5 Si 5 Mg 5 | | | | | | |
| 2014 | Mg 5 – Mg 5 Mg 5 | | | | | | | |
| 7020 | Mg 5 Mn Mg 5 Mn Mg 5 Mn Mg 5 Mn | | | | | | | |

Read table as follows
 Row 1 Maximum strength
 Row 2 Maximum corrosion resistance
 Row 3 Best resistance to weld cracking
 Row 4 Best colour match after anodising

Guide to EN ISO 2560-A: MMA electrodes for non-alloyed and fine grain steels

| Symbol | Tensile Strength MPa | Yield Strength min. MPa | Elongation min. % |
|--------|----------------------|-------------------------|-------------------|
| 35 | 440-570 | 355 | 22 |
| 38 | 470-600 | 380 | 20 |
| 42 | 500-640 | 420 | 20 |
| 46 | 530-680 | 460 | 20 |
| 50 | 560-720 | 500 | 18 |

| Symbol | Welding position |
|--------|---|
| 1 | All positions |
| 2 | All positions, except vertical down |
| 3 | Flat butt weld, flat fillet weld, horizontal-vertical fillet weld |
| 4 | Flat butt weld, flat fillet weld |
| 5 | Vertical down and positions according to symbol 3 |

| Symbol | Metal recovery, % | Type of current |
|--------|-------------------|-----------------|
| 1 | ≤105 | AC + DC |
| 2 | ≤105 | DC |
| 3 | 105 ≤ 125 | AC + DC |
| 4 | 105 ≤ 125 | DC |
| 5 | 125 ≤ 160 | AC + DC |
| 6 | 125 ≤ 160 | DC |
| 7 | >160 | AC + DC |
| 8 | >160 | DC |

E 46

3

1Ni

B

5

4

H5

Covered electrode for manual metal arc welding.

| Symbol | Coating type |
|--------|-----------------------|
| A | Acid |
| B | Basic |
| C | Cellulosic |
| R | Rutile |
| RR | Rutile (thick coated) |
| RC | Rutile-Cellulosic |
| RA | Rutile-Acid |
| RB | Rutile-Basic |

| Symbol | Hydrogen content, ml/100 g deposited weld metal, max. |
|--------|---|
| H5 | 5 |
| H10 | 10 |
| H15 | 15 |

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |

| Symbol | Chemical composition of all-weld metal, % * | | |
|-----------|---|-----------|-----------|
| | Mn | Mo | Ni |
| No symbol | 2.0 | — | — |
| Mo | 1.4 | 0.3 - 0.6 | — |
| MnMo | 1.4 - 2.0 | 0.3 - 0.6 | — |
| 1Ni | 1.4 | — | 0.6 - 1.2 |
| 2Ni | 1.4 | — | 1.8 - 2.6 |
| 3Ni | 1.4 | — | 2.6 - 3.8 |
| Mn1Ni | 1.4 - 2.0 | — | 0.6 - 1.2 |
| 1NiMo | 1.4 | 0.3 - 0.6 | 0.6 - 1.2 |
| Z | Any other agreed composition | | |

* If not specified Mo <0.2, Ni <0.3, Cr <0.2, V <0.05, Nb <0.05, Cu <0.3
Single values shown in the table mean maximum values.

Guide to EN ISO 18275-A: MMA electrodes for high strength steels

| Symbol | Yield Strength min. N/mm ² | Tensile Strength N/mm ² | Elongation min. % |
|--------|--|---------------------------------------|----------------------|
| 55 | 550 | 610-780 | 18 |
| 62 | 620 | 690-890 | 18 |
| 69 | 690 | 760-960 | 17 |
| 79 | 790 | 880-1080 | 16 |
| 89 | 890 | 980-1180 | 15 |

| Symbol | Welding position |
|--------|---|
| 1 | All positions |
| 2 | All positions, except vertical down |
| 3 | Flat butt weld, flat fillet weld, horizontal-vertical fillet weld |
| 4 | Flat butt weld, flat fillet weld |
| 5 | Vertical down and positions according to symbol 3 |

| Symbol | Metal recovery, % | Type of current |
|--------|-------------------|-----------------|
| 1 | ≤105 | AC + DC |
| 2 | ≤105 | DC |
| 3 | >105 ≤125 | AC + DC |
| 4 | >105 ≤125 | DC |
| 5 | >125 ≤160 | AC + DC |
| 6 | >125 ≤160 | DC |
| 7 | >160 | AC + DC |
| 8 | >160 | DC |

Indicates mechanical properties after stress relief treatment.

E 62 7 MnNi B 3 4 H5 T

Covered electrode/
manual metal arc
welding.

Only basic electrode
covering.

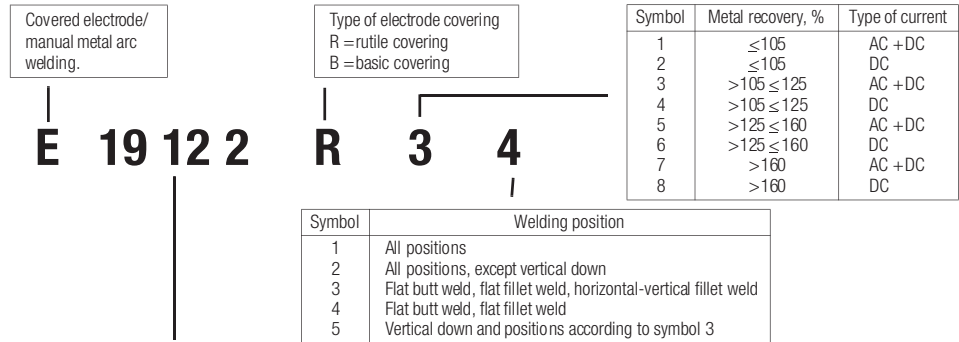
| Symbol | Hydrogen content, ml/100 g deposited weld metal, max. |
|--------|---|
| H5 | 5 |
| H10 | 10 |
| H15 | 15 |

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |
| 7 | -70 |
| 8 | -80 |

| Symbol | Chemical composition of all-weld metal, % * | | | |
|------------|---|-----------|-----------|-----------|
| | Mn | Ni | Cr | Mo |
| MnMo | 1.4 - 2.0 | — | — | 0.3 - 0.6 |
| Mn1Ni | 1.4 - 2.0 | 0.6 - 1.2 | — | — |
| 1NiMo | 1.4 | 0.6 - 1.2 | — | 0.3 - 0.6 |
| 1.5NiMo | 1.4 | 1.2 - 1.8 | — | 0.3 - 0.6 |
| 2NiMo | 1.4 | 1.8 - 2.6 | — | 0.3 - 0.6 |
| Mn1NiMo | 1.4 - 2.0 | 0.6 - 1.2 | — | 0.3 - 0.6 |
| Mn2NiMo | 1.4 - 2.0 | 1.8 - 2.6 | — | 0.3 - 0.6 |
| Mn2NiCrMo | 1.4 - 2.0 | 1.8 - 2.6 | 0.3 - 0.6 | 0.3 - 0.6 |
| Mn2Ni1CrMo | 1.4 - 2.0 | 1.8 - 2.6 | 0.6 - 1.0 | 0.3 - 0.6 |
| Z | Any other agreed composition | | | |

* If not specified C 0.03-0.10, Ni <0.3, Cr <0.2, Mo <0.2, V <0.05, Nb <0.05, Cu <0.3, P <0.025, S <0.020, Si <0.80.
Single values shown in the table are maximum values.

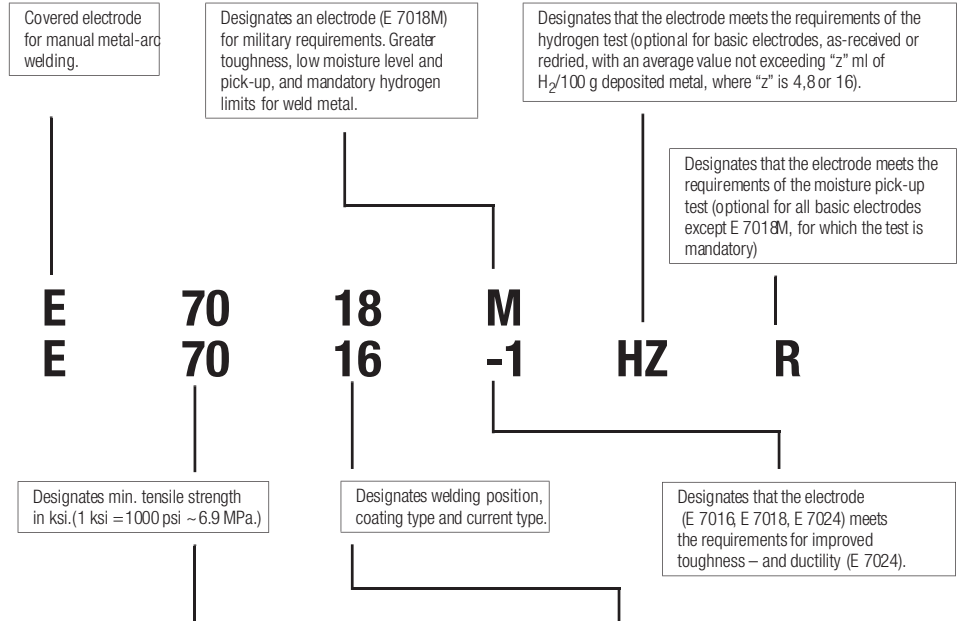
Guide to EN ISO 3581-A: MMA electrodes for stainless and heat resisting steels



