SIDEWELD

WELDING CONSUMABLES

ERLIKON
WIRE PROCESSING S.A.

CATEGORY 1: Rutile, oxide and cellulosic electrodes for un-alloyed and low-alloyed steels

FINO

Rutile heavy covering

INTERNATIONAL STANDARDS :

DIN 1913	EN 499	AWS : SFA - 5.1
E 51 32 RR 6	E 42 0 RR 12	E 6013

APPLICATIONS & CHARACTERISTICS :
The general purpose heavy coated rutile electrode, suitable for mild steel light gauge sheet welding, all position including vertical-down in small diameters.
While fillet welding it can be kept in contact with the workpiece with no resultant excess convexity. Automatic striking and restriking. Very little spatter loss. Slag is easily removable. Excellent bead appearance.

MATERIALS OF APPLICATION :

Unalloyed structural steels :	St 34 up to St 53.2. (DIN 17 100)
Boiler plates :	H I, H II, H III. (DIN 17 155)
Pipe steels :	Up to St 52.4 (DIN 1629), St 35.8 up to 19 Mn 5. (DIN 17 175)
	StE 210.7 up to StE 360.7 (DIN 17 172)
	including corresponding TM grades
Shipbuilding steels :	A, B, D.
Fine grained structural steels :	StE 235 up to StE 355. (DIN 17 102)
Cast steels :	GS-38 up to GS-52. (DIN 1681)

WELD METAL ANALYSIS % (typical values) **:**

C	Mn	Si	S	P
0.08	0.60	0.30	< 0.02	< 0.02

MECHANICAL PROPERTIES OF ALL WELD METAL
(Single values are typical values)**:**

Tensile strength (N/mm²)	Yield strength (N/mm²)	Elongation A5 (%)	Impact energy (J) ISO - V 0°C
500-640	> 420	> 20	> 47

WELDING POSITIONS :

REDRYING : Generally not required, if necessary 1 h at 100 ºC.

STANDARD PACKING

CURRENT (type & amperage) :	
Ø 2.00 / 300	50 - 70 A
Ø 2.50 / 350	70 - 100 A
Ø 3.25 / 350	100 - 140 A
Ø 4.00 / 350	140 - 190 A
Ø 5.00 / 350	160 - 220 A

DIMENSIONS	kg/pack	packs per carton box	kg/carton box
Ø 2.00 X 300 mm	3.0	6	18
Ø 2.50 X 350 mm	3.5	6	21
Ø 3.25 X 350 mm	3.5	6	21
Ø 4.00 X 350 mm	3.5	6	21
Ø 5.00 X 350 mm	3.5	6	21

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- ERLIKON-SIDENOR reserves the right to modify its products and the packing of its products without prior notice.
- The information contained in this document is designed to help the user in his choice of product.
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SIDEROOT (AWS/A 5.1 : E 6013)

Medium rutile-cellulosic covering. General use specially in vertical-down. Applications in containers, tanks, pipings etc. Smooth welds without undercutting. Slag in most cases self-releasing.

SIDEMAR (AWS/A 5.1 : E 6013)

General purpose rutile electrode for fabrications with higher tensile steels. The strongest rutile electrode (grade 3). Weld metal with high radiographic standards. Especially for ship maintenance works.

SIDEFER (AWS/A 5.1 : E 7024)

Heavy rutile+iron powder electrode. High efficiency up to 160 %. Low spatter loss and easy slag removal.

SIDECEL (AWS/A 5.1 : E 6010)

Electrode with cellulosic covering for welding seams of pipelines applying the vertical-down technique. Suitable for pipe welding.

CATEGORY 2 : Basic electrodes for un-alloyed, low-alloyed and special structural steels

SUPER B

Basic coating electrode

INTERNATIONAL STANDARDS :

DIN 1913	EN 499	AWS : SFA - 5.1
E 51 55 B 10	E 46 4 B 42 H10 120	E 7018

APPLICATIONS & CHARACTERISTICS : Low hydrogen basic coated electrode for producing crack- free welded joints with good toughness properties even on steels having a carbon content up to 0.4 %. Weld metal recovery is approx.120 %. Good operating characteristics, also in positional welding. Weld metal exhibits good toughness properties down to -50 ºC. Suitable for depositing buffer layers on steels having a higher carbon content.

