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ELEKTRODA ZAGREB d.d.
MANUFACTURER OF FILLER
MATERIALS FOR WELDING

2018



ELEKTRODA ZAGREB d.d.

Manufacturer of Filler Materials for Welding

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BUREAU VERITAS
Certification



ELEKTRODA ZAGREB d.d.

**RUŠEVJE 7
ZAPREŠIĆ, HRVATSKA**

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proveden audit sustava upravljanja navedene organizacije te je utvrđena
sukladnost sa zahtjevima slijedeće norme za sustave upravljanja*

ISO 9001:2008

Opseg certifikacije

PROIZVODNJA I PRODAJA DODATNOG MATERIJALA ZA ZAVARIVANJE

Datum početka certifikacijskog ciklusa: **25. SVIBNJA 2015.**

Uz uvjet trajne zadovoljavajuće primjene sustava upravljanja organizacijom,
ovaj certifikat vrijedi do: **24. SVIBNJA 2018.**

Datum prve certifikacije: **25. SVIBNJA 2012.**

Broj certifikata: **CRO19899Q** Verzija br. 01 Datum revizije: 22. SVIBNJA 2015.


Davor Turčić, *Rukovoditelj sektora I&F BV Hrvatska*
potpisano u ime BVCH SAS UK Branch

Adresa certifikacijskog tijela: 66 Prescott Street, London E1 8HG, Velika Britanija
Adresa lokalnog ureda: Riva 16/V, 51000 Rijeka, Hrvatska

Sva ostala pojašnjenja u odnosu na opseg certifikacije i primjenu zahtjeva sustava
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Izuzeće zahtjeva točka norme 7.5.2. i 7.5.4.
Za provjeru valjanosti certifikata molimo nazvati: 00 385 51 213 672



008



CERTIFICATE

The company

ELEKTRODA ZAGREB d.d.
Ruševje 7, HR-10290 Zaprešić – Zagreb
Croatia

has been repeatedly audited and approved as manufacturer of filler metals according to

VdTÜV-Merkblatt 1153
in connection with AD 2000-Merkblatt W 0

The scope of the audit and other relevant data are detailed in our report no. R-TÜV
SÜD Sava-15-02-1229-1/0215.

The company

- has facilities permitting manufacturing and inspection in compliance with the current technical standards,
- operates a quality system which guarantees that manufacturing and inspection of the filler metals stated in our report are in conformity with the technical rules and standards,
- employs qualified supervisory and inspection personnel.

The certificate expires in February 2018.

Munich, February 18th, 2015

Notified Body, Nr. 0036

(U. Fischer)
Subst. Head of the Certification Body



EQ2330838 TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80 686 München, Deutschland



Certificate of conformity of the factory production control

0036 - CPR - S 039

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of March 09th, 2011 (Construction Products Regulation - CPR), this certificate applies to the construction product

Welding consumables acc. to EN ISO 14341, EN ISO 2560 and EN ISO 3581

for the use in metallic structures or in composite metal and concrete structures.

Produced by or for

ELEKTRODA ZAGREB d.d.
Ruševje 7
HR-10290 Zaprešić – Zagreb, Croatia

and produced in the manufacturing plant: Ruševje 7, HR-10290 Zaprešić-Zagreb

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in annex ZA of the harmonised standard

EN 13479:2004

under system 2+ are applied and

the factory production control fulfils all the prescribed requirements set out above.

This certificate was first issued on 24.02.2009 and renewed on 18.02.2015 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly and latest on 18.02.2018.

Further information about the product parameters and description of the products are included in the annex 1 to this certificate.

Munich, 18th February 2015

Notified Body, Nr. 0036

(U. Fischer)
(Subst. Leader of the Certification Body)



EQ2330838 TÜV SÜD Industrie Service GmbH, Westendstraße 199, 80 686 München, Deutschland

Dear Sir or Madam,

Welding has for many years been irreplaceable as a technique of joining materials together in almost any process of production. Technological advancement and the need for improving product quality demand the development not only of new materials, but also of additional materials necessary for their welding. Since its foundation in 1948, and thanks to its long tradition, Elektroda Zagreb d.d. has been able to provide its customers with quality products that meet their needs. Complete business of the company is based on ISO: 9001 procedures, which continuously monitor and enriches all company processes. This catalogue is designed to introduce you with our latest programme of coated electrodes, wires, powders and rods used in welding.

Besides the standard assortment that we offer both in the domestic and foreign markets, there is also a novelty: a wide assortment of solid wires for welding low-alloyed steels, flux cored welding wires for non alloy, low alloy and high alloy steels, wires and rods for the welding of high alloy steels, aluminium and aluminium-based alloys, and wires and powders for SAW welding of non alloy and low alloy steels.

Taking into account the needs of the market as well as our clients' suggestions and opinions, both positive and negative, the development team within Elektroda Zagreb d.d. is constantly trying to improve the existing materials used in welding, as well as to develop new ones, for example thin-coated rutile and rutile-celullose electrode and the group of wires for welding of low-alloyed steels. Newest feature in our production is transposing all SG wires into drum packaging (250 kg drums). All our products undergo strict controls during the production process, from the stage of raw materials all the way to the finished products. This is best proved by the fact that our products have been certified by all major certificate authorities. Each produced batch comes with the factory certificate, including the "3.1 certificate", at the client's request.

Today, Elektroda Zagreb d.d. is a very significant name in the domestic, european and world market. Currently we provide about 90 different filler materials for welding which are available in over 40 different countries around the world. Our products can be found in almost any industrial branch, such as: shipbuilding industry, energy plants, automobile industry, chemical industry, civil engineering, bridge construction, etc.

In order to achieve the best possible quality of our products, and expand of our assortment we constantly invest in the modernisation of production equipment, quality control testing, education of personnel, and scientific research work.

The basic postulates of our business can be described by three features:

- quality,
- flexibility,
- speed.

We are grateful for your trust.

ELEKTRODA ZAGREB d.d.
ZAPRESIC
REPUBLIC OF CROATIA

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2.4 WIRES FOR WELDING COPPER AND COPPER ALLOYS

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EZ - MIG CuSi3	S Cu 6560 (CuSi3Mn1)	ERCuSi-A	80
EZ - MIG CuSn6	S Cu 5180 (CuSn6P)	ERCuSn-A	81
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EZ - TIG 309 LSi	W 23 12 L Si	ER309LSi	91
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EZ - TIG 316 LSi	W 19 12 3 L Si	ER316LSi	93
EZ - TIG 318 Si	W 19 12 3 Nb Si	ER318Si	94
EZ - TIG 347 Si	W 347 Si	ER347Si	95
EZ - TIG 625	S Ni 6625 (NiCr22Mo9Nb)	ERNiCrMo-3	96
EZ - TIG 2209	W 22 9 3 N L	ER2209	97

3.3 RODS FOR WELDING ALUMINUM AND ALUMINUM ALLOYS

EN ISO		AWS	
EZ - TIG Al99,7	S Al 1070 / Al99,7	~ ER1100	99
EZ - TIG AlSi5	S Al 4043 / AlSi5	ER4043	100
EZ - TIG AlMg3	S Al 5754 / AlMg3	ER5754	101
EZ - TIG AlMg5	S Al 5356 / AlMg5Cr(A)	ER5356	102
EZ - TIG AlMg4,5Mn	S Al 5183 / AlMg4,5Mn0,7(A)	ER5183	103

CONTENT

3.4 RODS FOR WELDING COPPER AND COPPER ALLOYS

	EN ISO	AWS	
EZ - TIG CuAl8	Cu 6100	ERCuAl-A1	105
EZ - TIG CuSi3	S Cu 6560 (CuSi3Mn1)	ERCuSi-A	106
EZ - TIG CuSn6	S Cu 5180 (CuSn6P)	ERCuSn-A	107
EZ - TIG CuSn10	S Cu 5211 (CuSn10MnSi)	-	108

4. KISWEL FILLER MATERIALS FOR WELDING

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K - 329 T	T 22 9 3 N L P C/M 1	E2209T1-1/4	117
K - 800 HT	-	-	118

4.2 ROD

	EN ISO	AWS	
T - 50	W 46 3 W3Si1	ER70S-6	120

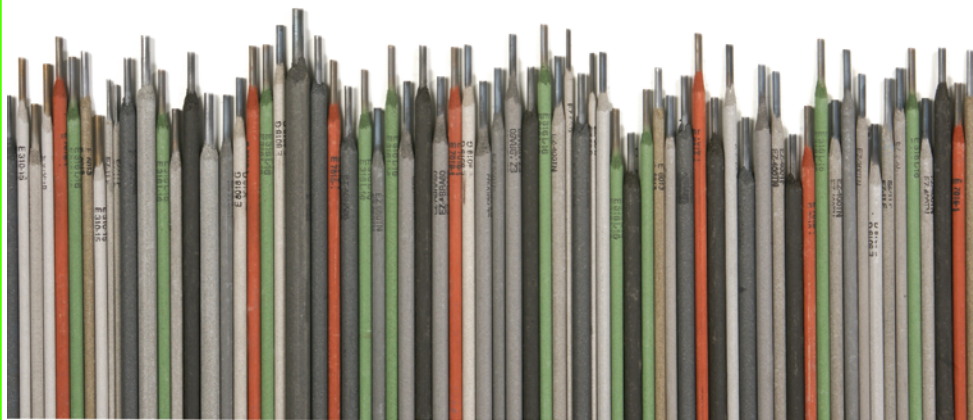
4.3 SAW WIRES AND FLUXES

	EN ISO	AWS	
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STICK ELECTRODES





**ELECTRODES FOR WELDING
UNALLOYED STEELS**

**ADRIA R
EZ - 7 C
EZ - 7 C Mo
EZ - 8 RC
EZ - 10 R
EZ - 10 RC
EZ - 11 F
EZ - 130
EZ - 180 R**

CLASSIFICATION

HRN EN ISO 2560-A	AWS / ASME SFA-5.1
E 35 0 RR 12	E6013

DESCRIPTION AND APPLICATION

Rutile electrode designed for welding of steels with tensile strength up to 470 N/mm². The electrode is characterized by very good operating welding characteristics and is therefore suitable for use with welders who do not have a lot of experience in welding.

Seam surface is smooth and slag detachment is easy.

Steel grade	HRN	DIN (W. Nr.)		EN / ISO
Constructional steels	Č 0261 do Č 0563	St 33 (1.0035) do St 52-3N (1.0045)		S 185 do S 355JR Fe 310-0 do Fe 510 D1
Boiler steels	Č 1202 Č 1204 Č 3133	HI (1.0345) 17Mn4 (1.0481)	HI1 (1.0425)	P235GH P265GH P295GH
Tube and pipe steels	Č 1212 do Č 3100	St 35.4 (1.0309) do St 52.4 (1.0581) StE 210.7 (1.0307) do StE 360.7 (1.0582)		DX55D do P355T2 L210 do L360NB
Shipbuilding steels	A, B, D	A, B, D		
Cold-reduced steel sheet	Č 0146 do Č 0148	St 12 (1.0330) do St 14 (1.0338)		Fe P01 do Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 360	> 440	> 22	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

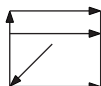
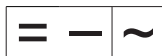
	C	Mn	Si
%	0,08	0,37	0,35

RECOMMENDED WELDING CURRENT

Ø mm	2,0	2,5	3,2	4,0	5,0	6,0
A	50 - 70	60 - 95	110 - 150	140 - 200	200 - 270	230 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	89 200	0,8; 3,7	20 x 0,8 = 16; 5 x 3,7 = 18,5
Ø 2,5 x 300	54 300	0,8; 3,5	20 x 0,8 = 16; 5 x 3,5 = 17,5
Ø 3,2 x 350	27 900	0,8; 4,3	25 x 0,8 = 20; 5 x 4,3 = 21,5
Ø 4,0 x 450	14 700	5,3	5 x 5,3 = 26,5
Ø 5,0 x 450	10 000	5,4	5 x 5,4 = 27
Ø 6,0 x 450	6 700	5,2	5 x 5,2 = 26



Marking: **ADRIA R**

CLASSIFICATION

HRN EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 3 C 25	E7010

DESCRIPTION AND APPLICATION

High cellulose electrode for all position welding, especially for vertical-down. Recommended for root passes, hot passes, filler layers, and especially recommended for welding pipelines. Besides strong penetration and concentrated electric arc, it offers good weld metal toughness and a good X-ray quality.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

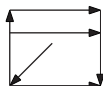
R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-30°C) J
> 420	500 - 640	> 22	≥ 50

APPROXIMATE CHEMICAL COMPOSITION

C	Mn	Si
% < 0,12	0,7	0,3

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	94 600	4,0	5 x 4,0 = 20,0
Ø 3,2 x 350	62 200	4,5	5 x 4,5 = 22,5
Ø 4,0 x 350	31 900	4,5	5 x 4,5 = 22,5
Ø 5,0 x 350	10 500	6,2	5 x 6,2 = 31,0



Marking: **EZ - 7 C**

EZ - 7 C Mo

CLASSIFICATION

HRN EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 3 Mo C 25	E7010-A1

DESCRIPTION AND APPLICATION

High cellulose electrode alloyed with molybdenum for all positional welding, especially vertical-down. Recommended for hot passes, filler and cover layers, and especially recommended for welding of pipelines. Besides strong penetration and concentrated electrical arc, it offers good weld metal toughness and good X-ray quality.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

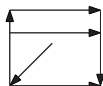
R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-30°C) J
> 420	500 - 640	> 22	≥ 50

APPROXIMATE CHEMICAL COMPOSITION

	C	Mn	Si	Mo
%	< 0,12	0,6	0,3	0,5

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	32 000	4,8	5 x 4,8 = 24,0
Ø 4,0 x 350	22 400	4,8	5 x 4,8 = 24,0
Ø 5,0 x 350	10 600	6,5	5 x 6,5 = 32,5



Marking: **EZ - 7 C Mo**

EZ - 8 RC

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 RC 11	E6013

DESCRIPTION AND APPLICATION

A medium coated electrode of rutile-cellulose type for welding of mild and low-alloy steels with tensile strength up to 510 N/mm². Suitable for welding in all positions, including vertical down. Distinguished by stable electric arc and easy slag detachment.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0261 to Č 0483	St 33 (1.0035) to St 44-3N (1.0144)	S 185 to S 275J2G3 Fe 310-0 to Fe 430 D1
Boiler steels	Č 1202 Č 1204 Č 3133	HI (1.0345) HII (1.0425) 17Mn4 (1.0481)	P235GH P265GH P295GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)	DX55D to P355T2 L210 do L360NB
Shipbuilding steels	A, B, D	A, B, D	
Cold-reduced steel sheet	Č 0146 to Č 0148	St 12 (1.0330) to St 14 (1.0338)	Fe P01 to Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 640	> 20	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,08	0,5	0,3

RECOMMENDED WELDING CURRENT

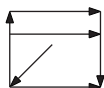
Ø mm	2,0	2,5	3,2	4,0	5,0
A	40 - 60	60 - 90	100 - 130	140 - 170	180 - 210

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	94 600	0,8; 3,5	20 x 0,8 = 16; 5 x 3,5 = 17,5
Ø 2,5 x 300	62 200	0,8; 3,5	20 x 0,8 = 16; 5 x 3,5 = 17,5
Ø 3,2 x 350	31 900	0,8; 4,5	25 x 0,8 = 20; 5 x 4,5 = 22,5
Ø 4,0 x 350	22 300	4,5	5 x 4,5 = 22,5
Ø 5,0 x 450	10 500	6,2	5 x 6,2 = 31,0

APPROVALS

ABS (2); BV (2); CRS (2); DB; DNV (2); GL (2); LR (2); RINA (2); TÜV



Marking: EZ - 8 RC

EZ - 10 R

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 R 12	E6013

DESCRIPTION AND APPLICATION

Thin-coated rutile electrode for welding of steels with tensile strength up to 510 N/mm². It is characterized by stabile welding arc, excellent slag detachment and fine smooth weld. It is suitable for welding in forced position, eg. overhead position.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Construction steel	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570)	S 185 to S 355J2G3 Fe 310-0 to Fe 510 D1
Boiler steels	Č 1202 Č 1204 Č 3133	HI (1.0345) HII (1.0425) 17Mn4 (1.0481)	P235GH P265GH P295GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)	DX55D to P355T2 L210 to L360NB
Shipbuilding steels	A, B, D	A, B, D	
Cold-reduced steel sheet	Č 0146 to Č 0148	St 12 (1.0330) to St 14 (1.0338)	Fe P01 to Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 640	> 20	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

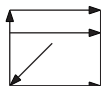
	C	Mn	Si
%	0,08	0,5	0,3

RECOMMENDED WELDING CURRENT

Ø mm	2,0	2,5	3,2	4,0
A	50 - 70	60 - 95	110 - 150	140 - 200

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	100 000	0,8; 4,0	20 x 0,8 = 16; 5 x 4,0 = 20,0
Ø 2,5 x 300	65 238	0,8; 4,2	20 x 0,8 = 16; 5 x 4,2 = 21,0
Ø 3,2 x 350	33 777	0,8; 4,5	25 x 0,8 = 20; 5 x 4,5 = 22,5
Ø 4,0 x 450	16 500	5,3	5 x 5,3 = 26,5



Marking: **EZ - 10 R**

EZ - 10 RC

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 RC 11	E6013

DESCRIPTION AND APPLICATION

Thin-coated rutile-cellulose electrode for welding mild and low-alloy steels with tensile strength up to 510 N/mm². Suitable for welding in all positions, including vertical down. It is characterised by stable welding arc and easy slag detachment.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0261 to Č 0483	St 33 (1.0035) to St 44-3N (1.0144)	S 185 to S 275J2G3 Fe 310-0 to Fe 430 D1
Boiler steels	Č 1202 Č 1204 Č 3133	HI (1.0345) HII (1.0425) 17Mn4 (1.0481)	P235GH P265GH P295GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)	DX55D to P355T2 L210 do L360NB
Shipbuilding steels	A, B, D	A, B, D	
Cold-reduced steel sheet	Č 0146 to Č 0148	St 12 (1.0330) to St 14 (1.0338)	Fe P01 to Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{EL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 640	> 20	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

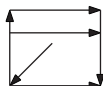
	C	Mn	Si
%	0,08	0,5	0,3

RECOMMENDED WELDING CURRENT

Ø mm	2,0	2,5	3,2	4,0
A	40 - 60	60 - 90	100 - 130	140 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	104 000	0,8; 4,0	20 x 0,8 = 16; 5 x 4,0 = 20,0
Ø 2,5 x 300	67 895	0,8; 3,8	20 x 0,8 = 16; 5 x 3,8 = 19,0
Ø 3,2 x 350	34 888	0,8; 4,5	25 x 0,8 = 20; 5 x 4,5 = 22,5
Ø 4,0 x 450	23 405	4,7	5 x 4,7 = 23,5



Marking: **EZ - 10 RC**

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 RR 12	E6013

DESCRIPTION AND APPLICATION

A heavily coated rutile electrode for welding of steels with tensile strength up to 510 N/mm². Distinguished by consistent welding arc, excellent slag detachment and fine smooth welds.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570)	S 185 to S 355J2G3 Fe 310-0 to Fe 510 D1
Boiler steels	Č 1202 Č 1204 Č 3133	HI (1.0345) HII (1.0425) 17Mn4 (1.0481)	P235GH P265GH P295GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)	DX55D to P355T2 L210 to L360NB
Shipbuilding steels	A, B, D	A, B, D	
Cold-reduced steel sheet	Č 0146 to Č 0148	St 12 (1.0330) to St 14 (1.0338)	Fe P01 to Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 640	> 20	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,08	0,6	0,35

RECOMMENDED WELDING CURRENT

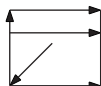
Ø mm	2,0	2,5	3,2	4,0	5,0	6,0
A	50 - 70	60 - 95	110 - 150	140 - 200	200 - 270	230 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	89 200	0,8; 3,7	20 x 0,8 = 16; 5 x 3,7 = 18,5
Ø 2,5 x 300	54 300	0,8; 3,5	20 x 0,8 = 16; 5 x 3,5 = 17,5
Ø 3,2 x 350	27 900	0,8; 4,3	25 x 0,8 = 20; 5 x 4,3 = 21,5
Ø 4,0 x 450	14 700	5,3	5 x 5,3 = 26,5
Ø 5,0 x 450	10 000	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	6 700	5,2	5 x 5,2 = 26,0

APPROVALS

ABS (2); BV (2); CRS (2); DB; DNV (2); GL (2); LR (2); TÜV



Marking: **EZ - 11 F**

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 RR 53	E7024

DESCRIPTION AND APPLICATION

A heavily coated rutile electrode, with effective efficiency approx. 130%. Particularly suitable for horizontal and fillet welding of steels with tensile strength up to 510 N/mm². Distinguished by excellent weldability, easy slag detachment and good mechanical properties.