| Alloy Symbol | Chemical composition of all-weld metal, % * | | | | | | | | |
|--|---|-----|---------|-------|-------|-----------|-----------|---------|----------------------------|
| | C | Si | Mn | P | S | Cr | Ni | Mo | Other elements |
| Martensitic/ferritic | | | | | | | | | |
| 13 | 0.12 | 1.0 | 1.5 | 0.030 | 0.025 | 11.0-14.0 | 0.60 | 0.75 | Cu 0.75 |
| 13 4 | 0.06 | 1.0 | 1.5 | 0.030 | 0.025 | 11.0-14.5 | 3.0-5.0 | 0.4-1.0 | Cu 0.75 |
| 17 | 0.12 | 1.0 | 1.5 | 0.030 | 0.025 | 16.0-18.0 | 0.60 | 0.75 | Cu 0.75 |
| Austenitic | | | | | | | | | |
| 199 | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.75 | Cu 0.75 |
| 199 L | 0.04 | 1.2 | 2.0 | 0.030 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.75 | Cu 0.75 |
| 199 Nb | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.75 | Cu 0.75, Ta+Nb 8 x C < 1.1 |
| 19 12 2 | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 17.0-20.0 | 10.0-13.0 | 2.0-3.0 | Cu 0.75 |
| 19 12 3 L | 0.04 | 1.2 | 2.0 | 0.030 | 0.025 | 17.0-20.0 | 10.0-13.0 | 2.5-3.0 | Cu 0.75 |
| 19 12 3 Nb | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 17.0-20.0 | 10.0-13.0 | 2.5-3.0 | Cu 0.75, Ta+Nb 8 x C < 1.1 |
| 19 13 4 N L | 0.04 | 1.2 | 1.0-5.0 | 0.030 | 0.025 | 17.0-20.0 | 12.0-15.0 | 3.0-4.5 | Cu 0.75, N 0.20 |
| Austenitic-ferritic. High corrosion resistance. | | | | | | | | | |
| 22 9 3 N L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 21.0-24.0 | 7.5-10.5 | 2.5-4.0 | Cu 0.75, N 0.08-0.20 |
| 25 7 2 N L | 0.04 | 1.2 | 2.0 | 0.035 | 0.025 | 24.0-28.0 | 6.0-8.0 | 1.0-3.0 | Cu 0.75, N 0.20 |
| 25 9 3 Cu N L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 24.0-27.0 | 7.5-10.5 | 2.5-4.0 | N 0.10-0.25, Cu 1.5-3.5 |
| 25 9 4 N L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 24.0-27.0 | 8.0-11.0 | 2.5-4.5 | N 0.20-0.30, Cu 1.5, W 1.0 |
| Fully austenitic. High corrosion resistance. | | | | | | | | | |
| 18 15 3 L | 0.04 | 1.2 | 1.0-4.0 | 0.030 | 0.025 | 16.5-19.5 | 14.0-17.0 | 2.5-3.5 | Cu 0.75 |
| 18 16 5 N L | 0.04 | 1.2 | 1.0-4.0 | 0.035 | 0.025 | 17.0-20.0 | 15.5-19.0 | 3.5-5.0 | Cu 0.75, N 0.20 |
| 20 25 5 Cu N L | 0.04 | 1.2 | 1.0-4.0 | 0.030 | 0.025 | 19.0-22.0 | 24.0-27.0 | 4.0-7.0 | Cu 1.0-2.0, N 0.25 |
| 20 16 3 Mn N L | 0.04 | 1.2 | 5.0-8.0 | 0.035 | 0.025 | 18.0-21.0 | 15.0-18.0 | 2.5-3.5 | Cu 0.75, N 0.20 |
| 25 22 2 N L | 0.04 | 1.2 | 1.0-5.0 | 0.030 | 0.025 | 24.0-27.0 | 20.0-23.0 | 2.0-3.0 | Cu 0.75, N 0.20 |
| 27 31 4 Cu L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 26.0-29.0 | 30.0-33.0 | 3.0-4.5 | Cu 0.6-1.5 |
| Special types | | | | | | | | | |
| 18 8 Mn | 0.20 | 1.2 | 4.5-7.5 | 0.035 | 0.025 | 17.0-20.0 | 7.0-10.0 | 0.75 | Cu 0.75 |
| 18 9 Mn Mo | 0.04-0.14 | 1.2 | 3.0-5.0 | 0.035 | 0.025 | 18.0-21.5 | 9.0-11.0 | 0.5-1.5 | Cu 0.75 |
| 20 10 3 | 0.10 | 1.2 | 2.5 | 0.030 | 0.025 | 18.0-21.0 | 9.0-12.0 | 1.5-3.5 | Cu 0.75 |
| 23 12 L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 22.0-25.0 | 11.0-14.0 | 0.75 | Cu 0.75 |
| 23 12 Nb | 0.10 | 1.2 | 2.5 | 0.030 | 0.025 | 22.0-25.0 | 11.0-14.0 | 0.75 | Cu 0.75, Ta+Nb 8 x C < 1.1 |
| 23 12 2 L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 22.0-25.0 | 11.0-14.0 | 2.0-3.0 | Cu 0.75 |
| 29 9 | 0.15 | 1.2 | 2.5 | 0.035 | 0.025 | 27.0-31.0 | 8.0-12.0 | 0.75 | Cu 0.75 |
| Heat resisting types | | | | | | | | | |
| 16 8 2 | 0.08 | 0.6 | 2.5 | 0.030 | 0.025 | 14.5-16.5 | 7.5-9.5 | 1.5-2.5 | Cu 0.75 |
| 19 9 H | 0.04-0.08 | 1.2 | 2.0 | 0.03 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.75 | Cu 0.75 |
| 25 4 | 0.15 | 1.2 | 2.5 | 0.030 | 0.025 | 24.0-27.0 | 4.0-6.0 | 0.75 | Cu 0.75 |
| 22 12 | 0.15 | 1.2 | 2.5 | 0.030 | 0.025 | 20.0-23.0 | 10.0-13.0 | 0.75 | Cu 0.75 |
| 25 20 | 0.06-0.20 | 1.2 | 1.0-5.0 | 0.030 | 0.025 | 23.0-27.0 | 18.0-22.0 | 0.75 | Cu 0.75 |
| 25 20 H | 0.35-0.45 | 1.2 | 2.5 | 0.030 | 0.025 | 23.0-27.0 | 18.0-22.0 | 0.75 | Cu 0.75 |
| 18 36 | 0.25 | 1.2 | 2.5 | 0.030 | 0.025 | 14.0-18.0 | 33.0-37.0 | 0.75 | Cu 0.75 |

* Single values shown in the table are maximum values.

Guide to AWS A5.1: Carbon steel electrodes for SMAW



| AWS Classification | Tensile Strength min. | | Yield Strength min. | | Elongation min. % | Impact Energy Charpy-V J/°C | Welding Position | Type of coating | Type of Current | |
|--------------------|-----------------------|-----|---------------------|-----------|-------------------|-----------------------------|------------------|-----------------------|-----------------|------------|
| | ksi | MPa | ksi | MPa | | | | | AC | DC |
| E 6010 | 60 | 430 | 48 | 330 | 22 | 27 / -30 | 1 | Cellulosic | - | + pol |
| E 6011 | 60 | 430 | 48 | 330 | 22 | 27 / -30 | 1 | Cellulosic | x | + pol |
| E 6012 | 60 | 430 | 48 | 330 | 17 | Not spec. | 1 | Rutile | x | - pol |
| E 6013 | 60 | 430 | 48 | 330 | 17 | Not spec. | 1 | Rutile | x | +/- pol |
| E 6019 | 60 | 430 | 48 | 330 | 22 | 27 / -20 | 1 | Rutile/Acid | x | +/- pol |
| E 6020 | 60 | 430 | 48 | 330 | 22 | Not spec. | 2 | Acid | x | c) +/- pol |
| E 6022 | 60 | 430 | Not spec. | Not spec. | Not spec. | Not spec. | 2 | Acid | x | - pol |
| E 6027 | 60 | 430 | 48 | 330 | 22 | 27 / -30 | 2 | Acid, high recovery | x | c) +/- pol |
| E 7014 | 70 | 490 | 58 | 400 | 17 | Not spec. | 1 | Rutile | x | +/- pol |
| E 7015 | 70 | 490 | 58 | 400 | 22 | 27 / -30 | 1 | Basic | - | + pol |
| E 7016 | 70 | 490 | 58 | 400 | 22 | 27 / -30 | 1 | Basic | x | + pol |
| E 7018 | 70 | 490 | 58 | 400 | 22 | 27 / -30 | 1 | Basic | x | + pol |
| E 7018 M | a) | 490 | b) | b) | 24 | 67 / -30 | 1 | Basic | - | + pol |
| E 7024 | 70 | 490 | 58 | 400 | 17 | Not spec. | 2 | Rutile, high recovery | x | +/- pol |
| E 7027 | 70 | 490 | 58 | 400 | 22 | 27 / -30 | 2 | Acid, high recovery | x | c) +/- pol |
| E 7028 | 70 | 490 | 58 | 400 | 22 | 27 / -20 | 2 | Basic, high recovery | x | + pol |
| E 7048 | 70 | 490 | 58 | 400 | 22 | 27 / -30 | 4 | Basic | x | + pol |

- a) Nominal value 70 ksi (490 MPa)
- b) Limits are 53-72 ksi (365-496 MPa)
For Ø 2,4 mm the limit is max. 77 ksi (530 MPa)
- c) H-V fillets: - pol

In addition there are requirements on:

- Chemical composition of the weld metal
- Radiographic tests

| Code | Welding position |
|------|--|
| 1 | All positions except vertical-down |
| 2 | Flat and H-V fillets |
| 4 | All positions but in the vertical, V-down only |

Guide to AWS A5.4: Stainless steel electrodes for SMAW

Covered electrode for manual metal-arc welding.

E 308 -17_

Indicates Compositional type.

| Suffix | Coating type and usability characteristics |
|--------|---|
| -15 | For use with DC+ only. Usually basic coating. All positions. |
| -16 | For use with DC+ and AC. Rutile coating. All positions. |
| -17 | As for -16, but higher silica content in coating gives following: <ul style="list-style-type: none"> • More of a spray arc and finer rippled bead surface in H-V fillets. • Slower freezing slag permits improved handling with a drag technique. • Mitre to slight concave H-V fillets • When making vertical-up fillets the slower freezing slag requires slight weave to produce flat profile. |
| -25 | Same coating and type as for -15 but with a mild steel core wire. Flat and horizontal positions only. |
| -26 | Same coating and type as for -16 but with a mild steel core wire. Flat and horizontal positions only. |

