

FULL-LINE CATALOG

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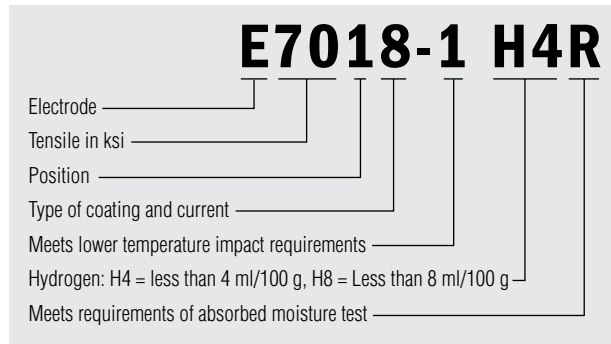
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# Stick Electrodes

## How AWS Classifies Mild Steel Covered Electrodes, SMAW Process



### Position

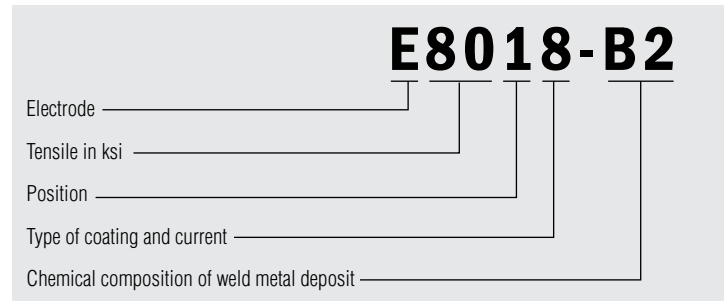
- 1 Flat, Horizontal, Vertical, Overhead
- 2 Flat and Horizontal only

### Types of Coating & Current

AWS	DIGIT	TYPE OF COATING	WELDING CURRENT
6010	0	cellulose sodium	DCEP
6011	1	cellulose potassium	AC or DCEP
6022	2	titania sodium	AC or DCEN
6013	3	titania potassium	AC or DCEP or DCEN
7014	4	iron powder titania	AC or DCEP or DCEN
7018	8	iron powder low hydrogen	AC or DCEP

DCEP-Direct Current Electrode Positive  
DCEN-Direct Current Electrode Negative  
AC-Alternating Current

## How AWS Classifies Low Alloy Covered Electrodes



### Chemical composition of weld metal deposit

AWS	Suffix	C	Mn	Si	Ni	Cr	Mo	V	P	S	Cu	Al	Nb	N	Cu
E7018	A1	0.12	0.90*	.80	—	—	.40-.65	—	.03	.03					
E8018	B2L	.05	.90	0.80	—	1.00-1.50	.40-.65	—	.03	.03					
E8018	B2	.05-.12	.90	0.80	—	1.00-1.50	.40-.65	—	.03	.03					
E9018	B3L	.05	.90	0.80*	—	2.00-2.50	.90-1.20	—	.03	.03					
E9018	B3	.05-.12	.90	0.80*	—	2.00-2.50	.90-1.20	—	.03	.03					
E8018	B6	.05-.10	1.0	.90	.40	4.0-6.0	.45-.65	—	.03	.03					
E8018	B8	.05-.10	1.0	.90	.40	8.0-10.5	.85-1.20	—	.03	.03					
E9015	B9	.08-.13	1.20	.30	8.0	8.0-10.5	.85-1.20	.15-.30	.01	.01	.25	.04	.02-.10	.02-.07	
E8018	C1	.12	1.25	0.80*	2.00-2.75	—	—	—	.03	.03					
E8018	C2	.12	1.25	0.80*	3.00-3.75	—	—	—	.03	.03					
E8018	C3	.12	.40-1.25	.80	.80-1.10	.15	.35	.05	.03	.03					
E10018	D2	.15	1.65-2.00	0.80*	.90	—	.25-.45	—	.03	.03					
EXXXX	G**	—	1.00 Min	.80 Min	.50 Min	.20 Min	.20 Min	.10 Min	.03	.03	.2				
E9018	M	.10	.60-1.25	.80	1.40-1.80	.15	.35	.05	.030	.030					
E10018M	M	.10	.60-1.25	.80	1.40-1.80	.15	.35	.05	.030	.030					
E11018M	M	.10	1.30-1.80	.60	1.25-2.50	.40	.25-.50	.05	.030	.030					
E12018	M	.10	1.30-2.25	.60	1.75-2.50	.30-1.50	.30-.55	.05	.030	.030					
E7010	P1	.20	1.20	.60	1.00	.30	.50	.10	.030	.030					
E8010	P1	.20	1.20	.60	1.00	.30	.50	.10	.030	.030					

\* Amount depends on electrode classification. Single values indicate maximum  
\*\* All G classifications have the same chemical minimum requirements

## Oven Storage and Reconditioning of Stick Electrodes

Welding electrodes may be damaged by atmospheric moisture. The following table recommends proper storage conditions, and time and temperature for reconditioning electrodes that have absorbed excess moisture.

**Notes for table:** Pallets and unopened cartons of electrodes should be stored away from exposure to water in the form of rain, snow, spray, or humidity. Only hermetically sealed cans are safe against these conditions. Damaged cartons permit entry of damp air which may be picked up by the product and lower its quality. Humidity below 50% should be avoided for 6010, 6011, 6012 and 6013 electrodes. At no time should these classes of electrodes be stored in an oven above 130°F.

The instruction, "Dry at Room Temperature" in the table signifies that the humidity should be below 70% and the temperature should be within the limits 40°F to 120°F.

Item Designation	Storage of Contents of Open Cartons*	Reconditioning*
Mild Steel – 6010, 6011	Dry at room temperature	Not recommended
Mild Steel – 6012, 6013, 6022, 7014, 7024	100°F – 130°F	250°F – 300°F, 1 hr.
Mild Steel Low Alloy – 7010, 8010, 9010	Dry at room temperature	Not recommended
Mild Steel, Low Alloy, Low Hydrogen – 7018, 8018, 9015, 9018, 10018, 11018, 12018	250°F – 300°F	500°F – 800°F, 1-2 hrs.
Stainless Steel Stick Electrodes DC Lime (AWS-15) Sterling® AP & AC/DC (AWS-16) Smootharc Plus (AWS-16) Sterling® (AWS-17)	225°F – 260°F	500°F – 600°F, 1 hr.
Hardalloy® Surfacing	225°F – 260°F	450°F – 600°F, 1 hr.
Special Maintenance GP	225°F – 260°F	500°F, 1 hr.
Cast Iron Electrodes	215°F – 230°F	250°F – 300°F, 1 hr.

\* Remove any packaging that may be damaged from oven storage or reconditioning.

## Pipemaster® Pro-60

### AWS E6010

This quick-starting, cellulosic electrode provides arc stability, penetration and wash-in. Ideal for welding in all positions, it produces a quality weld with light, easily removed slag. Features include enhanced weldability, increased physical properties and earth tone grey coating. Designed for these API 5L steels: Grade A, B, X-42, X-46, X-52, X-56 and for the root pass on material up to X-80.

#### Typical Applications:

- construction and shipbuilding
- general-purpose fabrication
- maintenance welding
- out-of-position X-ray welds
- pipe welding
- vertical and overhead plate welding

#### Typical Weld Metal Chemistry:

Carbon	.....0.13
Manganese	.....0.35
Silicon	.....0.10
Chromium	.....0.02
Nickel	.....0.02
Molybdenum	.....0.01
Vanadium	.....<0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	79,000 (542 MPa)
Yield Strength (psi)	66,000 (456 MPa)
Elongation % in 2" (50mm)	23%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	36 ft.lb. (49J)
-----------------------	-----------------

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm)	.....40-70 amps
1/8" (3.2 mm)	.....65-130 amps
5/32" (4.0 mm)	.....90-175 amps

Type of Current: DCEP

#### Approvals and Conformances:

- AWS A5.1, E6010
- ASME SFA 5.1, E6010
- Lloyd's Grade 3m
- En 499, E383C21
- ABS E6010

## Hobart® 610

### AWS E6010

A cellulose stick electrode quick starts and restarts with low spatter and arc stability. The bead wash, penetration and tie-in make it ideal for pipe welding applications or fabrication jobs. An all-positional capability and easy slag removal lead to excellent operator control.

#### Typical Applications:

- pipe welding
- construction and shipbuilding
- general purpose fabrication
- maintenance applications

#### Typical Weld Metal Chemistry:

Carbon	.....0.15
Manganese	.....0.52
Silicon	.....0.40
Phosphorus	.....0.007
Sulphur	.....0.015
Chromium	.....0.04
Nickel	.....0.06
Molybdenum	.....0.003

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000 (576 MPa)
Yield Strength (psi)	70,000 (479 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	37 ft.lb. (50J)
-----------------------	-----------------

#### Available diameter and recommended operating ranges:

1/8" (3.2 mm)	.....80-120 amps
5/32" (4.0 mm)	.....100-160 amps

Type of Current: DCEP

#### Approvals and Conformances:

- AWS A5.1, E6010
- CWB E4310

## Hobart® 335A

### AWS E6011

This cellulosic electrode with penetrating characteristics handles coated steels with a fine spray transfer. It is designed for use with AC power sources but can be used with DC currents as well. A stable arc and low spatter levels in all positions make it ideal for operators.

#### Typical Applications:

- galvanized steel work
- general-purpose fabrication
- railcar
- shipbuilding
- structural work

#### Typical Weld Metal Chemistry:

Carbon	.....0.12
Manganese	.....0.71
Silicon	.....0.29
Nickel	.....0.04
Chromium	.....0.06
Molybdenum	.....0.01
Vanadium	.....0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	82,000 (565 MPa)
Yield Strength (psi)	69,000 (478 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	38 ft.lb. (52J)
-----------------------	-----------------

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm)	.....60-90 amps
1/8" (3.2 mm)	.....80-125 amps
5/32" (4.0 mm)	.....130-160 amps
3/16" (4.8 mm)	.....160-190 amps

Type of Current: AC or DCEP

#### Approvals and Conformances:

- AWS A5.1, E6011
- ASME SFA 5.1
- Lloyd's 2m, 2Ym
- CWB-E4311
- ABS E6011

## Hobart® 447A

### AWS E6013

With fast-freeze characteristics, this soft arc E6013 electrode produces a stable arc with good weld bead appearance. It's ideal for sheet metal welding or applications with poor fit-up conditions and can be used with AC or DC power sources.

#### Typical Applications:

- general-purpose fabrication
- machine parts
- metal buildings and structures
- shaft buildup

#### Typical Weld Metal Chemistry:

Carbon .....	0.08
Manganese .....	0.39
Silicon .....	0.25
Nickel.....	0.04
Chromium .....	0.04
Molybdenum.....	0.01
Vanadium.....	0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	74,000 (514 MPa)
Yield Strength (psi)	67,000 (463 MPa)
Elongation % in 2" (50mm)	30%

#### Typical Charpy V-notch Impact Values:

Not required

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	40-80 amps
1/8" (3.2 mm) .....	70-120 amps
5/32" (4.0 mm) .....	130-160 amps
3/16" (4.8 mm) .....	140-220 amps

**Type of Current:** AC, DCEN or DCEP

#### Approvals and Conformances:

- AWS A5.1, E6013
- ASME SFA 5.1
- ABS E6013

## Hobart® Deckmaster™ 1139

### AWS E6022

Designed for welding roof decking to support beams, this E6022 electrode can weld through galvanized or painted roof decking and can be used on plated and dirty decking. It's excellent for rapid downhill welding when joining light-gauge materials or any application where burn-through spot welds with full penetration are required.