Steel grade	HRN		DIN (W. Nr.)		EN / ISO
Constructional steels	Č 0261 to Č 0563		St 33 (1.0035) to St 52-3N (1.0570)		S 185 to S 355J2G3 Fe 310-0 to Fe 510 D1
Boiler steels	Č 1202	Č 1204	HI (1.0345)	HI1 (1.0425)	P235GH P265GH P295GH
	Č 3133		17Mn4 (1.0481)		
Shipbuilding steels	A, B, D		A, B, D		
	AH 32 to DH 36		AH 32 to DH 36		

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 550	> 22	≥ 55

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,1	0,5	0,25

RECOMMENDED WELDING CURRENT

Ø mm	4,0	5,0	6,0
A	160 - 210	210 - 270	250 - 310

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 4,0 x 450	10 800	4,8	5 x 4,8 = 24,0
Ø 5,0 x 450	7 100	4,9	5 x 4,9 = 24,5
Ø 6,0 x 450	5 200	4,8	5 x 4,8 = 24,0

APPROVALS

ABS (2,2Y); BV (2Y); CRS (2Y); DNV (2); GL (2Y); LR (2,2Y); RINA (2Y)



Marking: **E 7024**

EZ - 180 R

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 0 RR 73	E7024

DESCRIPTION AND APPLICATION

A heavily coated rutile electrode with effective efficiency approximate 180%.
Suitable for welding of mild and low-alloy steels in flat and horizontal-vertical position.

Steel grade	HRN	DIN (W. Nr.)		EN / ISO	
Constructional steels	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570)		S 185 to S 355J2G3 Fe 310-0 to Fe 510 D1	
Boiler steels	Č 1202	Č 1204	HI (1.0345)	HI1 (1.0425)	P235GH P265GH
	Č 3133		17Mn4 (1.0481)		P295GH
Shipbuilding steels	A, B, D		A, B, D		
	AH 32 to DH 36		AH 32 to DH 36		

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (0°C) J
> 420	500 - 560	> 22	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,08	0,95	0,35

RECOMMENDED WELDING CURRENT

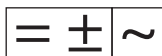
Ø mm	4,0	5,0
A	160 - 240	240 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 4,0 x 450	9 600	5,3	5 x 5,3 = 26,5
Ø 5,0 x 450	6 200	5,3	5 x 5,3 = 26,5

APPROVALS

ABS (2); BV (2); CRS (2); DNV (2); GL (2); LR (2); RINA (2); RS (2)



Marking: **E 7024**



**ELECTRODES FOR WELDING
UNALLOYED AND LOW-ALLOYED STEELS**

**EZ - 50 B
EZ - 500 B
EZ - 60 B
EZ - 65 B**

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 42 4 B 42 H5	E7018-1

DESCRIPTION AND APPLICATION

A heavily coated basic electrode for welding of mild and low alloy steels with tensile strength up to 640 N/mm². Also, it is suitable for welding of fine grained steels with yield strength up to 440 N/mm². Hydrogen content of all-weld metal < 5 ml/100 g. Effective efficiency approx. 120%.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570) StE 420 S (1.0428)	S 185 to S 355 J2G3 Fe 310-0 to Fe 510 D1
Boiler steels	Č 1202 Č 1204 Č 3133 Č 3105	HI (1.0345) HII (1.0425) 17Mn4 (1.0481) 19Mn6 (1.0473)	P235GH P265GH P295GH P355GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)	DX55D to P355T2 L210 to L360NB
Shipbuilding steels	A, B, D, E AH 32 to EH 36	A, B, D, E AH 32 to EH 36	
Fine grained steels	ČRO 250 to ČRO 350 ČPRV 250 to ČPRV 350	StE 285 (1.0486) StE (1.0562) WStE 285 (1.0487) WStE 355 (1.0565)	P275N P355N P275NH P355NH
Cast steels	ČL 0300 to ČL 0500	GS-38 (1.0416) to GS-52 (1.0551)	C18D to S355JRC

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J	KV (-40°C) J
> 440	500 - 640	> 26	≥ 120	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,08	1,0	0,5

RECOMMENDED WELDING CURRENT

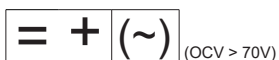
Ø mm	2,5	3,2	4,0	5,0	6,0
A	60 - 90	110 - 140	140 - 190	170 - 250	240 - 330

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	57 000	0,8; 3,2	20 x 0,8 = 16; 5 x 3,2 = 16,0
Ø 2,5 x 300	53 100	0,8; 3,2	20 x 0,8 = 16; 5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	0,8; 3,9	25 x 0,8 = 20; 5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	6 900	5,5	5 x 5,5 = 27,5

APPROVALS

ABS (3H10,3Y); BV (3,3YHH); CRS (3YHH); DB; DNV (3YH10); GL (3YH10); LR (3,3YH15); RINA (3YH10); RS (3YHH); TÜV



Marking: **EZ - 50 B**
Dry before use 2h/300°C

EZ - 500 B

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.1
E 46 4 B 42 H5	E7018-1

DESCRIPTION AND APPLICATION

A heavily coated basic type electrode for welding mild and low-alloy steels, fine-grained steels with tensile strength up to 460 N/mm². Easier to weld in forced positions with good restriking properties, better penetration and crack resistant coating.

Hydrogen content of all-weld metal < 5 ml/100 g.

Effective efficiency approx. 120%.

Steel grade	HRN	DIN (W. Nr.)		EN / ISO	
Constructional steels	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570)		S 185 to S 355 J2G3	
		StE 460 (1.8918)		P460NL2	
Boiler steels	Č 1202 Č 1204 Č 3133 Č 3105	HI (1.0345) HII (1.0425)		P235GH P265GH	
		17Mn4 (1.0481) 19Mn6 (1.0473)		P295GH P355GH	
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581)		DX55D to P355T2	
		StE 210.7 (1.0307) to StE 360.7 (1.0582)		L210 to L360NB	
Shipbuilding steels	A, B, D, E	A, B, D, E			
	AH 32 to EH 36	AH 32 to EH 36			
Fine grained steels	ČRO 250 to ČRO 350	StE 285 (1.0486) StE (1.0562)		P275N P355N	
	ČPRV 250 to ČPRV 350	WSIE 285 (1.0487) WSIE 355 (1.0565)		P275NH P355NH	
Cast steels	ČL 0300 to ČL 0500	GS-38 (1.0416) to GS-52 (1.0551)		C18D to S355JRC	

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J	KV (-40°C) J
> 460	530 - 680	> 26	≥ 160	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si
%	0,08	1,3	0,3

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0	6,0
A	60 - 90	110 - 140	140 - 190	170 - 250	240 - 330

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	57 000	3,2	5 x 3,2 = 16,0
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	6 900	5,5	5 x 5,5 = 27,5



Marking: **EZ - 500 B**
Dry before use 2h/300°C

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.5
E 50 6 1Ni B 42 H5	E8018-G

DESCRIPTION AND APPLICATION

A basic coated, alloyed with nickel (Ni), electrode for welding low-alloyed steels with tensile strength from 510 to 670 N/mm². Also suitable for welding fine-grained steels with yield strength up to 460 N/mm², where is required very good impact properties at low temperatures. Hydrogen content of all-weld metal < 5 ml/100 g.

Steel grade	HRN	DIN (W. Nr.)		EN / ISO
Constructional steels	Č 0561 to Č 0745	St 52-3N (1.0570) to St 70-2 (1.0070)		S 355J2G3 to E 360 Fe 510 D1 to Fe 690-2
Boiler steels	Č 3133 Č 3105	17 Mn4 (1.0481)	19Mn6 (1.0473)	P295GH P355GH
Fine-grained steels	ČRO 350 to ČRO 460	StE 355 (1.0562) to StE 460 (1.8905)		P355N P460N
	ČRV 350 to ČRV 460	WSiE 355 (1.0565) WSiE 460 (1.8935)		P355NH P460NH
	ČRM 350 to ČRN 460	TSiE 355 (1.0566) TSiE 460 (1.8915)		P355NL1 P460NL1
Nickel steels		11MnNi53 (1.6212)	13MnNi63 (1.6217)	11MnNi5-3 13MnNi6-3
Cast steels	ČL 0500 ČL 0600	GS-52 (1.0551)	GS-60 (1.0553)	S355JRC S355JO

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{el} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J	KV (-60°C) J
> 500	590 - 650	> 22	≥ 80	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

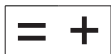
	C	Mn	Si	Ni
%	0,08	1,0	0,5	1,1

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0	6,0
A	65 - 80	120 - 140	140 - 180	220 - 250	260 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	6 900	5,5	5 x 5,5 = 27,5



Marking: **E 8018-G**
Dry before use 2h/300°C

CLASSIFICATION

EN ISO 2560-A	AWS / ASME SFA-5.5
E 50 4 B 42 H5	E8018-G

DESCRIPTION AND APPLICATION

A heavily coated basic electrode for welding of mild and low-alloy constructional steels with tensile strength from 510 to 670 N/mm². Also, it is suitable for welding of fine-grained steels with yield strength up to 460 N/mm².

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0561 to Č 0745	St 52-3N (1.0570) to St 70-2 (1.0070)	S 355J2G3 to E 360 Fe 510 D1 to Fe 690-2
Boiler steels	Č 3133 Č 3105	17 Mn4 (1.0481) 19Mn6 (1.0473)	P295GH P355GH
Tube and pipe steels	Č 3100 to Č 1402	St 52.4 (1.0581) to StE 55.4 (1.0509) StE 360.7 (1.0582) to StE 415.7 (1.8972)	P355T2 to S355K2G3Cu L210 to L415NB
Shipbuilding steels	A, B, D, E AH 32 to EH 36	A, B, D, E AH 32 to EH 36	
Fine grained steels	ČRO 350 to ČRO 460 ČRV 350 to ČRV 460	StE 355 (1.0562) to StE 460 (1.8905) WSIE 355 (1.0565) WSIE 460 (1.8935)	P355N P460N P355NH P460NH
Cast steels	ČL 0300 to ČL 0600	GS-38 (1.0416) to GS-60 (1.0553)	C18D to S355JO

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J	KV (-40°C) J
> 510	590 - 680	> 22	≥ 100	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

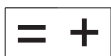
	C	Mn	Si
%	0,08	1,7	0,7

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0	6,0
A	70 - 80	110 - 130	140 - 170	220 - 250	260 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	6 900	5,5	5 x 5,5 = 27,5



Marking: **E 8018-G**
Dry before use 2h/300°C



**ELECTRODES FOR WELDING
CREEP RESISTING STEELS**

EZ - 55 B Mo

EZ - 70 B

EZ - 80 B

EZ - 55 B Mo

CLASSIFICATION

EN ISO 3580-A	AWS / ASME SFA-5.5
E Mo B 42	E7018-A1

DESCRIPTION AND APPLICATION

An Mo-alloyed basic coated electrode for welding of creep resisting steels, persistent on working temperatures up to 550°C.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0361 to Č 0545	St 37-2 (1.0037) to St 50-2 (1.0050)	S 235JR to E 295 Fe 360B to Fe 490-2
Fine-grained steels	ČRV 350 to ČRV 420	WStE 355 (1.0565) to WStE 420 (1.8932)	P355NH to P420NH
Boiler steels	Č 1202 Č 1204	HI (1.0481) HII (1.0473)	P235GH P265GH
	Č 3133 Č 3105	17Mn4 (1.0481) 19Mn6 (1.0473)	P295GH P355GH
	Č 7100	15Mo3 (1.5415)	16M03
Tube and pipe steels	Č 1214 Č 1215	St 35.8 (1.0305) St 45.8 (1.0405)	P235G1TH P255G1TH
Cast steels	ČL 7130	G-22 Mo4 (1.5419)	G20Mo5

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Stress relieved at 620°C.

R _{el} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J
> 450	530 - 660	> 23	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	Mo
%	0,08	1,0	0,5	0,5

RECOMMENDED WELDING CURRENT

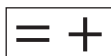
Ø mm	2,5	3,2	4,0	5,0
A	60 - 90	85 - 140	140 - 190	170 - 250

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0

APPROVALS

DB; TÜV



Marking: **EZ - 55 B Mo**
Dry before use 2h/300°C

CLASSIFICATION

EN ISO 3580-A	AWS / ASME SFA-5.5
E Cr Mo1 B 42	E8018-B2

DESCRIPTION AND APPLICATION

Basic coated electrode alloyed with Cr and Mo. Suitable for welding of creep resisting steels with working temperatures up to 550°C. Also, it is suitable for welding of heat treatable steels of similar chemical composition.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Creep resisting and heat-treatable steels and casts	Č 7400	13CrMo44 (1.7335)	13CrMo4-5
	Č 4732	42CrMo4 (1.7225)	42CrMo4
	Č 4730	25CrMo4 (1.7218)	25CrMo4
	Č 4720	15CrMo5 (1.7262)	18CrMo4
	ČL 4730	20CrMo4 (1.7321)	20MoCr5
	ČL 7431	16MnCr5 (1.7131)	16MnCr5
		GS-25 CrMo4 (1.7218)	G25CrMo4
		GS-24 CrMo 54 (1.7354)	G22CrMo5-4
		GS-17 CrMo 55 (1.7357)	G17CrMo5-5

MECHANICAL COMPOSITION OF THE ALL-WELD METAL

Stress relieved at 720°C.

R _{EL} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 470	570 - 700	> 22	≥ 110

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

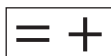
	C	Mn	Si	Cr	Mo
%	0,08	0,8	0,5	1,2	0,5

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	65 - 80	120 - 140	140 - 180	220 - 250

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0



Marking: **E 8018-B2**
Dry before use 2h/300°C

CLASSIFICATION

EN ISO 3580-A	AWS / ASME SFA-5.5
E Cr Mo2 B 42	E9018-B3

DESCRIPTION AND APPLICATION

Basic coated electrode alloyed with Cr and Mo. Suitable for welding creep resisting steels whose operating temperature is up to 600°C. It is also suitable for welding of heat treatable steels of similar chemical composition.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Creep resisting and heat treatable steels and cast	Č 7401	10CrMo 9 10 (1.7380)	10 CrMo 9-10
		10CrSiMoV (1.8075)	11CrMo 9-10
	Č 4734	30CrMoV 9 (1.7707)	30CrMoV9
		GS-12 CrMo 9 10 (1.7380)	G12CrMo9-10

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Stress relieved at 760°C.

R _{el} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 520	620 - 720	> 20	≥ 80

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

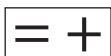
	C	Mn	Si	Cr	Mo
%	0,08	0,8	0,5	2,4	1,0

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	65 - 80	120 - 140	140 - 180	220 - 250

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	26 900	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	14 400	5,2	5 x 5,2 = 26,0
Ø 5,0 x 450	9 600	5,4	5 x 5,4 = 27,0



Marking: **E 9018-B3**
Dry before use 2h/300°C



**ELECTRODES FOR WELDING
HIGH-ALLOY STEELS**

**EZ - KROM 8
EZ - KROM 10 R
EZ - KROM 10 Nb
EZ - KROM 20
EZ - KROM 30 R
EZ - KROM 30 Nb
EZ - KROM 40 R
EZ - KROM 70**

EZ - KROM 8

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 29 9 R 12	E312-16

DESCRIPTION AND APPLICATION

A rutile coated electrode for welding of austenitic-ferritic steels, similar corrosion resisting steels and steel cast. Electrode is also suitable for joining dissimilar steels (alloyed and unalloyed), hard manganese steels, steels with poor weldability and high strength steels. Suitable for wear resistant surfacing and for buffer layers at hardfacing. Weld metal has an austenitic-ferritic structure.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	Tvrdoća HB
> 490	700 - 830	> 20	235 - 270

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

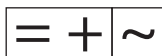
	C	Mn	Si	Cr	Ni
%	0,15	1,0	1,2	29,0	9,0

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	60 - 80	80 - 100	110 - 130	140 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 350	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	9 100	5,0	5 x 5,0 = 25,0



Marking: **EZ - KROM 8**
Dry before use 2h/300°C

EZ - KROM 10 R

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 19 9 LR 12	E308L-16

DESCRIPTION AND APPLICATION

A low-carbon rutile electrode for welding of identical or similar (stabilized and unstabilized) stainless steels. Weld metal is of austenitic Cr-Ni type with delta-ferrite. Weld is resistant to intergranular corrosion on working temperatures up to 350°C.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
Stainless high-alloy austenite steels	Č 4580	X5 CrNi 18 11 (1.4301)	304	X5CrNi18-10
	ČL 4571	G-X 10 CrNi 18 8 (1.4312)	-	GX10CrNi18-8
	Č 45701	X2 CrNi 19 11 (1.4306)	304 L	X2CrNi19-11
	ČL 45701	G-X6 CrNi 18 9 (1.4308)	-	GX5CrNi19-10
	Č 4582	X6 CrNiNb 18 10 (1.4550)	347	X6CrNiNb18-10
	ČL 4572	G-X5 CrNiNb 18 9 (1.4552)	-	GX5CrNiNb19-11
	Č 4572	X6 CrNiTi 18 10 (1.4541)	321	X6CrNiTi18-10

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 320	> 510	> 30	> 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	Cr	Ni
%	≤ 0,03	0,9	0,9	19	10

RECOMMENDED WELDING CURRENT

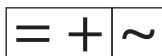
Ø mm	2,0	2,5	3,2	4,0	5,0
A	20 - 60	50 - 85	70 - 125	110 - 165	160 - 230

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	82 700	1,1	15 x 1,1 = 16,5
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 350	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	9 100	6,0	5 x 6,0 = 30,0

APPROVALS

ABS (308 L-16); BV (UP); DB; DNV (308 L); LR (304L); TÜV



Marking: **EZ - KROM 10 R**
Dry before use 2h/300°C

EZ - KROM 10 Nb

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 19 9 Nb R 12	E347-16

DESCRIPTION AND APPLICATION

A rutile type coated electrode for welding of identical (stabilized) and similar stainless steels. The weld metal is of austenitic Cr-ni type with low carbon, stabilized with niobium, resistant to intergranular corrosion up to 400°C and oxidation up to 800°C. Weld metal structure is austenite with delta ferrite.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High alloyed	Č 4582	X6 CrNiNb 18 10 (1.4550)	347	X6CrNiNb18-10
austenitic	ČL 4572	G-X5 CrNiNb 18 9 (1.4552)	-	GX5CrNiNb19-11
stainless steels	Č 4572	X6 CrNiTi 18 10 (1.4541)	321	X6CrNiTi18-10
and casts	Č 4580	X5 CrNi 18 11 (1.4301)	304	X5CrNi18-10
	Č 4571	G-X10 CrNi 18 8 (1.4312)	-	GX10CrNi18-8
	Č 45701	X2 CrNi 19 11 (1.4306)	304 L	X2CrNi19-11
	ČL 45701	G-X6 CrNi 18 9 (1.4308)	-	GX5CrNi19-10

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 400	600 - 700	> 30	> 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

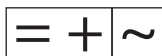
	C	Mn	Si	Cr	Ni	Nb
%	≤ 0,03	0,9	0,9	19	10	> 10x%C

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0
A	60 - 90	80 - 130	110 - 160

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 300	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2