| AWS Classification | Chemical composition of undiluted weld metal | | | | | | | | | | | Other elements |
|--------------------|--|-------------|-----------|-----------|-----------------------|-----------|------|-------|-------|-----------|-----------|---|
| | C | Cr | Ni | Mo | Nb + Ta | Mn | Si | P | S | N | Cu | |
| E209-xx | 0.06 | 20.5-24.0 | 9.5-12.0 | 1.5-3.0 | - | 4.0-7.0 | 1.00 | 0.04 | 0.03 | 0.10-0.30 | 0.75 | V 0.1-0.3 |
| E219-xx | 0.06 | 19.0-21.5 | 5.5-7.0 | 0.75 | - | 8.0-10.0 | 1.00 | 0.04 | 0.03 | 0.10-0.30 | 0.75 | |
| E240-xx | 0.06 | 17.0-19.0 | 4.0-6.0 | 0.75 | - | 10.5-13.5 | 1.00 | 0.04 | 0.03 | 0.10-0.30 | 0.75 | |
| E307-xxx | 0.04-0.14 | 18.0-21.5 | 9.0-10.7 | 0.5-1.5 | - | 3.30-4.75 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E308-xx | 0.08 | 18.0-21.0 | 9.0-11.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E308H-xx | 0.04-0.08 | 18.0-21.0 | 9.0-11.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E308L-xx | 0.04 | 18.0-21.0 | 9.0-11.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E308Mo-xx | 0.08 | 18.0-21.0 | 9.0-12.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E308LMo-xx* | 0.04 | 18.0-21.0 | 9.0-12.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309-xx | 0.15 | 22.0-25.0 | 12.0-14.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309H-xx | 0.04-0.15 | 22.0-25.0 | 12.0-14.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309L-xx | 0.04 | 22.0-25.0 | 12.0-14.0 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309Nb-xx | 0.12 | 22.0-25.0 | 12.0-14.0 | 0.75 | 0.70-1.00 | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309Mo-xx | 0.12 | 22.0-25.0 | 12.0-14.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E309LMo-xx* | 0.04 | 22.0-25.0 | 12.0-14.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E310-xx | 0.08-0.20 | 25.0-28.0 | 20.0-22.5 | 0.75 | - | 1.0-2.5 | 0.75 | 0.03 | 0.03 | - | 0.75 | |
| E310H-xx | 0.35-0.45 | 25.0-28.0 | 20.0-22.5 | 0.75 | - | 1.0-2.5 | 0.75 | 0.03 | 0.03 | - | 0.75 | |
| E310Nb-xx | 0.12 | 25.0-28.0 | 20.0-22.0 | 0.75 | 0.70-1.00 | 1.0-2.5 | 0.75 | 0.03 | 0.03 | - | 0.75 | |
| E310Mo-xx | 0.12 | 25.0-28.0 | 20.0-22.0 | 2.0-3.0 | - | 1.0-2.5 | 0.75 | 0.03 | 0.03 | - | 0.75 | |
| E312-xx | 0.15 | 28.0-32.0 | 8.0-10.5 | 0.75 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E316-xx | 0.08 | 17.0-20.0 | 11.0-14.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E316H-xx | 0.04-0.08 | 17.0-20.0 | 11.0-14.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E316L-xx | 0.04 | 17.0-20.0 | 11.0-14.0 | 2.0-3.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E316LMn-xx | 0.04 | 18.0-21.0 | 15.0-18.0 | 2.5-3.5 | - | 5.0-8.0 | 0.9 | 0.04 | 0.03 | 0.10-0.25 | 0.75 | |
| E317-xx | 0.08 | 18.0-21.0 | 12.0-14.0 | 3.0-4.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E317L-xx | 0.04 | 18.0-21.0 | 12.0-14.0 | 3.0-4.0 | - | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E318-xx | 0.08 | 17.0-20.0 | 11.0-14.0 | 2.0-3.0 | 6xC _≤ 1.00 | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E320-xx | 0.07 | 19.0-21.0 | 32.0-36.0 | 2.0-3.0 | 8xC _≤ 1.00 | 0.5-2.5 | 0.60 | 0.04 | 0.03 | - | 3.0-4.0 | |
| E320LR-xx | 0.03 | 19.0-21.0 | 32.0-36.0 | 2.0-3.0 | 8xC _≤ 0.40 | 1.50-2.50 | 0.30 | 0.020 | 0.015 | - | 3.0-4.0 | |
| E330-xx | 0.18-0.25 | 14.0-17.0 | 33.0-37.0 | 0.75 | - | 1.0-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E330H-xx | 0.35-0.45 | 14.0-17.0 | 33.0-37.0 | 0.75 | - | 1.0-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E347-xx | 0.08 | 18.0-21.0 | 9.0-11.0 | 0.75 | 8xC _≤ 1.00 | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E349-xx | 0.13 | 18.0-21.0 | 8.0-10.0 | 0.35-0.65 | 0.75-1.20 | 0.5-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | V 0.1-0.3Ti _≤ 0.15, W1.25-1.75 |
| E383-xx | 0.03 | 26.5-29.0 | 30.0-33.0 | 3.2-4.2 | - | 0.5-2.5 | 0.90 | 0.02 | 0.02 | - | 0.6-1.5 | |
| E385-xx | 0.03 | 19.5-21.5 | 24.0-26.0 | 4.2-5.2 | - | 1.0-2.5 | 0.90 | 0.03 | 0.02 | - | 1.2-2.0 | |
| E409Nb-xx | 0.12 | 11.0-14.0 | 0.6 | 0.75 | 0.50-1.50 | 1.0 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E410-xx | 0.12 | 11.0-13.5 | 0.7 | 0.75 | - | 1.0 | 0.90 | 0.04 | 0.03 | - | 0.75 | |
| E410NiMo-xx | 0.06 | 11.0-12.5 | 4.0-5.0 | 0.40-0.70 | - | 1.0 | 0.90 | 0.04 | 0.03 | - | 0.75 | |
| E430-xx | 0.10 | 15.0-18.0 | 0.6 | 0.75 | - | 1.0 | 0.90 | 0.04 | 0.03 | - | 0.75 | |
| E430Nb-xx | 0.10 | 15.0-18.0 | 0.6 | 0.75 | 0.50-1.50 | 1.0 | 1.00 | 0.04 | 0.03 | - | 0.75 | |
| E630-xx | 0.05 | 16.00-16.75 | 4.5-5.0 | 0.75 | 0.15-0.30 | 0.25-0.75 | 0.75 | 0.04 | 0.03 | - | 3.25-4.00 | |
| E16-8-2-xx | 0.10 | 14.5-16.5 | 7.5-9.5 | 1.0-2.0 | - | 0.5-2.5 | 0.60 | 0.03 | 0.03 | - | 0.75 | |
| E2209-xx | 0.04 | 21.5-23.5 | 8.5-10.5 | 2.5-3.5 | - | 0.5-2.0 | 1.00 | 0.04 | 0.03 | 0.08-0.20 | 0.75 | |
| E2553-xx | 0.06 | 24.0-27.0 | 6.5-8.5 | 2.9-3.9 | - | 0.5-1.5 | 1.00 | 0.04 | 0.03 | 0.10-0.25 | 1.5-2.5 | |
| E2593-xx | 0.04 | 24.0-27.0 | 8.5-10.5 | 2.9-3.9 | - | 0.5-1.5 | 1.00 | 0.04 | 0.03 | 0.08-0.25 | 1.5-3.0 | |
| E2594-xx | 0.04 | 24.0-27.0 | 8.0-10.5 | 3.5-4.5 | - | 0.5-2.0 | 1.00 | 0.04 | 0.03 | 0.20-0.30 | 0.75 | |
| E2595-xx | 0.04 | 24.0-27.0 | 8.0-10.5 | 2.5-4.5 | - | 2.5 | 1.2 | 0.03 | 0.025 | 0.20-0.30 | 0.4-1.5 | W 0.4-1.0 |
| E3155-xx | 0.10 | 20.0-22.5 | 19.0-21.0 | 2.5-3.5 | 0.75-1.25 | 1.0-2.5 | 1.00 | 0.04 | 0.03 | - | 0.75 | Co 18.5-21.0, W 2.0-3.0 |
| E33-31-xx | 0.03 | 31.0-35.0 | 30.0-32.0 | 1.0-2.0 | - | 2.5-4.0 | 0.9 | 0.02 | 0.01 | 0.3-0.5 | 0.4-0.8 | |

* Earlier E308MoL-xx and E309MoL-xx

Guide to AWS A5.5: Low alloy steel electrodes for SMAW

Covered electrode for manual metal-arc welding.

Designates welding position, coating type and current type.

E 80 16 -D3

Designates min. tensile strength in ksi.
(1 ksi = 1000 psi ~ 6.9 MPa)

Designates chemical composition of weld metal.

| AWS Classification | Welding Position | Type of coating | Type of Current | |
|--------------------|------------------|---------------------|-----------------|------------|
| | | | AC | DC |
| E xx10 | 1 | Cellulosic | - | +pol |
| E xx11 | 1 | Cellulosic | x | +pol |
| E xx13 | 1 | Rutile | x | +/- pol |
| E xx15 | 1 | Basic | - | +pol |
| E xx16 | 1 | Basic | x | +pol |
| E xx18 | 1 | Basic, iron powder | x | +pol |
| E xx20 | 2 | Acid | x | c) +/- pol |
| E xx27 | 2 | Acid, high recovery | x | c) +/- pol |

c) Kålsvets liggande endast -pol

| Code | Welding position |
|------|------------------------------------|
| 1 | All positions except vertical-down |
| 2 | Flat and H-V fillets |

| AWS Classification | Tensile Strength min. MPa | Yield Strength min. Mpa |
|--------------------|---------------------------|-------------------------|
| E 70xx-x | 490 | 390 |
| E 70xx-BL2 | 520 | 390 |
| E 70xx-P1 | 490 | 415 |
| E 70xx-W1 | 490 | 415 |
| E 80xx-x | 550 | 460 |
| E 80xx-C3 | 550 | 470-550 |
| E 90xx-x | 620 | 530 |
| E 90xx-M | 620 | 540-620 |
| E 100xx-x | 690 | 600 |
| E 100xx-M | 690 | 610-690 |
| E 110xx-x | 760 | 670 |
| E 110xx-M | 760 | 680-760 |
| E 120xx-x | 830 | 740 |
| E 120xx-M | 830 | 745-830 |
| E 120xx-M1 | 830 | 745-830 |

| AWS Classification | Impact Energy | |
|--------------------|---------------|-----------|
| | min. J | °C |
| E 7010-P1 | 27 | -30 |
| E 8010-P1 | 27 | -30 |
| E 8018-P2 | 27 | -30 |
| E 8045-P2 | 27 | -30 |
| E 9010-P1 | 27 | -30 |
| E 9018-P2 | 27 | -30 |
| E 9045-P2 | 27 | -30 |
| E 10045-P2 | 27 | -30 |
| E 8018-NM1 | 27 | -40 |
| E 8016-C3 | 27 | -40 |
| E 8018-C3 | 27 | -40 |
| E 7018-C3L | 27 | -50 |
| E 8016-C4/D3 | 27 | -50 |
| E 8018-C4/D3 | 27 | -50 |
| E 9015-D1 | 27 | -50 |
| E 9018-D1/D3 | 27 | -50 |
| E 10015-D2 | 27 | -50 |
| E 10016-D2 | 27 | -50 |
| E 10018-D2 | 27 | -50 |
| E 9018-M | 27 | -50 |
| E 10018-M | 27 | -50 |
| E 11018-M | 27 | -50 |
| E 12018-M | 27 | -50 |
| E 12018-M1 | 67 | -20 |
| E 7018-W1 | 27 | -20 |
| E 8018-W2 | 27 | -20 |
| E 8016-C1 | 27 | -60 |
| E 8018-C1 | 27 | -60 |
| E 7015-C1L | 27 | -75 |
| E 7016-C1L | 27 | -75 |
| E 7018-C1L | 27 | -75 |
| E 8016-C2 | 27 | -75 |
| E 8018-C2 | 27 | -75 |
| E 7015-C2L | 27 | -100 |
| E 7016-C2L | 27 | -100 |
| E 7018-C2L | 27 | -100 |
| E 9015-C5L | 27 | -115 |
| E XXXX-A1/BX/BXL | Not spec. | Not spec. |
| E (X)XX-G | Not spec. | Not spec. |

| Suffix | Alloying system | Nominal values, wt% |
|----------|--------------------------------------|-------------------------|
| -A1 | C / Mo | ~0.1/ 0.5 |
| -B1 | Cr / Mo | ~0.5/ 0.5 |
| -B2 | Cr / Mo | ~1.3/ 0.5 |
| -B2L* | Cr / Mo | ~1.3/ 0.5 |
| -B3 | Cr / Mo | ~2.3/ 1.0 |
| -B3L* | Cr / Mo | ~2.3/ 1.0 |
| -B4L* | Cr / Mo | ~2.0/ 0.5 |
| -B5 | Cr / Mo / V | ~0.5/ 1.0/ 0.05 |
| -C1 | Ni | ~2.5 |
| -C1L* | Ni | ~2.5 |
| -C2 | Ni | ~3.5 |
| -C2L* | Ni | ~3.5 |
| -C3 | Ni / Cr / Mo / V | ~1.0 / 0.1 / 0.3 / 0.05 |
| -NM | Ni / Mo | ~1.0/ 0.5 |
| -D1 | Mn / Mo | ~1.5/ 0.3 |
| -D2 | Mn / Mo | ~1.8/ 0.3 |
| -D3 | Mn / Mo | ~1.5/ 0.5 |
| -G/-M/-W | All other low alloy steel electrodes | |

* C max. 0.05%

Guide to EN ISO 14341: Wire electrodes and deposits for gas shielded metal arc welding of non-alloy and fine grain steels

| Symbol | Yield Strength min. Mpa | Tensile Strength MPa | Elongation min. % |
|--------|-------------------------|----------------------|-------------------|
| 35 | 355 | 440-570 | 22 |
| 38 | 380 | 470-600 | 20 |
| 42 | 420 | 500-640 | 20 |
| 46 | 460 | 530-680 | 20 |
| 50 | 500 | 560-720 | 18 |

| Symbol | Shielding gas |
|--------|--|
| M | EN ISO 14175 Mixed gas without helium |
| C | EN ISO 14175 Carbon dioxide |

G 46 3 M G3Si1

Wire electrode and /or deposit/ gas shielded metal arc welding.

