2014

Strongweld®

Ultimate Welding Performance

Welding Electrodes

Electrodes for carbon steel

Strongweld 6010 — AWS: E 6010

The deposited metal is ductile, good penetration, with soft arch and stable. Good efficiency. Especially suitable for applications in all positions under radiographic demand. Structures, pressure pipes, heavy machinery.

Approved by:
- Lloyd's Register of Shipping.
- Bureau Veritas.
- American Bureau of Shipping.
- Germanischer Lloyd.
- Det Norske Veritas.

Recommended Amperages

Dim. Elect. inch	mm.	Amperage min.	max.	Electrode x kg. aprox.
3/32"	2,4	60	90	75
1/8"	3,2	80	110	35
5/32"	4,0	110	160	24
3/16"	4,8	150	200	17

CC (+). All positions
Traction resistance : 72.500 lb/inch^2 (500 MPa)
Fluency limit : 64.000 lb/inch^2 (441 MPa)
Lengthen in 50 mm : 30%

Chemical Composition (typical):
C: 0,12% Mn: 0,60% P: 0,010% S: 0,020% Si: 0,24%

Strongweld 6011 — AWS: E 6011

Specially designed to use with alternate stream, even though it can also be used with continuous stream, positive electrode. Their other properties and applications are similar to E 6010 electrode.

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- Lloyd's Register of Shipping.
- Bureau Veritas.
- American Bureau of Shipping.
- Germanischer Lloyd.
- Det Norske Veritas.

Recommended Amperages

Dim. Elect. inch	mm.	Amperage min.	max.	Electrode x kg. aprox.
3/32"	2,4	50	90	77
1/8"	3,2	80	120	37
5/32"	4,0	120	160	26
3/16"	4,8	140	220	18

CC (+). All positions
Traction resistance : 71.500 lb/inch^2 (493 MPa)
Fluency limit : 61.000 lb/inch^2 (420 MPa)
Lengthen in 50 mm : 30%

Chemical Composition (typical):
C: 0,10% Mn: 0,680% P: 0,01% S: 0,020% Si: 0,340%

Strongweld 6013 — AWS: E 6013

Soft arch, little splashing, good appearance deposit, special for light structures, metal furniture. Low penetration.

Approved by:
- American Bureau of Shipping.

Recommended Amperages

Dim. Elect. inch	mm.	Amperage min.	max.	Electrode x kg. aprox.
3/32"	2,4	40	90	52
1/8"	3,2	70	120	35
5/32"	4,0	120	190	22
3/16"	4,8	160	240	17

CC (+). All positions
Traction resistance : : 75.400 lb/inch^2 (520 MPa)
Fluency limit : : 64.000 lb/inch^2 (440 MPa)
Lengthen in 50 mm : : 28%

Chemical Composition (typical):
C: 0,10% Mn: 0,30% P: 0,02% S: 0,03% Si: 0,30%

Strongweld 7018-RH — AWS: E 7018

Low contents of hydrogen and humidity resistant electrode, radiographic quality in all positions. Especially for kettles, pipes and steels submitted to low temperatures.

Approved by:
- Lloyd's Register of Shipping.
- Bureau Veritas.
- American Bureau of Shipping.
- Germanischer Lloyd.
- Det Norske Veritas.

Recommended Amperages

Dim. Elect. inch	mm.	Amperage min.	max.	Electrode x kg. aprox.
3/32"	2,4	70	120	65
1/8"	3,2	120	150	32
5/32"	4,0	140	200	19
3/16"	4,8	200	275	14
1/4"	6,4	275	400	7

CC (+). All positions
Traction resistance : 73.000 lb/inch^2 (505 MPa)
Fluency limit : 63.300 lb/inch^2 (437 MPa)
Lengthen in 50 mm : 30%

Chemical Composition (typical):
C: 0,06% Mn: 1,0% P: 0,012% S: 0,015% Si: 0,48%

Electrodes for stainless steels

Strongweld 308-L — AWS: E 308L-16

Stainless steel electrode extra carbon low (0.03% max.). Especially for welding in chemical plants, in steel welding type 302, 304, 304L, 321, 347. The low carbon contents prevent the formation of chrome carburets on the grain limits.