#### Typical Applications:

- rapid downhill welding
- roof decking
- sheet metal

#### Typical Weld Metal Chemistry:

Carbon .....	0.04
Manganese .....	1.17
Silicon.....	0.15
Phosphorus .....	0.013
Sulphur .....	0.013

#### Typical Mechanical Properties:

Transverse tensile strength exceeds	
63,000 psi	(435 MPa)

#### Typical Charpy V-notch Impact Values:

Not required

#### Available diameter and recommended operating ranges:

1/8" (3.2 mm) .....	110-150 amps
5/32" (4.0 mm) .....	150-180 amps

**Type of Current:** DCEN, DCEP or AC

#### Approvals and Conformances:

- AWS A5.1, E6022

## Hobart® 14A

### AWS E7014

This versatile, all-position electrode has a rutile base with an iron powder addition for higher deposition rates and travel speeds. Operated with AC, DCEP or DCEN power, it delivers a good weld bead appearance and easy slag removal.

#### Typical Applications:

- frames
- heavy sheet metal
- machine bases

#### Typical Weld Metal Chemistry:

Carbon .....	0.063
Manganese .....	0.42
Silicon.....	0.22
Phosphorus .....	0.013
Sulphur .....	0.014
Nickel.....	0.07
Chromium .....	0.06
Molybdenum.....	0.01
Vanadium.....	0.02

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	81,000 (561 MPa)
Yield Strength (psi)	73,000 (505 MPa)
Elongation % in 2" (50mm)	24%

#### Typical Charpy V-notch Impact Values:

Not required

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	70-90 amps
1/8" (3.2 mm) .....	120-145 amps
5/32" (4.0 mm) .....	140-210 amps
3/16" (4.8 mm) .....	180-280 amps

**Type of Current:** AC, DCEP or DCEN

#### Approvals and Conformances:

- AWS A5.1, E7014
- ASME SFA 5.1, E7014
- CWB E4914
- ABS E7014

## Hobart® 24

### AWS E7024, E7024-1

Ideal for fillet welds, this high-speed electrode is exceptionally fast when used down hand in properly designed weld joints or in horizontal fillet welds where equal leg fillets are desired. It's arc force minimizes slag entrapment and the slag is self-removing in most applications.

#### Typical Applications:

- earthmoving equipment
- mining machinery
- plate fabrication
- railcar
- structural
- shipbuilding
- mobile trailers

#### Typical Weld Metal Chemistry:

Carbon	0.06
Manganese	0.77
Silicon	0.37
Phosphorus	0.008
Sulphur	0.019
Nickel	0.07
Chromium	0.05
Molybdenum	0.01
Vanadium	0.03

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	79,000 (545 MPa)
Yield Strength (psi)	71,000 (487 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (AW) for E7024-1:

Avg. at 0°F (-20°C)	50 ft.lb. (68J)
---------------------	-----------------

#### Available diameter and recommended operating ranges:

1/8" (3.2 mm)	130-150 amps
5/32" (4.0 mm)	180-225 amps
3/16" (4.8 mm)	200-280 amps
7/32" (5.6 mm)	250-320 amps
1/4" (6.4 mm)	300-360 amps

**Type of Current:** DCEN, AC, or DCEP

#### Approvals and Conformances:

- AWS A5.1, E7024, E7024-1
- ASME SFA 5.1, E7024
- ABS 3
- CWB E4924-1
- ABS E7024-1

## Hobart® 418

### AWS E7018 H4R, E7018-1 H4R

This general purpose, low-hydrogen electrode is easy to use in all welding positions, with excellent arc stability, low spatter levels, and easy slag removal. Its ideal for prior to finish welding with Fabshield® self-shielded, tubular wire.

#### Typical Applications:

- field erections, steel structures
- jobs where low-hydrogen weld metal in the tensile strength range of 70,000 psi is required
- low alloy structurals
- low-, medium- and high-carbon steels
- offshore rigs, power plants

#### Typical Weld Metal Chemistry:

Carbon	0.04
Manganese	0.95
Silicon	0.54
Phosphorus	0.012
Sulphur	0.014
Nickel	0.07
Chromium	0.07
Molybdenum	0.03
Vanadium	< 0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	78,000 (541 MPa)
Yield Strength (psi)	64,000 (441 MPa)
Elongation % in 2" (50mm)	29%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -50°F (-46°C)	86 ft.lb. (116J)
-----------------------	------------------

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm)	80-100 amps
1/8" (3.2 mm)	90-150 amps
5/32" (4.0 mm)	110-230 amps
3/16" (4.8 mm)	150-300 amps
1/4" (6.4 mm)	270-380 amps

**Type of Current:** DCEP or AC

#### Approvals and Conformances:

- AWS A5.1, E7018 H4R, E7018-1 H4R
- ASME SFA 5.1, E7018
- ABS 3H5, 3Y
- Lloyd's BF3.3YH5
- CWB E4918-1 H4
- ABS E7018

## Hobart® 718MC

### AWS E7018 H4R, E7018(M)-1 H4R

With moisture resistance and out-of-position welding capabilities, this stick electrode provides improved deposition rates and bead appearance when welding in low-temperature environments where low-temperature impacts are important. It also meets the requirements of military specification Mil-E-22200/10, including moisture absorption limits of .10% max. as opened and .20% max. after 9 hrs. at 80°F and 80% relative humidity.

#### Typical Applications:

- barge offshore rigs, shipbuilding
- boiler code applications
- field erection, steel structures
- petrochemical plants, power plants
- railcar and locomotive construction
- welding of enameling steels; free machining steels; low alloy structurals; and low, medium or high carbon steels
- weldments in low-temperature environments where low-temperature impacts are important

#### Typical Weld Metal Chemistry:

Carbon	0.04
Manganese	0.92
Silicon	0.25
Phosphorus	0.011
Sulphur	0.016
Nickel	0.07
Chromium	0.06
Molybdenum	0.01
Vanadium	0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	80,000 (550 MPa)
Yield Strength (psi)	69,000 (478 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -50°F (-46°C)	106 ft.lb. (144J)
-----------------------	-------------------

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm)	70-110 amps
1/8" (3.2 mm)	90-165 amps
5/32" (4.0 mm)	125-220 amps
3/16" (4.8 mm)	160-300 amps
1/4" (6.4 mm)	270-380 amps

**Type of Current:** DCEP or AC

#### Approvals and Conformances:

- AWS A5.1, E7018 H4R, E7018 -1H4R
- ABS 3H5, 3Y
- ASME SFA 5.1, E7018
- MIL-E-22200/10

## Hobart® 7018XLM

### AWS E7018 H4R, E7018-1 H4R

The XLM (Extra Low Moisture) is a high deposition rate iron powder electrode designed for DC reverse polarity or AC operation in all positions. With a quiet arc, minimal spatter and good re-strike capabilities, it offers good slag removal and an easily controlled weld puddle for mild steel and joining mild steel to low alloy steels.

#### Typical Applications:

- field erections
- shipbuilding
- pipeline
- construction

#### Typical Weld Metal Chemistry

Carbon	.....0.05
Manganese	.....0.93
Silicon	.....0.38
Phosphorus	.....0.012
Sulphur	.....0.009
Nickel	.....0.04
Chromium	.....0.05
Molybdenum	.....0.01
Vanadium	.....<0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	77,000 (529MPa)
Yield Strength (psi)	64,000 (441MPa)
Elongation % in 2" (50mm)	32%

#### Typical Charpy V-Notch Impact Values (AW):

Avg. @ -50°F (-46C)	86 ft.lb. (117J)
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#### Available diameters and recommended operating ranges:

3/32" (2.4mm)	.....70-110 amps
1/8" (3.2mm)	.....90-160 amps
5/32" (4.0mm)	.....110-230 amps
3/16" (4.8mm)	.....190-300 amps
1/4" (6.4mm)	.....310-390 amps

**Type of Current:** DCEP or AC

#### Approvals or Conformances:

- AWS A5.1, E7018-1 H4R
- ASME SFA 5.1, E7018-1 H4R
- ABS E7018-1 H4R

## Hobart® 18AC

### AWS E7018 H8

Designed for AC power sources, this stick electrode will work well using small 208/230V on utility-type, single-phase welders. The excellent re-striking characteristics and a stable arc make it ideal for skip or tack welds.

#### Typical Applications:

- low-, medium-, and high-carbon steels
- skip or tack welds
- shops, farms, hobbyist
- some high-strength low alloy steels

#### Typical Weld Metal Chemistry:

Carbon	.....0.05
Manganese	.....0.77
Silicon	.....0.37
Chromium	.....0.07
Molybdenum	.....0.01
Nickel	.....0.07
Vanadium	.....0.02
Phosphorus	.....0.009
Sulphur	.....0.021

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	87,000 (597 MPa)
Yield Strength (psi)	75,000 (516 MPa)
Elongation % in 2" (50mm)	30%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	54 ft.lb. (74J)
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#### Available diameter and recommended operating ranges:

3/32" (2.4 mm)	.....70-110 amps
1/8" (3.2 mm)	.....90-165 amps
5/32" (4.0 mm)	.....125-220 amps

**Type of Current:** AC, DCEN or DCEP

#### Approvals and Conformances:

- AWS A5.1, E7018 H8
- ASME SFA 5.1, E7018



## Pipemaster® 70

### AWS E7010-P1

This cellulosic electrode produces quality welds, single- or multi-pass, on 5L, 5LX and X52 through X65 pipes. Its quick start has light slag and excellent wash-in. The arc stability and drive results in the best penetration positions, including vertical-down welding.

#### Typical Applications:

- welding of high-yield pipe steels
- pipeline welding using downhill travel
- shipbuilding
- storage tanks
- drill platforms

#### Typical Weld Metal Chemistry:

Carbon .....	0.15
Manganese .....	0.54
Silicon .....	0.13
Nickel .....	0.72
Molybdenum .....	0.01
Phosphorus .....	0.01
Sulphur .....	0.02
Chromium .....	0.02
Vanadium .....	0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	83,000 (570 MPa)
Yield Strength (psi)	69,000 (475 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	57 ft.lb. (78J)
Avg. at -40°F (-40°C)	43 ft.lb. (34J)

#### Available diameter and recommended operating ranges:

1/8" (3.2 mm) .....	70-140 amps
5/32" (4.0 mm) .....	80-190 amps
3/16" (4.8 mm) .....	120-230 amps

#### Type of Current: DCEP

#### Approvals and Conformances:

- AWS A5.5, E7010-P1
- ASME SFA 5.5, E7010-P1
- Lloyd's Grade 3m, 3Ym
- ABS E7010-P1

## Pipemaster® 80

### AWS E8010-P1

With good low-temperature impact properties, this all-position cellulosic electrode can be used on pipe steels with relatively high silicon (up to .30). Plus, it is ideal for the single- or multi-pass, vertical-down welding of X56-X70 pipes. Features include quick starting, arc stability, superior penetration, light slag and excellent wash-in.