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |

| Symbol | Chemical composition of wire electrodes * | | | | | | | | |
|--------|---|-------------|-------------|-------|-------|-----------|-----------|-----------|-----------|
| | C | Si | Mn | P | S | Ni | Mo | Al | Ti + Zr |
| G2Si | 0.06 - 0.14 | 0.50 - 0.80 | 0.90 - 1.30 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| G3Si1 | 0.06 - 0.14 | 0.70 - 1.00 | 1.30 - 1.60 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| G4Si1 | 0.06 - 0.14 | 0.80 - 1.20 | 1.60 - 1.90 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| G3Si2 | 0.06 - 0.14 | 1.00 - 1.30 | 1.30 - 1.60 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| G2Ti | 0.04-0.14 | 0.40-0.80 | 0.90-1.40 | 0.025 | 0.025 | 0.15 | 0.15 | 0.05-0.20 | 0.05-0.25 |
| G3Ni1 | 0.06-0.14 | 0.50-0.90 | 1.00-1.60 | 0.020 | 0.020 | 0.80-1.50 | 0.15 | 0.02 | 0.15 |
| G2Ni2 | 0.06-0.14 | 0.40-0.80 | 0.80-1.40 | 0.020 | 0.020 | 2.10-2.70 | 0.15 | 0.02 | 0.15 |
| G2Mo | 0.08-0.12 | 0.30-0.70 | 0.90-1.30 | 0.020 | 0.020 | 0.15 | 0.40-0.60 | 0.02 | 0.15 |
| G4Mo | 0.06-0.14 | 0.50-0.80 | 1.70-2.10 | 0.025 | 0.025 | 0.15 | 0.40-0.60 | 0.02 | 0.15 |
| G2Al | 0.08-0.14 | 0.30-0.50 | 0.90-1.30 | 0.025 | 0.025 | 0.15 | 0.15 | 0.35-0.75 | 0.15 |

* If not specified Cr ≤ 0.15, Cu ≤ 0.35, V ≤ 0.03. Residual copper content in the steel plus any coating shall not exceed 0.35%
Single values shown in the table mean maximum values.

Guide to EN ISO 636-A: Rods, wires and deposits for tungsten inert gas welding of non-alloy and fine grain steels

| Symbol | Yield Strength min. Mpa | Tensile Strength MPa | Elongation min. % |
|--------|----------------------------|-------------------------|----------------------|
| 35 | 355 | 440-570 | 22 |
| 38 | 380 | 470-600 | 20 |
| 42 | 420 | 500-640 | 20 |
| 46 | 460 | 530-680 | 20 |
| 50 | 500 | 560-720 | 18 |

W 46 3 W3Si1

Wire electrode and
/or deposit/ gas shielded
metal arc welding.

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |

| Symbol | Chemical composition of wire electrodes * | | | | | | | | |
|--------|---|-------------|-------------|-------|-------|-----------|-----------|-----------|-----------|
| | C | Si | Mn | P | S | Ni | Mo | Al | Ti + Zr |
| W2Si | 0.06 - 0.14 | 0.50 - 0.80 | 0.90 - 1.30 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| W3Si1 | 0.06 - 0.14 | 0.70 - 1.00 | 1.30 - 1.60 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| W4Si1 | 0.06 - 0.14 | 0.80 - 1.20 | 1.60 - 1.90 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| W3Si2 | 0.06 - 0.14 | 1.00 - 1.30 | 1.30 - 1.60 | 0.025 | 0.025 | 0.15 | 0.15 | 0.02 | 0.15 |
| W2Ti | 0.04-0.14 | 0.40-0.80 | 0.90-1.40 | 0.025 | 0.025 | 0.15 | 0.15 | 0.05-0.20 | 0.05-0.25 |
| W3Ni1 | 0.06-0.14 | 0.50-0.90 | 1.00-1.60 | 0.020 | 0.020 | 0.80-1.50 | 0.15 | 0.02 | 0.15 |
| W2Ni2 | 0.06-0.14 | 0.40-0.80 | 0.80-1.40 | 0.020 | 0.020 | 2.10-2.70 | 0.15 | 0.02 | 0.15 |
| W2Mo | 0.08-0.12 | 0.30-0.70 | 0.90-1.30 | 0.020 | 0.020 | 0.15 | 0.40-0.60 | 0.02 | 0.15 |
| W4Mo | 0.06-0.14 | 0.50-0.80 | 1.70-2.10 | 0.025 | 0.025 | 0.15 | 0.40-0.60 | 0.02 | 0.15 |
| W2Al | 0.08-0.14 | 0.30-0.50 | 0.90-1.30 | 0.025 | 0.025 | 0.15 | 0.15 | 0.35-0.75 | 0.15 |

* If not specified Cr ≤ 0.15, Cu ≤ 0.35, V ≤ 0.03. Residual copper content in the steel plus any coating shall not exceed 0.35%
Single values shown in the table mean maximum values.

Guide to EN ISO 16834-A: Wire electrodes, wires, rods and deposits for gas-shielded arc welding of high strength steels

| Symbol | Yield Strength min. MPa | Tensile Strength MPa | Elongation min. % |
|--------|-------------------------|----------------------|-------------------|
| 55 | 550 | 640-820 | 18 |
| 62 | 620 | 700-890 | 18 |
| 69 | 690 | 770-940 | 17 |
| 79 | 790 | 880-1080 | 16 |
| 89 | 890 | 940-1180 | 15 |

| Symbol | Shielding gas |
|--------|---|
| M | ISO 14175-M21 Mixed gas without helium |
| C | ISO 14175-C1 Carbon dioxide |
| A | Ar + 1-5% O ₂ |

G 62 6 M G4Ni1Mo

Wire electrode and /or deposit/ gas shielded metal arc welding.

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |

| Symbol | Chemical composition of wire electrodes * | | | | | | | | | |
|--------------|---|-----------|-----------|-------|-------|-----------|-----------|-----------|-----------|-------------|
| | C | Si | Mn | P | S | Ni | Cr | Mo | Cu | Total other |
| Mn3NiCrMo | 0.14 | 0.60-0.80 | 1.30-1.80 | 0.015 | 0.018 | 0.50-0.65 | 0.40-0.65 | 0.15-0.30 | 0.30 | 0.25 |
| Mn3Ni1CrMo | 0.12 | 0.40-0.70 | 1.30-1.80 | 0.015 | 0.018 | 1.20-1.60 | 0.20-0.40 | 0.20-0.30 | 0.35 | 0.25** |
| Mn3Ni1Mo | 0.12 | 0.40-0.80 | 1.30-1.90 | 0.015 | 0.018 | 0.80-1.30 | 0.15 | 0.25-0.65 | 0.30 | 0.25 |
| Mn3Ni1,5Mo | 0.08 | 0.20-0.60 | 1.30-1.80 | 0.015 | 0.018 | 1.40-2.10 | 0.15 | 0.25-0.55 | 0.30 | 0.25 |
| Mn3Ni1Cu | 0.12 | 0.20-0.60 | 1.20-1.80 | 0.015 | 0.018 | 0.80-1.25 | 0.15 | 0.20 | 0.30-0.65 | 0.25 |
| Mn3Ni1MoCu | 0.12 | 0.20-0.60 | 1.20-1.80 | 0.015 | 0.018 | 0.80-1.25 | 0.15 | 0.20-0.55 | 0.30-0.65 | 0.25 |
| Mn3Ni2,5CrMo | 0.12 | 0.40-0.70 | 1.30-1.80 | 0.015 | 0.018 | 2.30-2.80 | 0.20-0.60 | 0.30-0.65 | 0.30 | 0.25 |
| Mn4Ni1Mo | 0.12 | 0.50-0.80 | 1.60-2.10 | 0.015 | 0.018 | 0.80-1.25 | 0.15 | 0.20-0.55 | 0.30 | 0.25 |
| Mn4Ni2Mo | 0.12 | 0.25-0.60 | 1.60-2.10 | 0.015 | 0.018 | 2.00-2.60 | 0.15 | 0.30-0.65 | 0.30 | 0.25 |
| Mn4Ni1,5CrMo | 0.12 | 0.50-0.80 | 1.60-2.10 | 0.015 | 0.018 | 1.30-1.90 | 0.15-0.40 | 0.30-0.65 | 0.30 | 0.25 |
| Mn4Ni2CrMo | 0.12 | 0.60-0.90 | 1.60-2.10 | 0.015 | 0.018 | 1.80-2.30 | 0.20-0.45 | 0.45-0.70 | 0.30 | 0.25 |
| Mn4Ni2,5CrMo | 0.13 | 0.50-0.80 | 1.60-2.10 | 0.015 | 0.018 | 2.30-2.80 | 0.20-0.60 | 0.30-0.65 | 0.30 | 0.25 |

* If not specified Ti ≤ 0.10, Zr ≤ 0.10, Al ≤ 0.12, V ≤ 0.03. Residual copper content in the steel plus any coating shall comply with stated value.

Single values shown in the table mean maximum values.