MATERIALS OF APPLICATION :

Unalloyed structural steels :	St 33 up to St 52-3. (DIN 17 100), St 50-2*, St 60-2*, St 70-2*.
Boiler plates :	H I, H II. (DIN17 155),
Pipe steels :	Up to St 52.4 (DIN 1629), St 35.8 up to 19 Mn 5. (DIN 17 175)
	StE 210.7 up to StE 360.7. (DIN 17 172)
	including corresponding TM grades
Shipbuilding steels :	A, B, D, E.
Fine grained structural steels :	StE 235 up to StE 355. (DIN 17 102), WStE 235 up to WStE 355.
	TStE 235 up to TStE 355.
Cast steels :	GS-38 up to GS-52. (DIN 1681)

WELD METAL ANALYSIS % (typical values) **:**

C	Mn	Si
0.07	1.20	0.50

MECHANICAL PROPERTIES OF ALL WELD METAL :

Tensile strength (N/mm^2)	Yield strength (N/mm^2)	Elongation A5 (%)	Impact energy (J) ISO - V - 40°C
530-680	> 460	> 20	> 47

WELDING POSITIONS :

~ =+ **REDRYING** : Required, 1 h at 250 ºC - 350 ºC .

STANDARD PACKING

CURRENT (type & amperage) :	
Ø 2.50 / 350	60 - 90 A
Ø 3.25 / 350	90 - 140 A
Ø 3.25 / 450	90 - 140 A
Ø 4.00 / 450	140 - 190 A
Ø 5.00 / 450	190 - 250 A

DIMENSIONS	kg / pack	packs per carton box	kg / carton box
Ø 2.50 X 350 mm	3.0	6	18
Ø 3.25 X 350 mm	3.5	6	21
Ø 3.25 X 450 mm	4.5	6	27
Ø 4.00 X 450 mm	4.5	6	27
Ø 5.00 X 450 mm	4.5	6	27

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*** : Preheat to 150-300 ºC, depending on plate thickness.**

SUPER B-1 (AWS/A 5.1 : E 7018 - 1)

Basic electrode with very low hydrogen content. For tough crack-free joints. Smooth welds without undercut. Suitable for buffer layers on carbon steels.

SIDETEN 90 (AWS/A 5.1 : E 9018 - G)

Basic type electrode for high-tensile fine grain structular steels. Tested for offshore applications. Welds are X-ray quality.

CATEGORY 3: Electrodes for hardfacing applications

SIDEDUR 600 (DIN 8555 : E 6 UM 55 GP)

Easy to use hardfacing electrode. High resistance to wear and impact. First layer hardness 550 HB. Second layer hardness 590-680 HB (57-62 HRC).

CATEGORY 4: Electrodes for stainless and heat-resisting steels

SIDENOX 308 (AWS/A 5.4 : E 308L - 16)

Rutile high-alloy electrode for austenitic stainless Cr-Ni steels or cast steels. For operating temperatures up to +350 ºC. Non-scaling up to +800 ºC.

SIDENOX 310 (AWS/A 5.4 : E 310 - 16)

Rutile inox electrode austenitic type. Suitable for heat-resisting chromium and chromium-nickel steels, as well as for cast steels. Non-scaling up to +1200 ºC.

SIDENOX 312 (AWS/A 5.4 : E 312 - 16)

Rutile electrode with 25-30% ferrite content, suitable for welding dissimilar and difficult steels and for cladding on ferritic steels. Weld metal non-scaling up to +1100 ºC. High resistance to cracking when used as buffer layer on sensitive base metals.

SIDENOX 316 (AWS/A 5.4 : E 316L - 16)

Rutile high-alloy electrode for austenitic stainless Cr-Ni-Mo steels or cast steels. Extra low carbon content. For operating temperatures up to +400 ºC.

CATEGORY 5: Electrodes for cast iron

SIDEFONTE NiCu (AWS/A 5.15 : E NiCu B)

Electrode suitable for filling-up and repair of cast defects on malleable or nodular cast iron. Weld metal is machinable.

SIDEFONTE Ni (AWS/A 5.15 : E Ni C1)

Suitable for repair of grey cast iron and for joining components made of steel, copper or nickel to malleable castings. Weld metal is machinable.

SIDEFONTE NiFe (AWS/A 5.15 : E NiFe C1)

Nickel-iron electrode with special basic covering. Suitable for welding nodular cast iron and for joining components made of steel, copper or nickel to graphite castings. Weld metal is machinable.

SIDEFIL 1

MIG-MAG welding wire

INTERNATIONAL STANDARDS :

DIN 8559	EN 440	AWS : SFA - 5.18
SG 2	G 3 Si 1	ER 70 S-6

APPLICATIONS & CHARACTERISTICS :
Copper-plated unalloyed wire for welding in CO_2 atmosphere, suitable for mild and unalloyed steels, for boiler and tank construction and pipe welding, offering tensile strength up to 510 N/mm^2.