#### Typical Applications:

- welding of high-yield pipe steels
- pipe welding using downhill travel
- shipbuilding
- storage tanks
- drill platforms

#### Typical Weld Metal Chemistry:

Carbon .....	0.19
Manganese .....	0.84
Silicon .....	0.25
Nickel .....	0.87
Molybdenum .....	0.14
Phosphorus .....	0.008
Sulphur .....	0.015
Chromium .....	0.07
Vanadium .....	0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	98,000 (672 MPa)
Yield Strength (psi)	81,000 (560 MPa)
Elongation % in 2" (50mm)	19%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	42 ft.lb. (57J)
Avg. at -50°F (-46°C)	25 ft.lb. (34J)

#### Available diameter and recommended operating ranges:

1/8" (3.2 mm) .....	70-140 amps
5/32" (4.0 mm) .....	80-190 amps
3/16" (4.8 mm) .....	130-240 amps

#### Type of Current: DCEP

#### Approvals and Conformances:

- AWS A5.5, E8010-P1
- ASME SFA 5.5, E8010-P1
- Lloyd's Grade 3m, 3Ym
- ABS E8010-P1

## Hoballoy® 7018A1

### AWS E7018-A1 H4R

With coating specially formulated to resist moisture pick-up of high heat and humidity, this stick electrode is ideal for welding the 0.50% Molybdenum steel and other low alloy steels. This resistance to moisture reabsorption helps prevent hydrogen cracking and aids in the elimination of starting porosity.

#### Typical Applications:

- construction and maintenance of boilers
- piping
- tubing

#### Typical Weld Metal Chemistry:

Carbon .....	0.03
Manganese .....	0.77
Silicon .....	0.42
Phosphorus .....	0.02
Sulphur .....	0.01
Molybdenum .....	0.52

#### Typical Mechanical Properties

##### (stress relieve 1 hour @ 1150°F):

Tensile Strength (psi)	85,000 (587 MPa)
Yield Strength (psi)	74,000 (507 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values

Not required

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps

#### Type of Current: DCEP or AC

#### Approvals and Conformances:

- AWS A5.5, E7018-A1 H4R
- ASME SFA 5.5, E7018-A1
- ABS E7018-A1

### Hoballoy® 8018B2

#### AWS E8018-B2 H4R

This stick electrode is ideal for higher strength steels with tensile strengths greater than 80,000 pounds. A specially formulated coating resists moisture pick-up under conditions of high heat and humidity which helps prevent hydrogen cracking and aids in the elimination of starting porosity.

#### Typical Applications:

- fabrication and maintenance of boilers and associated piping
- steels such as 1-1/4 Cr-1/2 Mo and 1/2 Cr-1/2 Mo

#### Typical Weld Metal Chemistry:

Carbon .....	0.08
Manganese .....	0.69
Silicon .....	0.66
Phosphorus .....	0.02
Sulphur .....	0.01
Chromium .....	1.34
Molybdenum.....	0.51

#### Typical Mechanical Properties

##### (stress relieve 1 hour @ 1275°F):

Tensile Strength (psi)	105,000 (723 MPa)
Yield Strength (psi)	92,000 (634 MPa)
Elongation % in 2" (50mm)	21%

#### Typical Charpy V-notch Impact Values

Not required

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps

Type of Current: DCEP or AC

#### Approvals and Conformances:

- AWS A5.5, E8018-B2 H4R
- ASME SFA 5.5, E8018-B2
- ABS E8018-B2

### Hoballoy® 8018C1

#### AWS E8018-C1 H4

When toughness of the weld metal is important, this stick electrode provides good puddle control, excellent wetting action and tie-in and offers good arc characteristics as well as notch toughness (65 foot-pounds at -75°Fahrenheit) and easy slag removal. It is designed for applications of two percent nickel deposits and the welding of nickel-bearing steels for low-temperature applications.

#### Typical Applications:

- shipbuilding
- piping
- gas storage tanks

#### Typical Weld Metal Chemistry:

Carbon .....	0.04
Manganese .....	1.04
Silicon .....	0.44
Phosphorus .....	0.01
Sulphur .....	0.02
Nickel.....	2.44

#### Typical Mechanical Properties

##### (stress relieve 1 hour @ 1125°F):

Tensile Strength (psi)	93,000 (643 MPa)
Yield Strength (psi)	79,000 (543 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (SR):

Avg. at -75°F (-59°C) 59 ft.lb. (80J)

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps

Type of Current: DCEP or AC

#### Approvals and Conformances:

- AWS A5.5, E8018-C1 H4
- ASME SFA 5.5, E8018-C1 H4
- ABS E8018-C1

### Hoballoy® 8018C3

#### AWS E8018-C3 H4

This stick electrode provides notch toughness (20 foot-pounds at 40° Fahrenheit) and puddle control with wetting action and tie in. With coating specifically formulated to resist conditions of high heat and humidity, it's ideal for 80,000 psi tensile strength applications and also one percent nickel applications.

#### Typical Applications:

- commercial using 80,000 tensile steels
- military using 80,000 tensile steels
- welding of AR and T-1 steels

#### Typical Weld Metal Chemistry:

Carbon .....	0.04
Manganese .....	0.98
Silicon .....	0.26
Phosphorus .....	0.01
Sulphur .....	0.01
Nickel.....	0.89
Chromium .....	0.07
Molybdenum.....	0.09
Vanadium.....	0.01

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000 (576 MPa)
Yield Strength (psi)	73,000 (503 MPa)
Elongation % in 2" (50mm)	30%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C) 98 ft.lb. (133J)

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps

Type of Current: DCEP or AC

#### Approvals and Conformances:

- AWS A5.5, E8018-C3 H4
- ASME SFA 5.5, E8018-C3 H4
- MIL-E-22200/1 (1/8, 5/32)
- ABS E8018-C3

**Hoballoy® 9018B3****AWS E9018-B3 H4R**

With coating specially formulated to resist moisture pick-up under conditions of high heat and humidity, this stick electrode is designed for welding higher strength steel applications including piping, castings and forgings. It resists moisture reabsorption which helps prevent hydrogen cracking and aids in the elimination of starting porosity.

**Typical Applications:**

- chrome-moly pipes
- castings
- forgings
- boiler work

**Typical Weld Metal Chemistry:**

Carbon .....	0.08
Manganese .....	0.68
Silicon .....	0.55
Phosphorus .....	0.02
Sulphur .....	0.01
Chromium .....	2.39
Molybdenum.....	1.05

**Typical Mechanical Properties****(stress relieve 1 hour @ 1275°F):**

Tensile Strength (psi)	109,000 (750 MPa)
Yield Strength (psi)	93,000 (640 MPa)
Elongation % in 2" (50mm)	22%

**Typical Charpy V-notch Impact Values**

Not required

**Available diameter and recommended operating ranges:**

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps

**Type of Current:** DCEP or AC

**Approvals and Conformances:**

- AWS A5.5, E9018-B3 H4R
- ASME SFA 5.5, E9018-B3 H4R
- ABS E9018-B3

**Hoballoy® 9018M****AWS E9018-M H4R**

Ideal for welding higher strength steels with tensile strength in excess of 90,000 psi, this stick electrode has a specially formulated coating that reduces moisture pick-up to help minimize hydrogen cracking and starting porosity.

**Typical Applications:**

- joining HY-90 steel
- joining HY-80 steel
- joining T-1 steel
- joining other high-tensile steels

**Typical Weld Metal Chemistry:**

Carbon .....	0.06
Manganese .....	0.92
Silicon .....	0.16
Phosphorus .....	0.014
Sulphur .....	0.016
Nickel.....	1.63
Chromium .....	0.08
Molybdenum.....	0.26
Vanadium.....	0.01

**Typical Mechanical Properties (AW):**

Tensile Strength (psi)	97,000 (672 MPa)
Yield Strength (psi)	84,000 (583 MPa)
Elongation % in 2" (50mm)	26%

**Typical Charpy V-notch Impact Values (AW):**

Avg. at -60°F (-51°C)	60 ft.lb. (81J)
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**Available diameter and recommended operating ranges:**

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps

**Type of Current:** DCEP or AC

**Approvals and Conformances:**

- AWS A5.5, E9018-M H4R
- ASME SFA 5.5, E9018-M H4R
- ABS E9018-M
- DNV 5 YH5

**Hoballoy® 10018D2****AWS E10018-D2 H4R**

With good arc characteristics, ductility, crack-resistance, easy slag removal, and low spatter and smoke, this stick electrode is designed for the welding of high tensile steels and manganese-molybdenum steels requiring tensile strengths of at least 100,000 psi. The coating is specially formulated to resist moisture pick-up under conditions of high heat and humidity.

**Typical Applications:**

- manganese-moly castings
- alloy forgings
- structurals
- pressure vessel applications in either the as welded or stress-relieved condition

**Typical Weld Metal Chemistry:**

Carbon .....	0.05
Manganese .....	1.96
Silicon .....	0.19
Phosphorus .....	0.02
Sulphur .....	0.01
Molybdenum.....	0.40
Nickel.....	0.47

**Typical Mechanical Properties****(stress relieve 1 hour @ 1150°F):**

Tensile Strength (psi)	109,000 (772 MPa)
Yield Strength (psi)	96,000 (661 MPa)
Elongation % in 2" (50mm)	23%

**Typical Charpy V-notch Impact Values (SR):**

Avg. at -60°F (-51°C)	40 ft.lb. (54J)
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**Available diameter and recommended operating ranges:**

3/32" (2.4 mm) .....	70-110 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps

**Type of Current:** DCEP or AC

**Approvals and Conformances:**

- AWS A5.5, E10018-D2 H4R
- ASME SFA 5.5, E10018-D2 H4R

### Hoballoy® 11018M

#### AWS E11018-M H4R

Designed for use in military applications which requires weld joints with 100,000 psi minimum tensile strength, this stick electrode provides excellent puddle control with good wetting action and tie in. It offers good ductility, good crack resistance and high notch toughness even at temperatures as low as -60° Fahrenheit.