Marking: **E 347-16**
Dry before use 2h/300°C

EZ - KROM 20

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 18 8 Mn B 22	~ E307-15

DESCRIPTION AND APPLICATION

A basic coated electrode for welding Cr-Ni stainless steels, steels with poor weldability, and steels with dissimilar structural phases (unalloyed and low-alloy steels as well as manganese steel). Electrode is also suitable for obtaining elastic buffer layer in hardfacing. Weld metal is austenitic Cr-Ni-Mn type, nonmagnetic, wear resistant, and corrosion resistant up to 800°C.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 350	590 - 690	> 35	> 80

APPROXIMATE CHEMICAL PROPERTIES OF THE ALL-WELD METAL

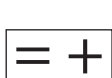
	C	Mn	Si	Cr	Ni
%	0,12	6,0	1,0	18,5	8,0

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	65 - 85	90 - 110	125 - 145	150 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	65 000	1,3	15 x 1,3 = 19,5
Ø 3,2 x 350	33 000	1,2	17 x 1,2 = 20,4
Ø 4,0 x 350	22 000	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	11 300	5,2	5 x 5,2 = 26,0



Marking: **EZ - KROM 20**
Dry before use 2h/300°C

EZ - KROM 30 R

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 19 12 3 LR 12	E316L-16

DESCRIPTION AND APPLICATION

A low-carbon rutile electrode for welding of identical and similar (stabilized and unstabilized) stainless steels. Weld metal is of austenitic Cr-Ni-Mo type with delta-ferrite. Weld metal is resistant to intergranular corrosion on working temperatures up to 350°C.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
Stainless high-alloy austenite steels	Č 4573	X5 CrNiMo 17 12 2 (1.4401)	316	X5CrNiMo17-12-2
	Č 45703	X2 CrNiMo 17 13 2 (1.4404)	316 L	X2CrNiMo17-12-2
	Č 4574	X6 CrNiMoTi 17 12 2 (1.4571)	316 Ti	X6CrNiMoTi17-12-2
	Č 4583	X6 CrNiMoNb 17 12 2 (1.4580)	316 Cb	X6CrNiMoNb17-12-2
	ČL 4580	G-X6 CrNiMo 18 10 (1.4408)	-	GX5CrNiMo19-11-2
	ČL 4573	G-X10 CrNiMo 18 9 (1.4410)	-	-

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 320	> 510	> 25	> 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	Cr	Ni	Mo
%	≤ 0,03	0,9	0,8	18,5	12	2,7

RECOMMENDED WELDING CURRENT

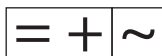
Ø mm	2,0	2,5	3,2	4,0	5,0
A	40 - 60	50 - 85	70 - 125	110 - 165	160 - 230

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	79 100	1,1	15 x 1,1 = 16,5
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 350	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	9 100	6,0	5 x 6,0 = 30,0

APPROVALS

ABS (316 L-16); BV (UP); DB; DNV (316 L); LR (316 L); RS (A-6); TÜV



Marking: **EZ - KROM 30 R**
Dry before use 2h/300°C

EZ - KROM 30 Nb

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 19 12 3 Nb R 12	E318-16

DESCRIPTION AND APPLICATION

A rutile type coated electrode for welding of identical (stabilized) and similar stainless steels. The weld metal is of Cr-Ni-Mo type with low carbon, stabilized with niobium, resistant to intergranular corrosion up to 400°C and oxidation up to 800°C. Weld metal structure is austenitic with delta ferrite.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High alloy	Č 4573	X5 CrNiMo 17 12 2 (1.4401)	316	X5CrNiMo17-12-2
austenitic	Č 45703	X2 CrNiMo 17 13 2 (1.4404)	316 L	X2CrNiMo17-12-2
stainless steels	Č 4574	X6 CrNiMoTi 17 12 2 (1.4571)	316 Ti	X6CrNiMoTi17-12-2
and cast	Č 4583	X6 CrNiMoNb 17 12 2 (1.4580)	316 Cb	X6CrNiMoNb17-12-2
	ČL 4580	G-X6 CrNiMo 18 10 (1.4408)	-	GX5CrNiMo19-11-2
	ČL 4573	G-X10 CrNiMo 18 9 (1.4410)	-	-

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 400	590 - 690	> 30	> 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

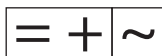
	C	Mn	Si	Cr	Ni	Mo	Nb
%	≤ 0,03	0,9	0,8	18,5	12,0	2,7	> 10x%C

RECOMMENDED WELDING CURRENT

Ø mm	2,0	2,5	3,2	4,0	5,0
A	40 - 60	50 - 85	70 - 125	110 - 165	160 - 230

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,0 x 300	79 100	1,1	15 x 1,1 = 16,5
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 350	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	9 100	6,0	5 x 6,0 = 30,0



Marking: **E 318-16**
Dry before use 2h/300°C

EZ - KROM 40 R

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 23 12 2 LR 12	E309MoL-16

DESCRIPTION AND APPLICATION

Rutile coated electrode for welding of identical and similar stainless steels. Electrode is also used for welding dissimilar steels (for eg. stainless steel with mild steels), and for claddings on mild and low-alloy steels. Weld metal is of Cr-Ni-Mo austenitic type with delta-ferrite, resistant on temperatures up to 350°C.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 350	> 550	> 30	> 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	Cr	Ni	Mo
%	≤ 0,03	0,9	0,8	22,5	12,5	2,7

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	60 - 80	80 - 110	110 - 150	150 - 190

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	52 800	1,1	15 x 1,1 = 16,5
Ø 3,2 x 350	26 300	1,1	17 x 1,1 = 18,7
Ø 4,0 x 350	18 200	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	9 100	5,5	5 x 5,5 = 27,5

APPROVALS

ABS (309 MoL-16); BV (UP); DNV (309 MoL); LR (SS/CMn); RS (A-9sp)



Marking: **EZ - KROM 40 R**
Dry before use 2h/300°C

CLASSIFICATION

EN ISO 3581-A	AWS / ASME SFA-5.4
E 25 20 B 22	E310-15

DESCRIPTION AND APPLICATION

A Basic coated electrode for welding and surfacing heat resistant steels of 25/20 Cr-Ni type, ferrite-perlite Cr, Cr-Si and Cr-Al steels and heat resisting steel cast. Weld metal is austenite Cr-Ni type, resistant up to 1200°C.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High alloy heat resistant steels	Č 4578	X15 CrNiSi 25 20 (1.4841)	310 / 314	X15CrNiSi25-21
	-	X12 CrNi 25 21 (1.4845)	310 S	X8CrNi25-21
	-	G-X15 CrNi 25 20 (1.4840)	-	GX15CrNi25-20
	-	X7 CrNi 23 14 (1.4833)	-	X12CrNi23-13
	Č 4586	X20 CrNiSi 25 4 (1.4821)	327	X15CrNiSi25-4
	-	G-X 40 CrNiSi 22 9 (1.4826)	-	GX40CrNiSi22-9
	-	G-X 25 CrNiSi 20 14 (1.4832)	-	GX25CrNiSi20-14
	ČL 4577	G-X 40 CrNiSi 25 12 (1.4837)	-	GX40CrNiSi25-12

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J
> 350	> 550	> 20	> 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

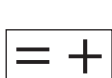
	C	Mn	Si	Cr	Ni
%	0,12	2,5	1,0	25,0	20,0

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	65 - 85	90 - 110	125 - 145	150 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	62 900	1,3	15 x 1,3 = 19,5
Ø 3,2 x 350	32 100	1,2	17 x 1,2 = 24,0
Ø 4,0 x 350	22 000	1,2	16 x 1,2 = 19,2
Ø 5,0 x 450	11 000	6,0	5 x 6,0 = 30,0



Marking: **E 310-15**
Dry before use 2h/300°C



**ELECTRODES FOR WELDING
CAST IRON**

**EZ - Fe NIKALJ
EZ - NIKALJ 10**

EZ - Fe NIKALJ

CLASSIFICATION

EN ISO 1071	AWS / ASME SFA-5.15
E C NiFe-CI-1	ENiFe-CI

DESCRIPTION AND APPLICATION

A basic coated electrode for welding of grey cast iron, temper and steel cast without preheating. It is also suitable for welding of unalloyed, low-alloy and high-alloy steels, and for joining cast iron to steel. Weld deposit is machinable.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness

HB

190

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

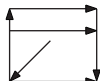
	Ni	Fe
%	55	45

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	60 - 80	90 - 110	120 - 140	150 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	62 500	1,3	15 x 1,3 = 19,5
Ø 3,2 x 350	32 500	1,3	17 x 1,3 = 22,1
Ø 4,0 x 350	21 800	1,5	16 x 1,5 = 24,0
Ø 5,0 x 450	11 000	6,0	5 x 6,0 = 30,0



Marking: **EZ - Fe NIKALJ**

EZ - NIKALJ 10

CLASSIFICATION

EN ISO 1071	AWS / ASME SFA-5.15
E C Ni-CI	ENi-CI

DESCRIPTION AND APPLICATION

Basic coated electrode for welding of grey cast iron, temper and steel cast without preheating. It is also suitable for welding of unalloyed, low-alloy and high-alloy steels, and for joining cast iron to steel, copper and copper alloys. Preheating is required when welding copper and copper alloys.

Weld deposit is machinable.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness
HB
175

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

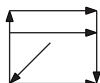
Ni
% ≥ 98

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0
A	60 - 80	90 - 110	120 - 140	150 - 170

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	62 500	1,3	15 x 1,3 = 19,5
Ø 3,2 x 350	32 500	1,3	17 x 1,3 = 22,1
Ø 4,0 x 350	21 800	1,5	16 x 1,5 = 24,0
Ø 5,0 x 450	11 000	6,0	5 x 6,0 = 30,0



Marking: **E Ni-CI**



**ELECTRODE FOR WELDING
COPPER AND COPPER ALLOYS**

EZ - BAKAR 1

EZ - BAKAR 1

CLASSIFICATION

AWS / ASME	DIN
-	-
-	-

DESCRIPTION AND APPLICATION

Basic coated electrode for welding of copper to steel and for welding copper alloys.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _m N/mm ²	A ₅ %	Hardness HB
> 390	> 28	100 - 200

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	Cu	Mn	Si	Fe
%	88,0	8,0	2,0	2,0

RECOMMENDED WELDING CURRENT

Ø mm	3,2	4,0
A	90 - 110	130 - 150

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	28 900	1,3	17 x 1,3 = 22,1
Ø 4,0 x 350	20 300	1,5	16 x 1,5 = 24,0





**ELECTRODES FOR
HARDFACING**

**EZ - 300 TN
EZ - 400 TN
EZ - 650 TN
EZ - ABRA 60
EZ - ABRA 65**

EZ - 300 TN

CLASSIFICATION

EN 14700	DIN 8555
E Fe 1	E1-UM-300

DESCRIPTION AND APPLICATION

A basic heavily coated electrode for medium-hard and wear resisting buildups. The deposit is machinable and resistant to abrasive wear abrasives which hardness is up to 140 HV. When hardfacing apply medium welding current and no weaving of electrode is recommended.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness HB
275 - 325

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

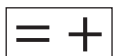
	C	Mn	Si
%	0,15	1,6	1,0

RECOMMENDED WELDING CURRENT

Ø mm	3,2	4,0	5,0	6,0
A	110 - 130	150 - 170	200 - 240	250 - 290

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	31 200	4,1	5 x 4,1 = 20,5
Ø 4,0 x 450	15 700	5,1	5 x 5,1 = 25,5
Ø 5,0 x 450	10 200	5,2	5 x 5,2 = 26,0
Ø 6,0 x 450	7 300	5,2	5 x 5,2 = 26,0



Marking: **EZ - 300 TN**

EZ - 400 TN

CLASSIFICATION

EN 14700	DIN 8555
E Fe 1	E1-UM-400

DESCRIPTION AND APPLICATION

A basic heavily coated electrode for medium-hard and wear resisting buildups. The deposit is machinable and resistant to abrasive wear abrasives which hardness is up to 140 HV. When hardfacing apply medium welding current and no weaving of electrode is recommended.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness HB
375 - 450

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

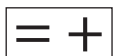
	C	Mn	Si	Cr
%	0,2	2,0	1,0	1,2

RECOMMENDED WELDING CURRENT

Ø mm	3,2	4,0	5,0	6,0
A	110 - 130	150 - 170	200 - 240	250 - 290

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	28 400	3,7	5 x 3,7 = 18,5
Ø 4,0 x 450	15 000	5,0	5 x 5,0 = 25,0
Ø 5,0 x 450	10 000	5,2	5 x 5,2 = 26,0
Ø 6,0 x 450	7 100	5,5	5 x 5,5 = 27,5



Marking: **EZ - 400 TN**

EZ - 650 TN

CLASSIFICATION

EN 14700	DIN 8555
E Fe 2	E6-UM-60

DESCRIPTION AND APPLICATION

A basic heavily coated electrode for hard buildups. The deposit is hard, tough and abrasion resistant to hardness up to 500 HV. Weld is machinable only by grinding. When hardfacing apply medium welding current and no weaving of electrode is recommended.

At multilayer hardfacing it is recommended to weld buffer layer with electrode EZ - KROM 20.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness HRC
57 - 62

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

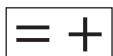
	C	Mn	Si	Cr	Mo
%	0,5	2,0	1,4	6,0	0,6

RECOMMENDED WELDING CURRENT

Ø mm	2,5	3,2	4,0	5,0	6,0
A	70 - 90	110 - 130	150 - 170	200 - 240	250 - 290

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 2,5 x 300	53 100	3,2	5 x 3,2 = 16,0
Ø 3,2 x 350	27 600	3,8	5 x 3,8 = 19,0
Ø 4,0 x 450	15 600	4,8	5 x 4,8 = 24,0
Ø 5,0 x 450	10 200	5,4	5 x 5,4 = 27,0
Ø 6,0 x 450	7 100	5,5	5 x 5,5 = 27,5



Marking: **EZ - 650 TN**

EZ - ABRA 60

CLASSIFICATION

EN 14700	DIN 8555
E Fe 14	E10-UM-60-GR

DESCRIPTION AND APPLICATION

A high-efficiency, heavily coated rutile electrode for hard buildups. The metal deposit is extremely resistant to mineral abrasion and impact. Typical application in mining and mineral industry on wearing parts subjected to hard abrasive minerals (e.g. quartz, sand, dross, cement, ore etc.).

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness HRC
≈ 60 (20°C)

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

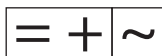
	C	Cr
%	3,2	32

RECOMMENDED WELDING CURRENT

Ø mm	3,2	4,0	5,0
A	100 - 110	150 - 170	170 - 190

PACKAGING

Electrode dimension mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	19 200	3,9	5 x 3,9 = 19,5
Ø 4,0 x 450	8 900	4,8	5 x 4,8 = 24,0
Ø 5,0 x 450	5 600	4,8	5 x 4,8 = 24,0



Marking: **EZ - ABRA 60**

EZ - ABRA 65

CLASSIFICATION

EN 14700	DIN 8555
E Fe 16	E10-UM-65-GRZ

DESCRIPTION AND APPLICATION

A high efficiency, heavily coated basic electrode for hard buildups. The metal deposit is extremely resistant to mineral abrasion and moderate impact at high temperatures (working temperatures up to 700°C). Typical application in mining and mineral industry on wearing parts subjected to abrasion at high temperatures (e.g. crushing mills for incandescent coal, coke, dross etc.).

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness
65 HRC (20°C)
600 HV (700°C)

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

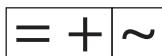
	C	Si	Cr	Mo	Nb	W	V
%	4,5	2,5	23,0	5,0	5,0	3,5	1,0

RECOMMENDED WELDING CURRENT

Ø mm	3,2	4,0	5,0
A	140 - 170	180 - 220	230 - 300

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	16 200	4,0	5 x 4,0 = 20,0
Ø 4,0 x 450	8 600	5,1	5 x 5,1 = 25,5
Ø 5,0 x 450	5 400	5,2	5 x 5,2 = 26,0



Marking: **EZ - ABRA 65**



**ELECTRODE FOR
GOUGING AND CUTTING**

EZ - 12

DESCRIPTION AND APPLICATION

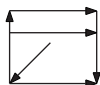
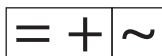
Heavily coated electrode designed for gouging and cutting. Especially suitable for gouging of grey cast iron before repair welding.

RECOMMENDED GOUGING CURRENT

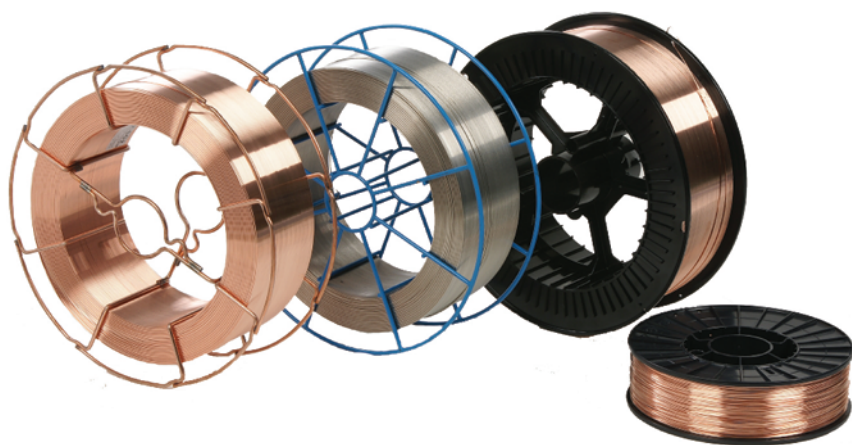
Ø mm	3,2	4,0	5,0
A	180 - 300	300 - 450	400 - 600

PACKAGING

Electrode dimensions mm	Quantity per ton approx. pieces	Weight of packaging kg	Weight of transport box pcs x kg/pcs = kg
Ø 3,2 x 350	23 100	2,9	5 x 2,9 = 14,5
Ø 4,0 x 350	15 700	2,8	5 x 2,8 = 14,0
Ø 5,0 x 450	8 100	3,7	5 x 3,7 = 18,5



WIRES





**WIRES FOR WELDING
UNALLOYED AND LOW-ALLOY STEELS**

**EZ - SG 2
EZ - SG 3
EZ - SG Mo
EZ - SG Ti
EZ - SG CORTEN
EZ - SG 100
EZ - SG 120**

EZ - SG 2

CLASSIFICATION

EN ISO 14341-A	AWS / ASME SFA-5.18	DIN 8559	W. Nr.
G 42 4 C/M 3Si1	ER70S-6	SG 2	1.5125

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire for welding in C1 (CO₂) or M21 (Ar/CO₂) shielding atmosphere. Suitable for welding of mild and low-alloy steels with tensile strength up to 590 N/mm².

Steel grade	HRN	DIN (W. Nr.)		EN / ISO	
Constructional steels	Č 0261 to Č 0545	St 33 (1.0035) to St 52-2N (1.0050)		S 185 to E 295 Fe 310-0 to Fe 490-2	
Boiler steels	Č 1202 Č 1204	HI (1.0345)	HI1 (1.0425)	P235GH	P265GH
	Č 3133 Č 3105	17Mn4 (1.0481)	19Mn6 (1.0473)	P295GH	P355GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)		DX55D to P355T2 L210 to L360NB	
Shipbuilding steels	A, B, D, E AH 32 to EH 36	A, B, D, E AH 32 to EH 36			
Fine-grained steels	ČRO 250 to ČRO 350	StE 285 (1.0486)	StE 355 (1.0562)	P275N	P355N
	ČRV 250 to ČRV 350	WSIE 285 (1.0487)	WSIE 355 (1.0565)	P275NH	P355NH
Cast steels	ČL 0300 to ČL 0500	GS-38 (1.0416) to GS-52 (1.0551)		C18D to S355JRC	

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J
> 430	500 - 640	> 22	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	Cu
%	0,06 - 0,13	1,4 - 1,6	0,7 - 1,0	≤ 0,3

SHIELDING GAS

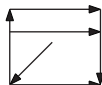
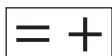
C1 or M21

PACKAGING

Wire diameter mm	Winding
0,6; 0,8; 1,0; 1,2; 1,6	random-wound (S-L); precision-wound (S-S)
1 kg - plastic spool (wire diameters 0,6 and 0,8 mm)	
5 kg - plastic spool (wire diameters 0,6 and 0,8 mm)	
15 kg - plastic (S-L or S-S wind) or metal spool (S-S wind) (wire diameters 0,8; 1,0; 1,2 and 1,6 mm)	
250 kg - drum (wire diameters 0,8; 1,0 and 1,2 mm)	

APPROVALS

ABS (3YSA); BV (SA 3Y M); CRS (3YS); DB; DNV (IIIMYS); GL (3YS); LR (3S,3YS); RINA (3YS); TÜV



EZ - SG 3

CLASSIFICATION

EN ISO 14341-A	AWS / ASME SFA-5.18	DIN 8559	W. Nr.
G 46 4 C/M 4Si1	ER70S-6	SG 3	1.5130

DESCRIPTION AND APPLICATION

Coppered or bronze coated solid wire for welding in C1 (CO₂) or M21 (Ar/CO₂) shielding atmosphere. Suitable for welding of mild and low-alloy steels with strenght up to 640 N/mm².