Ampe raje s Re co mendados:

Diámetro Pulg.	mm.	Amps.
3/32"	2,4	60 - 90
1/8"	3,2	80 - 120
5/32"	4,0	120 - 150
*3/16"	4,8	150 - 190

*Manufactured only by request
Consult minimum quantities and delivery terms.

CC (+). All positions
Traction resistance : 92.700 lb/inch^2 (591 MPa)
Fluency limit : 67.900 lb/inch^2 (425 MPa)
Lengthen in 50 mm : 44%

Chemical Composition (typical):
C: 0,03% Mn: 0,9% P: 0,02% S: 0,02% Si: 0,5%
Cr: 19,0% Ni: 9,9%

Strongweld 309-L — AWS: E 309L-16

Stainless steel austenitic electrode, with low contents of carbon. Corrosion resistant. Design to weld 309L, 309Cb, 321, 347 steels.

Recommended Amperages

Diam inch.	mm.	Amps.
3/32"	2,4	60 - 80
1/8"	3,2	80 - 110
5/32"	4,0	110 - 140
*3/16"	4,8	140 - 180

CC (+). All positions
Traction resistance : 86.000 lb/inch² (620 MPa)
Fluency limit : 71.900 lb/inch² (485 MPa)
Lengthen in 50 mm : 40%

Chemical Composition (typical):
C: 0,03% Mn: 1,0% P: 0,02% S: 0,02% Si: 0,50%
Cr: 23,0% Ni: 13,5%

Strongweld 29-9S — AWS: E 312-16

Stainless steel deposits with good appearance and penetration, manufactured for stainless steel welding type 312,314,303, dissimilar steel and high in nickel. Axle and gears reparation, template steels.

Recommended Amperages

Diam inch.	mm.	Amps.
1/8"	3,2	80 - 120
*5/32"	4,0	120 - 150
*3/16"	4,8	150 - 190

CC (+). All positions
Traction resistance : 120.000 lb/inch² (828 MPa)
Fluency limit : 99.000 lb/inch² (660 MPa)
Lengthen in 50 mm : 36%

Chemical Composition (typical):
C: 0,11% Mn: 1,25% P: 0,02% S: 0,02% Si: 0,70%
Cr: 29,5% Ni: 9,2%

Strongweld 316-L — AWS: E 316L-16

Stainless steel electrode extra carbon low (0.03% max.) Avoids carburets formation and is corrosion resistant (attack by acids). Recommended for stainless steel applications type 316, 316L, 317, 317L and 318.

Approved by:
- Lloyd's Register of Shipping.
- American Bureau of Shipping.

Recommended Amperages

Diam inch.	mm.	Amps.
3/32"	2,4	60 - 80
1/8"	3,2	80 - 110
5/32"	4,0	110 - 140
*3/16"	4,8	140 - 180

CC (+). All positions
Traction resistance : 83.900 lb/inch² (612 MPa)
Fluency limit : 55.000 lb/inch² (400 MPa)
Lengthen in 50 mm : 41%

Chemical Composition (typical):
C: 0,03% Mn: 1,0% P: 0,020% S: 0,020% Si: 0,8%
Cr: 18,5% Ni: 13,0% Mo: 2,5%

Cast iron electrodes

NICKEL 55 — AWS: E Ni-Fe-Cl — Strongweld

The Nickel 55 based nickel-iron produces high mechanic resistant deposits, cracks and porosity free. Especially adequate in foundries with high percentage of phosphorus, grey foundries, malleable, nodular and also foundries unions with carbon steel.

Recommended Amperages

Diam inch.	mm.	Amps.
*3/32"	2,4	40 - 65
1/8"	3,2	70 - 100
5/32"	4,0	100 - 125
*3/16"	4,8	130 - 150

Typical applications:
Machinery bases, pumps cover, plates, etc.

CA, CC (+).