MATERIALS OF APPLICATION :

Unalloyed structural steels :	St 33, St 37, St 44, St 52.3, St 50-2*, St 60-2*.
Boiler plates :	H I, H II, H III, 17 Mn 4, 19 Mn 5*.
Pipe steels :	St 35, St 35.4, St 35.8, St 45, St 45.4, St 45.8, St 55*, St 55.4*,
	St 52, St 52.4, St 34.7, St 38.7, St 43.7, St 47.7, St 53.7.
Shipbuilding steels :	A, B, C, D, E .
Cast steels :	GS-38, GS-45, GS-52.

*** : Preheat to 150-300 ºC, depending on plate thickness**

WELD METAL ANALYSIS % :

C	Mn	Si	S + P
0.06 - 0.14	1.3 - 1.6	0.7 - 1.0	< 0.050

CURRENT, GAS CONSUMPTION AND WIRE FEED SPEED

CO_2	ø 0.8	ø 1.0	ø 1.2	ø 1.6
12-20 l/min	50 - 70 A	80 - 230 A	120 - 280 A	200 - 400 A
m/min	2.5-12	2.5-10	3-10	3-8

MECHANICAL PROPERTIES OF ALL WELD METAL :

Shield gas type	Tensile strength (N/mm^2)	Yield strength (N/mm^2)	Elongation A5 (%)	Impact energy
CO_2	490-590	> 370	> 25	> 47 (-20 ºC)
mixed	510-610	> 390	> 25	> 47 (-40 ºC)

PROCEDURAL RECOMMENDATION :
Mechanical properties apply to the use of shielding gas DIN EN 439-C1 (100 % vol. CO_2), M21, M22, M23, M24.

Standard Packing In 15 kg spools (net weight)

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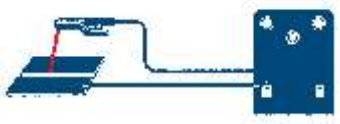
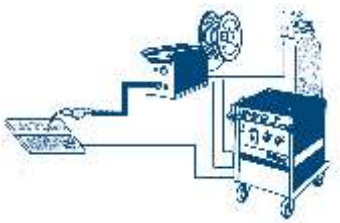
SHORT DESCRIPTION OF THE WELDING METHODS

1. SMAW (Shielded Metal Arc Welding)



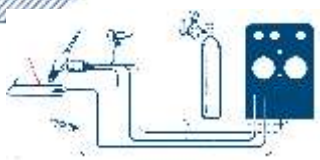
In this method the arc is established between a covered electrode and the workpiece. Apart from arc operation and protection, the electrode coating provides alloying elements to the weld metal thus offering specific mechanical and chemical properties. Therefore, optimal electrode selection is of utmost importance for successful application.
ERLIKON-SIDENOR offers electrodes for all steel types (even for non-ferrous metals).

2. GMAW (Gas Metal Arc Welding)



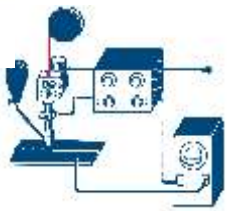
This method allows high welding speed and productivity. In this case the wire acts as the current conductor and generates the arc, while simultaneously being fused and deposited on the work. Though not as versatile as the SMAW method, GMAW is particularly suited for automation.
ERLIKON-SIDENOR offers SG 2 wire, covering an extensive application range.

3. GTAW (Gas Tungsten Arc Welding)



In this method the arc is established between a non-consumable tungsten electrode and the workpiece. The welder feeds a welding rod while operating the torch providing the protection gas with the other hand. This method produces superior quality seams and is particularly suited for root welding.

4. SAW (Submerged Arc Welding)



This is an automatic welding method using welding wire and the appropriate flux. It has been developed for large works on ships, armored vehicles or fuel tanks and achieves high welding speed at the horizontal or the circumferential position (pipelines, tubular tanks etc.).

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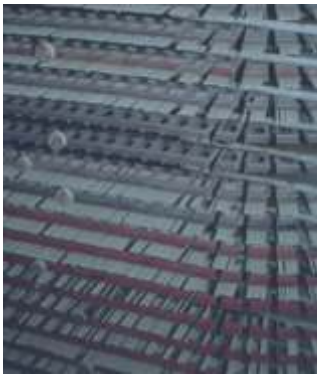
SIDEWELD



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