Steel grade	HRN	DIN (W. Nr.)		EN / ISO
Constructional steels	Č 0361 to Č 0563	St 37-3N (1.0116) to St 52-3N (1.0570)		S 235J2G3 to S355J2G3 Fe 310-0 to Fe 490-2
Boiler steels	Č 1202 Č 1204	HI (1.0345)	HI1 (1.0425)	P235GH P265GH
	Č 3133 Č 3105	17Mn4 (1.0481)	19Mn6 (1.0473)	P295GH P355GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)		DX55D to P355T2 L210 to L360NB
Shipbuilding steels	A, B, D, E AH 32 to EH 36	A, B, D, E AH 32 to EH 36		
Fine-grained steels	ČRO 250 to ČRO 460	StE 285 (1.0486)	StE 460 (1.8905)	P275N P460N
	ČRV 250 to ČRV 460	WSIE 285 (1.0487)	WSIE 460 (1.8935)	P275NH P460NH
Cast steels	ČL 0300 to ČL 0500	GS-38 (1.0416) to GS-52 (1.0551)		C18D to S355JRC

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J
> 460	530 - 680	> 22	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	C	Mn	Si	Cu
%	0,08 - 0,12	1,6 - 1,8	0,9 - 1,1	≤ 0,3

SHIELDING GAS

C1 or M21

PACKAGING

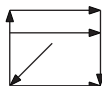
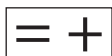
Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)

15 kg - metal spool (S-S) (wire diameter 0,8; 1,0; 1,2; 1,6 mm)

250 kg - drum (wire diameter 0,8; 1,0 i 1,2 mm)

APPROVALS

DB; TÜV



CLASSIFICATION

EN ISO 21952-A	AWS / ASME SFA-5.28	DIN 8575	W. Nr.
G MoSi	ER70S-A1 (ER80S-G)	SG Mo	1.5424

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire alloyed with molybdenum, used for welding of mild and low-alloyed steels with tensile strength up to 590 N/mm². Application for constructions, pipes and high-pressure vessels with working range temperature up to 500°C.

Steel grade	HRN		DIN (W. Nr.)	HRN / EN / ISO
Constructional steels	Č 0361 do Č 0563		St 37-2 (1.0037) do St 52-3N (1.0570)	S 235JR do S 355J2G3 Fe 360 B do Fe 510 D1
Boiler steels	Č 1202	Č 1204	HI (1.0345) HIII (1.0435)	P235GH P285NH
	Č 3113	Č 3105	17Mn4 (1.0481) 19Mn6 (1.0473)	P295GH P355GH
Tube and pipe steels	Č 1214	Č 1215	St 35.8 (1.0305) St 45.8 (1.0405)	P235G1TH P255G1TH
	Č 7100		15Mo3 (1.5415)	16Mo3

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 430	540 - 640	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Mo
%	0,06 - 0,1	0,4 - 0,6	1,0 - 1,15	0,45 - 0,5

SHIELDING GAS

M21

PACKAGING

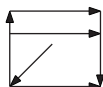
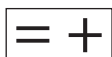
Wire diameter mm	Winding
0,8; 1,0; 1,2	precision-wound (S-S)

15 kg - metal spool (S-S) (wire diameter 0,8; 1,0; 1,2 mm)

250 kg - drum (wire diameter 0,8; 1,0; 1,2 mm)

APPROVALS

DB; TÜV



CLASSIFICATION

EN ISO 14341-A	AWS / ASME SFA-5.28	W. Nr.
G 42 2 C/M 2Ti	ER70S-2	1.5125

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire alloyed with titanium for welding of carbon and carbon-manganese steels with tensile strength up to 510 N/mm². Due to it's titanium addition it is suitable for single-pass welding of galvanized, primer coated or oxidized steels.

Steel grade	HRN	DIN (W. Nr.)	HRN / EN / ISO
Constructional steels	Č 0261 to Č 0545	St 33 (1.0035) to St 52-2N (1.0050)	S 185 do E 295 Fe 310-0 do Fe 490-2
Boiler steels	Č 1202 Č 1204 Č 3133 Č 3105	HI (1.0345) HII (1.0425) 17Mn4 (1.0481) 19Mn6 (1.0473)	P235GH P265GH P295GH P355GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.8 (1.0305) to St 45.8 (1.5415)	DX55D do P355T2

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 430	540 - 640	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Ti
%	0,04 - 0,06	0,5 - 0,8	1,1 - 1,5	0,1 - 0,12

SHIELDING GAS

C1 ili M21

PACKAGING

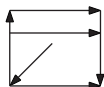
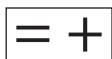
Wire diameter mm	Winding
0,8; 1,0; 1,2	precision-wound (S-S)

15 kg - metal spool (S-S) (wire diameter 0,8; 1,0; 1,2 mm)

250 kg - drum (wire diameter 0,8; 1,0; 1,2 mm)

APPROVALS

DB; TÜV



EZ - SG CORTEN

CLASSIFICATION

EN ISO 14341-A	AWS / ASME SFA-5.28
G 42 2 C/M 0	ER80S-G

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire alloyed with nickel and copper. It is used for welding of atmospheric corrosion resistant steels (COR-TEN A, COR-TEN B). It is also suitable for welding of mild and low-alloy steels with tensile strength up to 590 N/mm². Shielding atmosphere C1 (CO₂) or M21 (Ar/CO₂).

Steel grade	HRN	DIN (W. Nr.)	HRN / EN / ISO
Constructional steels	Č 0261 do Č 0545	St 33 (1.0035) do St 52-2N (1.0050) COR-TEN A, B, C; Patinax 37	S 185 do E 295 Fe 310-0 do Fe 490-2
Boiler steels	Č 1202 Č 1204 Č 3133 Č 3105	HI (1.0345) HII (1.0425) 17Mn4 (1.0481) 19Mn6 (1.0473)	P235GH P265GH P295GH P355GH
Tube and pipe steels	Č 1212 do Č 3100	St 35.4 (1.0309) do St 52.4 (1.0581) StE 210.7 (1.0307) do StE 360.7 (1.0582)	DX55D do P355T2 L210 do L360NB
Shipbuilding steels	A, B, D, E AH 32 do EH 36	A, B, D, E AH 32 do EH 36	
Fine-grained steels	ČRO 250 do ČRO 350 ČRV 250 do ČRV 350	StE 285 (1.0486) StE 355 (1.0562) WSIE 285 (1.0487) WSIE 355 (1.0565)	P275N P355N P275NH P355NH
Cast steels	ČL 0300 do ČL 0500	GS-38 (1.0416) do GS-52 (1.0551)	C18D do S355JRC

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
> 430	540 - 640	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Ni	Cu
%	0,06 - 0,10	0,7 - 0,9	1,4 - 1,5	0,5 - 0,8	0,3 - 0,5

SHIELDING GAS

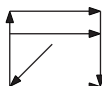
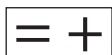
C1 ili M21

PACKAGING

Wire diameter mm	Winding
1,0; 1,2	precision-wound (S-S)
15 kg - metal spool (S-S) (wire diameter 1,0; 1,2 mm)	
250 kg - drum (wire diameter 1,0; 1,2 mm)	

APPROVALS

DB; TÜV



EZ - SG 100

CLASSIFICATION

EN ISO 16384-A	AWS / ASME SFA-5.28
G 69 4 M Mn3Ni1CrMo	ER100S-G

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire alloyed with manganese, nickel, chromium and molybdenum. It is used for welding of fine-grained steels with tensile strength up to 690 N/mm² like N-A-XTRA 70 and WELDOX steels.

Steel grade	HRN	DIN (W. Nr.)	HRN / EN / ISO
Fine-grained constructional steels	Č 0690	StE 690 V (1.8931)	S690Q

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J
> 690	750 - 940	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	Mo	Cu	V
%	0,12	0,4 - 0,7	1,3 - 1,8	0,2 - 0,4	1,2 - 1,6	0,2 - 0,3	≤ 0,3	0,05 - 0,13

SHIELDING GAS

M21 ili C1

PACKAGING

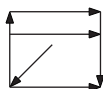
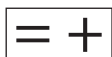
Wire diameter mm	Winding
0,8; 1,0; 1,2	precision-wound (S-S)

15 kg - metal spool (S-S) (wire diameter 0,8; 1,0; 1,2 mm)

250 kg - drum (wire diameter 0,8; 1,0; 1,2 mm)

APPROVALS

DB; TÜV



EZ - SG 120

CLASSIFICATION

EN ISO 16834-A	AWS / ASME SFA-5.28
G 89 6 M Mn4Ni2CrMo	ER120S-G

DESCRIPTION AND APPLICATION

A copper or bronze coated solid wire for welding of fine-grained structural steels with tensile strength up to 890 N/mm². Because of micro alloying elements weld is highly ductility and

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Fine-grained structural steels	Č 0890	StE 880 V (1.8940)	S890Q

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-60°C) J
> 890	940 - 1180	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	Mo
%	0,1	0,8	1,8	0,35	2,0	0,5

SHIELDING GAS

M21 ili C1

PACKAGING

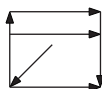
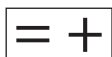
Wire diameter mm	Winding
1,0; 1,2	precision-wound (S-S)

15 kg - metal spool (S-S) (wire diameter 1,0; 1,2 mm)

250 kg - drum (wire diameter 1,0; 1,2 mm)

APPROVALS

DB; TÜV





**WIRES FOR WELDING
HIGH-ALLOY STEELS**

**EZ - MIG 307 Si
EZ - MIG 308 LSi
EZ - MIG 309 LSi
EZ - MIG 310
EZ - MIG 316 LSi
EZ - MIG 318 Si
EZ - MIG 347 Si
EZ - MIG 625
EZ - MIG 2209**

EZ - MIG 307 Si

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 18 8 Mn	~ ER307	1.4370

DESCRIPTION AND APPLICATION

Austenitic solid welding wire for GMAW of identical and similar stainless steels, dissimilar joints, poor weldability steels and manganese steels. Also, the wire is use for welding of elastic buffer layer at hardfacing. The high proportion of manganese makes weld resistant to hot cracking, and the structure of the weld metal is fully austenitic.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

$R_{p0.2}$ N/mm ²	R_m N/mm ²	A_5 %	KV (+20°C) J
> 350	> 500	> 25	≥ 100

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	C	Mn	Si	Cr	Ni
%	≤ 0,07	6,9	0,7	18,5	8,0

SHIELDING GAS

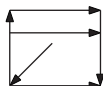
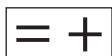
M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	

APPROVALS

TÜV



EZ - MIG 308 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 19 9 L Si	ER308LSi	1.4316

DESCRIPTION AND APPLICATION

Austenitic stainless steel solid wire for gas metal arc welding of identical and similar (stabilized and unstabilized) 18/8 CrNi steels. Low carbon content insures a good resistance to intergranular corrosion. Higher silicon content improves welding characteristics.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High-alloy stainless steels of austenitic type and austenitic steel cast	Č 4580	X5 CrNi 18 11 (1.4301)	304	X5CrNi18-10
	ČL 4571	G-X 10 CrNi 18 8 (1.4312)	-	GX10CrNi18-8
	Č 45701	X2 CrNi 19 11 (1.4306)	304 L	X2CrNi19-11
	ČL 45701	G-X6 CrNi 18 9 (1.4308)	-	GX5CrNi19-10
	Č 4582	X6 CrNiNb 18 10 (1.4550)	347	X6CrNiNb18-10
	ČL 4572	G-X5 CrNiNb 18 9 (1.4552)	-	GX5CrNiNb18-11
	Č 4572	X6 CrNiTi 18 10 (1.4541)	321	X6CrNiTi18-10

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 320	> 510	> 30	≥ 80

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	C	Mn	Si	Cr	Ni
%	≤ 0,02	1,95	0,8	20,0	10,0

SHIELDING GAS

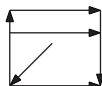
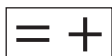
M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	

APPROVALS

TÜV



EZ - MIG 309 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 23 12 L Si	ER309LSi	1.4332

DESCRIPTION AND APPLICATION

Austenitic stainless steel solid wire for GMAW of dissimilar joints. Weld metal is ductile and crack resistant. This wire is also used for cladding.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

$R_{p0.2}$ N/mm ²	R_m N/mm ²	A_5 %	KV (+20°C) J
> 320	> 510	> 25	≥ 130

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

C	Mn	Si	Cr	Ni
% ≤ 0,02	2,0	0,8	23,5	14,0

SHIELDING GAS

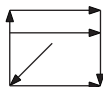
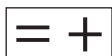
M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	

APPROVALS

TÜV



EZ - MIG 310

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 25 20	ER310	1.4842

DESCRIPTION AND APPLICATION

Austenitic solid wire for GMAW of heat resistant austenitic steels of the 25/20 CrNi types. Weld metal has good oxidation resistance especially at high temperatures due to its high Cr content. Weld metal is heat resistant to temperatures up to 1200°C.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High-alloyed heat resistant steels	Č 4578	X15 CrNiSi 25 20 (1.4841)	310 / 314	X15CrNiSi25-21
	-	X12 CrNi 25 21 (1.4845)	310 S	X8CrNi25-21
	-	G-X15 CrNi 25 20 (1.4840)	-	GX15CrNi25-20
	-	X7 CrNi 23 14 (1.4833)	-	X12CrNi23-13
	Č 4586	X20 CrNiSi 25 4 (1.4821)	327	X15CrNiSi25-4
	-	G-X 40 CrNiSi 22 9 (1.4826)	-	GX40CrNiSi22-9
	-	G-X 25 CrNiSi 20 14 (1.4832)	-	GX25CrNiSi20-14
	ČL 4577	G-X 40 CrNiSi 25 12 (1.4837)	-	GX40CrNiSi25-12

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 350	> 550	> 20	≥ 120

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

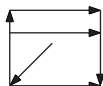
	C	Mn	Si	Cr	Ni
%	≤ 0,1	1,7	0,4	25,6	21,0

SHIELDING GAS

M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	



EZ - MIG 316 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 19 12 3 L Si	ER316LSi	1.4430

DESCRIPTION AND APPLICATION

Austenitic stainless steel solid wire for gas metal arc welding of identical and similar (stabilized and unstabilized) 17/12/2 CrNiMo steels. Low carbon content insures a good resistance to intergranular corrosion. Higher silicon content improves welding characteristics.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High-alloy stainless steels of austenitic type and austenitic steel cast	Č 4573	X5 CrNiMo 17 12 2 (1.4401)	316	X5CrNiMo17-12-2
	Č 45703	X2 CrNiMo 17 13 2 (1.4404)	316 L	X2CrNiMo17-12-2
	Č 4574	X6 CrNiMoTi 17 12 2 (1.4571)	316 Ti	X6CrNiMoTi17-12-2
	Č 4583	X6 CrNiMoNb 17 12 2 (1.4580)	316 Cb	X6CrNiMoNb17-12-2
	ČL 4580	G-X6 CrNiMo 18 10 (1.4408)	-	GX5CrNiMo19-11-2
	ČL 4573	G-X10 CrNiMo 18 9 (1.4410)	-	-

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{0,2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 320	> 510	> 25	≥ 80

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	C	Mn	Si	Cr	Ni	Mo
%	≤ 0,03	1,7	0,8	18,5	12,0	2,6

SHIELDING GAS

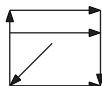
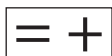
M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,6; 0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	

APPROVALS

TÜV



EZ - MIG 318 Si

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 19 12 3 Nb Si	ER318Si	1.4576

DESCRIPTION AND APPLICATION

Stabilized austenitic stainless steel solid wire for GMAW of corrosion resistant stabilized CrNi(Mo) steels, boilers and equipment in the chemical and pharmaceutical industry. The wire is stabilized with niobium which increases resistance to intergranular corrosion. Higher silicon content improves welding properties such as wetting. Wire is recommended for welding parts whose operating temperature does not exceeds 400°C.

Steel grade	DIN (W. Nr.)
High alloy stainless steels	X5 CrNiMo 17 12 (1.4401) X5 CrNiMo 17 13 3 (1.4436) X6 CrNiMoTi 17 12 2 (1.4571) X10 CrNiMoTi 18 12 (1.4573) X6 CrNiMoNb 17 12 2 (1.4580) X10 CrNiMoNb 18 12 (1.4583)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 350	> 550	> 25	≥ 90

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

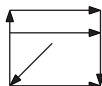
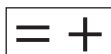
	C	Mn	Si	Cr	Ni	Mo	Nb
%	≤ 0,04	1,5	0,85	19,0	12,0	2,5	0,65

SHIELDING GAS

M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 to 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	



EZ - MIG 347 Si

CLASSIFICATION

HRN EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 19 9 Nb Si	ER347Si	1.4551

DESCRIPTION AND APPLICATION

Stabilized austenitic stainless steel solid wire for GMAW of stabilized 18/9 CrNi steel, boilers and equipment in the chemical and pharmaceutical industry. The wire is stabilized with niobium which increases resistance to intergranular corrosion. Higher silicon content improves welding properties such as wetting. Wire is recommended for welding parts whose operating temperature does not exceeds 400°C.

Steel grade	DIN (W. Nr.)
High alloy stainless steels	X5 CrNi 18 10 (1.4301) X2 CrNi 19 11 (1.4306) G-X6 CrNi 18 9 (1.4308) G-X5 CrNiNb 18 9 (1.4552) X6 CrNiNb 18 10 (1.4550) X6 CrNiTi 18 10 (1.4541)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 350	> 550	> 25	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	C	Mn	Si	Cr	Ni	Nb
%	≤ 0,05	1,3	0,8	19,0	9,0	0,70

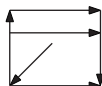
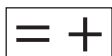
SHIELDING GAS

M12 (Ar + 2,5% CO₂) or M13 (Ar + 1 do 3% O₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)

15 kg - wire spool



EZ - MIG 625

CLASSIFICATION

HRN EN ISO 18274	AWS / ASME SFA-5.9	W. Nr.
S Ni 6625 (NiCr22Mo9Nb)	ERNiCrMo-3	2.4831

DESCRIPTION AND APPLICATION

Austenitic Ni-base solid wire for GMAW of special and high quality corrosion resistant steels and nickel alloys. It's used for welding and cladding of identical and dissimilar steels, for example – CrMn steels, creep resistant CrMo steels and Ni steels. It can be used for great service temperature range: from extremely low temperature (-196°C) to very high (about 1000 °C).