#### Typical Applications:

- low-alloy steels including HY-80, HY-90 and T-1

#### Typical Weld Metal Chemistry:

Carbon .....	0.04
Manganese .....	1.57
Silicon .....	0.34
Nickel .....	1.99
Phosphorus .....	0.015
Sulphur .....	0.010
Molybdenum.....	0.29
Chromium .....	0.19
Vanadium.....	0.010

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	116,000 (799 MPa)
Yield Strength (psi)	107,000 (736 MPa)
Elongation % in 2" (50mm)	22%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-51°C)	56 ft.lb. (76J)
-----------------------	-----------------

#### Available diameter and recommended operating ranges:

3/32" (2.4 mm) .....	75-115 amps
1/8" (3.2 mm) .....	90-160 amps
5/32" (4.0 mm) .....	130-220 amps
3/16" (4.8 mm) .....	200-300 amps
1/4" (6.4 mm) .....	300-400 amps

**Type of Current:** DCEP or AC

#### Approvals and Conformances:

- AWS A5.5, E11018-M H4R
- ASME SFA 5.5, E11018-M
- ABS E11018M
- MIL-E-222001, (1/8)
- DNV 5Y69

## Pieces Per Pound Arc Welding Electrodes

Hobart® Type	Diameter: Length:	3/32" 10"	3/32" 14"	1/8" 14"	5/32" 14"	3/16" 14"	7/32" 18"	1/4" 18"
<b>Pipemaster® 70, 80 Pipemaster® Pro-60, 610</b>		—	30	17	12	8	—	—
<b>335A</b>		—	29	16	11	7	—	—
<b>447A</b>		—	30	15	10	7	—	—
<b>14A</b>		—	23	13	9	6	—	—
<b>24 (-1)</b>		—	—	10	7	—	4	2
<b>XX18 (Iron Powder)</b>		—	21	12	9	7	—	3

## Comparative Index of Mild Steel & Low Hydrogen Electrodes

AWS Class	HOBART®	MUREX	ESAB	LINCOLN
E6010	610 Pipemaster® Pro-60	—	SW-10P; SW-10P Plus	Fleetweld 5P, 5P+; Pipeliner 6P+
E6011	335A	6011C	SW-14	Fleetweld 35; 35LS; 180
E6013	447A	6013D	SW-15; 6013LV	Fleetweld 37
E6022	1139	—	—	Fleetweld 22
E7014	14A	7014	SW-15 IP	Fleetweld 47
E7018 (AC)	18AC	—	Atom Arc 7018-AC	Lincoln 7018AC
E7018	7018XLM 418; 718MC	7018MR	Atom Arc 7018	Excalibur 7018MR; Jetweld LH-70; Jet-LH-78 MR
E7018-1	7018XLM 418; 718MC	—	Atom Arc 7018-1	Excalibur 7018-1 MR
E7024	24	7024	Sureweld 7024	Jetweld 1
E7024-1	24	—	Sureweld 7024	Jetweld 1
E7010-P1	Pipemaster® 70	—	Sureweld 710p	Shield-Arc HYP+
E8010-P1	Pipemaster® 80	—	SW-810P	Pipeliner 8P+ Shield-Arc 80

# Stick Electrodes

## Comparative Index of Low Alloy Electrodes

AWS Class	HOBART®	ESAB	LINCOLN
E7018-A1	<b>Hoballoy® 7018A1</b>	Atom Arc 7018-Mo	Excalibur 7018-A1 MR
E8018-B2	<b>Hoballoy® 8018-B2</b>	Atom Arc 8018-CM	Excalibur 8018-B2 MR
E8018-C1	<b>Hoballoy® 8018C1</b>	Atom Arc 8018-C1	Excalibur 8018-C1 MR
E8018-C3	<b>Hoballoy® 8018C3</b>	Atom Arc 8018	Excalibur 8018-C3 MR
E9018-B3	<b>Hoballoy® 9018B3</b>	Atom Arc 9018-CM	Excalibur 9018-B3 MR
E9018M	<b>Hoballoy® 9018M</b>	Atom Arc 9018	Excalibur 9018M MR
E10018-D2	<b>Hoballoy® 10018D2</b>	Atom Arc 10018-MM	Excalibur 10018-D2 MR
E11018M	<b>Hoballoy® 11018M</b>	Atom Arc T	Excalibur 11018M MR

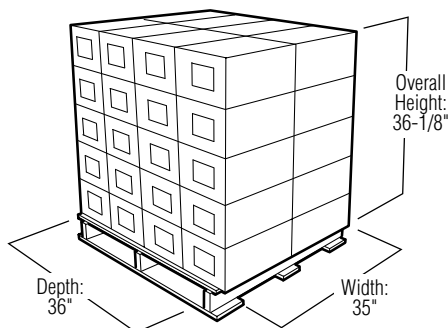
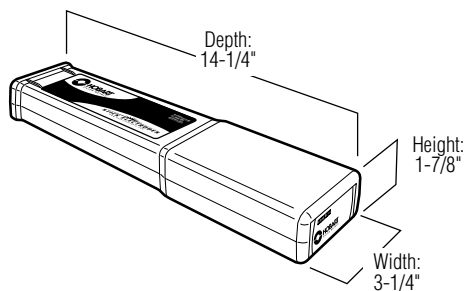
## Approvals, Specifications, Classifications

All filler metals listed conform to the specifications listed in each section. Because some agencies do not specifically approve particular types, please be careful to note whether or not the heading for each section indicates specific approval.

Product	AWS/ASME	ABS	Lloyd's	CWB
<b>PIPEMASTER® PRO 60</b>	E6010	E6010	3m	-
<b>610</b>	E6010	-	-	E4310
<b>HOBART® 335A</b>	E6011	E6011	2m, 2Ym	E4311
<b>HOBART® 447A</b>	E6013	E6013	-	E4313
<b>HOBART® 1139</b>	E6022	-	-	-
<b>HOBART® 14A</b>	E7014	E7014	-	E4914
<b>HOBART® 418</b>	E7018 H4R/E7018-1 H4R	3 H5, 3Y	3m, 3Ym	E4918-1-H4
<b>HOBART® 718MC</b>	E7018 H4R/E7018-1 H4R	3 H5, 3Y	-	-
<b>7018XLM</b>	E7018 H4R/E7018-1 H4R	E7018-1	-	-
<b>HOBART® 18AC</b>	E7018 H8	-	-	-
<b>HOBART® 24</b>	E7024/E7024-1	3	-	E4924-1
<b>PIPEMASTER® 70</b>	E7010-P1	E7010-P1	3m, 3Ym	-
<b>PIPEMASTER® 80</b>	E8010-P1	E8010-P1	3m, 3Ym	-
<b>HOBALLOY® 7018A1</b>	E7018-A1	E7018-A1	-	-
<b>HOBALLOY® 8018B2</b>	E8018-B2	E8018-B2	-	-
<b>HOBALLOY® 8018C1</b>	E8018-C1	E8018-C1	-	-
<b>HOBALLOY® 8018C3</b>	E8018-C3	E8018-C3	-	-
<b>HOBALLOY® 9018B3</b>	E9018-B3	E9018-B3	-	-
<b>HOBALLOY® 9018M</b>	E9018-M	E9018-M	-	-
<b>HOBALLOY® 10018D2</b>	E10018-D2	E10018-D2	-	-
<b>HOBALLOY® 11018M</b>	E11018-M	E11018-M	-	-

## 5-lb. Plastic-Pak

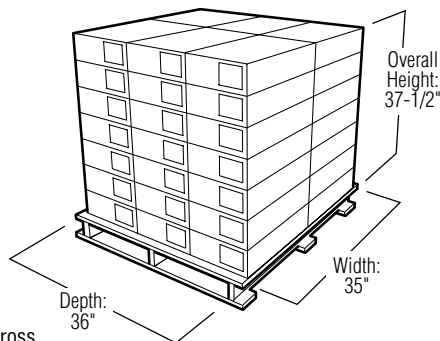
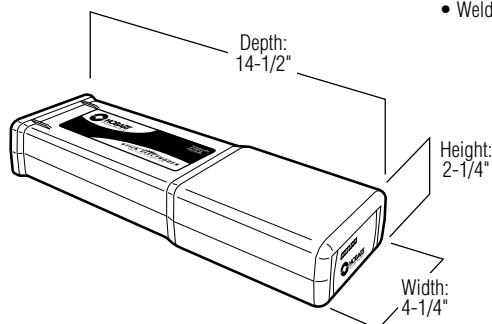
- Color-coded labels for easy product identification
- Packaging designed for display in showroom
- Resealable Plastic-Pak protects and preserves product before and after use
- Welding parameters on label



Weight: 2,000 lbs. net, 2,235 lbs. gross  
Stacking sequence: 4 wide, 2 deep and 5 high  
Master pack per pallet: 40  
10 packs per 50 lb master pack

## 10-lb. Plastic-Pak

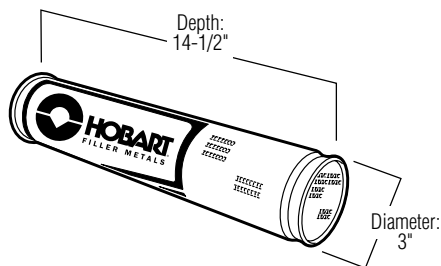
- Color-coded for easy product identification
- Packing designed for display in showroom
- Resealable Plastic-Pak protects and preserves product before and after use
- Welding parameters on label



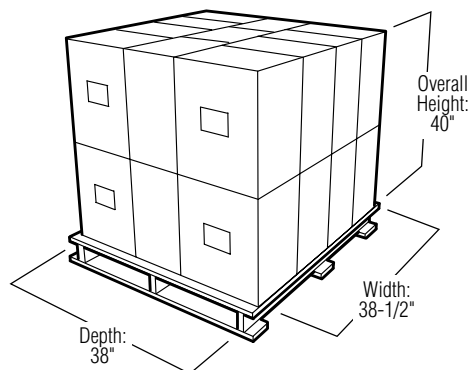
Weight: 2,100 lbs. net, 2,235 lbs. gross  
Stacking sequence: 3 wide, 2 deep and 7 high  
Master pack per pallet: 42  
5 packs per 50 lb master pack

## 10-lb. Can

- Hermetically-sealed cans keep electrodes protected and ready to use when opened
- Easy open pull-tab with plastic lid to protect product after opening



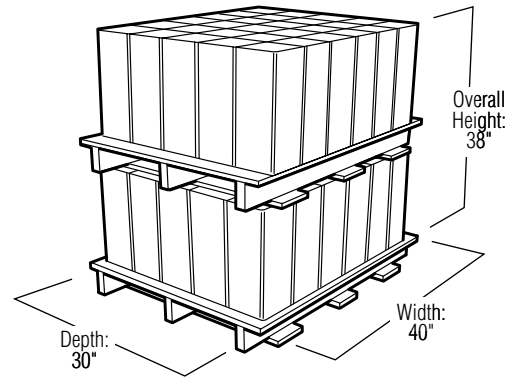
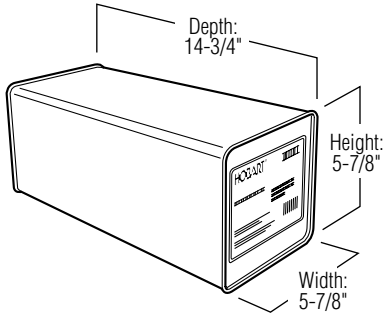
Weight: 1,260 lbs. net, 1,330 lbs. gross  
7 layers, 6 per layer  
Master pack per pallet: 42  
3 cans per 30 lb master pack



# Stick Electrodes

## 50-lb. Can 14" length

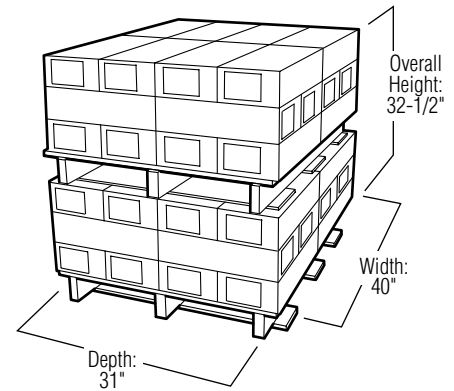
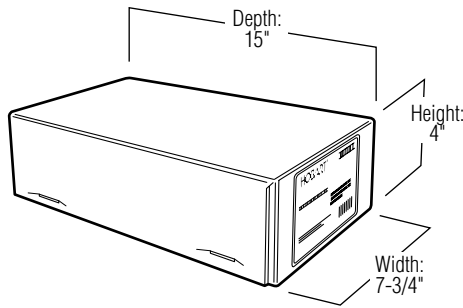
- Hermetically-sealed cans keep electrodes protected and ready for use when opened
- Pull-tab for safe, trouble-free opening
- Two separate pallets for convenient handling