** V = 0.05-0.013

Guide to ISO 17632-A: Cored wires for non-alloy and fine grain steels

| Symbol | Yield Strength min. MPa | Tensile Strength MPa | Elongation min. % |
|--------|-------------------------|----------------------|-------------------|
| 35 | 355 | 440-570 | 22 |
| 38 | 380 | 470-600 | 20 |
| 42 | 420 | 500-640 | 20 |
| 46 | 460 | 530-680 | 20 |
| 50 | 500 | 560-720 | 18 |

| Symbol | Welding position |
|--------|---|
| 1 | All positions |
| 2 | All positions, except vertical down |
| 3 | Flat butt weld, flat fillet weld, horizontal-vertical fillet weld |
| 4 | Flat butt weld, flat fillet weld |
| 5 | Vertical down and positions according to symbol 3 |

Tubular cored electrode/ metal arc welding

| Symbol | Impact Energy Charpy-V Temp °C for 47J min. |
|--------|---|
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |

| Symbol | Shielding gas |
|--------|--|
| M | EN ISO 14175 Mixed gas without helium |
| C | EN ISO 14175 Carbon dioxide |

T 46 3 1Ni B M 4 H5

| Symbol | Chemical composition of all-weld metal, % * | | |
|-----------|---|-----------|-----------|
| | Mn | Ni | Mo |
| No symbol | 2.0 | — | — |
| Mo | 1.4 | — | 0.3 - 0.6 |
| MnMo | 1.4 - 2.0 | — | 0.3 - 0.6 |
| 1Ni | 1.4 | 0.6 - 1.2 | — |
| 1.5Ni | 1.6 | 1.2 - 1.8 | — |
| 2Ni | 1.4 | 1.8 - 2.6 | — |
| 3Ni | 1.4 | 2.6 - 3.8 | — |
| Mn1Ni | 1.4 - 2.0 | 0.6 - 1.2 | — |
| 1NiMo | 1.4 | 0.6 - 1.2 | 0.3 - 0.6 |
| Z | Any other agreed composition | | |

* If not specified Mo<0.2, Ni <0.5, Cr < 0.2, V <0.08, Nb <0.05, Cu < 0.3 and for electrodes without a gas shield Al<20
Single values shown in the table are maximum values.

| Symbol | Hydrogen content, ml/100 g deposited weld metal, max. |
|--------|---|
| H5 | 5 |
| H10 | 10 |
| H15 | 15 |

| Symbol | Characteristics | Types of weld | | Shielding gas |
|--------|------------------------------------|---------------|---------------|---------------|
| | | Singel-pass | Multiple-pass | |
| R | Rutile, slow freezing slag | X | X | Required |
| P | Rutile, fast freezing slag | X | X | Required |
| B | Basic | X | X | Required |
| M | Metal powder | X | X | Required |
| V | Rutile or basic/fluoride | X | | Not required |
| W | Basic/fluoride, slow freezing slag | X | X | Not required |
| Y | Basic/fluoride, fast freezing slag | X | X | Not required |
| Z | Other types | | | |

Guide to ISO 17633-A: Cored wires for stainless steels

Tubular cored electrode/metal arc welding

| Symbol | Type of electrode core |
|--------|----------------------------|
| R | Rutile, slow freezing slag |
| P | Rutile, fast freezing slag |
| M | Metal powder |
| U | Selfshielding |
| Z | Other types |

| Symbol | Shielding gas |
|--------|--|
| M | ISO 14175-M2 Mixed gas without helium |
| C | ISO 14175-C1 Carbon dioxide |
| N | Without a gas shield |

T 19 12 3L R M 4

| Symbol | Welding position |
|--------|---|
| 1 | All positions |
| 2 | All positions, except vertical down |
| 3 | Flat butt weld, flat fillet weld, horizontal-vertical fillet weld |
| 4 | Flat butt weld, flat fillet weld |
| 5 | Vertical down and positions according to symbol 3 |

| Alloy Symbol | Chemical composition of all-weld metal, % * | | | | | | | | | |
|---|---|-----|---------|-------|-------|-----------|-----------|---------|-----------------------|--|
| | C | Si | Mn | P | S | Cr | Ni | Mo | Other elements | |
| Martensitic/ferritic | | | | | | | | | | |
| 13 | 0.12 | 1.0 | 1.5 | 0.030 | 0.025 | 11.0-14.0 | 0.3 | 0.3 | Cu 0.5 | |
| 13Ti | 0.10 | 1.0 | 0.80 | 0.030 | 0.030 | 10.5-13.0 | 0.3 | 0.3 | Cu 0.5, 10 x C - 1.5 | |
| 134 | 0.06 | 1.0 | 1.5 | 0.030 | 0.025 | 11.0-14.5 | 3.0-5.0 | 0.4-1.0 | Cu 0.5 | |
| 17 | 0.12 | 1.0 | 1.5 | 0.030 | 0.025 | 16.0-18.0 | 0.3 | 0.3 | Cu 0.5 | |
| Austenitic | | | | | | | | | | |
| 199L | 0.04 | 1.2 | 2.0 | 0.030 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.3 | Cu 0.5 | |
| 199Nb | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 18.0-21.0 | 9.0-11.0 | 0.3 | Cu 0.5, Nb 8 x C- 1.1 | |
| 19123L | 0.04 | 1.2 | 2.0 | 0.030 | 0.025 | 17.0-20.0 | 10.0-13.0 | 2.5-3.0 | Cu 0.5 | |
| 19123Nb | 0.08 | 1.2 | 2.0 | 0.030 | 0.025 | 17.0-20.0 | 10.0-13.0 | 2.5-3.0 | Cu 0.5, Nb 8 x C-1.1 | |
| 19134NL | 0.04 | 1.2 | 1.0-5.0 | 0.030 | 0.025 | 17.0-20.0 | 12.0-15.0 | 3.0-4.5 | Cu 0.5, N 0.08-0.20 | |
| Austenitic-ferritic. High corrosion resistance. | | | | | | | | | | |
| 2293NL | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 21.0-24.0 | 7.5-10.5 | 2.5-4.0 | Cu 0.5, N 0.08-0.20 | |
| Fully austenitic. High corrosion resistance. | | | | | | | | | | |
| 18165NL | 0.03 | 1.0 | 1.0-4.0 | 0.03 | 0.02 | 17.0-20.0 | 16.0-19.0 | 3.5-5.0 | Cu 0.5, N 0.10-0.20 | |
| Special types | | | | | | | | | | |
| 188Mn | 0.20 | 1.2 | 4.5-7.5 | 0.035 | 0.025 | 17.0-20.0 | 7.0-10.0 | 0.3 | Cu 0.5 | |
| 20103 | 0.08 | 1.2 | 2.5 | 0.035 | 0.025 | 19.5-22.0 | 9.0-11.0 | 2.0-4.0 | Cu 0.5 | |
| 2312L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 22.0-25.0 | 11.0-14.0 | 0.3 | Cu 0.5 | |
| 23122L | 0.04 | 1.2 | 2.5 | 0.030 | 0.025 | 22.0-25.0 | 11.0-14.0 | 2.0-3.0 | Cu 0.5 | |
| 299 | 0.15 | 1.2 | 2.5 | 0.035 | 0.025 | 27.0-31.0 | 8.0-12.0 | 0.3 | Cu 0.5 | |
| Heat resisting types | | | | | | | | | | |
| 2212H | 0.15 | 1.2 | 2.5 | 0.030 | 0.025 | 20.0-23.0 | 10.0-13.0 | 0.3 | Cu 0.5 | |
| 2520 | 0.06-0.20 | 1.2 | 1.0-5.0 | 0.030 | 0.025 | 23.0-27.0 | 18.0-22.0 | 0.3 | Cu 0.5 | |

* Single values shown in the table are maximum values.

Guide to AWS A5.18: Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding

| AWS Classification | Chemical composition of solid wire or rod, wt % * | | | | | |
|--------------------|---|-----------|-----------|-----------|-----------|-------|
| | C | Mn | Si | P | S | Cu |
| ER70S-2 | ≤0.07 | 0.90-1.40 | 0.40-0.70 | ≤0.025 | ≤0.035 | ≤0.50 |
| ER70S-3 | 0.06-0.15 | 0.90-1.40 | 0.45-0.70 | ≤0.025 | ≤0.035 | ≤0.50 |
| ER70S-4 | 0.06-0.15 | 1.00-1.50 | 0.65-0.85 | ≤0.025 | ≤0.035 | ≤0.50 |
| ER70S-6 | 0.06-0.15 | 1.40-1.85 | 0.80-1.15 | ≤0.025 | ≤0.035 | ≤0.50 |
| ER70S-7 | 0.07-0.15 | 1.50-2.00 | 0.50-0.80 | ≤0.025 | ≤0.035 | ≤0.50 |
| ER70S-G | Not spec. | Not spec. | Not spec. | Not spec. | Not spec. | ≤0.50 |

* Single values shown in the table are maximum values.

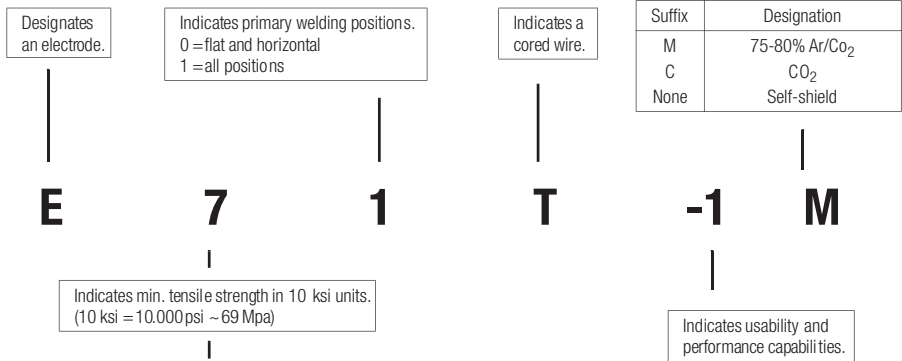
| AWS Classification ** | Chemical composition of weld metal from metal cored wire, wt % * | | | | | |
|-----------------------|--|-----------|-----------|-----------|-----------|-----------|
| | C | Mn | Si | P | S | Cu |
| E70C-3X | 0.12 | 1.75 | 0.90 | 0.03 | 0.03 | 0.50 |
| E70C-6X | 0.12 | 1.75 | 0.90 | 0.03 | 0.03 | 0.50 |
| E70C-G(X) | Not spec. | Not spec. | Not spec. | Not spec. | Not spec. | Not spec. |
| E70C-GS(X) | Not spec. | Not spec. | Not spec. | Not spec. | Not spec. | Not spec. |

* Single values shown in the table are maximum values.
 ** The final X shown in the classification represents a "C" or "M" which corresponds to the shielding gas with which the electrode is classified. The use of "C" designates 100% CO₂ shielding, "M" designates 75-80% Ar/balance CO₂.

| AWS Classification * | Mechanical Properties of weld metal | | | | |
|----------------------|-------------------------------------|--------------------------------------|-------------------|-----------------------------|--|
| | Tensile Strength min. MPa | Yield Strength min. MPa (0.2% proof) | Elongation min. % | Impact Energy Charpy-V J/°C | Shielding gas |
| ER70S-2 | 480 | 400 | 22 | 27 / -30 | CO ₂ or Ar / CO ₂ |
| ER70S-3 | 480 | 400 | 22 | 27 / -20 | CO ₂ or Ar / CO ₂ |
| ER70S-4 | 480 | 400 | 22 | Not required | CO ₂ or Ar / CO ₂ |
| ER70S-6 | 480 | 400 | 22 | 27 / -30 | CO ₂ or Ar / CO ₂ |
| ER70S-7 | 480 | 400 | 22 | 27 / -30 | CO ₂ or Ar / CO ₂ |
| ER70S-G | 480 | 400 | 22 | As agreed | CO ₂ or Ar / CO ₂ |
| E70C-3X | 480 | 400 | 22 | 27 / -20 | CO ₂ or 75-80%Ar / bal. CO ₂ |
| E70C-6X | 480 | 400 | 22 | 27 / -30 | CO ₂ or 75-80%Ar / bal. CO ₂ |
| E70C-G(X) | 480 | 400 | 22 | As agreed | As agreed |
| E70C-GS(X) | 480 | Not spec. | Not spec. | Not required | As agreed |

* The final X shown in the classification represents a "C" or "M" which corresponds to the shielding gas with which the electrode is classified. The use of "C" designates 100% CO₂ shielding, "M" designates 75-80% Ar/balance CO₂.