Steel grade	DIN (W. Nr.)
High alloy stainless steels	NiCr22Mo9Nb - Alloy 625 - UNS N06625 (2.4856) X1NiCrMoCuN 25-20-7 - Alloy 926 - UNS N08925 (1.4529) 16Mo3 - ASTM A672 (1.5415) P235TR1 - ASTM A53 (1.0254)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J	KV (-196°C) J
> 450	> 760	> 30	≥ 80	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

C	Mn	Si	Cr	Ni	Mo	Nb
% ≤ 0,03	0,2	0,25	22,0	bal.	9,0	3,5

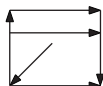
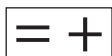
SHIELDING GAS

I1 (Ar); M12 (Ar +30% He+0,5% CO₂)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2	precision-wound (S-S)

15 kg - wire spool



EZ - MIG 2209

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
G 22 9 3 N L	ER2209	1.4462

DESCRIPTION AND APPLICATION

Stainless steel solid wire for gas metal arc welding of ferritic-austenitic (duplex) stainless steels. Wire can be used in a temperature range from -60°C up to +250°C. The weld metal not only features high strength and toughness, but is also exceptionally resistant to stress corrosion cracking and to pitting and can be used in applications containing chloride and hydrogen sulphide solutions.

Steel grade	DIN (W. Nr.)
Ferritic-austenitic (duplex) stainless steels	X2CrNiMoN22-5-3 (1.4462) X2CrNiN23-4 (1.4362)

Dissimilar materials X2CrNiMoN22-5-3 (1.4462) i X10CrNiMoNb18-12 (1.4583)
X2CrNiMoN22-5-3 (1.4462) i P235GH; P265GH; S255N; P295GH; S355N; 16Mo3

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 510	> 680 - 890	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

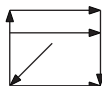
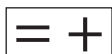
	C	Mn	Si	Cr	Ni	Mo	N
%	≤ 0,02	1,7	0,4	22,5	9,0	3,2	0,15

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	





**WIRES FOR WELDING
ALUMINUM AND ALUMINUM ALLOYS**

**EZ - MIG Al99,7
EZ - MIG AlSi5
EZ - MIG AlMg3
EZ - MIG AlMg5
EZ - MIG AlMg4,5Mn**

EZ - MIG Al99,7

CALSSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 1070 / Al 99,7	~ ER1100	3.0289

DESCRIPTION AND APPLICATION

Pure aluminum solid wire for gas metal arc welding of aluminum with similar composition. Soft weld metal has an excellent ductility, electrical conductivity and corrosion resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
35	80	> 35

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

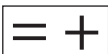
Al
% > 99,7

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6; 2,0	Precision-wound (S-S)
5 kg i 7 kg - plastic or wire spool (wire diameter žice 0,8 mm)	
7 kg - plastic or wire spool (wire diameter 1,0; 1,2; 1,6; 2,0 mm)	



EZ - MIG AISi5

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 4043 / Al Si5	ER4043	3.2245

DESCRIPTION AND APPLICATION

Aluminum solid wire for gas metal arc welding alloyed with 5% of silicon. It is suitable for welding Al-Si and Al-Mg-Si alloys. The silicone addition improves fluidity. The weld metal is not sensitive to hot cracking.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
55	150	> 15

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

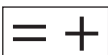
	Al	Si	Fe	Mn	Zn
%	bal.	5,0	0,15	0,01	0,01

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6; 2,0	Precision-wound (S-S)
5 kg i 7 kg - plastic or wire spool (wire diameter žice 0,8 mm)	
7 kg - plastic or wire spool (wire diameter 1,0; 1,2; 1,6; 2,0 mm)	



EZ - MIG AlMg3

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5754 / Al Mg3	ER5754	3.3536

DESCRIPTION AND APPLICATION

Aluminum solid wire for gas metal arc welding alloyed with 3% of magnesium. Wire is intended for welding Al-Mg alloys which contains < 3% magnesium. Weld metal has elevated tensile strength and corrosion resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
110	230	> 23

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	Al	Mg	Mn	Cr	Si	Fe
%	bal.	3,0	0,2	0,01	0,05	0,12

SHIELDING GAS

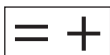
I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6; 2,0	precision-wound (S-S)

5 kg i 7 kg - plastic or wire spool (wire diameter žice 0,8 mm)

7 kg - plastic or wire spool (wire diameter 1,0; 1,2; 1,6; 2,0 mm)



EZ - MIG AlMg5

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5356 / Al Mg5Cr(A)	ER5356	3.3556

DESCRIPTION AND APPLICATION

Aluminum solid wire for gas metal arc welding alloyed with 5% magnesium, for welding of Al-Mg and Al-Mg-Si alloys. Relatively high strength weld metal, and very good corrosion resistance make this alloy excellent in marine environment. Suitable for welding parts which are going to be anodized.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
120	260	> 25

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

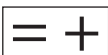
	Al	Mg	Mn	Cr	Si	Fe
%	bal.	5,0	0,15	0,10	0,05	0,15

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6; 2,0	Precision-wound (S-S)
5 kg i 7 kg - plastic or wire spool (wire diameter žice 0,8 mm)	
7 kg - plastic or wire spool (wire diameter 1,0; 1,2; 1,6; 2,0 mm)	



EZ - MIG AlMg4,5Mn

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5183 / AlMg4,5Mn0,7(A)	ER5183	3.3548

DESCRIPTION AND APPLICATION

Aluminum solid wire for gas metal arc welding alloyed with approx. 4,8% Mg and 0,7% Mn. It is suitable for welding Al-Mg-Mn and Al-Mg alloys. High strength weld metal and good impact properties enable it's wide range of application in welding aluminum structures. Weld metal has an good corrosion in marine atmosphere.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
140	280	> 24

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	Al	Mg	Mn	Si	Fe
%	bal.	4,8	0,7	0,1	0,2

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6; 2,0	Precision-wound (S-S)
5 kg i 7 kg - plastic or wire spool (wire diameter žice 0,8 mm)	
7 kg - plastic or wire spool (wire diameter 1,0; 1,2; 1,6; 2,0 mm)	





**WIRES FOR WELDING
COPPER AND COPPER ALLOYS**

**EZ - MIG CuAl8
EZ - MIG CuSi3
EZ - MIG CuSn6
EZ - MIG CuSn10**

EZ - MIG CuAl18

CLASSIFICATION

HRN EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
Cu 6100	ERCuAl-A1	SG-CuAl8	2.0921

DESCRIPTION AND APPLICATION

Solid, copper wire alloyed with aluminum for welding of aluminum-bronze. It is also used for plating and metallizing. Weld (deposit) is corrosion resistance and has hardness up to 100 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	Hardness HB
> 180	390 - 450	> 30	100

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	Cu	Al	Mn	Other
%	bal.	7,5 - 8,5	<0,3	≤ 0,5

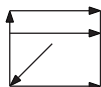
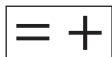
SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)

15 kg - plastic or wire spool



EZ - MIG CuSi3

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 6560 (CuSi3Mn1)	ERCuSi-A	SG-CuSi3	2.1461

DESCRIPTION AND APPLICATION

Solid, copper wire alloyed with silicone for the gas metal arc welding of copper-zinc alloys and low-alloyed copper, for gas metal arc brazing of zinc-coated steel sheets and for cladding of cast iron. Wire is alloyed with silicon and manganese and has good wear resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 120	330 - 370	> 40	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

	Cu	Mn	Si	Sn
%	bal.	0,75 - 0,95	2,80 - 2,95	≤ 0,1

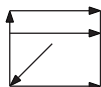
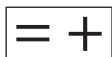
SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)

15 kg - plastic or wire spool



EZ - MIG CuSn6

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 5180 (CuSn6P)	ERCuSn-A	SG-CuSn6	2.1022

DESCRIPTION AND APPLICATION

Solid, copper wire alloyed with tin for the metal arc welding of copper-tin bronzes. Wire is widely used for joining copper-zinc alloys to steel. Weld has good temperature and corrosion resistance and good sliding properties and hardness 100 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{el} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 180	330 - 370	> 20	≥ 32

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

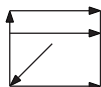
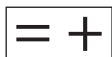
	Cu	Sn	P	Rest
%	bal.	6,00 - 6,60	0,20 - 0,25	≤ 0,5

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	Precision-wound (S-S)
15 kg - plastic or wire spool	



EZ - MIG CuSn10

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 5211 (CuSn10MnSi)	-	-	2.1086

DESCRIPTION AND APPLICATION

Solid, copper wire alloyed with tin and manganese for cladding of cast iron and for welding deep drawn metal sheets. Weld has hardness 115 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 180	330 - 370	> 15	≥ 24

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

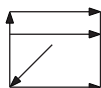
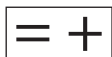
	Cu	Sn	Mn	Si
%	bal.	9,00 - 10,00	0,20 - 0,35	0,20 - 0,30

SHIELDING GAS

I1 (Ar)

PACKAGING

Wire diameter mm	Winding
0,8; 1,0; 1,2; 1,6	Precision-wound (S-S)
15 kg - plastic or wire spool	





**WIRE FOR
HARDFACING**

EZ - MAG 600 TN

EZ - MAG 600 TN

CLASSIFICATION

DIN	W. Nr.
8555	
MSG 6-GZ-60	1.4718

DESCRIPTION AND APPLICATION

Solid wire for hardfacing of parts subjected to impact and medium strong abrasion. It is used for hardfacing parts of the machines in quarries, stone crushers, steel mills, cement plants etc.. Regardless of the high hardness, weld metal is tough and resistant to cracks and corrosion. If hardfacing steel which is prone to crack, it is necessary to preheat workpiece on 200-300°C. Weld metal is machinable only by grinding. If hardfacing in more than one layer it is recommended to weld elastic buffer layer with electrode EZ - KROM 20 or with wire EZ - MIG 307 Si.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness
HRC
55 - 60

APPROXIMATE CHEMICAL COMPOSITION OF THE WIRE

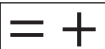
	C	Si	Mn	Cr
%	0,45	3,0	0,4	9,5

SHIELDING GAS

C1 (CO ₂) or M21 (Ar + 18% CO ₂)
--

PACKAGING

Wire diameter	Winding
mm	
0,8; 1,0; 1,2; 1,6	precision-wound (S-S)
15 kg - wire spool	



RODS





**ROD FOR OXY/ACETILENE WELDING
UNALLOYED STEELS**

EZ - ZP 37

CLASSIFICATION

EN 12536	AWS / ASME SFA-5.2	DIN 8554	W. Nr.
O I	R 45	G I	1.1116

DESCRIPTION AND APPLICATION

Mild solid rod for oxy-acetylene welding. Weld metal is uniform, mild and well workable.

Steel grade	HRN	DIN (W. Nr.)	EN / ISO
Constructional steels	Č 0261 to Č 0461	St 33 (1.0035) to St 44-2 (1.0044)	S 185 to S 275 JR Fe 310-0 to Fe 430 B
Tube and pipe steels	Č 1212 to Č 1213	St 35.4 (1.0309) to St 45.4 (1.0418)	DX55D to L240NB
Cold-reduced steel sheet	Č 0146 to Č 0148	St 12 (1.0330) to St 14 (1.0338)	Fe P01 to Fe P04

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _m N/mm ²	A ₅ %	KV (+20°C) J	Hardness HB
340 - 410	> 15	≥ 45	100 - 120

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Si	Mn
%	0,08	0,1	0,55

PACKAGING

Rod diameter mm	Rod length mm
2,0; 2,5; 3,2; 4,0; 5,0; 6,0	700; 1000
15 kg - rod length 700 mm	
20 kg - rod length 1000 mm	



**RODS FOR WELDING
HIGH-ALLLOY STEELS**

**EZ - TIG 307 Si
EZ - TIG 308 LSi
EZ - TIG 309 LSi
EZ - TIG 310
EZ - TIG 316 LSi
EZ - TIG 318 Si
EZ - TIG 347 Si
EZ - TIG 625
EZ - TIG 2209**

EZ - TIG 307 Si

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 18 8 Mn	~ ER307	1.4370

DESCRIPTION AND APPLICATION

Austenitic solid welding rod for TIG welding of identical and similar stainless steels, dissimilar joints, poor weldability steels and manganese steels. Also, the rod is used for welding of elastic buffer layer at hardfacing. The high proportion of manganese makes weld resistant to hot cracking, and the structure of the weld metal is fully austenitic.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

$R_{p0.2}$ N/mm ²	R_m N/mm ²	A_5 %	KV (+20°C) J
> 350	> 500	> 25	≥ 100

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Mn	Si	Cr	Ni
%	≤ 0,07	6,9	0,7	18,5	8,0

SHIELDING GAS

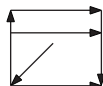
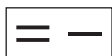
I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5

APPROVALS

TÜV



Marking: EZ - 307 Si / 1.4370

EZ - TIG 308 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 19 9 L Si	ER308LSi	1.4316

DESCRIPTION AND APPLICATION

Austenitic stainless steel solid rod for gas tungsten arc welding of identical and similar (stabilized and unstabilized) 18/8 CrNi steels. Low carbon content insures a good resistance to intergranular corrosion. Higher silicon content improves welding characteristics.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High-alloy stainless steels of austenitic type, and austenitic steel cast	Č 4580	X5 CrNi 18 11 (1.4301)	304	X5CrNi18-10
	ČL 4571	G-X 10 CrNi 18 8 (1.4312)	-	GX10CrNi18-8
	Č 45701	X2 CrNi 19 11 (1.4306)	304 L	X2CrNi19-11
	ČL 45701	G-X6 CrNi 18 9 (1.4308)	-	GX5CrNi19-10
	Č 4582	X6 CrNiNb 18 10 (1.4550)	347	X6CrNiNb18-10
	ČL 4572	G-X5 CrNiNb 18 9 (1.4552)	-	GX5CrNiNb18-11
	Č 4572	X6 CrNiTi 18 10 (1.4541)	321	X6CrNiTi18-10

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 320	> 510	> 30	≥ 80

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Mn	Si	Cr	Ni
%	≤ 0,02	1,95	0,8	20,0	10,0

SHIELDING GAS

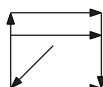
I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5

APPROVALS

TÜV



Marking: EZ - 308 LSi / 1.4316

EZ - TIG 309 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 23 12 L Si	ER309LSi	1.4332

DESCRIPTION AND APPLICATION

Austenitic stainless steel solid rod for TIG welding of dissimilar joints. Weld metal is ductile and crack resistant. This rod is also used for cladding.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 320	> 510	> 25	≥ 130

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Mn	Si	Cr	Ni
%	≤ 0,02	2,0	0,8	23,5	14,0

SHIELDING GAS

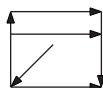
I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Wight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5

APPROVALS

TÜV



Marking: EZ - 309 LSi / 1.4332

EZ - TIG 310

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 25 20	ER310	1.4842

DESCRIPTION AND APPLICATION

Austenitic solid rod for TIG welding of heat resistant austenitic steels of the 25/20 CrNi types. Weld metal has good oxidation resistance especially at high temperatures due to its high Cr content. Weld metal is heat resistant to temperatures up to 1200°C.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High alloyed	Č 4578	X15 CrNiSi 25 20 (1.4841)	310 / 314	X15CrNiSi25-21
heat resistant	-	X12 CrNi 25 21 (1.4845)	310 S	X8CrNi25-21
stainless steels	-	G-X15 CrNi 25 20 (1.4840)	-	GX15CrNi25-20
	-	X7 CrNi 23 14 (1.4833)	-	X12CrNi23-13
	Č 4586	X20 CrNiSi 25 4 (1.4821)	327	X15CrNiSi25-4
	-	G-X 40 CrNiSi 22 9 (1.4826)	-	GX40CrNiSi22-9
	-	G-X 25 CrNiSi 20 14 (1.4832)	-	GX25CrNiSi20-14
	ČL 4577	G-X 40 CrNiSi 25 12 (1.4837)	-	GX40CrNiSi25-12

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 350	> 550	> 20	≥ 120

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

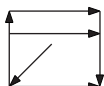
	C	Mn	Si	Cr	Ni
%	≤ 0,1	1,7	0,4	25,6	21,0

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5



Marking: ER 310 / 1.4842

EZ - TIG 316 LSi

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 19 12 3 L Si	ER316LSi	1.4430

DESCRIPTION AND APPLICATION

Austenitic stainless steel rod for gas tungsten arc welding of identical and similar (stabilized and unstabilized) 17/12/2 CrNiMo steels. Low carbon content insures a good resistance to intergranular corrosion. Higher silicon content improves welding characteristics.

Steel grade	HRN	DIN (W. Nr.)	ASTM / AISI	EN / ISO
High-alloy stainless steels of austenitic type, and austenitic steel cast	Č 4573	X5 CrNiMo 17 12 2 (1.4401)	316	X5CrNiMo17-12-2
	Č 45703	X2 CrNiMo 17 13 2 (1.4404)	316 L	X2CrNiMo17-12-2
	Č 4574	X6 CrNiMoTi 17 12 2 (1.4571)	316 Ti	X6CrNiMoTi17-12-2
	Č 4583	X6 CrNiMoNb 17 12 2 (1.4580)	316 Cb	X6CrNiMoNb17-12-2
	ČL 4580	G-X6 CrNiMo 18 10 (1.4408)	-	GX5CrNiMo19-11-2
	ČL 4573	G-X10 CrNiMo 18 9 (1.4410)	-	-

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 320	> 510	> 25	≥ 80

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Mn	Si	Cr	Ni	Mo
%	≤ 0,03	1,7	0,8	18,5	12,0	2,6

SHIELDING GAS

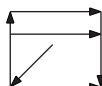
I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5

APPROVALS

TÜV



Marking: EZ - 316 LSi / 1.4430

EZ - TIG 318 Si

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 19 12 3 Nb Si	ER318 Si	1.4576

DESCRIPTION AND APPLICATION

Stabilized austenitic stainless steel solid rod for TIG welding of corrosion resistant stabilized CrNi(Mo) steels, boilers and equipment in the chemical and pharmaceutical industry. The rod is stabilized with niobium which increases resistance to intergranular corrosion. Higher silicon content improves welding properties such as wetting. Rod is recommended for welding parts whose operating temperature does not exceeds 400°C.

Steel grade	DIN (W. Nr.)
High alloy	X5 CrNiMo 17 12 (1.4401)
stainless steels	X5 CrNiMo 17 13 3 (1.4436)
	X6 CrNiMoTi 17 12 2 (1.4571)
	X10 CrNiMoTi 18 12 (1.4573)
	X6 CrNiMoNb 17 12 2 (1.4580)
	X10 CrNiMoNb 18 12 (1.4583)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 350	> 550	> 25	≥ 90

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

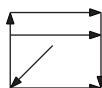
	C	Mn	Si	Cr	Ni	Mo	Nb
%	≤ 0,04	1,5	0,85	19,0	12,0	2,5	0,65

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5



Marking: ER 318 Si / 1.4576

EZ - TIG 347 Si

CLASSIFICATION

HRN EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 19 9 Nb Si	ER347Si	1.4551

DESCRIPTION AND APPLICATION

Stabilized austenitic stainless steel solid rod for TIG welding of stabilized 18/9 CrNi steel, boilers and equipment in the chemical and pharmaceutical industry. The rod is stabilized with niobium which increases resistance to intergranular corrosion. Higher silicon content improves welding properties such as wetting. Rod is recommended for welding parts whose operating temperature does not exceeds 400°C.

Steel grade	DIN (W. Nr.)
High alloy stainless steels	X5 CrNi 18 10 (1.4301) X2 CrNi 19 11 (1.4306) G-X6 CrNi 18 9 (1.4308) G-X5 CrNiNb 18 9 (1.4552) X6 CrNiNb 18 10 (1.4550) X6 CrNiTi 18 10 (1.4541)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

$R_{p0.2}$ N/mm ²	R_m N/mm ²	A_5 %	KV (+20°C) J
> 350	> 550	> 25	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

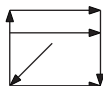
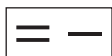
	C	Mn	Si	Cr	Ni	Nb
%	≤ 0,05	1,3	0,8	19,0	9,0	0,70

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5



Marking: ER 347 Si / 1.4551

EZ - TIG 625

CLASSIFICATION

HRN EN ISO 18274	AWS / ASME SFA-5.9	W. Nr.
S Ni 6625 (NiCr22Mo9Nb)	ERNiCrMo-3	2.4831

DESCRIPTION AND APPLICATION

Šipka na bazi niklja za TIG zavarivanje visokolegiranih korozijski otpornih čeličnih i nikalij legura. Upotrebljava se za zavarivanje i navarivanje istih, ali i raznorodnih materijala, kao CMn čelika, CMo čelika otpornih na puzanje, CrNiMo čelika i čelika legiranih nikljom. Upotrebljava se za vrlo široki raspon temperatura od ekstremno niskih (-196°C) do vrlo visokih (1000°C).