Weight: 3,000 lbs net, 3,150 gross  
Stacking sequence: 5 wide, 6 deep & 2 high  
Cans per pallet: 60 cans

## 50-lb. Carton

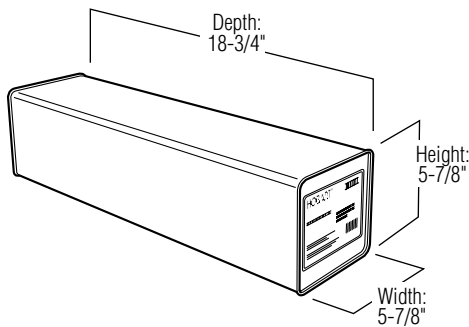
- Two separate pallets for convenient handling



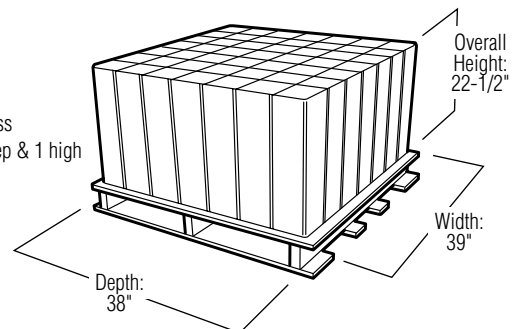
Weight: 3,000 lbs net, 3,090 gross  
Stacking sequence: 4 wide, 4 deep & 2 high  
Cartons per pallet: 48 cartons

## 50-lb. Can 18" length

- Hermetically-sealed cans keep electrodes protected and ready for use when opened
- Pull-tab for safe, trouble-free opening
- Two separate pallets for convenient handling



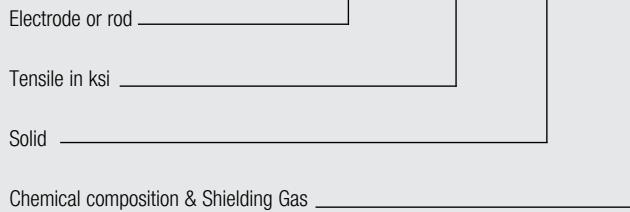
Weight: 2,450 lbs net, 2,540 gross  
Stacking sequence: 7 wide, 7 deep & 1 high  
Cans per pallet: 49 cans





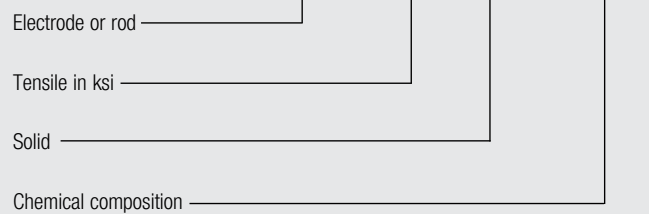
## How AWS Classifies Mild Steel Solid Electrodes, GMAW, GTAW and PAW (AWS A5.18)

### ER70S-3



## How AWS Classifies Low Alloy Solid Electrodes, GMAW, GTAW and PAW (AWS A5.28)

### ER80S-D2



### Chemical Composition of Solid Wires Using CO<sub>2</sub> Shielding Gas

AWS classification	Shielding gas	Tensile Strength ksi (MPa)	Yield Strength ksi (MPa)	% Elongation min. in 2" (50 mm)	Impact strength Min. ft.lb. at °F (J at °C)	CHEMICAL COMPOSITION									
						C	Mn	Si	P	S	Ni	Cr	Mo	Cu	Other
ER70S-2	CO <sub>2</sub>	70 (480)	58 (400)	22	20 at -20 (27 at -29)	.07	.90-1.40	.40-.70	.025	.035	—	—	—	.50	Ti, Zr, Al
ER70S-3	CO <sub>2</sub>	70 (480)	58 (400)	22	20 at 0 (27 at -18)	.06-.15	.90-1.40	.45-.70	.025	.035	—	—	—	.50	—
ER70S-4	CO <sub>2</sub>	70 (480)	58 (400)	22	—	.07-.15	1.00-1.50	.65-.85	.025	.035	—	—	—	.50	—
ER70S-5	CO <sub>2</sub>	70 (480)	58 (400)	22	—	.07-.19	.90-1.40	.30-.60	.025	.035	—	—	—	.50	Al
ER70S-6	CO <sub>2</sub>	70 (480)	58 (400)	22	20 at -20 (27 at -29)	.07-.15	1.40-1.85	.80-1.15	.025	.035	—	—	—	.50	—
ER70S-7	CO <sub>2</sub>	70 (480)	58 (400)	22	20 at -20 (27 at -29)	.07-.15	1.50-2.00	.50-.80	.025	.035	—	—	—	.50	—
ER80S-D2	CO <sub>2</sub>	80 (550)	68 (470)	17	20 at -20 (27 at -29)	.07-.12	1.60-2.10	.50-.80	.025	.025	.15	—	.40-.60	.50	—

### GMAW Shielding Gases

Type	Metal	Shielding Gas/Advantage
Spray Transfer	Carbon steel	<b>95-98% Ar/2-5% O<sub>2</sub></b> — Improves arc stability; produces a more fluid and controllable puddle; good coalescence and bead contour; minimizes undercutting; permits higher speeds than pure argon. <b>90-92% Ar/8-10% CO<sub>2</sub></b> — High-speed mechanized welding; low-cost manual welding; pulsed welding.
	Low alloy steel	<b>98% Ar/2% O<sub>2</sub></b> — Minimizes undercutting; provides good toughness.
Short Circuiting Transfer	Carbon steel	<b>CO<sub>2</sub></b> — Broad penetration; reduces chances of porosity. <b>75% Ar/25% CO<sub>2</sub></b> — High welding speeds without burn-through; minimum distortion and spatter. <b>Ar/5-10% CO<sub>2</sub></b> — Deeper penetration; faster welding speeds.
	Low alloy steel	<b>60-70% He/25-35% Ar/4-5% CO<sub>2</sub></b> — Minimum reactivity; excellent toughness; excellent arc stability, wetting characteristics, and bead contour; little spatter. <b>75% Ar/25% CO<sub>2</sub></b> — Fair toughness; excellent arc stability, wetting characteristics and bead contour; little spatter.

## Quantum Arc™ 3

### AWS ER70S-3

With a precision mix of silicon and manganese, this deoxidized wire makes short-circuiting and spray-transfer applications go smoothly. Versatile enough for general fabrication and Carbon or Argon rich shielding gases, this wire meets AWS EM13K requirements for sub-arc in the 1/16" diameter only.

#### Typical Applications:

- automotive
- general fabrication
- farm equipment
- ornamental iron fabrication
- railcars
- sheet metal
- storage bins

#### Typical wire chemistry (as manufactured):

Carbon	.....0.08
Manganese	.....1.19
Silicon	.....0.46
Phosphorus	.....0.15
Sulphur	.....0.10
Copper	.....0.20

#### Typical Mechanical Properties (AW):

	CO <sub>2</sub>
Tensile Strength (psi)	77,000 (531 MPa)
Yield Strength (psi)	63,000 (436 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C), CO<sub>2</sub> 83 ft.lb. (113J)

#### Approvals and Conformances:

- AWS A5.18, ER70S-3
- ASME SFA 5.18, ER70S-3
- CWB ER49S-3
- AWS A5.17, EM 13K (1/16" diameter only)

## Quantum Arc™ 6

### AWS ER70S-6

With higher deoxidizers, this wire is ideal for applications that may have light rust or mill scale. It's formulated to ensure sound, porosity-free welds over a wide range of general shop fabrications.

#### Typical Applications:

- construction
- farm equipment
- general shop work
- steel castings or forging salvage
- shaft buildup
- tanks
- automotive

#### Typical wire chemistry (as manufactured):

Carbon	.....0.10
Manganese	.....1.43
Silicon	.....0.83
Phosphorus	.....0.007
Sulphur	.....0.005
Copper	.....0.20

#### Typical Mechanical Properties (AW):

	CO <sub>2</sub>
Tensile Strength (psi)	88,000 (607 MPa)
Yield Strength (psi)	75,000 (507 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C), CO<sub>2</sub> 50 ft.lb. (67J)

#### Approvals and Conformances:

- AWS A5.18, ER70S-6
- ASME SFA A5.18, ER70S-6
- CWB ER49S-6

## HB-28

### AWS ER70S-6

This copper-coated, mild steel solid welding wire with a high deoxidizer content provides excellent welding performance with Carbon and Argon rich shielding gases. It produces an exceptionally smooth and stable arc with minimal spatter and offers good wetting characteristics that allow for a uniform tie-in.

#### Typical Applications:

- construction work
- farm equipment
- general shop applications with poor fit-up or rusty, oily plates
- steel castings or forging salvage
- tanks
- home projects
- sheet metal

#### Typical wire chemistry (as manufactured):

Carbon	.....0.08
Manganese	.....1.52
Silicon	.....0.80
Phosphorus	.....0.009
Sulphur	.....0.012

#### Typical Mechanical Properties (AW):

	CO <sub>2</sub>
Tensile Strength (psi)	85,000 (587 MPa)
Yield Strength (psi)	70,000 (483 MPa)
Elongation % in 2" (50mm)	29%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C), CO<sub>2</sub> 44 ft.lb. (60J)

#### Approvals and Conformances:

- AWS A5.18, ER70S-6
- ASME SFA 5.18, ER70S-6

## Quantum Arc™ D2

### AWS ER80S-D2, ER90S-G

This high-strength, copper-coated, mild steel solid wire provides X-ray quality welds when used on carbon and low alloy steels. It produces a high-quality weld that is virtually porosity and slag-free.

#### Typical Applications:

- alloy applications
- construction equipment
- high-strength welds
- X-ray quality applications

#### Typical wire chemistry (as manufactured):

Carbon .....	0.10
Manganese .....	1.72
Silicon .....	0.63
Phosphorus .....	0.008
Sulphur .....	0.016
Molybdenum.....	0.49

#### Typical Mechanical Properties (AW):

	CO <sub>2</sub>
Tensile Strength (psi)	94,000 (652 MPa)
Yield Strength (psi)	80,000 (552 MPa)
Elongation % in 2" (50mm)	20%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C), CO<sub>2</sub> 34 ft.lb. (46J)

#### Approvals and Conformances:

- AWS A5.28, ER80S-D2, ER90S-G
- ASME SFA 5.28, ER80S-D2, ER90S-G
- CWB

# Solid Steel Wires

## Comparative Index Of Solid Wires

AWS CLASS	HOBART®	LINCOLN	ESAB	NATIONAL STANDARD
ER70S-6	HB-28; QUANTUM ARC™ 6	SuperArc L-56; SuperGlide S6	Spoolarc 86; ESAB MIG-6	NS-115
ER80S-D2	QUANTUM ARC™ D2	SuperArc LA-90	Spoolarc 83	NS-102
ER70S-3	QUANTUM ARC™ 3	SuperArc L-50	Spoolarc 82	NS-101

## Packaging of Hobart® Solid Welding Wires

Package	Pallet Net Weight lb. (kg)	Flange diameter inches	Hub diameter inches	Width inches	Arbor hole inches	Engaging hole inches	Eng. hole off center inches	Available in the following Brands:
2 lb. spool	20* (18.2)	4"	1-1/2"	1-3/4"	5/8"	n/a	n/a	HB
10 lb. plastic spool	1,920 (871.7)	8"	3-7/8"	2-1/8"	2-1/16"	7/16"	1-3/4"	HB
33 lb. Steel Reel	2,376 (1,078.7)	11-3/4"	6-7/8"	4"	2-1/16"	n/a	n/a	QA
45 lb. Steel Reel	3,240 (1,471)	11-3/4"	6-7/8"	4"	2-1/16"	n/a	n/a	QA
33 lb. plastic spool	2,376 (1078.7)	11-3/4"	8"	4"	2-1/16"	7/16"	1-3/4"	HB
45 lb. plastic spool	3,240 (1471)	11-3/4"	6-1/2"	4"	2-1/16"	7/16"	1-3/4"	HB
45 lb. fiber spool	3,240 (1471)	11-3/4"	6-1/2"	4"	2-1/16"	7/16"	1-3/4"	
60 lb. fiber spool	1,920 (871.7)	14"	8-1/4"	4"	2-1/16"	7/16"	1-3/4"	QA
600 lb. ROBOPAK	2,400 (1,089.6)	Height - 32-1/4", Diameter - 20-3/8", Core diameter - 11-1/2"						QA
300 lb. Recyclable ROBOPAK	2,400 (1,089.6)	Height - 21", Diameter - 23"						QA
600 lb. Recyclable ROBOPAK	2,400 (1089.6)	Height - 35-1/2", Diameter - 23"						QA
950 lb. Recyclable ROBOPAK	1,900 (862.6)	Height - 35-1/2", Diameter - 23"						QA

\*Carton weight.