Guide to AWS A5.20: Carbon steel wires for FCAW



| AWS Classification | Tensile Strength MPa | Yield Strength min. MPa | Elongation min. % | Impact Energy Charpy-V J/°C |
|--------------------|----------------------|-------------------------|-------------------|-----------------------------|
| E 7xT-1C, -1M | 490 - 670 | 390 | 22 | 27 / -20 |
| E 7xT-2C, -2M | 490 min | Not specified | Not specified | Not specified |
| E 7xT-3 | 490 min | Not specified | Not specified | Not specified |
| E 7xT-4 | 490 - 670 | 390 | 22 | Not specified |
| E 7xT-5C, -5M | 490 - 670 | 390 | 22 | 27 / -30 |
| E 7xT-6 | 490 - 670 | 390 | 22 | 27 / -30 |
| E 7xT-7 | 490 - 670 | 390 | 22 | Not specified |
| E 7xT-8 | 490 - 670 | 390 | 22 | 27 / -30 |
| E 7xT-9C, -9M | 490 - 670 | 390 | 22 | 27 / -30 |
| E 7xT-10 | 490 min | Not specified | Not specified | Not specified |
| E 7xT-11 | 490 - 670 | 390 | 22 | Not specified |
| E 7xT-12C, -12M | 490 - 620 | 390 | 22 | 27 / -30 |
| E 6xT-13 | 430 min | Not specified | Not specified | Not specified |
| E 7xT-13 | 490 min | Not specified | Not specified | Not specified |
| E 7xT-14 | 490 min | Not specified | Not specified | Not specified |
| E 6xT-G | 430 - 600 | 330 | 22 | Not specified |
| E 7xT-G | 490 - 670 | 390 | 22 | Not specified |
| E 6xT-GS | 430 min | Not specified | Not specified | Not specified |
| E 7xT-GS | 490 min | Not specified | Not specified | Not specified |

| Suffix | Shielding gas | Multiple-pass | Single-pass | Flux type |
|--------|---------------|---------------|-------------|---------------|
| -1 | X | X | X | DC +pol |
| -2 | X | | X | DC +pol |
| -3 | | | X | DC +pol |
| -4 | | X | X | DC +pol |
| -5 | X | X | X | DC +/- pol |
| -6 | | X | X | DC +pol |
| -7 | | X | X | DC -pol |
| -8 | | X | X | DC -pol |
| -9 | X | X | X | DC +pol |
| -10 | | | X | DC -pol |
| -11 | | X | X | DC -pol |
| -12 | X | X | X | DC +pol |
| -13 | | | X | DC -pol |
| -14 | | | X | DC -pol |
| -G | Not specified | X | X | Not specified |
| -GS | Not specified | | X | Not specified |

Guide to AWS A5.28: Low-alloy Steel Electrodes and Rods for Gas Shielded Arc Welding

| AWS Classification | Chemical composition of solid wire or rod, wt % * | | | | | | | | | | | | | | |
|--------------------|---|-----------|-----------|-------|-------|-----------|------------|-----------|-----------|------|------|------|------|----------------------|--|
| | C | Mn | Si | P | S | Ni | Cr | Mo | V | Ti | Zr | Al | Cu | Other elements total | |
| ER70S-A1 | 0.12 | 1.30 | 0.3-0.70 | 0.025 | 0.025 | 0.20 | - | 0.40-0.65 | - | - | - | - | 0.35 | 0.50 | |
| ER80S-B2 | 0.07-0.12 | 0.40-0.70 | 0.40-0.70 | 0.025 | 0.025 | 0.20 | 1.20-1.50 | 0.40-0.65 | - | - | - | - | 0.35 | 0.50 | |
| ER70S-B2L | 0.05 | 0.40-0.70 | 0.40-0.70 | 0.025 | 0.025 | 0.20 | 1.20-1.50 | 0.40-0.65 | - | - | - | - | 0.35 | 0.50 | |
| ER90S-B3 | 0.07-0.12 | 0.40-0.70 | 0.40-0.70 | 0.025 | 0.025 | 0.20 | 2.30-2.70 | 0.90-1.20 | - | - | - | - | 0.35 | 0.50 | |
| ER80S-B3L | 0.05 | 0.40-0.70 | 0.40-0.70 | 0.025 | 0.025 | 0.20 | 2.30-2.70 | 0.90-1.20 | - | - | - | - | 0.35 | 0.50 | |
| ER80S-B6 | 0.10 | 0.40-0.70 | 0.50 | 0.025 | 0.025 | 0.6 | 4.50-6.00 | 0.45-0.65 | - | - | - | - | 0.35 | 0.50 | |
| ER80S-B8 | 0.10 | 0.40-0.70 | 0.50 | 0.025 | 0.025 | 0.5 | 8.00-10.5 | 0.8-1.2 | - | - | - | - | 0.35 | 0.50 | |
| ER90S-B9 | 0.07-0.13 | 1.20 | 0.15-0.50 | 0.010 | 0.010 | 0.80 | 8.00-10.50 | 0.85-1.20 | 0.15-0.30 | - | - | 0.04 | 0.20 | 0.50 | |
| ER80S-Ni1 | 0.12 | 1.25 | 0.40-0.80 | 0.025 | 0.025 | 0.80-1.10 | 0.15 | 0.35 | 0.05 | - | - | - | 0.35 | 0.50 | |
| ER80S-Ni2 | 0.12 | 1.25 | 0.40-0.80 | 0.025 | 0.025 | 2.00-2.75 | - | - | - | - | - | - | 0.35 | 0.50 | |
| ER80S-Ni3 | 0.12 | 1.25 | 0.40-0.80 | 0.025 | 0.025 | 3.00-3.75 | - | - | - | - | - | - | 0.35 | 0.50 | |
| ER80S-D2 | 0.7-0.12 | 1.60-2.10 | 0.50-0.80 | 0.025 | 0.025 | 0.15 | - | 0.40-0.60 | - | - | - | - | 0.5 | 0.50 | |
| ER90S-D2 | 0.7-0.12 | 1.60-2.10 | 0.50-0.80 | 0.025 | 0.025 | 0.15 | - | 0.40-0.60 | - | - | - | - | 0.5 | 0.50 | |
| ER100S-1 | 0.08 | 1.25-1.80 | 0.20-0.55 | 0.010 | 0.010 | 1.40-2.10 | 0.30 | 0.25-0.55 | 0.05 | 0.10 | 0.10 | 0.10 | 0.25 | 0.50 | |
| ER110S-1 | 0.09 | 1.40-1.80 | 0.20-0.55 | 0.010 | 0.010 | 1.90-2.60 | 0.50 | 0.25-0.55 | 0.04 | 0.10 | 0.10 | 0.10 | 0.25 | 0.50 | |
| ER120S-1 | 0.10 | 1.40-1.80 | 0.25-0.60 | 0.010 | 0.010 | 2.00-2.80 | 0.60 | 0.30-0.65 | 0.03 | 0.10 | 0.10 | 0.10 | 0.25 | 0.50 | |
| ERXXS-G | Not specified | | | | | | | | | | | | | | |

* Single values shown in the table are maximum values.

| AWS Classification | Chemical composition of weld metal from metal cored wire, wt % * | | | | | | | | | | | | | | |
|--------------------|--|-----------|-----------|-------|-------|-----------|------------|-----------|-----------|----|----|------|-----------|----------------------|--|
| | C | Mn | Si | P | S | Ni | Cr | Mo | V | Ti | Zr | Al | Cu | Other elements total | |
| E80C-B2 | 0.05-0.12 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.030 | 0.20 | 1.00-1.50 | 0.40-0.65 | 0.03 | - | - | - | - | 0.50 | |
| E70C-B2L | 0.05 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.030 | 0.20 | 1.00-1.50 | 0.40-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E90C-B3 | 0.05-0.12 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.030 | 0.20 | 2.00-2.50 | 0.90-1.20 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-B3L | 0.05 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.030 | 0.20 | 2.00-2.50 | 0.90-1.20 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-B6 | 0.10 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.025 | 0.60 | 4.50-6.00 | 0.45-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-B8 | 0.10 | 0.40-1.00 | 0.25-0.60 | 0.025 | 0.025 | 0.20 | 8.00-10.50 | 0.80-1.20 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E90C-B9 | 0.08-0.13 | 1.20** | 0.50 | 0.020 | 0.015 | 0.80** | 8.00-10.50 | 0.85-1.20 | 0.15-0.30 | - | - | 0.04 | 0.20 | 0.50 | |
| E80C-Ni1 | 0.12 | 1.50 | 0.90 | 0.025 | 0.030 | 0.80-1.10 | - | 0.30 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E70C-Ni2 | 0.08 | 1.25 | 0.90 | 0.025 | 0.030 | 1.75-2.75 | - | - | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-Ni2 | 0.12 | 1.50 | 0.90 | 0.025 | 0.030 | 1.75-2.75 | - | - | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-Ni3 | 0.12 | 1.50 | 0.90 | 0.025 | 0.030 | 2.75-3.75 | - | - | 0.03 | - | - | - | 0.35 | 0.50 | |
| E90C-D2 | 0.12 | 1.00-1.90 | 0.90 | 0.025 | 0.030 | - | - | 0.40-0.60 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E90C-K3 | 0.15 | 0.75-2.25 | 0.80 | 0.025 | 0.025 | 0.50-2.50 | 0.15 | 0.25-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E100C-K3 | 0.15 | 0.75-2.25 | 0.80 | 0.025 | 0.025 | 0.50-2.50 | 0.15 | 0.25-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E110C-K3 | 0.15 | 0.75-2.25 | 0.80 | 0.025 | 0.025 | 0.50-2.50 | 0.15 | 0.25-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E110C-K4 | 0.15 | 0.75-2.25 | 0.80 | 0.025 | 0.025 | 0.50-2.50 | 0.15-0.65 | 0.25-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E120C-K4 | 0.15 | 0.75-2.25 | 0.80 | 0.025 | 0.025 | 0.50-2.50 | 0.15-0.65 | 0.25-0.65 | 0.03 | - | - | - | 0.35 | 0.50 | |
| E80C-W2 | 0.12 | 0.50-1.30 | 0.35-0.80 | 0.025 | 0.030 | 0.40-0.80 | 0.45-0.70 | - | 0.03 | - | - | - | 0.30-0.75 | 0.50 | |
| EXXC-G | Not specified | | | | | | | | | | | | | | |