Hardness (-) : 200 HB

Chemical Composition (typical):
C: 0,90% Mn: 0,80% Si: 0,70% Ni: Balance Fe: 45,0%

NICKEL 99 — AWS: E Ni-Cl — Strongweld

This electrode, based nickel produces homogeneous deposits very smooth, porosity free and greater resistant and ductibility than the base material. Specially designed for union welding in cold and melted iron filling, where plotter deposits are required.

Recommended Amperages

Diam inch.	mm.	Amps.
3/32"	2,4	60 - 80
1/8"	3,2	70 - 110
5/32"	4,0	100 - 130
*3/16"	4,8	150 - 180

Typical applications:
Engine blocks, pumps covers, cylinder heads, gears, pulleys, machinery benches.

CA, CC (+).

Hardness (-) : 160 HB

Chemical Composition (typical):
C: 1,20% Mn: 1,0% Si: 0,45% P: 0,02% S: 0,02%
Ni: Balance Fe: 2,70%

Bronze and stainless steel rods

INDURA 127

Strong welding alloy for Bronze - thin plates and ironed material

Special Features:
INDURA 127 is a strong welding alloy, specially formulated to endure high mechanic efforts. Contains manganese for greater resistant-silica as dioxide agent and tin for greater oxidation resistance. [n its type is the one with greater fluency, produces high mechanic resistant metallurgic joints and insuperable chemical stability in the presence of corrosion agents. During the welding process generates very low fume index. Very easy to use. Produces clean finishing with absence of pores. In bronze and thin plates, their deposits look like base metal.

International Norms:
ANSI / AWS : A5.8 - 92
AWS : RB Cu Zn-C

Technical characteristics:
Work Temperature : 866 - 888°C
Traction resistant : 40 - 45 Kg./mm^2
Hardness : 80 - 100 HB

Nominal Chemical Analysis (%):
Cu : 57.00 %
Sn : 1.0 %
Mn : 0.20 %
Si : 0.10 %
Zn : Balance

Indura 127 FX (Fluxes Incorporated)

Strong welding alloy of Bronze - thin plates and ironed material with flexible smelter cover

Special Features:
INDURA 127 FX is a strong welding alloy, specially formulated to endure high mechanic efforts. Contains manganese for greater resistant-silica as deoxidant agent and tin for greater oxidation resistance. In its type is the one with greater fluency, produces high mechanic resistant metallurgic joints and insuperable chemical stability in the presence of corrosion agents. During the welding process generates very low fume index. Very easy to use. Produces clean finishing with absence of pores. In bronze and thin plates, their deposits look like base metal.

It doesn't need smelter. The smelter is attached to the small rod.

International Norms:
ANSI / AWS : A5.8 - 92
AWS : RB Cu Zn-C

Technical characteristics:
Covering color : Blue
Work Temperature : 866 - 888°C
Traction resistant : 40 - 45 Kg./mm^2
Hardness : 80 - 100 HB

Nominal Chemical Analysis (%):
Cu : 57.0 %
Sn : 1.0 %
Mn : 0.20 %
Mn : 0.20 %
Si : 0.10 %
Zn : Balance

Strongweld TIG 308-L (AWS ER - 308L)

INDURA S.A. is Certified ISO 9001

General Applications
Stainless Steel Type 308L - 304L - 308 - 321 - 347
Used on process equipments and storage of food and chemistry products.
Application with pumps, heath interchangers, etc.

Addition metal properties
Nominal Chemical Composition (%):

C: <0,025	Si: 0,4	Mn: 1,8	P: <0,025	S: <0,015
Cr: 20	Ni: 10	Mo: <0,5	Co: <0,20	Cu: <0,2
N: 0,060				

Mechanical Properties:

Temperature	°C	20	400	-196
Resistance test, R	Mpa	390	290	-
Resistance testing, R	Mpa	600	440	-
Elongation, A1	%	34	25	-
Reduction area	%	56	-	-
Energy Impact, Charpy V	J	135	-	60
Dureza, Vickers		160	-	-

TIG welding
The parameters for TIG welding are more or less, depending on the material thickness and the application when welding. To avoid the tungsten electrode fusion you must use a direct polarity (negative electrode) and an inactive protection gas, such as Argon or Helium.