Steel grade	DIN (W. Nr.)
High alloy stainless steels	NiCr22Mo9Nb - Alloy 625 - UNS N06625 (2.4856) X1NiCrMoCuN 25-20-7- Alloy 926 - UNS N08925 (1.4529) 16Mo3 - ASTM A 672 (1.5415) P235TR1 - ASTM A 672(1.0254)

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J	KV (-196°C) J
450	760	30	≥80	≥60

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

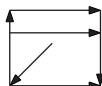
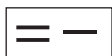
C	Mn	Si	Cr	Ni	Mo	Nb
% ≤ 0,03	0,2	0,25	22,0	bal.	9,0	3,5

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,6; 2,0; 2,4	1000	5



EZ - TIG 2209

CLASSIFICATION

EN ISO 14343-A	AWS / ASME SFA-5.9	W. Nr.
W 22 9 3 N L	ER2209	1.4462

DESCRIPTION AND APPLICATION

Stainless steel rod for gas tungsten arc welding of ferritic-austenitic (duplex) stainless steels. Rod can be used in a temperature range from -60°C up to +250°C. The weld metal not only features high strength and toughness, but is also exceptionally resistant to stress corrosion cracking and to pitting and can be used in applications containing chloride and hydrogen sulphide solutions.

Steel grade	DIN (W. Nr.)
Ferritic-austenitic (duplex) stainless steels	X2CrNiMoN22-5-3 (1.4462) X2CrNiN23-4 (1.4362)

Dissimilar materials X2CrNiMoN22-5-3 (1.4462) i X10CrNiMoNb18-12 (1.4583)
X2CrNiMoN22-5-3 (1.4462) i P235GH; P265GH; S255N; P295GH; S355N; 16Mo3

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (+20°C) J
> 510	> 680 - 890	> 20	≥ 47

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

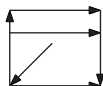
	C	Mn	Si	Cr	Ni	Mo	N
%	≤ 0,02	1,7	0,4	22,5	9,0	3,2	0,15

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2	1000	5



Marking: ER 2209 / 1.4462



**RODS FOR WELDING
ALUMINUM AND ALUMINUM ALLOYS**

**EZ - TIG Al99,7
EZ - TIG AlSi5
EZ - TIG AlMg3
EZ - TIG AlMg5
EZ - TIG AlMg4,5Mn**

EZ - TIG Al99,7

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 1070 / Al 99,7	~ ER1100	3.0289

DESCRIPTION AND APPLICATION

Pure aluminum solid rod for tungsten inert gas welding of aluminum with similar composition. Soft weld metal has an excellent ductility, electrical conductivity and corrosion resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0,2} N/mm ²	R _m N/mm ²	A ₅ %
35	80	> 35

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

Al
% > 99,7

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2; 4,0	1000	5



Marking: 3.0289 / 1100

EZ - TIG AISi5

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 4043 / Al Si5	ER4043	3.2245

DESCRIPTION AND APPLICATION

Aluminum rod for tungsten inert gas welding alloyed with 5% of silicon. Suitable for welding of Al-Si and Al-Mg-Si alloys. The silicon addition improves fluidity. The weld metal is not sensitive to hot cracking.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
55	150	> 15

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	Al	Si	Fe	Mn	Zn
%	bal.	5,0	0,15	0,01	0,01

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2; 4,0	1000	5



Marking: 3.2245 / 4043

EZ - TIG AlMg3

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5754 / Al Mg3	ER5754	3.3536

DESCRIPTION AND APPLICATION

Aluminum solid rod for TIG welding alloyed with 3% of magnesium. Rod is intended for welding Al-Mg alloys which contains < 3% magnesium. Weld metal has elevated tensile strength and corrosion resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0,2} N/mm ²	R _m N/mm ²	A ₅ %
110	230	> 23

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	Al	Mg	Mn	Cr	Si	Fe
%	bal.	3,0	0,2	0,01	0,05	0,12

SHIELDING GAS

l1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2; 4,0	1000	5



Marking: 3.3536 / 5754

EZ - TIG AlMg5

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5356 / Al Mg5Cr(A)	ER5356	3.3556

DESCRIPTION AND APPLICATION

Aluminum solid rod for tungsten inert gas welding alloyed with 5% magnesium, for welding Al-Mg and Al-Mg-Si alloys. Relatively high strength weld metal, and very good corrosion resistance make this alloy excellent in marine environment. Suitable for welding parts which are going to be anodized.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0,2} N/mm ²	R _m N/mm ²	A ₅ %
120	260	> 25

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	Al	Mg	Mn	Cr	Si	Fe
%	bal.	5,0	0,15	0,10	0,05	0,15

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2; 4,0	1000	5



Marking: 3.3556 / 5356

EZ - TIG AlMg4,5Mn

CLASSIFICATION

EN ISO 18273	AWS / ASME SFA-5.10	W. Nr.
S Al 5183 / AlMg4,5Mn0,7(A)	ER5183	3.3548

DESCRIPTION AND APPROVALS

Aluminum solid rod for tungsten inert gas welding alloyed with approx. 4,8% Mg and 0,7% Mn. It is suitable for welding Al-Mg-Mn and Al-Mg alloys. High strength weld metal and good impact properties enable it's wide range of application in welding of aluminum structures.

Weld metal has an good corrosion in marine atmosphere.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %
140	280	> 24

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	Al	Mg	Mn	Si	Fe
%	bal.	4,8	0,7	0,1	0,2

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
1,2; 1,6; 2,0; 2,4; 3,2; 4,0	1000	5



Marking: 3.3548 / 5183



**RODS FOR WELDING
COPPER AND COPPER ALLOYS**

**EZ - TIG CuAl8
EZ - TIG CuSi3
EZ - TIG CuSn6
EZ - TIG CuSn10**

EZ - TIG CuAl8

CLASSIFICATION

HRN EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
Cu 6100	ERCuAl-A1	SG-CuAl8	2.0921

DESCRIPTION AND APPLICATION

Copper rod alloyed with aluminum for welding of aluminum-bronze. It is also used for plating and metallizing. Weld (deposit) is corrosion resistance and has hardness up to 100 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	Hardness HB
> 180	390 - 450	> 30	100

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

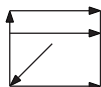
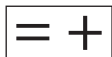
	Cu	Al	Mn	Other
%	bal.	7,5 - 8,5	<0,3	≤ 0,5

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
2,0; 2,4; 3,2; 4,0; 5,0; 6,0	1000	5



EZ - TIG CuSi3

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 6560 (CuSi3Mn1)	ERCuSi-A	SG-CuSi3	2.1461

DESCRIPTION AND APPLICATION

Copper rod alloyed with silicone for tungsten inert gas welding of copper-zinc alloys and low-alloyed copper, for gas metal arc brazing of zinc-coated steel sheets and for cladding of cast iron. Rod is alloyed with silicon and manganese and has good wear resistance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 120	330 - 370	> 40	≥ 60

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

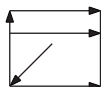
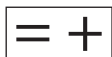
	Cu	Mn	Si	Sn
%	bal.	0,75 - 0,95	2,80 - 2,95	≤ 0,1

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
2,0; 2,4; 3,2; 4,0; 5,0; 6,0	1000	5



EZ - TIG CuSn6

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 5180 (CuSn6P)	ERCuSn-A	SG-CuSn6	2.1022

DESCRIPTION AND APPLICATION

Solid, copper rod alloyed with tin for tungsten inert gas welding of copper-tin bronzes. Rod is widely used for joining copper-zinc alloys to steel. Weld has good temperature and corrosion resistance and good sliding properties and hardness 100 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{el} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 180	330 - 370	> 20	≥ 32

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

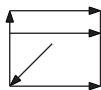
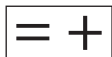
	Cu	Sn	P	Rest
%	bal.	6,00 - 6,60	0,20 - 0,25	≤ 0,5

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
2,0; 2,4; 3,2; 4,0; 5,0; 6,0	1000	5



EZ - TIG CuSn10

CLASSIFICATION

EN ISO 24373	AWS / ASME SFA-5.7	DIN 1733	W. Nr.
S Cu 5211 (CuSn10MnSi)	-	-	2.1086

DESCRIPTION AND APPLICATION

Copper rod alloyed with tin and manganese for cladding of cast iron and for welding deep drawn metal sheets. Weld has hardness 115 HB.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (20°C) J
> 180	330 - 370	> 15	≥ 24

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

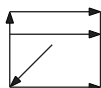
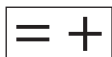
	Cu	Sn	Mn	Si
%	bal.	9,00 - 10,00	0,20 - 0,35	0,20 - 0,30

SHIELDING GAS

I1 (Ar)

PACKAGING

Rod diameter mm	Rod length mm	Weight of packaging kg
2,0; 2,4; 3,2; 4,0; 5,0; 6,0	1000	5





KISWEL
FILLER MATERIALS FOR WELDING



FLUX OR METAL CORED WIRES

**K - 71 TLF
K - NGS11
KX - 706 M
K - 308 LT
K - 309 LT
K - 316 LT
K - 329 T
K - 800 HT**

K - 71 TLF

CLASSIFICATION

EN ISO 17632-A	AWS / ASME SFA-5.20
T46 2 P C/M 1 H5	E71T-1C/1M

DESCRIPTION AND APPLICATION

Rutile type flux cored wire for welding in CO₂ or Ar/CO₂ shielding atmosphere. Suitable for welding mild and low-alloy steels with tensile strenght up to 590 N/mm² and fine-grained steels with yield strength up to 355 N/mm². Weld surface is smooth, spatter is minimum and slag removal is easy. It provides low fume generation and has good impact strength at low temperatures.

Steel grade	HRN	DIN (W. Nr.)		EN / ISO
Constructional steels	Č 0261 to Č 0563	St 33 (1.0035) to St 52-3N (1.0570)		S 185 to S 355J2G3 Fe 310-0 to Fe 490-2
Boiler steels	Č 1202 Č 1204	HI (1.0345)	HI1 (1.0425)	P235GH P265GH
	Č 3133 Č 3105	17Mn4 (1.0481)	19Mn6 (1.0473)	P295GH P355GH
Tube and pipe steels	Č 1212 to Č 3100	St 35.4 (1.0309) to St 52.4 (1.0581) StE 210.7 (1.0307) to StE 360.7 (1.0582)		DX55D to P355T2 L210 to L360NB
Shipbuilding steels	A, B, D, E AH 32 to EH 36	A, B, D, E AH 32 to EH 36		
Fine-grained steels	ČRO 250 to ČRO 350	StE 285 (1.0486) to StE 355 (1.0562)		P275N P355N
	ČRV 250 to ČRV 350	WSiE 285 (1.0487) to WSiE 355 (1.0565)		P275NH P355NH
Cast steels	ČL 0300 to ČL 0500	GS-38 (1.0416) to GS-52 (1.0551)		C18D to S355JRC

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
520	570	28	65

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Mn	Si	S	P
%	0,03	1,35	0,38	≤ 0,010	≤ 0,015

RECOMMENDED WELDING PARAMETERS

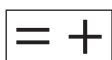
Wire diameter mm	Welding current A	Electric arc voltage V	Shielding gas (gas flow)
1,2	160 - 260	26 - 30	C1; M21 (12 - 16 l/min)

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	4,5; 15

APPROVALS

ABS (3YSA H10); BV (3S 3YS H10); DNV (IIIYMS(H10)); GL (3YH10S); LR (3Y10SH5)



K - NGS11

CLASSIFICATION

EN ISO 17632-A	AWS / ASME SFA-5.20
T42 Z Y N 1	E71T-11

DESCRIPTION AND APPLICATION

Self-shielded flux cored wire for welding mild and low-alloy steels with tensile strength up to 490 N/mm² where no impact properties are required. Wire is suitable for outdoor welding. It has good arc stability, low spatter generation, high efficiency, good bead shape and slag removal. When welding with self-shielded flux cored wire the emission of fume gases is slightly higher than in welding with flux cored wires with shielding gases. Wire has to use DCEN (electrode negative).

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
500	530	23	-

APPROXIMATE CHEMICAL COMPOSITION OF THE-ALL WELD METAL

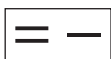
	C	Mn	Si	Al	S	P
%	0,10	0,55	0,10	1,21	≤ 0,006	≤ 0,015

RECOMMENDED WELDING PARAMETERS

Wire diameter mm	Welding current A	Electric arc voltage V	Polarity
0,9	80 - 120	18 - 22	DCEN (DC-)
1,2	120 - 180	21 - 23	DCEN (DC-)

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
0,9; 1,2	precision-wound (S-S)	4,5; 15



CLASSIFICATION

EN ISO 17632-A	AWS / ASME SFA-5.18
T46 2 M M 4 H5	E70C-6M

DESCRIPTION AND APPLICATION

Metal type of flux cored wire designed for welding of mild and low alloy steels with tensile strength up to 490 N/mm². Features of this wire are good penetration, high resistance to porosity, good wetting behaviour as well as low hydrogen contents. It is intended for semi-automatic, automatic, single and multi pass welding.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
480	540	29	70

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	P	S
%	0,04	0,60	1,50	≤ 0,014	≤ 0,010

SHIELDING GAS

M21 (Ar + 18%CO₂) gas flow 15 - 25 l/min

RECOMMENDED WELDING PARAMETERS

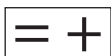
Wire diameter mm	Welding current A	Electric arc voltage V	Polarity
1,2	160 - 340	24 - 32	DCEP (DC+)

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	5; 15

APPROVALS

ABS (3YSA); BV (3S3YS); DNV (III YMS); GL (3YS); LR (3YS)



K - 308 LT

CLASSIFICATION

EN ISO 17633-A	AWS / ASME SFA-5.22
T 19 9 L P C/M 1	E308LT1-1/4

DESCRIPTION AND APPLICATION

Flux cored wire designed for MAG welding of low carbon 18/8 CrNi stainless steels. The weld metal contains optimum ferrite contents in their austenitic structures. Therefore, weldability is excellent with lower crack susceptibility. It has easy slag removal, low spatter generation and good weld soundness of weld metal. C1 (CO₂) or M21 (Ar + 18%CO₂) can be used as shielding gases.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-40°C) J	Shielding gas
440	570	39	65	C1
450	580	38	63	M21

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	FN	Shielding gas
%	0,03	0,6	1,15	20,3	10,5	9,0	C1
%	0,03	0,65	1,25	20,4	10,5	10,0	M21

SHIELDING GAS

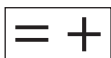
C1 (CO₂) or M21 (Ar + 18%CO₂) gas flow 15 - 25 l/min

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	12,5

APPROVALS

ABS (E308T1-1); BV (UP); DNV (308L MS); LR (304L S); TÜV



K - 309 LT

CLASSIFICATION

EN ISO 17633-A	AWS / ASME SFA-5.22
T 23 12 L P C/M 1	E309LT1-1/4

DESCRIPTION AND APPLICATION

Flux cored wire designed for MAG welding of similar stainless steels, and for welding dissimilar joints. Wire is also used for cladding. Weld metal contains comparatively much more ferrite in their austenitic structure, therefore they provide better weldability together with superior heat and corrosion resistance. It is easy to use and operate with powerful penetrating spray arc transfer, minimum spatter formation and self releasing slag. C1 (CO₂) or M21 (Ar + 18%CO₂) can be used as shielding gases.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-30°C) J	Shielding gas
430	560	37	45	C1
440	570	37	48	M21

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	FN	Shielding gas
%	0,03	0,6	1,12	23,7	13,2	14	C1
%	0,03	0,75	1,2	23,9	13,2	15	M21

SHIELDING GAS

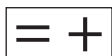
C1 (CO₂) or M21 (Ar + 18%CO₂) gas flow 15 - 25 l/min

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	12,5

APPROVALS

ABS (E309LT1-1); BV (UP); DNV (308L MS); LR (SS/CmN S); TÜV



K - 316 LT

CLASSIFICATION

EN ISO 17633-A	AWS / ASME SFA-5.22
T 19 12 3 L P C/M 1	E316LT1-1/4

DESCRIPTION AND APPLICATION

Flux cored wire designed for MAG welding of low carbon 18/12/2 Cr-Ni-Mo stainless steels. Wire has low carbon content which gives good resistance to most types of corrosion of the weld metal. Weld metal contains optimum ferrite contents in their austenitic structures and therefore their weldability is excellent with lower crack susceptibility. Wire has self-detaching slag, excellent weldability and increased creep resistance at elevated temperatures. C1 (CO₂) or M21 (Ar + 18%CO₂) can be used as shielding gases.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-60°C) / (-105°C) J	Shielding gas
420	560	38	50 / 38	C1
430	570	38	52 / 40	M21

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	Mo	FN	Shielding gas
%	0,03	0,6	1,15	19,5	12,7	2,4	7,5	C1
%	0,03	0,65	1,2	19,7	12,7	2,4	8,0	M21

SHIELDING GAS

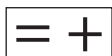
C1 (CO ₂) or M21 (Ar + 18%CO ₂) gas flow 15 - 25 l/min
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PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	12,5

APPROVALS

ABS (E316LT1-1); BV (UP); DNV (316L MS); GL (4435S); LR (316LS); TÜV



CLASSIFICATION

EN ISO 17633-A	AWS / ASME SFA-5.22
T 22 9 3 N L P C/M 1	E2209T1-1/4

DESCRIPTION AND APPLICATION

Titania type of flux cored wire designed for MAG welding of 23/9/3 Cr-Ni-Mo duplex stainless steels. It is suitable for welding in chemical plants, shipbuildings as well as in nuclear plants industries. Weld metal is excellent in pitting corrosion resistance and stress corrosion cracking resistance. Wire is used for all-position welding and has a stable welding arc producing a weld with easy slag removal and minimal spatter. C1 (CO₂) or M21 (Ar + 18%CO₂) can be used as shielding gases.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) / (-40°C) J	Shielding gas
715	818	27	52 / 42	C1
720	825	26	50 / 40	M21

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	Cr	Ni	Mo	FN	Shielding gas
%	0,03	0,52	0,80	23,20	9,60	3,26	36,7	C1
%	0,03	0,54	0,85	23,40	9,60	3,3	36,8	M21

SHIELDING GAS

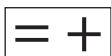
C1 (CO ₂) or M21 (Ar + 18%CO ₂)	gas flow 15 - 25 l/min
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PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2	precision-wound (S-S)	12,5

APPROVALS

ABS (E2209T1-1); DNV



K - 800 HT

CLASSIFICATION

EN ISO	AWS / ASME
-	SFA
-	-

DESCRIPTION AND APPLICATION

Flux cored wire for MAG hardfacing. It is designed for heavy abrasion resistance with martensitic structure. Typical applications include augers, bucket lips, conveyor screws, blower blades, dozer blades etc.. In order to minimize cracking it is recommended to preheat work piece and obtain interpass temperature around 200°C. C1 (CO₂) is used as shielding gas.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

Hardness HV	Hardness HRC	Hardness HS	Interpass temp. °C	Shielding gas
780	63	87	200	C1

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

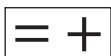
	C	Si	Mn	P	S	Cr	W	Shielding gas
%	0,44	3,40	0,55	≤ 0,013	≤ 0,011	7,5	1,0	C1

SHIELDING GAS

C1 (CO ₂) gas flow 15 - 25 l/min
--

PACKAGING

Wire diameter mm	Winding	Weight of packaging kg
1,2; 1,4; 1,6	precision-wound (S-S)	15





ROD

T - 50

CLASSIFICATION

EN ISO 636-A	AWS / ASME SFA-5.18
W 46 3 W3Si1	ER70S-6

DESCRIPTION AND APPLICATION

Rod for GTAW of mild and low-alloy steels with tensile strength up to 490 N/mm². Weld metal has excellent mechanical and toughness properties in low temperature conditions. Rod is generally used in root pass welding of pipes in all positions. Proper tungsten electrode extension from the tip of torch is 4 to 6 mm in general.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{eL} N/mm ²	R _m N/mm ²	A ₅ %	KV (-30°C) J
> 490	580	30	130

APPROXIMATE CHEMICAL COMPOSITION OF THE ROD

	C	Si	Mn	P	S
%	0,07	0,82	1,52	≤ 0,012	≤ 0,015

SHIELDING GAS

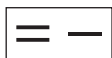
I1 (Ar)

PACKAGING

Rod diameter mm	Weight of packaging kg
1,6; 2,0; 2,4; 3,2	5

APPROVALS

ABS (2YSA); LR (YMH15)





SAW WIRES AND FLUXES

EF-200K x KD-42

EF-100S x KD-42

EF-200K x KD-42

CLASSIFICATION

Flux EF-200K	EN 756	
SA CS 1 57 AC		
Wire KD-42	EN 756	AWS / ASME SFA-5.17
SZ		EM12K
Flux and wire EF-200K x KD-42	EN 756	AWS / ASME SFA-5.17
S 46 5 CS SZ		F7A(P)6-EM12K

DESCRIPTION AND APPLICATION

Wire and flux for single and multi-pass butt welding of shipbuildings, structural steels, offshore structures and pressure vessels. Excellent impact toughness and crack resistibility. Good resistance to porosity on rust, scales, oil and primer. Applicable on AC or DC (+). Redry the flux at 250 to 350°C for 60 minutes before use. Add new flux periodically when continuously reusing flux. Excessive flux may bring out poor bead appearance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{el2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-50°C) J
550	610	29	80

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	P	S
%	0,08	0,35	1,65	≤ 0,026	≤ 0,009

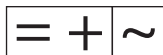
PACKAGING

Wire diameter mm	Weight of packaging kg
1,6; 2,0; 2,4; 3,2; 4,0; 4,8; 5,0; 6,0	25 kg (wire); 20 kg (flux)

Wire is packaged in cardboard box while flux is packaged in metal can.