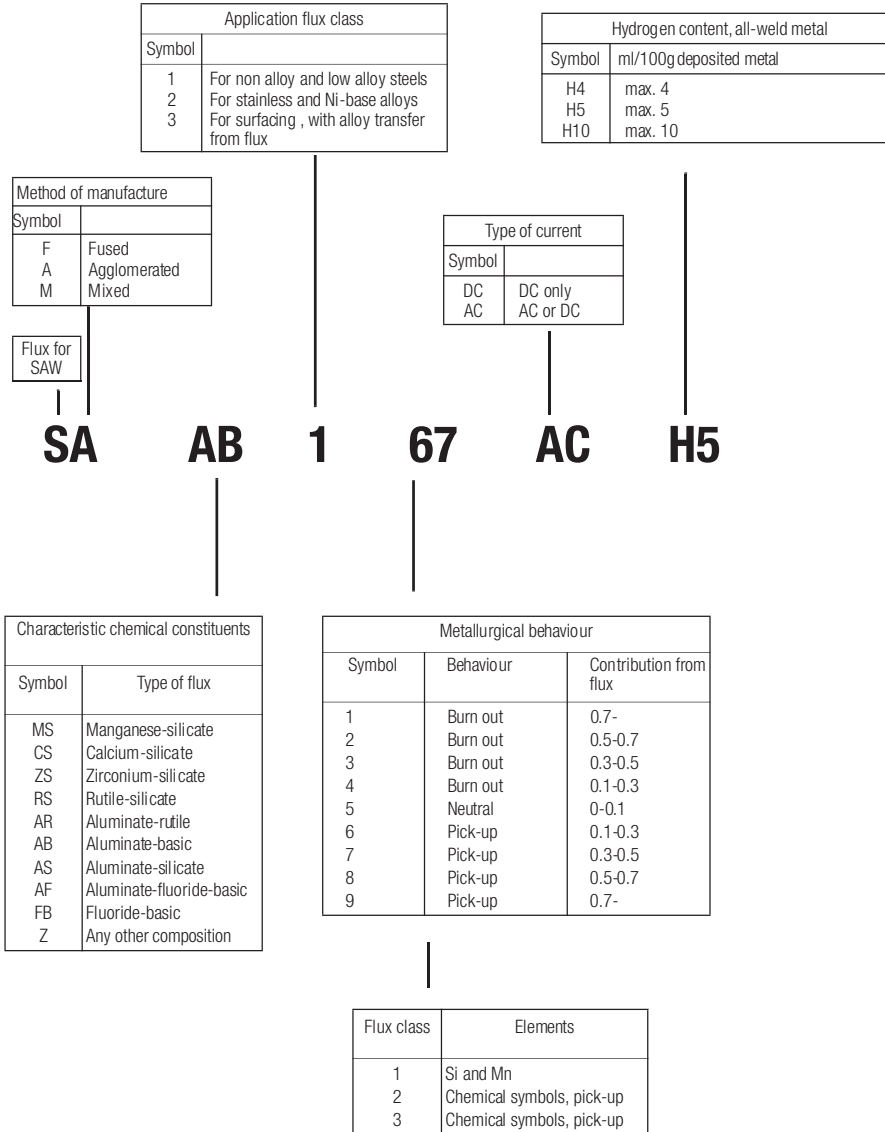
* Single values shown in the table are maximum values. ** Max 1.50% of Mn and Ni in total.

Guide to AWS A5.28: Low-alloy Steel Electrodes and Rods for Gas Shielded Arc Welding

| AWS Classification | Mechanical Properties of weld metal | | | | |
|--------------------|-------------------------------------|--------------------------------------|-------------------|-----------------------------|-------------------|
| | Tensile Strength min. MPa | Yield Strength min. MPa (0.2% proof) | Elongation min. % | Impact Energy Charpy-V J/°C | Testing condition |
| ER70S-B2L/A1 | 515 | 400 | 19 | Not required | *1) |
| ER80S-B2 | 550 | 470 | 19 | Not required | *1) |
| ER80S-B3L | 550 | 470 | 17 | Not required | *2) |
| ER90S-B3 | 620 | 540 | 17 | Not required | *2) |
| ER80S-B6/B8 | 550 | 470 | 17 | Not required | *3) |
| ER90S-B9 | 620 | 410 | 16 | Not required | *4) |
| ER80S-Ni1 | 550 | 470 | 24 | 27 / -46 | As-Welded |
| ER80S-Ni2 | 550 | 470 | 24 | 27 / -62 | *1) |
| ER80S-Ni3 | 550 | 470 | 24 | 27 / -73 | *1) |
| ER80S-D2 | 550 | 470 | 17 | 27 / -29 | As-Welded |
| ER90S-D2 | 620 | 540 | 17 | 27 / -29 | As-Welded |
| ER100S-1 | 690 | 610 | 16 | 68 / -51 | As-Welded |
| ER110S-1 | 760 | 660 | 15 | 68 / -51 | As-Welded |
| ER120S-1 | 830 | 730 | 14 | 68 / -51 | As-Welded |
| ER70S-G | 490 | Not specified | Not specified | As agreed | As agreed |
| ER80S-G | 550 | Not specified | Not specified | As agreed | As agreed |
| ER90S-G | 620 | Not specified | Not specified | As agreed | As agreed |
| ER100S-G | 690 | Not specified | Not specified | As agreed | As agreed |
| ER110S-G | 760 | Not specified | Not specified | As agreed | As agreed |
| ER120S-G | 830 | Not specified | Not specified | As agreed | As agreed |
| E70C-B2L | 515 | 400 | 19 | Not required | *1) |
| E80C-B2 | 550 | 470 | 19 | Not required | *1) |
| E80C-B3L | 550 | 470 | 17 | Not required | *2) |
| E90C-B3 | 620 | 540 | 17 | Not required | *2) |
| E80C-B6/B8 | 550 | 470 | 17 | Not required | *3) |
| E90C-B9 | 620 | 410 | 16 | Not required | *4) |
| E70C-Ni2 | 490 | 400 | 24 | 27 / -62 | *1) |
| E80C-Ni1 | 550 | 470 | 24 | 27 / -46 | As-Welded |
| E80C-Ni2 | 550 | 470 | 24 | 27 / -62 | *1) |
| E80C-Ni3 | 550 | 470 | 24 | 27 / -73 | *1) |
| E90C-D2 | 620 | 540 | 17 | 27 / -29 | As-Welded |
| E90C-K3 | 620 | 540 | 18 | 27 / -51 | As-Welded |
| E100C-K3 | 690 | 610 | 16 | 27 / -51 | As-Welded |
| E100C-K3/K4 | 760 | 680 | 15 | 27 / -51 | As-Welded |
| E120C-K4 | 830 | 750 | 15 | 27 / -51 | As-Welded |
| E80C-W2 | 550 | 470 | 22 | 27 / -29 | As-Welded |
| E70C-G | 490 | Not specified | Not specified | As agreed | As agreed |
| E80C-G | 550 | Not specified | Not specified | As agreed | As agreed |
| E90C-G | 620 | Not specified | Not specified | As agreed | As agreed |
| E100C-G | 690 | Not specified | Not specified | As agreed | As agreed |
| E110C-G | 760 | Not specified | Not specified | As agreed | As agreed |
| E120C-G | 830 | Not specified | Not specified | As agreed | As agreed |

*1) PWHT 620 +/-15°C *2) PWHT 690 +/-15°C *3) PWHT 745 +/-15°C *4) PWHT 760 +/-15°C

Guide to EN ISO 14174: Fluxes for submerged arc welding



Guide to EN ISO 14171-A: Solid wires, solid wire- flux and tubular cored electrode- flux combinations for submerged arc welding of non alloy and fine grain steels

S

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6

AB

S3Si

S SAW process

| Tensile properties, all-weld metal | | | |
|------------------------------------|----------------------------|-------------------------|----------------------|
| Symbol | Yield strength MPa min. | Tensile strength Mpa | Elongation % min. |
| 35 | 355 | 440-570 | 22 |
| 38 | 380 | 470-600 | 20 |
| 42 | 420 | 500-640 | 20 |
| 46 | 460 | 530-680 | 20 |
| 50 | 500 | 560-720 | 18 |

| Impact properties | |
|-------------------|--|
| Symbol | Temp.°C for min. average Impact energy of 47J |
| Z | No requirements |
| A | +20 |
| 0 | 0 |
| 2 | -20 |
| 3 | -30 |
| 4 | -40 |
| 5 | -50 |
| 6 | -60 |
| 7 | -70 |
| 8 | -80 |

| Chemical constituents of flux | |
|-------------------------------|--------------------------|
| Symbol | Type of flux |
| MS | Manganese-silicate |
| CS | Calcium-silicate |
| ZS | Zirconium-silicate |
| RS | Rutile-silicate |
| AR | Aluminate-rutile |
| AB | Aluminate-basic |
| AS | Aluminate-silicate |
| AF | Aluminate-fluoride-basic |
| FB | Fluoride-basic |
| Z | Any other type |

| Tensile properties, two-run technique | | |
|---------------------------------------|---|--|
| Symbol | Parent material Yield strength Mpa min. | Welded joint Tensile strength MPa min. |
| 2T | 275 | 370 |
| 3T | 355 | 470 |
| 4T | 420 | 520 |
| 5T | 500 | 600 |

| Chemical composition of solid wire , % | | | | | |
|--|------------------------------|-----------|-----------|-----------|-----------|
| Symbol | C | Si | Mn | Ni | Mo |
| SZ | Any other agreed composition | | | | |
| S1 | 0.05-0.15 | 0.15 | 0.35-0.60 | 0.15 | 0.15 |
| S2 | 0.07-0.15 | 0.15 | 0.80-1.30 | 0.15 | 0.15 |
| S3 | 0.07-0.15 | 0.15 | 1.30-1.75 | 0.15 | 0.15 |
| S4 | 0.07-0.15 | 0.15 | 1.75-2.25 | 0.15 | 0.15 |
| S1Si | 0.07-0.15 | 0.15-0.40 | 0.35-0.60 | 0.15 | 0.15 |
| S2Si | 0.07-0.15 | 0.15-0.40 | 0.80-1.30 | 0.15 | 0.15 |
| S2Si2 | 0.07-0.15 | 0.40-0.60 | 0.80-1.30 | 0.15 | 0.15 |
| S3Si | 0.07-0.15 | 0.15-0.40 | 1.30-1.85 | 0.15 | 0.15 |
| S4Si | 0.07-0.15 | 0.15-0.40 | 1.85-2.25 | 0.15 | 0.15 |
| S1Mo | 0.05-0.15 | 0.05-0.25 | 0.35-0.60 | 0.15 | 0.45-0.65 |
| S2Mo | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 0.15 | 0.45-0.65 |
| S3Mo | 0.07-0.15 | 0.05-0.25 | 1.30-1.75 | 0.15 | 0.45-0.65 |
| S4Mo | 0.07-0.15 | 0.05-0.25 | 1.75-2.25 | 0.15 | 0.45-0.65 |
| S2Ni1 | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 0.80-1.20 | 0.15 |
| S2Ni1.5 | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 1.20-1.80 | 0.15 |
| S2Ni2 | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 1.80-2.40 | 0.15 |
| S2Ni3 | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 2.80-3.70 | 0.15 |
| S2Ni1Mo | 0.07-0.15 | 0.05-0.25 | 0.80-1.30 | 0.80-1.20 | 0.45-0.65 |
| S3Ni1.5 | 0.07-0.15 | 0.05-0.25 | 1.30-1.70 | 1.20-1.80 | 0.15 |
| S3Ni1Mo | 0.07-0.15 | 0.05-0.25 | 1.30-1.80 | 0.80-1.20 | 0.45-0.65 |
| S3Ni1.5Mo | 0.07-0.15 | 0.05-0.25 | 1.20-1.80 | 1.20-1.80 | 0.30-0.50 |