## Short Circuit Transfer Welding Parameters

Size	Material thickness <sup>1</sup>		Electrode diameter		Welding current amps-DC	Arc voltage (electrode positive)	Wire feed speed ipm	Travel speed ipm	Shielding gas flow CFH <sup>2</sup>
	in. (decimal)	mm	in.	mm					
24 ga.	0.025	0.6	0.024	0.6	30-50	13-15	130-160	10-20	15-20
24 ga.	0.025	0.6	0.030	0.8	30-50	15-17	85-100	12-20	15-20
22 ga.	0.031	0.8	0.030	0.8	40-60	15-17	90-130	18-22	15-20
20 ga.	0.037	0.9	0.035	0.9	55-85	15-17	70-120	35-40	15-20
18 ga.	0.050	1.3	0.035	0.9	70-100	16-19	100-160	35-40	15-20
1/16"	0.063	1.6	0.035	0.9	80-110	17-20	120-180	30-35	20-25
5/64"	0.078	2.0	0.035	0.9	100-130	18-20	160-220	25-30	20-25
1/8"	0.125	3.2	0.035	0.9	120-160	19-22	210-290	20-25	20-25
1/8"	0.125	3.2	0.045	1.1	180-200	20-24	210-240	27-32	20-25
3/16"	0.187	4.7	0.035	0.9	140-160	19-22	210-290	14-19	20-25
3/16"	0.187	4.7	0.045	1.1	180-205	20-24	210-245	18-22	20-25
1/4"	0.250	6.4	0.035	0.9	140-160	19-22	240-290	11-15	20-25
1/4"	0.250	6.4	0.045	1.1	180-225	20-24	210-290	12-18	20-25

Note: Single-pass flat and horizontal fillet positions. Reduce current 10 to 15% for vertical and overhead welding.  
 1 For fillet and groove welds – for fillet welds, size equals metal thickness; for square groove welds, the root opening should equal 1/2 the metal thickness.  
 2 Shielding Gas is CO<sub>2</sub>, or 75% Ar/25% CO<sub>2</sub>.

## Spray Transfer Welding Parameters

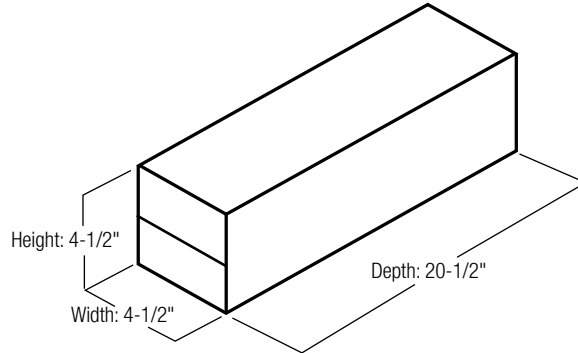
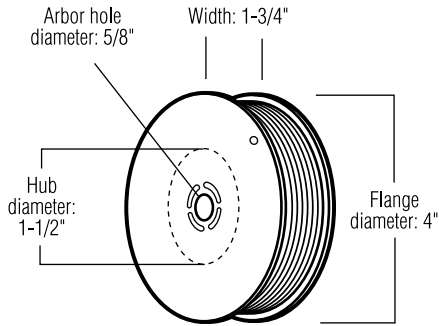
Size	Material thickness		Type of weld <sup>1</sup>	Electrode diameter		Welding current amps-DC	Arc voltage (electrode positive)	Wire feed speed ipm	Travel speed ipm	92% Ar/8% CO <sub>2</sub> gas flow CFH
	in. (decimal)	mm		in.	mm					
18 ga.	0.050	1.3	fillet	0.045	1.1	280	26	350	190	25
			square groove	0.045	1.1	270	25	340	180	25
16 ga.	0.063	1.6	fillet	0.045	1.1	325	26	360	150	35
			square groove	0.045	1.1	300	28	350	140	35
14 ga.	0.078	2.0	fillet	0.045	1.1	325	27	360	130	35
			square groove	0.045	1.1	325	29	360	110	35
			square groove	0.045	1.1	330	29	350	105	35
11 ga.	0.125	3.2	fillet	1/16	1.6	380	28	210	85	35
			square groove	0.045	1.1	350	29	380	100	35
3/16"	0.188	4.8	fillet	1/16	1.6	425	31	260	75	35
			square groove	1/16	1.6	425	30	320	76	35
			square groove	1/16	1.6	375	31	260	70	35
1/4"	0.250	6.4	square groove	1/16	1.6	475	32	340	55	35

1 For mild carbon and low alloy steels – on square groove welds, backing is required.

# Solid Steel Wires

## 2-lb. Plastic Spool

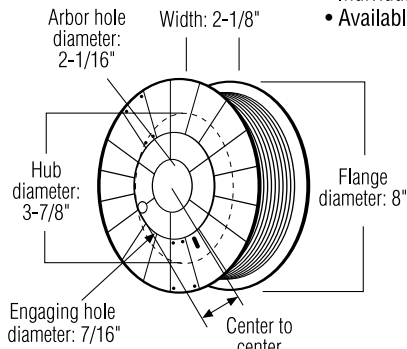
- Color-coded labels for easy wire identification
- Clear, plastic clamshell allows easy viewing of wire product
- Available in:  HB



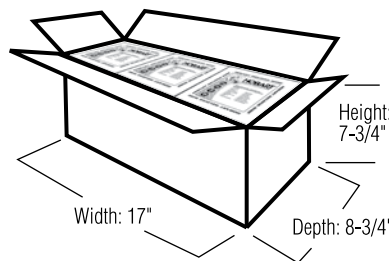
Weight: 20 lbs.  
Spools per master carton: 10

## 10-lb. Plastic Spool

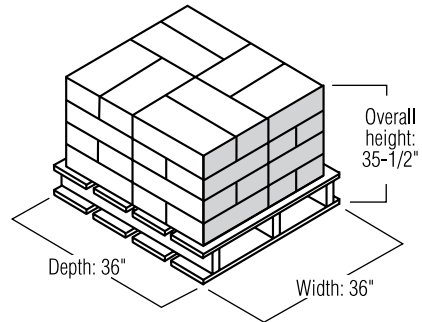
- Color-coded labels for easy wire identification
- Colorful packaging—great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection
- Available in:  HB



Spool weight (empty):  
0.8 lbs.



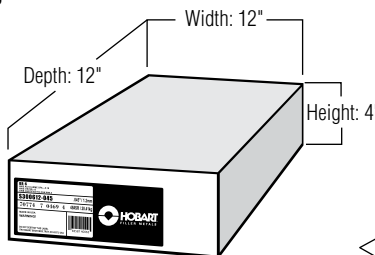
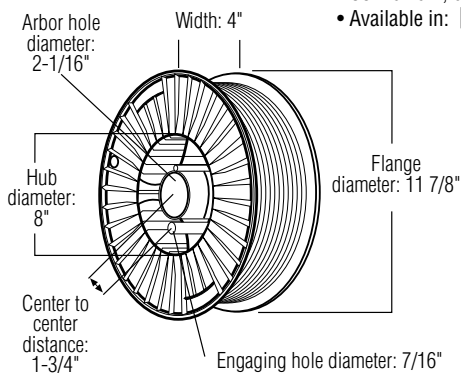
Weight: 60 lbs.  
Spools per master carton: 10



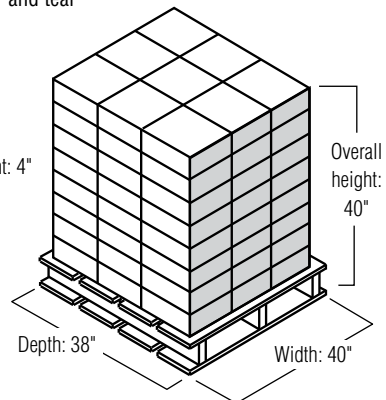
Weight: 1,920 lbs.  
Stacking sequence: 4 wide, 4 deep and 4 high  
Master cartons per pallet: 32  
Spools per pallet: 192

## 33-lb. Plastic Spool

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over
- Available in:  HB

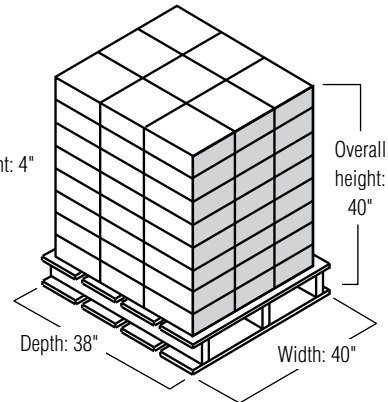
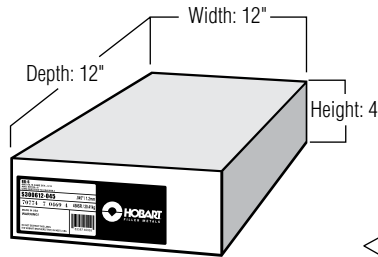
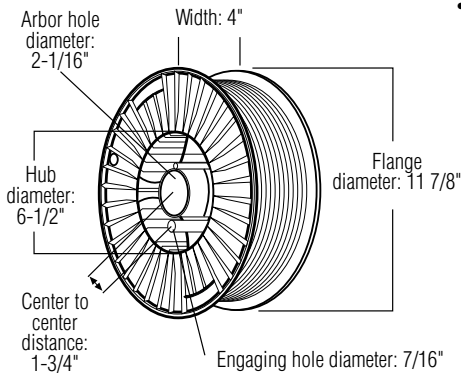


Weight: 2,376 lbs.  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72



## 45-lb. Plastic Spool

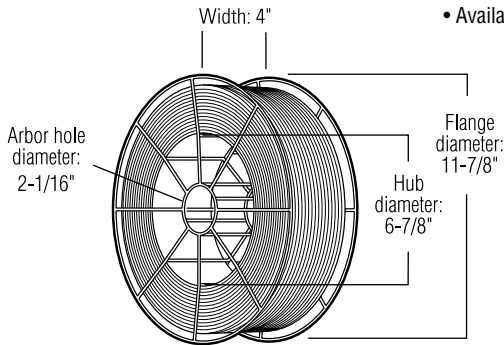
- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over
- Available in:  HB



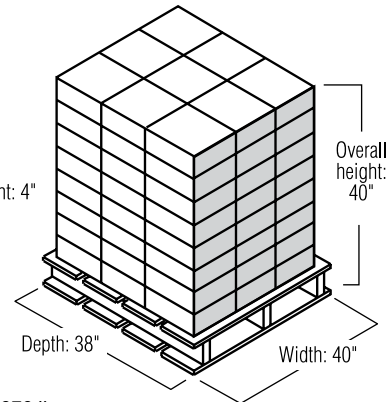
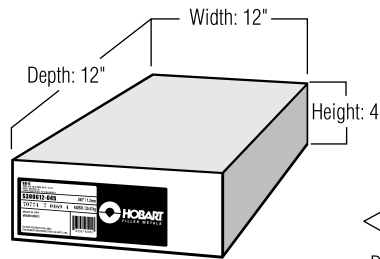
Weight: 3,240 lbs.  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72

## 33-lb. & 45-lb. Steel Reels™

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Recyclable – no need to separate from other steel scrap materials
- Available in:  Quantum Arc™



Steel Reel weight (empty): 1.1 lbs.