Strongweld TIG 316-L (AWS ER - 316L)

INDURA S.A. is Certified ISO 9001

General Applications
Specially designed for austenitic type 316L - 316 - 318 stainless steel welding.
Used mainly in food industries, paper turbines, pumps, etc. Recommended for corrosion resistant applications when there is a pricking possibility (attack by acid).

Addition metal properties
Nominal Chemical Composition (%):

C: <0,020	Si: 0,4	Mn: 1,8	P: <0,025	S: <0,015
Cr: 18,5	Ni: 12,5	Mo: 2,6	Co: <0,10	Cu: <0,05
N: <0,060				

Mechanical Properties:

Temperature	°C	20	400	-196
Resistance test, R	Mpa	390	290	-
Resistance testing, R	Mpa	600	470	-
Elongation, A1	%	35	26	-
Reduction area	%	40	-	-
Energy Impact, Charpy V	J	110	-	50
Dureza, Vickers		160	-	-

TIG welding
The parameters for TIG welding are more or less, depending on the material thickness and the application when welding. To avoid the tungsten electrode fusion you must use a direct polarity (negative electrode) and an inactive protection gas, such as Argon or Helium.

Hard facing electrodes

BUILD UP 28

Strongweld

The Build Up 28 electrode is specially designed for wear out surfaces reconstruction applications that requires a greater resistant to impact and compression, its deposits must be plotted. Base for hard coverings.

Recommended Amperage

Diam Inch.	mm.	Amps.
1/8"	3,2	70 - 125
5/32"	4,0	110 - 180
3/16"	4,8	150 - 250

Typical applications
Axle heads, caterpillar links, grains, pulleys, etc.

CA, CC (+).

Hardness (-): ASTM Steel 255-280 HB

ANTIFRIX 37

Strongweld

Martensitic alloyed deposit with good resistant to the wear away by moderate impact and compression. Use for low alloying carbon steels covering, submitted to metal - metal and impact ware out. Is not recommended in foundries or manganese steel.

Recommended Amperage

Diam Inch	mm.	Amps.
1/8"	3,2	80 - 150
5/32"	4,0	140 - 210
3/16"	4,8	165 - 250

Typical applications:
Guide rollers, tensor wheels, matrix wheels and other caterpillar parts.

CA, CC (+).

Hardness (-): SAE 1020 Steel: 300-400 HB

Mn-14

Strongweld

The Mn-14 electrode has been designed to join, filling and covering of manganese steel parts. Excellent ware out by impact or moderate abrasiveness.

Recommended Amperage

Diam Inch	mm.	Amps.
1/8"	3,2	80 - 140
5/32"	4,0	140 - 180
3/16"	4,8	160 - 230

Typical applications:
Shovel Buckets, Guide rollers, Molars, Borer robes, Excavator tooth, Borer sledge hammer, etc.

CA, CC (+),

Hardness : Just weld : 180 - 210 HB
Hardening during work : 400 - 500 HB

OVERLAY 60

Strongweld

Is an electrode based on chrome carburets that offer an excellent combination of abrasion wear out resistance and moderate impact. Is specially designed for carbon steel covering, low alloy and manganese.

Recommended Amperage

Diam Inch	mm.	Amps.
1/8"	3,2	70 - 160
5/32"	4,0	175 - 200
3/16"	4,8	225 - 300

Typical applications:
Transporting screws, Shovel tooth, Grinder sledge hammers, cams, rollers, and mining equipment.

CA, CC (+),

Hardness (-): SAE 1045 Steel: 57- 61 HRc

OVERLAY 62

Strongweld

Extra high contents of chrome carburets deposit, used as a final coat on parts submitted to an extremely sever abrasion condition. Can be used also in applications were resistance to temperature abrasion is required. Very little slag left in deposit and generates cracks to relieve tensions.