Other elements: Cu max. 0.30, Al max. 0.03

P&S: SZ-S4Mo max. 0.025, S2Ni-S3Ni1.5Mo max 0.02

Cr: SZ-S2Ni3 max. 0.15, S2Ni1Mo-S3Ni1.5Mo max. 0.20

Single values are maximum

Quick guide for selection of welding consumables for unalloyed/low alloyed and high strength steels

| Yield strength Min. MPa | Steel grade Example | Impact energy Test temp. | Cored wires - Elgacore 136/138 | Electrodes 111 | MAG 135 | TIG 141 |
|----------------------------|--|-----------------------------|--|--|---|-----------------------------|
| | | | | | | |
| 235-275 | S235JR, NVA, A106 Gr.B, A333 Gr.6, S35.8, P235GH, S275J0, S275JR | +20°C, 0°C | DWA-50, 52F, 55E, 55L, 55Ni1, 55LSR, 51B, DWX 50, MXX 100, MX 100T, MXA-100, 100XP, 55T. | All unalloyed, P48M, P48S, P51, P47D, Maxeta 11 etc. | Elgamatic 100, Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -20°C | DWA-50, 52F, 55E, 55L, 55Ni1, 55LSR, 51B, DWX 50, MXX 100, MX 100T, MXA-100, 100XP, 55T. | P48M, P48S, 48P, P51, P47, P47D, P52T, P54, P62MR, Maxeta 5, 20, 21, 22, 24. | Elgamatic 100, Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -40°C | DWA-55E, 55L, 55Ni1, 55LSR, MXA-100, 100XP, 55T. | P48M, P48S, P51, P47, P62MR, Maxeta 21, 22, 24. | Elgamatic 103, Elgamatic 162 | Elgatic 162 |
| 235-355 | S235J0W, S355J2WP, S355J2G2W, COR-TEN | 0°C, -20°C | DW 588 | P62MR, P48K | Elgamatic 140 | |
| 355 | S355J2, S355N, P355NL1, NVE 36, X52, L360, S355MCD, S355ML, S355G10+N | +20°C, 0°C | DWA-50, 52F, 55E, 55L, 55Ni1, 55LSR, 51B, DWX 50, MXX 100, MX 100T, MXA-100, 100XP, 55T. | Rutile electrodes max. t15mm. P48M, P48S, P48P, P51, P47, P47D, P52T, P54, P62MR, 20, 21, 22, 24. | Elgamatic 100, Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -20°C | DWA-50, 52F, 55E, 55L, 55Ni1, 55LSR, 51B, DWX 50, MXX 100, MX 100T, MXA-100, 100XP, 55T. | P48M, P48S, P48P, P51, P47, P47D, P52T, P54, P62MR, Maxeta 20, 21, 22, 24. | Elgamatic 100, Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -40°C | DWA-55E, 55L, 55Ni1, 55LSR, MXA-100, 100XP, 55T. | P62MR, P48M, P48S, P51, P47, Maxeta 24, 21, 22. | Elgamatic 103, Elgamatic 162 | Elgatic 162 |
| | | -50°C | DWA-55L, 55Ni1, 55LSR, MXA 55T. | P62MR, P48M, P47, Maxeta 24. | Elgamatic 162 | Elgatic 162 |
| | | -60°C | DWA-55L, 55Ni1, 55LSR, MXA 55T. | P62MR. | Elgamatic 162 | Elgatic 162 |

Quick guide for selection of welding consumables for unalloyed/low alloyed and high strength steels, cont.

| Yield strength | Steel grade | Impact energy | Cored wires - Elgacore | Electrodes | MAG | TIG |
|----------------|--|---------------|--|--|---|--------------------------|
| Min. MPa | Example | Test temp. | 136/138 | 111 | 135 | 141 |
| 420 | S420N, S460ML, P420ML2, S420MCD, S420G2+M, X60, L450, NVE 420, NVE420 | -20°C | DWA-50, 52F, 55E, 55L, 55Ni1, 55LSR, 51B, DWX 50, MXX 100, MX 100T, MXA-100, 100XP, 55T. | P48M, P48S, P48P, P51, P47, P47D, P52T, P54, P62MR, Maxeta 20, 21, 22, 24. | Elgamatic 100, Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -40°C | DWA-55E, 55L, 55Ni1, 55LSR, MXA-100, 100XP, 55T. | P62MR, P48M, P48S, P51, P47, Maxeta 24, 21, 22. | Elgamatic 103, Elgamatic 162 | Elgatic 162 |
| | | -50°C | DWA-55L, 55Ni1, 55LSR, MXA 55T. | P62MR, P48M, P47, Maxeta 24 | Elgamatic 162 | Elgatic 162 |
| | | -60°C | DWA-55L, 55Ni1, 55LSR, MXA 55T. | P62MR | Elgamatic 162 | Elgatic 162 |
| 460 | S460M, S460ML, P460ML2, S460MCD, S460G2+M, X65, L450, NVE 460, NVE 460 | -20°C | DWA-55L, 55Ni1, 55LSR, MXA-100XP, 55T. | P62MR, Maxeta 24, P48P, P51, P47 | Elgamatic 103, Elgamatic 162 | Elgatic 100, Elgatic 162 |
| | | -40°C | DWA-55L, 55Ni1, 55LSR, MXA-100XP, 55T. | P62MR, Maxeta 24, P51, P47 | Elgamatic 103, Elgamatic 162 | Elgatic 162 |
| | | -50°C | DWA-55L, 55Ni1, 55LSR, MXA 55T. | P62MR, P48M, P47, Maxeta 24 | Elgamatic 162 | Elgatic 162 |
| | | -60°C | DWA-55L, 55Ni1, 55LSR, MXA-55T. | P62MR | Elgamatic 162 | Elgatic 162 |
| 500 | S500QL, S500QL1, P500QL1, P500QL2, S500G2+M, B14NVE 500 | | DWA 65L (-40°C) DWA-65NiMo (-50°C) | P65MR (-60°C) | | |
| 690 | S690Q, S690QL, S690QL1, NVE 690 | | Elgacore R690 (-40°C) M690 (-60°C) | P110MR (-60°C) | Elgamatic 135, (-40°C), Elgamatic 147 (-40°C) | Elgatic 135, (-40°C) |
| 890 | S890Q, S890QL, S890QL1 | | | | Elgamatic 138 (-40°C) | |

Quick guide for selection of welding consumables for unalloyed/low alloyed and high strength steels, cont.

| Yield strength Min. MPa | Steel grade Example | Impact energy Test temp. | Cored wires - Elgacore | Electrodes | MAG | TIG |
|---|--|--|------------------------|------------|-----|-----|
| | | | | | | |
| 550-690 General principles | S550QL, S600QL1, S650QL, S650M(CD), S690Q, S690QL1 | Always use consumable in medium strength class for root pass in butt welds. Impact strength requirements should be fulfilled. Fillet welds can usually be made using undermatching consumable. EN-class T42-T46, AWS E70/E71-E80/E81. E.g. DWA 55L, MXA 100, P 62MR. | | | | |
| 235-500 to 550-690 | | Use consumable that matches steel in the lowest strength class. | | | | |
| Need for preheat should always be evaluated for steels with yield strength \geq 355 MPa. Preheat should be calculated according to EN 1011-2. | | | | | | |

Quick guide for selection of welding consumables for creep resistant Cr-Mo steels

| Yield strength Min. MPa | Steel grade | Impact energy Test temp. | Cored wires - Elgacore | Electrodes | MAG | TIG |
|---|--|--|------------------------|------------|-----------------|----------------|
| | | | | | | |
| 550-690 General principles | S550QL, S600QL1, S650QL, S650M(CD), S690Q, S690QL1 | Always use consumable in medium strength class for root pass in butt welds. Impact strength requirements should be fulfilled. Fillet welds can usually be made using undermatching consumable. EN-class T42-T46, AWS E70/E71-E80/E81. E.g. DWA 55L, MXA 100, P 62MR. | | | | |
| 235-500 to 550-690 | | Use consumable that matches steel in the lowest strength class. | | | | |
| Need for preheat should always be evaluated for steels with yield strength \geq 355 MPa. Preheat should be calculated according to EN 1011-2. | | | | | | |
| 15Mo3, 16Mo3, A335 Grade P1 (0,5%-Mo-steel) | | | | 111 | 135 | 141 |
| 13Cr1Mo4-4, 13Cr1Mo4-5, A335 Gr. P11, A335 Gr. P12 (1-1,25%Cr/0,5%Mo) | | | | P81CR | Elgamatic 181CR | Elgating 181CR |
| | | | | P83CR | Elgamatic 183CR | Elgating 183CR |
| Preheat and stress relief often specified. Follow fabrication specification. | | | | | | |

Quick guide for selection of welding consumables for stainless steels

| Steel grade EN / ASTM / UNS | Electrode 111 Cromarod | Core wire 136/138 Cromacore | MAG 135 Cromamig | TIG 141 Cromatig |
|--|-------------------------------------|-----------------------------------|------------------------|------------------------|
| Austenitic stainless steel | | | | |
| 1.4301, 1.4307, 1.4311, 304, 304L, 304LN | 308L, 308LP | DW 308L, 308LP | 308LSi | 308LSi |
| 1.4541, 1.4550, 321, 347 | 347 | 347 | 347Si | 347Si |
| 1.4401, 1.4404, 1.4406, 1.4432, 1.4436, 316, 316L, 316LN | 316L, 316LP, 316L-140, 316LV, B316L | DW 316L, 316LP | 316LSi | 316LSi |
| 1.4571, 316Ti | 318 | | 318Si | 318Si |
| 1.4845, 310S | 310 | | 310 | 310 |
| 1.4835, S30815 | 253 | | | |
| 1.4539, 904L | 385 | | 385 | 385 |
| 1.4547, S31254, 6Mo | 625 | 625P | 625 | 625 |
| Ferit/austenitic stainless steel (duplex) | | | | |
| 1.4162, 1.4362, 1.4462, S32101, S32304, S32205, S32101, S32003 | Duplex, Duplex LP, Duplex B | DW 329A, 329AP LDX, P | Duplex LDX | Duplex LDX |
| 1.4410, 1.4507, S32750, S32550, S32760 | 2507B | 2507 | 2507 | 2507 |
| Ferit stainless steel | | | | |
| 1.4016, 1.4003, 430, 409 | 308L, 309L, 316L | DW 308L/LP, 309L/LP, 316L/LP | 308, 309, 316LSi | 308, 309, 316LSi |

Quick guide for selection of welding consumables for stainless steels, cont.

| Steel grade EN / ASTM / UNS | Electrode 111 Cromarod | Cored wire 136/138 Cromacore | MAG 135 Cromamig | TIG 141 Cromatig |
|---|------------------------------|--|------------------------|--------------------------|
| Ni-base alloys | | | | |
| 2.4816, 1.4876, N06600, N08800 | 82 (625) | | (625), 82 | (625), 82 |
| 2.4856, N06625 | 625 | 625P | 625 | 625 |
| Dissimilar joints | | | | |
| Stainless to unalloyed or low alloyed steel. | 309L, 309MoL, Duplex, 312 | DW 309L/LP, 309MoL/MoLP, 329A/AP | 309LSi, Duplex | 309LSi, Duplex 309MoL |
| Ni-base to unalloyed or low alloyed steel. | 625, 82 | 625P | 625 | 625 |
| High temperature joints. Ni-base /stainless to unalloyed/ low alloyed steels. | 625, 82 | 625P | 625 | 625 |

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