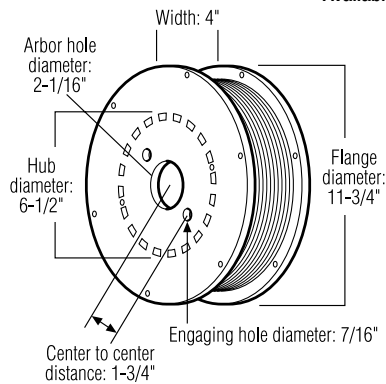


Weight: 33-lb Steel Reel 2,376 lbs.  
45-lb Steel Reel 3,240 lbs.  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72

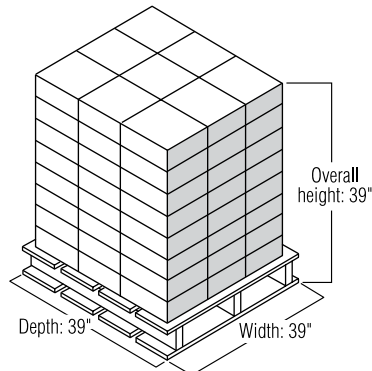
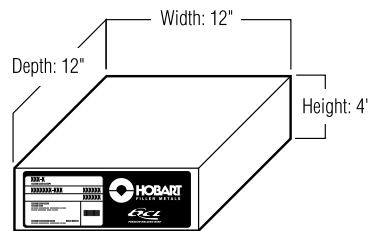
# Solid Steel Wires

## 45-lb. Fiber Spool

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over
- Available in:  Quantum Arc™



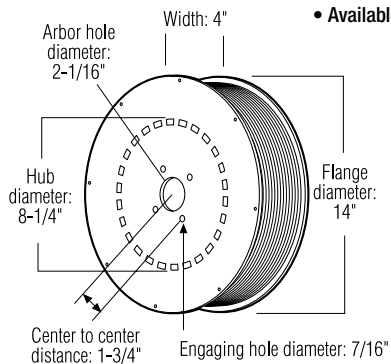
Spool weight (empty): 2.6 lbs.



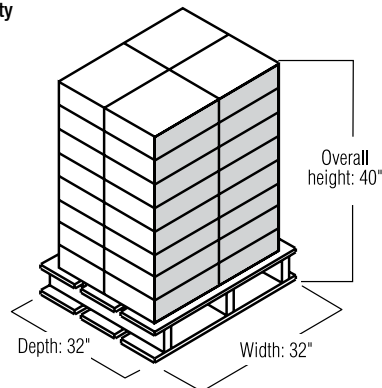
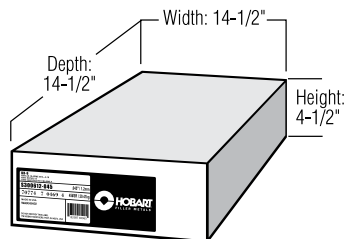
Weight: 3,240 lbs. net, 3,470 lbs. gross (est.)  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72

## 60-lb. Fiber Spool

- Convenient, easy to change over
- Simplicity reduces changeover time, increases productivity
- More wire on spool means fewer changeovers
- Available in:  Quantum Arc™



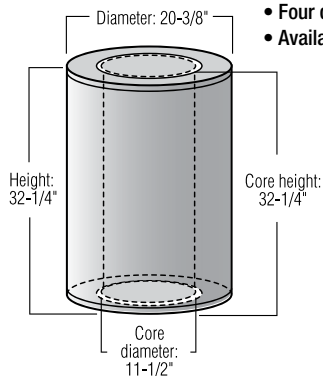
Spool weight (empty): 3 lbs.



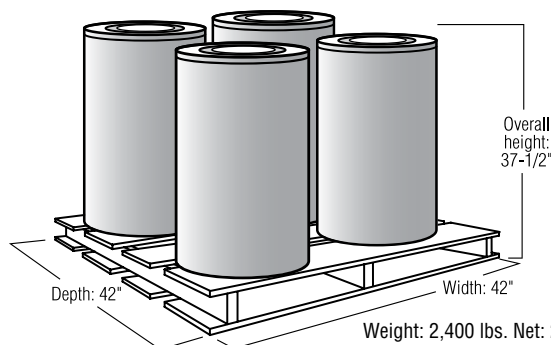
Weight: 1,920 lbs. net, 2,115 lbs. gross (est.)  
Stacking sequence: 2 wide, 2 deep and 8 high  
Spools per pallet: 32

## 600-lb. ROBOPAK®

- Tangle-free feeding, no wire flip
- Compact drum to reduce floor-space requirements
- ROBOPAK® protects wire from manufacturing environment (dust, spatter, oil, etc.)
- Can be located away from the weld station for convenient changeover
- Four drums per pallet reduces excess handling
- Available in:  Quantum Arc™



Drum weight (empty): 19 lbs.



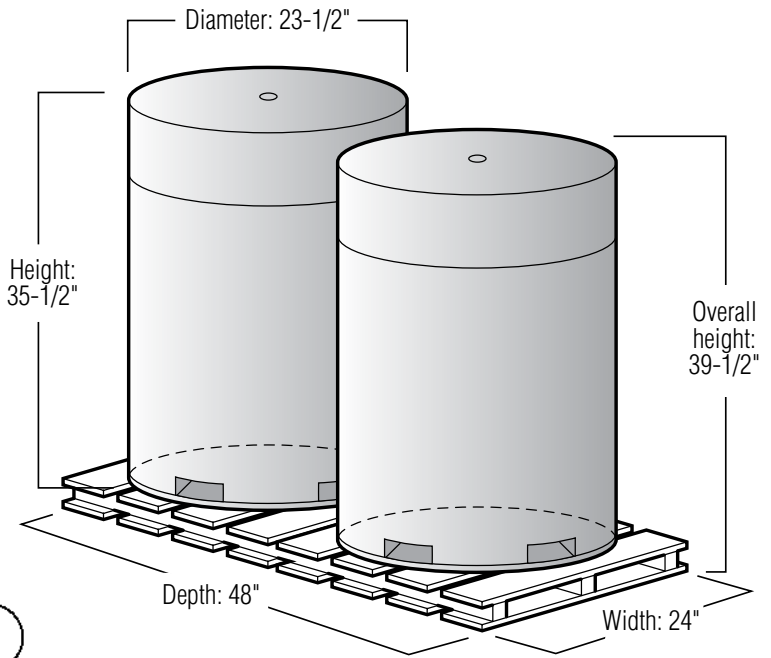
Weight: 2,400 lbs. Net: 2,519 lbs. gross (est.)  
Drums per pallet: 4



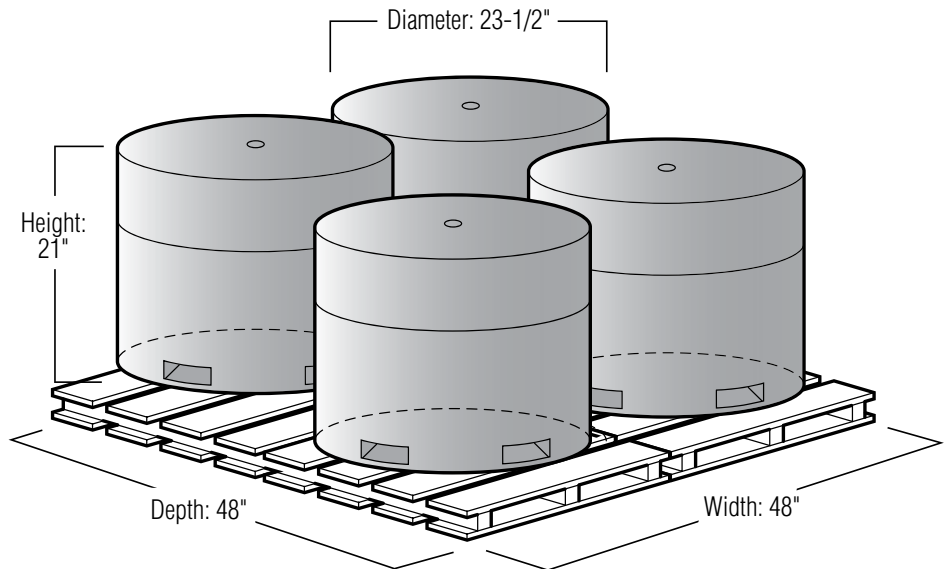
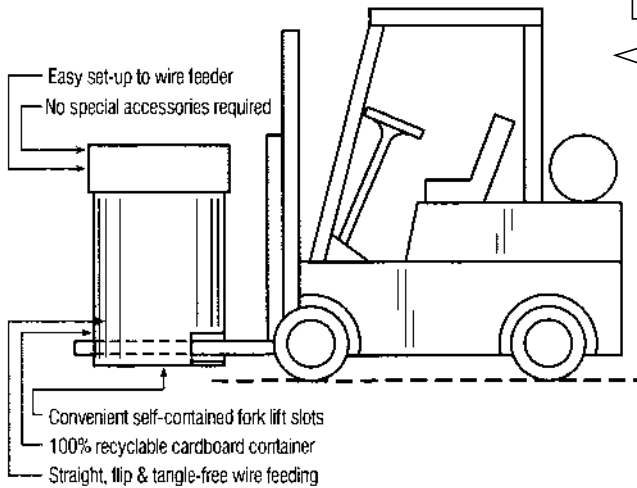
# Solid Steel Wires

## Recyclable ROBOPAK® 300/600/700/950

- Tangle-free feeding, no flip wire
- Compact drum to reduce floor-space requirements
- ROBOPAK® protects wire from manufacturing environment (dust, spatter, oil, etc.)
- Can be located away from the weld station for convenient change over
- No payoff cone required, connectors and conduit attach directly to lid
- Available in:  Quantum Arc™