Recommended Amperage

Diam Inch	mm.	Amps.
1/8"	3,2	70 - 160
5/32"	4,0	175 - 200
3/16"	4,8	225 - 300

Typical applications:
Indicated for protection isopterous and reticulated on the shovel and bucket edges, final coat in cones and borer jaws and in general similar applications as Overlay 60, but with greater resistant to abrasion.

CA, CC (+).

Hardness (-): SAE 1045 Steel: 60- 63 HRc

Continuous Wire for carbon steel (Mig/Mag)

INDURA 70S-6 — AWS: ER 70S-6 — Strongweld

Approved by:
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- Germanischer Lloyd.
- Det Norske Veritas.
- Canadian Welding Bureau.

Solid wire for MIG/MAG process. Has higher level of manganese and silica than other solid wire grades, requires protection gas C02 or argon- C02 mixture.

Typical applications:
Ship construction, pressurize recipients, pipe welding, structures, general manufacturing jobs.

CC(+), All positions
Traction resistance : 76.800 lb/inch^2 (529 MPa)
Fluency limit : 62.100 lb/inch^2 (429 MPa)
Lengthen in 50 mm : 26%

Chemical Composition (typical):
C: 0,10% Mn: 1,55% P: 0,02% S: 0,02% Si: 0,95%

Recommended Amperages

Diam (mm)	Amperage	Volts.	CO Flow (lt/min)
0,8	50 - 110	15 - 21	7 - 12
0,9	60 - 120	16 - 22	8 - 12
1,1	120 - 250	22 - 28	12 - 14
1,2	120 - 250	22 - 28	12 - 14
1,6	200 - 300	25 - 32	14 - 16

MIGMATIC — Strongweld

Approved by:
- Lloyd's Register of Shipping.
- Bureau Veritas.
- American Bureau of Shipping.
- Germanischer Lloyd.
- Det Norske Veritas.
- Canadian Welding Bureau.

New container for ER 70S-6 wires with 272 Kg (600 lb) capacity, ideal for automatic welding process and semi automatic for high production volume. Has the same characteristics than the 15 Kg coil with a great vantage at increasing productivity and decreasing death times in production. Wire with perfectly balanced curvature and axle, prevents the wire vibration perceived at the standard coil (15 Kg). Less detaching of the wire copper layer, due the minor friction in the conducts and reduces sliding on the feeding rollers.

Regulation MIG system chart:

Thickness in Gauge	Thickness in inch.	Thickness in mm.	ø Electrode in mm./inch	Amperage in C.C.	Voltage in C.C.	Speed advance m/min.	Gas in PCH.	Liters per min.
22		0,77	0,8 (0,030")	35 - 60	16 - 17,5	0,50	15 - 20	7 - 9
20		0,92	0,8 (0,030")	40 - 70	17 - 18	0,70	15 - 20	8 - 9
8		1,25	0,9 (0,035")	70 - 90	18 - 19	0,50 - 0,70	15 - 20	8 - 9
14	5/64	2,1	0,9 (0,035")	120 - 130	20 - 21	40 - 0,50	20 - 25	9 - 12
11	1/8	3,17	1,1 (0,045")	120 - 180	20 - 23	0,37 - 0,50	20 - 25	9 - 13
7	3/16	4,76	1,1 (0,045")	190 - 200	21 - 22	0,60 - 0,70	25 - 30	12 - 14
	1/4	6,25	1,1 (0,045")	160 - 180	22,5 - 23	0,35 - 0,45	25 - 30	12 - 14
	5/16	7,93	1,1 (0,045")	200 - 210	23 - 23,5	0,30 - 0,50	25 - 30	12 - 14
	3/8	9,5	1,1 (0,045")	220 - 250	24 - 25	0,30 - 0,40	15 - 30	12 - 14
	1/2	12,5	1,1 (0,045")	280	28 - 29	0,35	25 - 30	12 - 14
	3/4	19	1,6 (1/16")	300	32	0,25	30 - 35	14 - 16

CONTACT US!

www.strongweld.net www.strongweld.net www.strongweld.net

Scan this code for more info.

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