APPROVALS

ABS (3YTM); BV (A3YTM); DNV (III YTM); GL (3YTM); LR (3YTM)



EF-100S x KD-42

CLASSIFICATION

Flux EF-100S	EN 756	
SAAB 1 77 AC		
Wire KD-42	EN 756	AWS / ASME SFA-5.17
	SZ	EM12K
Flux and wire EF-100S x KD-42	EN 756	AWS / ASME SFA-5.17
	S 46 2 AB SZ	F7A(P)2-EM12K

DESCRIPTION AND APPLICATION

Wire and flux for single and multi-pass fillet welding of shipbuildings, structural steels, offshore structures and pressure vessels. Excellent impact toughness and crack resistibility. Good resistance to porosity on rust, scales, oil and primer. Applicable on AC or DC (+). Redry the flux at 250 to 350°C for 60 minutes before use. Add new flux periodically when continuously reusing flux. Excessive flux may bring out poor bead appearance.

MECHANICAL PROPERTIES OF THE ALL-WELD METAL

R _{el2} N/mm ²	R _m N/mm ²	A ₅ %	KV (-20°C) J
545	600	29	70

APPROXIMATE CHEMICAL COMPOSITION OF THE ALL-WELD METAL

	C	Si	Mn	P	S
%	0,05	0,55	1,60	≤ 0,025	≤ 0,012

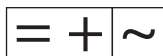
PACKAGING

Wire diameter mm	Weight of packaging kg
1,6; 2,0; 2,4; 3,2; 4,0; 4,8; 5,0; 6,0	25 kg (wire); 20 kg (flux)

Wire is packaged in cardboard box while flux is packaged in metal can.

APPROVALS

ABS



Protection in welding

Welder is at his workplace exposed to many dangers, which have their source in the welding process or in the immediate environment. Therefore, it is essential that the welder is familiar with the dangers and hazards that can be encountered during welding, which may impair his health. Ensuring safe working conditions greatly reduces the chance of welders injury.

Welding produces harmful metal fumes and gases, and long-term exposure to them is one of the biggest problems. The hazard depends on:

- the welding method,
- type and dimension of welding consumable,
- type of base metal,
- paint or any other coating on the base metal,
- ventilation.

In confined spaces welding fumes and gases are extremely dangerous and can be even deadly. Good ventilation is the most common way of controlling exposure to harmful fumes and gases. Good general ventilation, local exhaust-ventilation and respirators should be an absolute "must have" in every working environment. Also it is necessary to wear protective mask to reduce as much as possible the amount of harmful fumes in the breathing area.

But one must not forget other hazards and ways of preventing injuries.

Skin protection is important to prevent burns and other injuries. Welders should always wear helmets, boots, gloves, in general flame-retardant clothing. Suitable eye protection protects eyes from radiation (goggles or safety glasses).

Welders are often exposed to noise, so hearing protectors must be worn. Electric shock can be avoided by using proper welding technique, training welders in the electrical hazards and working with good quality equipment only. It is important to understand all hazards, read and understand safety data sheets and labels, read, understand and follow safety instructions.

Packaging

Welding consumables are packed as follows:

- Electrodes for welding unalloyed steels (rutile electrodes) are packed in cardboard box
- Electrodes for welding unalloyed and low-alloyed steels (basic electrodes) electrodes for welding of high-alloyed steels, electrodes for hardfacing, for gouging, welding cast iron and welding non-ferrous metals are packed in a cardboard box, which is afterward wrapped in plastic foil or, on customers demand, in vacuum foil,
- Wires for GMAW unalloyed and low alloyed steels are packed in plastic foil and then in cardboard box,
- Wires for GMAW of high-alloy stainless steels and wires for GMAW of aluminum are packed in heat-treated PVC foil, and then in a cardboard box,
- Rods for GTAW are packed in cardboard box,
- Rod for oxy-acetylene welding is packed in PVC foil,
- Flux cored wire for GMAW unalloyed and low alloyed steels is packed in a PVC vacuum foil and then in a cardboard box,
- wire for SAW is packed in a cardboard box,
- SAW flux is packed in a tin bucket (metal can).

Welding consumables must be in original and undamaged packaging until use.

Storage

Storage of welding consumables must be done in a proper and correct way. Storage area should be dry, ambient temperature between 17 and 25° C and relative humidity up to 60%. For ambient heating, it is recommended to use electric heaters or central heating in order to minimize humidity. Heating with solid fuels is not recommended due to contamination of the environment with flue gases, and increase of humidity.

It is not recommended to store welding consumables for period longer then three years. The issue of welding consumables from warehouse to job sites shall be carried out in a controlled manner and in accordance to the principle: "First in / First out" or: the goods that first entered the warehouse must first leave the warehouse.

Re-drying

Rutile-cellulosic type - no re-drying.

Rutile type electrodes - re-drying usually not necessary.

Basic coated electrodes - it is essential for this type of electrodes to be thoroughly dried before use, for the purpose of controlling maximum hydrogen content at 5ml/100g weld metal, and avoiding porosity in weld metal deposit.

Recommended redrying conditions are shown on labels on packaging and in our catalogue. The basic type electrodes and electrodes for welding of high alloy stainless steels should be kept in heated chambers (temp. between 70 - 120°C) to prevent moisture apsorption.



*American Bureau
of Shipping*



Bureau Veritas



*Hrvatski Registar
Brodova*



Deutsche Bahn



Det Norske Veritas



Germanischer Lloyd



*Lloyd's Register
of Shipping*



*Registro Italiano
Navale*



*Russian Maritime
Register of Shipping*



*Technischer
Überwachungs Verein*

	ABS	BV	CRS	DB	DNV	GL	LR	RINA	RS	TÜV
EZ - 8 RC	2	2	2	+	2	2	2	2		+
EZ - 11 F	2	2	2	+	2	2	2			+
EZ - 130	2,2Y	2Y	2Y		2	2Y	2,2Y	2Y		
EZ - 180 R	2	2	2		2	2	2	2	2	
EZ - 50 B	3H10,3Y	3,3YHH	3YHH	+	3YH10	3YH10	3Y,YH15	3YH10	3YHH	+
EZ - 55 B Mo				+						+
EZ - KROM 10 R	308L-16	UP		+	308L		304L			+
EZ - KROM 30 R	316L-16	UP		+	316L		316L		A-6	+
EZ - KROM 40 R	309MoL-16	UP			309MoL		SS/CMn		A-9sp	
EZ - SG 2	3YSA	SA 3Y M	3YS	+	III YMS	3YS	3S,3YS	3YS		+
EZ - SG 3				+						+
EZ - SG Mo				+						+
EZ - SG Ti				+						+
EZ - SG CORTEN				+						
EZ - SG 100				+						+
EZ - SG 120				+						
EZ - MIG 307 Si				+						+
EZ - MIG 308 LSi				+						+
EZ - MIG 309 LSi				+						+
EZ - MIG 316 LSi				+						+
EZ - TIG 307 Si				+						+
EZ - TIG 308 LSi				+						+
EZ - TIG 309 LSi				+						+
EZ - TIG 316 LSi				+						+

KISWEL FILLER MATERIALS FOR WELDING

T - 50	2YSA						YMH15			
K - 71 TLF	3YSAH10	3S3YSH10			III YMS(H10)	3YH10S	3Y10SH5			
K - NGS11										
KX - 706 M	3YSA	3S3YS			III YMS	3YS	3YS			
K - 308 LT	E308T1-1	UP			308L MS		304L S			
K - 309 LT	E309LT1-1	UP			309L MS		SS/CMn S			+
K - 316 LT	E316LT1-1	UP			316LMS	4435S	316LS			+
K - 329 T	E2209T1-1				+					
K - 800 HT										
EF-200K x KD-42	3YTM	A3YTM			III YTM	3YTM	3YTM			
EF-100S x KD-42	+									

example: **EZ - 50 B**

E 42 4 B 42 H5

E	covered electrodes for MMA welding
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Symbols for the tensile strength and elongation of the all-weld metal

Symbol	Yield strength min. [N/mm ²]	Tensile strength min. [N/mm ²]	Elongation [%]
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

Symbols for the temperature of the impact properties (Charpy V)

Symbol	Temperature [°C] impact properties min. [47J]
Z	no requirements
A	+ 20
0	0
2	- 20
3	- 30
4	- 40
5	- 50
6	- 60

Symbols for chemical composition of the all-weld metal

Symbol	Chemical composition [%] ¹		
	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 analysis		

¹ If not specified Mo<0,2; Ni<0,3; Cr<0,2; V<0,05; Nb<0,05; Cu<0,3

Symbols for diffusible hydrogen content in all-weld metal

Symbol	Hydrogen content ml H ₂ /100g deposited all-weld max.
H5	5
H10	10
H15	15

Symbols for the welding position

1	All positions
2	All positions, except vertical down position
3	Flat butt weld, flat fillet weld, horizontal/vertical weld
4	Flat butt weld, flat fillet weld
5	All positions including vertical down position

Symbols for recovery and type of welding current

Symbol	Weld metal recovery [%]	Type of current Alternating current, AC (-) Direct current, DC (=)
1	≤ 105	AC and DC
2	≤ 105	DC
3	105 - 125	AC and DC
4	105 - 125	DC
5	125 - 160	AC and DC
6	125 - 160	DC
7	> 160	AC and DC
8	> 160	DC

Symbols for the type of electrode covering

A	acid
B	basic
C	cellulosic
R	rutile
RA	rutile-acid
RB	rutile-basic
RC	rutile-cellulosic
RR	heavily coated rutile

example: **EZ - ABRA 60****E Fe 14****E** covered electrode for
MMA welding

Alloy symbols and chemical composition

Alloy symbol ¹⁾	Suitability	Chemical composition, [%]									
		C	Cr	Ni	Mn	Mo	W	V	Nb	Other	Balance
Fe 1	p	≤ 0,4	≤ 3,5	-	0,5 - 3,0	≤ 1,0	≤ 1,0	≤ 1,0	-	-	Fe
Fe 2	p	0,4 - 1,2	≤ 7,0	≤ 1,0	0,5 - 3,0	≤ 1,0	≤ 1,0	≤ 1,0	-	-	Fe
Fe 3	s t	0,2 - 0,5	1,0 - 8,0	≤ 5,0	≤ 3,0	≤ 4,5	≤ 10,0	≤ 1,5	-	Co, Si	Fe
Fe 4	s t (p)	0,2 - 1,5	2,0 - 6,0	≤ 4,0	≤ 3,0	≤ 10,0	≤ 19,0	≤ 4,0	-	Co, Ti	Fe
Fe 5	c p s t w	≤ 0,5	≤ 0,1	17,0 - 22,0	≤ 1,0	3,0 - 5,0	-	-	-	Co, Al	Fe
Fe 6	g p s	≤ 2,5	≤ 10,0	-	≤ 3,0	≤ 3,0	-	-	≤ 10,0	Ti	Fe
Fe 7	c p t	≤ 0,2	4,0 - 30,0	≤ 6	≤ 3	≤ 2,0	-	≤ 1,0	≤ 1,0	Si	Fe
Fe 8	g p t	0,2 - 2,0	5,0 - 18,0	-	0,3 - 3,0	≤ 4,5	≤ 2,0	≤ 2,0	≤ 10,0	Si Ti	Fe
Fe 9	k (n) p	0,3 - 1,2	≤ 19,0	≤ 3,0	11,0 - 18,0	≤ 2,0	-	≤ 1,0	-	Ti	Fe
Fe 10	c k (n) p z	≤ 0,25	17,0 - 22,0	7,0 - 11,0	3,0 - 8,0	≤ 1,5	-	-	≤ 1,5	Si	Fe
Fe 11	c n z	≤ 0,3	18,0 - 31,0	8,0 - 20,0	≤ 3,0	≤ 4,0	-	-	≤ 1,5	Cu	Fe
Fe 12	c (n) z	≤ 0,08	17,0 - 26,0	9,0 - 26,0	0,5 - 3,0	≤ 4,0	-	-	≤ 1,5	-	Fe
Fe 13	g	≤ 1,5	≤ 6,5	≤ 4,0	0,5 - 3,0	≤ 4,0	-	-	-	B, Ti	Fe
Fe 14	g (c)	1,5 - 4,5	25,0 - 40,0	≤ 4,0	0,5 - 3,0	≤ 4,0	-	-	-	-	Fe
Fe 15	g	4,5 - 5,5	20,0 - 40,0	≤ 4,0	0,5 - 3,0	≤ 2,0	-	-	≤ 10,0	B	Fe
Fe 16	g z	4,5 - 7,5	10,0 - 40,0	-	≤ 3,0	≤ 9,0	≤ 8,0	≤ 10,0	≤ 10,0	B, Co	Fe
Fe 20	c g t z	WCa ²⁾	-	-	-	-	-	-	-	-	Fe
Ni 1	c p t	≤ 1,0	15,0 - 30,0	Balance	0,3 - 1,0	≤ 6,0	≤ 2,0	≤ 1,0	-	Si, Fe, B	Ni
Ni 2	c k p t z	≤ 0,1	15,0 - 30,0	Balance	≤ 1,5	≤ 28,0	≤ 8,0	≤ 1,0	≤ 4,0	Co, Si, Ti	Ni
Ni 3	c p t	≤ 1,0	1,0 - 15,0	Balance	0,3 - 1,0	≤ 6,0	≤ 2,0	≤ 1,0	-	Si, Fe, B	Ni
Ni 4	c k p t z	≤ 1,0	1,0 - 15,0	Balance	≤ 1,5	≤ 28,0	≤ 8,0	≤ 1,0	≤ 4,0	Co, Si, Ti	Ni
Ni 20	c g t z	WCa ²⁾	-	-	-	-	-	-	-	-	Ni
Co 1	c k t z	≤ 0,6	20,0 - 35,0	≤ 10,0	0,1 - 2,0	≤ 10,0	≤ 15,0	-	≤ 1,0	Fe	Co
Co 2	t z (c) (s)	0,6 - 3,0	20,0 - 35,0	≤ 4,0	0,1 - 2,0	-	4,0 - 10,0	-	-	Fe	Co
Co 3	t z (c) (s)	1,0 - 3,0	20,0 - 35,0	≤ 4,0	≤ 2,0	≤ 1,0	6,0 - 14,0	-	-	Fe	Co
Cu 1	c (n)	-	-	≤ 6,0	≤ 15,0	-	-	-	-	Al, Fe, Sn	Cu
Al 1	c n	-	-	10,0 - 35,0	≤ 0,5	-	-	-	-	Cu, Si	Al
Cr	g n	1,0 - 5,0	Balance	-	≤ 1,0	-	-	15,0 - 35,0	-	Fe, B, Si, Zr	Cr

c - resistance to rusting
g - resistance to abrasion
k - work hardenablen - cannot be magnetised
p - impact resistance
s - edge retentiont - heat resistance
z - scaling resistance
w - precipitation hardened

(.) - may not apply to all alloys of this type

¹⁾ Alloys which are not included in this table are analogies signified, but letter "Z" shall be put in front.²⁾ Tungsten fused carbide or tungsten carbide broken or spherical.

example: **EZ - SG 2**

G	solid wire for GMAW
----------	---------------------

Symbols for strength and elongation of all-weld metal

Symbol	Yield strength min. [N/mm ²]	Tensile strength [N/mm ²]	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

G 42 4 C/M 3Si1

Symbols for shielding gas

Symbol	Shielding gas
M	shielding gas mixture of M group, according to EN 439, without helium
C	shielding gas of C group according to EN ISO 14175, carbon dioxide (CO ₂)
N	symbol for self-shielded flux cored wires without shielding gas

Symbols for impact properties of all-weld metal

Symbol	Temperature [°C] for minimum average impact energy of 47J
Z	no requirements
A	+ 20
0	0
2	- 20
3	- 30
4	- 40
5	- 50
6	- 60

Symbols for chemical composition of the wire

Symbol	Chemical composition, [%] ^{1) 2) 3)}							
	C	Si	Mn	P	S	Ni	Mo	Al
0	Any other agreed composition							
2Si1	0,06 - 0,14	0,50 - 0,80	0,90 - 1,30	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	≤ 0,02
3Si1	0,06 - 0,14	0,70 - 1,00	1,30 - 1,60	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	≤ 0,02
4Si1	0,06 - 0,14	0,80 - 1,20	1,60 - 1,90	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	≤ 0,02
3Si2	0,06 - 0,14	1,00 - 1,30	1,30 - 1,60	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	≤ 0,02
2Ti	0,04 - 0,14	0,40 - 0,80	0,90 - 1,40	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	0,05 - 0,20
3Ni1	0,06 - 0,14	0,50 - 0,90	1,00 - 1,60	≤ 0,020	≤ 0,020	0,80 - 1,50	≤ 0,15	≤ 0,02
2Ni2	0,06 - 0,14	0,40 - 0,80	0,80 - 1,40	≤ 0,020	≤ 0,020	2,10 - 2,70	≤ 0,15	≤ 0,02
2Mo	0,08 - 0,12	0,30 - 0,70	0,90 - 1,30	≤ 0,020	≤ 0,020	≤ 0,15	0,40 - 0,60	≤ 0,02
4Mo	0,06 - 0,14	0,50 - 0,80	1,70 - 2,10	≤ 0,025	≤ 0,025	≤ 0,15	0,40 - 0,60	≤ 0,02
2Al	0,08 - 0,14	0,30 - 0,50	0,90 - 1,30	≤ 0,025	≤ 0,025	≤ 0,15	≤ 0,15	0,35 - 0,75

¹⁾ 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 % by mass,

²⁾ Single values shown in the table are maximum values,

³⁾ The results shall be rounded to the same number of significant figures as in the specified value using the rules according to annex B, Rule A of ISO 31-0:1992.

example: **EZ - TIG 316 LSi**

W 19 12 3 L Si

W rod for GTAW

Higher silicon content (Si) 0,65 - 1,20%

Symbol of alloy designation

Alloy symbol
Martensitic / ferritic type
13
13 L
13 4
17
Austenitic type
19 9
19 9 Nb
19 12 3 L
19 12 3 Nb
Ferritic / austenitic type
22 9 3 N L
25 7 2 L
25 9 3 Cu N L
25 9 4 N L
Fully austenitic type
18 15 3 L
18 16 5 N L
19 13 4 L
20 25 5 Cu L
20 16 3 Mn L
25 22 2 N L
27 31 4 Cu L
Special types
18 8 Mn
20 10 3
23 12 L
23 12 Nb
23 12 2 L
29 9
Heat resisting types
16 8 2
19 9 H
19 12 3 H
22 12 H
25 4
25 20
25 20 Mn
25 20 H
18 36 H

Explanation of chemical composition of the rod

19 - chromium content (Cr) 18,0 - 20,0%
12 - nickel content (Ni) 11,0 - 14,0%
3 - molybdenum content (Mn) 2,5 - 3,0 %
L - low carbon content (C) ≤ 0,03%

Note

- wire electrodes, wires and rods can
also be used for other welding
methods and then, instead of W,
are following marks:
G - for GMAW
P - for plasma arc welding
S - for SAW

example: **KISWEL K-71 TLF** T 46 2 P C/M 1 H5

T	flux cored wire
----------	-----------------

Symbols for the strength and elongation of the all-weld metal (MULTI-PASS WELDING)

Symbol	Yield strength min. [N/mm ²]	Tensile strength min. [N/mm ²]	Elongation [%]
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

Symbols for the strength of the all-weld metal (SINGLE-PASS WELDING)

Symbol	Yield strength min. [N/mm ²]	Tensile strength min. [N/mm ²]
3T	355	470
4T	420	520
5T	500	600

Symbols for impact properties of all-weld metal (Charpy V)

Symbol	Temperature [°C] for minimum average impact energy of 47J
Z	no requirements
A	+ 20
0	0
2	- 20
3	- 30
4	- 40
5	- 50
6	- 60

Symbols for chemical composition of all-weld metal

Symbol	Chemical composition [%] ¹		
	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
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	0,3 - 0,6	0,6 - 1,2
Z	any other agreed composition		

¹ If not specified Mo<0,2; Ni<0,3; Cr<0,2; V<0,05; Nb<0,05; Cu<0,3

Symbols for diffusable hydrogen content in all-weld metal

Symbol	Hydrogen content ml H ₂ /100g deposited all-weld max.
H5	5
H10	10
H15	15

Symbols for the welding positions

1	All positions
2	All positions except vertical down position
3	Flat butt weld, flat fillet weld horizontal/vertical fillet weld
4	Flat butt weld, flat fillet weld
5	All positions including vertical down position

Symbols for shielding gas

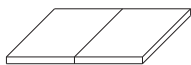
Symbol	Shielding gas
M	shielding gas mixture of M group according to EN 439, without helium
C	shielding gas of C group according to EN ISO 14175, carbon dioxide (CO ₂)
N	symbol for self-shielded flux cored wires without shielding gas

Symbols for type of flux

Symbol	Flag properties	Type of welding	Shielding gas
R	Rutile slow freezing slag	Single and multilayer	Yes
P	Rutile, fast freezing slag	Single and multilayer	Yes
B	Basic	Single and multilayer	Yes
M	Metal powder flux type	Single and multilayer	Yes
V	Rutile or basic / flouride	Single layer	No
W	Basic / flouride, slow freezing slag type	Single and multilayer	No
Y	Basic / flouride, fast freezing slag type	Single and multilayer	No
Z	Other types	-	-

BUTT WELDS PLATE TO PLATE

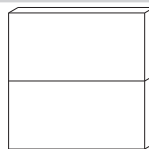
EN ISO 6947
PA



ASME
1G

Horizontal

EN ISO 6947
PC



ASME
2G

Transverse

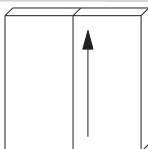
EN ISO 6947
PE



ASME
4G

Overhead

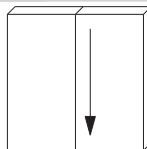
EN ISO 6947
PF



ASME
3F

Vertical up

EN ISO 6947
PG

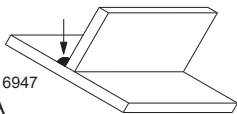


ASME
3G

Vertical down

FILLET WELDS PLATE TO PLATE

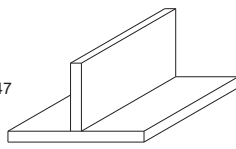
EN ISO 6947
PA



ASME
1F

Horizontal

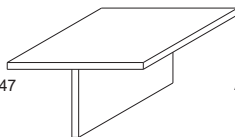
EN ISO 6947
PB



ASME
2F

Horizontal (downhead)

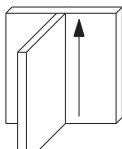
EN ISO 6947
PD



ASME
4F

Overhead

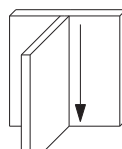
EN ISO 6947
PF



ASME
3G

Vertical up

EN ISO 6947
PG

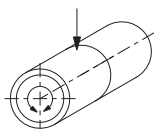


ASME
3F

Vertical down

BUTT WELDS PIPE TO PIPE

EN ISO 6947
PA



ASME
1G

Pipe rotated; pipe axis horizontal

EN ISO 6947
PC



ASME
2G

Pipe fixed; pipe axis vertical

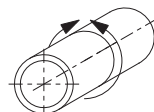
EN ISO 6947
H-LO45
(ascending welding)
J-LO45
(descending welding)



ASME
6G

Pipe fixed; pipe axis angle (e.g. 45°)

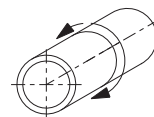
EN ISO 6947
PF



ASME
5G

Pipe fixed; pipe axis horizontal

EN ISO 6947
PG

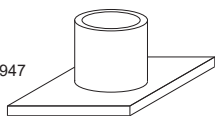


ASME
5G

Pipe fixed; pipe axis horizontal

FILLET WELDS PIPE TO PLATE

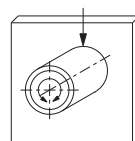
EN ISO 6947
PB



ASME
2F

Pipe fixed; pipe axis vertical

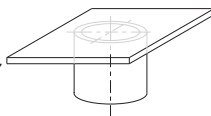
EN ISO 6947
PB



ASME
2F

Pipe rotated; pipe axis horizontal

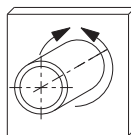
EN ISO 6947
PD



ASME
4F

Pipe fixed; pipe axis vertical

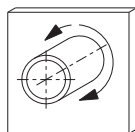
EN ISO 6947
PF



ASME
5F

Pipe fixed; pipe axis horizontal

EN ISO 6947
PG

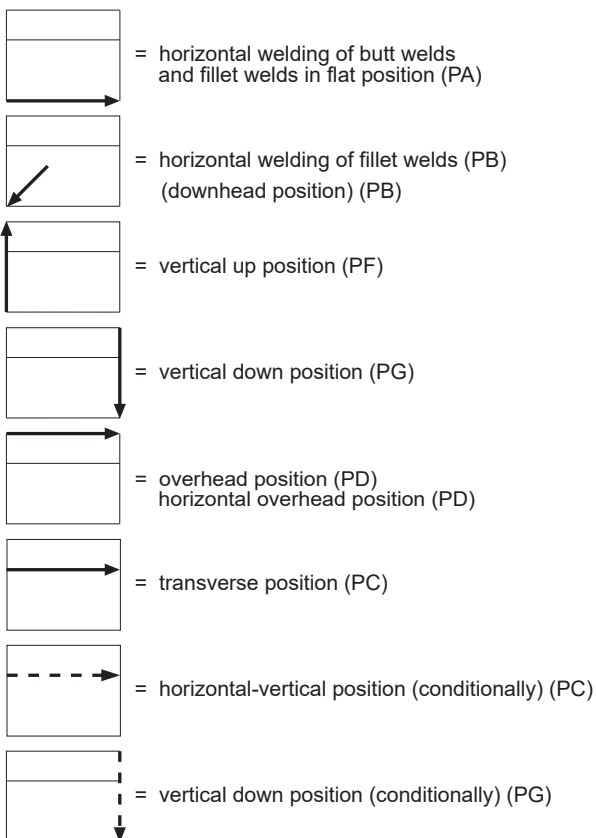


ASME
5F

Pipe fixed; pipe axis horizontal

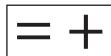
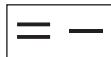
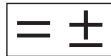
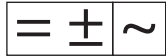
Taking into account the base material, welding conditions and type of electrode covering, welding can be performed in all positions or only some positions.

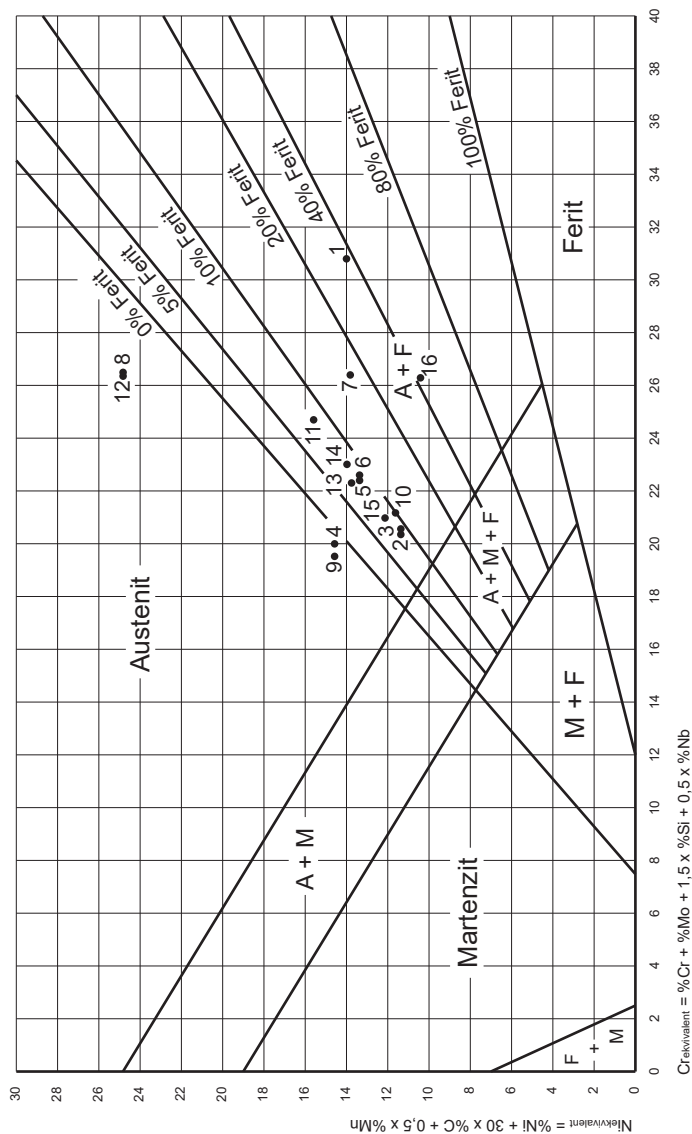
In this catalogue welding positions are indicated with symbols consisting of the arrows. Recommended welding positions are represented with full line arrow. Limited welding positions are represented with dashed line arrow.



To obtain quality welding job it is very important to use the correct type of welding current (AC or DC), and corresponding polarity when welding with DC (+ or -).

In this catalogue welding current type and polarities are indicated with following symbols.

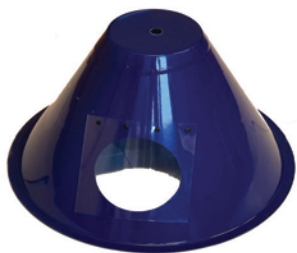
	= alternating current AC
	= direct current DC, electrode positive (DCEP)
	= direct current DC, electrode negative (DCEN)
	= direct current DC, electrode positive or negative (DCEP or DCEN)
	= direct current DC, electrode positive (DCEP) or alternating current AC
	= direct current DC, electrode negative (DCEN) or alternating current AC
	= direct current DC, electrode positive or negative (DCEP or DCEN) or alternating current AC
	= direct current DC, electrode positive (DCEP) or alternating current AC but conditionally



Stick electrodes for MMA welding	
1. EZ - KROM 8	9. EZ - MIG 307 Si / EZ - TIG 307 Si
2. EZ - KROM 10 R	10. EZ - MIG 308 LSi / EZ - TIG 308 LSi
3. EZ - KROM 10 Nb	11. EZ - MIG 309 LSi / EZ - TIG 309 LSi
4. EZ - KROM 20	12. EZ - MIG 310 / EZ - TIG 310
5. EZ - KROM 30 R	13. EZ - MIG 316 LSi / EZ - TIG 316 LSi
Wires for GMAW / Rods for GTAW	
6. EZ - KROM 30 Nb	14. EZ - MIG 318 Si / EZ - TIG 318 Si
7. EZ - KROM 40 R	15. EZ - MIG 347 Si / EZ - TIG 347 Si
8. EZ - KROM 70	16. EZ - MIG 2209 / EZ - TIG 2209

Brinell HB	Vickers HV	Rockwell		Shore HS
HRB	HRC			
95	95	52	-	-
97	97	54	-	-
99	99	56	-	-
101	101	58	-	-
103	103	59	-	-
105	105	61	-	-
107	107	62	-	-
109	109	64	-	-
111	111	65	-	-
114	114	67	-	-
116	116	68	-	-
118	118	69	-	-
121	121	71	-	-
123	123	72	-	-
126	126	73	-	-
128	128	74	-	20
131	131	75	-	20
133	133	76	-	21
137	137	77	-	21
140	140	78	-	21
143	143	79	-	22
146	146	80	-	22
149	149	81	-	23
152	152	82	-	23
156	156	83	-	24
159	159	84	-	24
163	163	85	-	25
167	167	86	-	25
170	170	87	-	26
174	174	88	-	26
179	179	89	-	27
183	183	90	-	27
187	187	91	-	28
192	192	92	14	28
197	197	93	15	29
201	201	94	16	30
207	207	95	17	30
212	212	96	18	31
217	217	97	19	31
223	223	98	20	32

Brinell HB	Vickers HV	Rockwell		Shore HS
HRB	HRC			
223	223	98	20	32
229	229	99	21	33
235	235	100	22	34
241	241	101	23	35
248	248	102	24	36
255	256	103	25	37
262	263	104	26	37
269	270	105	28	38
277	279	106	29	39
285	287	107	30	40
293	296	107	31	42
302	305	108	32	43
311	316	109	33	44
321	327	110	34	45
330	339	111	35	46
341	350	111	36	48
352	363	112	37	49
363	375	113	38	51
375	389	113	40	52
388	404	114	41	54
(401)	420	114	42	55
(415)	437	115	44	57
(429)	454	-	45	59
(444)	473	-	46	61
(461)	496	-	47	63
(477)	520	-	49	65
(495)	546	-	50	67
(514)	575	-	52	70
(534)	608	-	53	72
(555)	645	-	55	75
(578)	692	-	57	78
(601)	735	-	58	81
(627)	790	-	60	84
(653)	845	-	62	87
(682)	930	-	64	91
(712)	1000	-	66	95
(745)	1085	-	68	100
(780)	1175	-	70	106



009130 ROUND DRUM HOOD



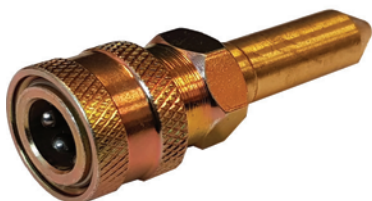
009223 QUICK DRUM CONNECTOR



**006869 LINER WITH METAL
SPIRAL INSIDE**



**009222 MALE BAYONET
CONNECTOR FOR CONDUIT**



**009221 UNIVERSAL FEEDER
ADAPTER**



009220 DRUM LIFTER MAX 500 KG



Remove fixation bar



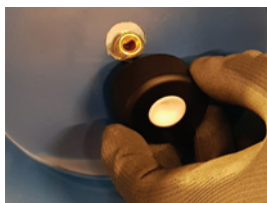
**Drum without of the
fixation bar**



Drum connectors parts



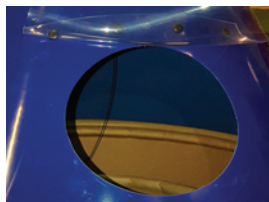
**Attach drum upper hood
connector**



**Attach the inner hood
connectors**



**Feed the wire through
the cone**



**Feed the wire through the
cone to the hood connector**



**Feed the wire through
the liner**



**Place cone and close
fixation ring**



**Click the liner onto the
hood**



Universal feeder adapter



**Connect the liner into
the feeder adapter**

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- repair of parts and machine elements subjected to impact, abrasion, erosion, cavitation or parts that are subjected to wear,
- repair of parts and components for the transmission of motion (gears, sprockets, shafts),
- repair of engine blocks, housing etc.,
- welding parts of aluminum, copper, cast iron, cast steel, low alloy steel, stainless steel etc.,
- training and certification of welders (according to EN, ASME, UIC, API etc.),
- certification of welding processes (WPAR, WPS according to EN, ASME, UIC, API etc.),
- mechanical and chemical examinations.

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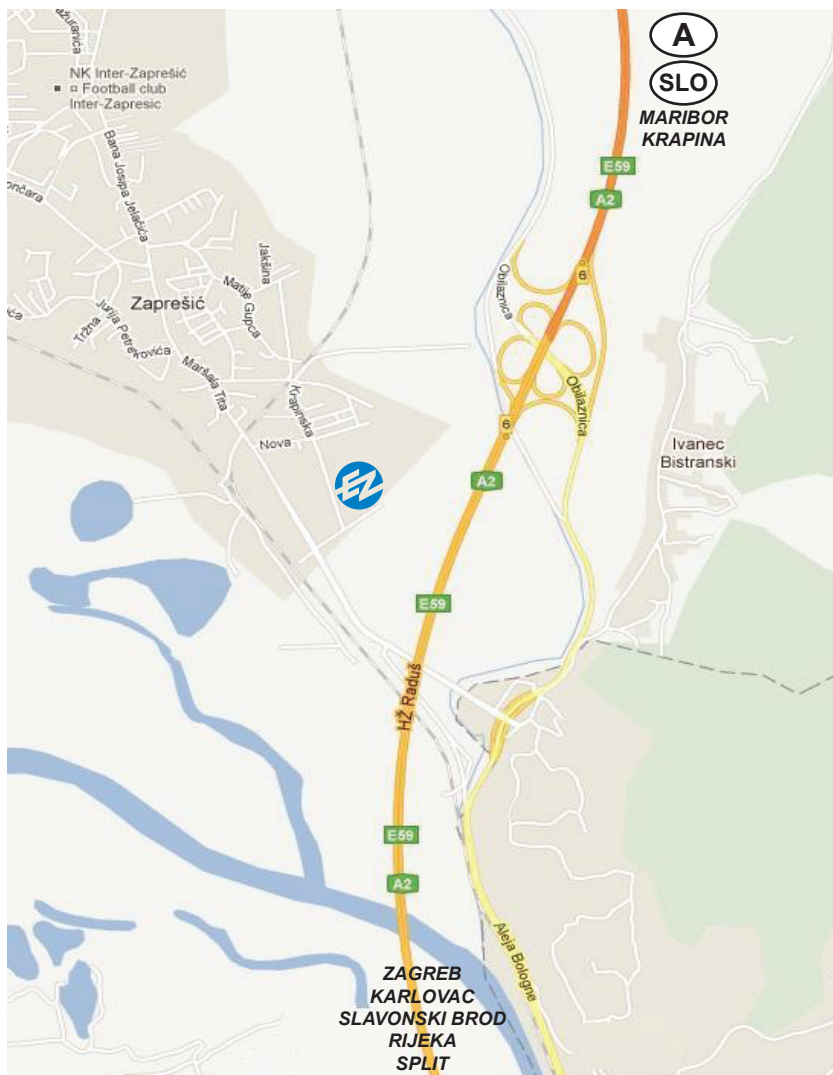






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