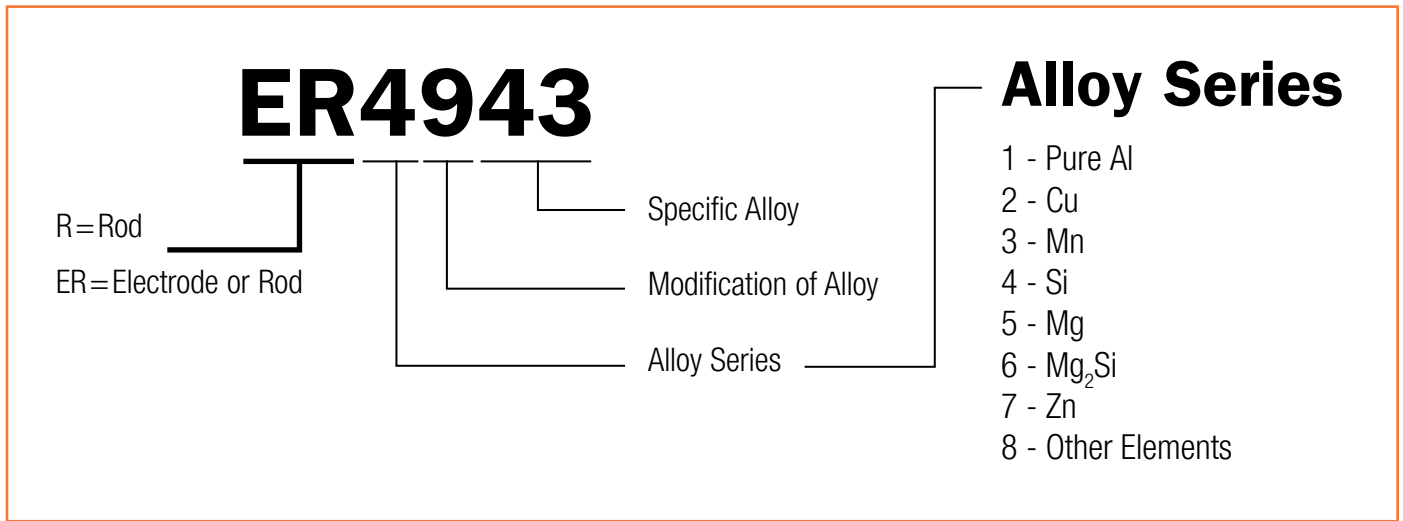
950 Weight: 1900 lb.  
 600 Weight: 2400 lb.  
 700 Weight: 1400 lb. (1/16 only)



300 Weight: 1200

# Aluminum Wires

## How AWS Classifies Aluminum



## MaxalMig® 4043

### AWS ER4043

This moderate strength (28 kips per square inch/190 megapascals typical) filler metal is an ideal aluminum/silicon filler alloy for general purpose welding applications due to corrosion resistance. With a low melting temperature and high fluidity, it produces clean, bright welds while minimizing hot cracking and distortion. It also has moderate electrical and thermal conductivity with low shrinkage rate and reduced distortion.

#### Benefits:

- moderate strength (28ksi/190Mpa typical)
- low melting temperature and high fluidity
- minimizes hot cracking and distortion
- clean, bright welds

#### Typical Applications:

- sport products - scooters/bicycles
- general repair and maintenance
- automotive/motorcycle frames and wheels
- welding 6XXX alloys

#### Typical Weld Metal Chemistry:

Silicon.....	4.5-6.0	Zinc .....	0.10
Iron.....	0.80	Titanium.....	0.20
Copper.....	0.30	Beryllium .....	< 0.0003
Manganese .....	0.05	Others Total .....	0.15
Magnesium .....	0.05	Aluminum.....	remainder
Chromium .....	—		

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	28,000 (190 MPa)
Yield Strength (psi)	12,000 (80 MPa)
Elongation % in 2" (50mm)	24%

#### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	90	20	260	
	3/32" (2.4mm)	110	22	350	
	1/8" (3.2mm)	130	23	450	
	3/16" (4.8mm)	150	24	550	
	1/4" (6.4mm)	175	24	650	
0.035"/0.9mm	1/8" (3.2mm)	130	24	400	
	1/4" (6.4mm)	170	25	500	
0.047"/1.2mm	3/32" (2.4mm)	110	25	170	
	1/8" (3.2mm)	150	26	270	
	1/4" (6.4mm)	190	26	320	
	3/8" (9.5mm)	220	27	390	
0.062"/1.6mm	1/4" (6.4mm)	200	26	170	
	3/8" (9.5mm)	230	27	200	
	1/2" (12.7mm)	260	28	240	
	3/4" (19.1mm)	280	29	260	
	1.00" (25.4mm)	300	30	280	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.10, ER4043
- ASME SFA 5.10, ER4043
- AWS A5.01, Class S1, Schedule F
- CWB

## MaxalMig® 4047

### AWS ER4047

Ideal for thin sections where the higher fluidity and lower shrinkage rate are important for distortion control, this wire is also used in applications requiring excellent wetting action for joint sealing of pressurized fluids and gases. It minimizes hot cracking with a low melting temperature and high fluidity.

#### Benefits:

- low melting temperature and high fluidity
- excellent wetting action for joint sealing applications
- lowest shrinkage rate/reduced distortion
- minimizes hot cracking

#### Typical Applications:

- welding 6XXX alloys
- radiator and air conditioning components
- general repair and maintenance
- water and gas tight applications

#### Typical Weld Metal Chemistry:

Silicon.....	11.0-13.0	Zinc .....	0.10
Iron.....	0.80	Titanium.....	—
Copper.....	0.30	Beryllium .....	< 0.0003
Manganese .....	0.15	Others Total .....	0.15
Magnesium .....	—	Aluminum.....	remainder
Chromium .....	—		

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	38,000 (260 MPa)
Yield Strength (psi)	20,000 (135 MPa)
Elongation % in 2" (50mm)	11%

#### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	90	20	260	
	3/32" (2.4mm)	110	22	350	
	1/8" (3.2mm)	130	23	450	
	3/16" (4.8mm)	150	24	550	
	1/4" (6.4mm)	175	24	650	
0.035"/0.9mm	1/8" (3.2mm)	130	24	400	
	1/4" (6.4mm)	170	25	500	
0.047"/1.2mm	3/32" (2.4mm)	110	25	170	
	1/8" (3.2mm)	150	26	270	
	1/4" (6.4mm)	190	26	320	
	3/8" (9.5mm)	220	27	390	
0.062"/1.6mm	1/4" (6.4mm)	200	26	170	
	3/8" (9.5mm)	230	27	200	
	1/2" (12.7mm)	260	28	240	
	3/4" (19.1mm)	280	29	260	
	1.00" (25.4mm)	300	30	280	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.10, ER4047
- ASME SFA 5.10, ER4047
- AWS A5.01, Class S1, Schedule F

# Aluminum Wires

## MaxalMig® 4943

### AWS ER4943

This heat treatable wire does not depend upon dilution from the base metal during welding to increase the strength of the weld deposit while maintaining the same weld characteristics and benefits of MaxalMig® 4043 and MaxalMig® 4643. It's moderate to high strength (35 kips per square inch/240 megapascals typical) has a 25 percent higher ultimate tensile strength and 50 percent higher yield strength than MaxalMig® 4043 in the as-welded condition.

### Benefits:

- 25% higher UTS and 50% higher yield strength than 4043 in as-welded condition
- moderate to high strength (35ksi/240mpa typical)
- low melting temperature and high fluidity
- heat treatable

### Typical Applications:

- current 4043 and 4643 applications, 1XXX, 3XXX, 5XXX with less than 3.0% Mg (example 5052), and 6XXX
- post weld aged, post weld heatreat & age applications
- automotive/motorcycle frames and wheels
- ladders and furniture

### Typical Weld Metal Chemistry:

Silicon.....	5.0-6.0	Zinc .....	0.10
Iron.....	0.40	Titanium.....	0.15
Copper.....	0.10	Beryllium .....	< 0.0003
Manganese .....	0.05	Others Total .....	0.15
Magnesium ...	0.30-0.50	Aluminum.....	remainder
Chromium .....	—		

### Typical Mechanical Properties (AW):

Tensile Strength (psi)	35,000 (240 MPa)
Yield Strength (psi)	18,000 (125 MPa)
Elongation % in 2" (50mm)	16%

### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	90	20	260	
	3/32" (2.4mm)	110	22	350	
	1/8" (3.2mm)	130	23	450	
	3/16" (4.8mm)	150	24	550	
	1/4" (6.4mm)	175	24	650	
0.035"/0.9mm	1/8" (3.2mm)	130	24	400	
	1/4" (6.4mm)	170	25	500	
0.047"/1.2mm	3/32" (2.4mm)	110	25	170	
	1/8" (3.2mm)	150	26	270	
	1/4" (6.4mm)	190	26	320	
	3/8" (9.5mm)	220	27	390	
0.062"/1.6mm	1/4" (6.4mm)	200	26	170	
	3/8" (9.5mm)	230	27	200	
	1/2" (12.7mm)	260	28	240	
	3/4" (19.1mm)	280	29	260	
	1.00" (25.4mm)	300	30	280	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

### Approvals and Conformances:

- AWS A5.10, ER4943
- ASME SFA 5.10, ER4943
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

## MaxalMig® 5183

### AWS ER5183

With high strength values (41 kips per square inch typical) and excellent salt water corrosion resistance, this filler metal is the most common aluminum/magnesium alloy for welding 5083 base metal in shipbuilding applications. It also offers a very good color match after anodizing with 5xxx/6xxx base materials.

### Benefits:

- very high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance when welded to 5083 base metal

### Typical Applications:

- applications using base metal with 40ksi (275 MPa) minimum (5083)
- shipbuilding
- pressure vessels
- cryogenic tanks

### Typical Weld Metal Chemistry:

Silicon.....	0.40	Zinc .....	0.25
Iron.....	0.40	Titanium.....	0.15
Copper.....	0.10	Beryllium .....	< 0.0003
Manganese ....	0.50-1.0	Others Total .....	0.15
Magnesium .....	4.3-5.2	Aluminum.....	remainder
Chromium ....	0.05-0.25		

### Typical Mechanical Properties (AW):

Tensile Strength (psi)	41,000 (280 MPa)
Yield Strength (psi)	22,000 (150 MPa)
Elongation % in 2" (50mm)	12%

### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed	
	Thickness	Amps	Volts	Speed (ipm)
0.030"/0.8 mm	1/16" (1.6mm)	100	18	300
	3/32" (2.4mm)	120	21	400
	1/8" (3.2mm)	140	21	500
	3/16" (4.8mm)	160	22	600
0.035"/0.9mm	1/4" (6.4mm)	185	22	700
	1/8" (3.2mm)	140	22	450
	1/4" (6.4mm)	180	23	600
0.047"/1.2mm	3/32" (2.4mm)	120	24	220
	1/8" (3.2mm)	160	25	330
0.062"/1.6mm	1/4" (6.4mm)	220	25	370
	3/8" (9.5mm)	230	25	450
	1/2" (12.7mm)	270	26	270
0.062"/1.6mm	3/4" (19.1mm)	290	27	300
	1.00" (25.4mm)	310	28	320

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

### Approvals and Conformances:

- AWS A5.10, ER5183
- ASME SFA 5.10, ER5183
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS
- VdTUV
- DB

## MaxalMig® 5356

### AWS ER5356

The high ductility, fatigue strength, and very high toughness (38 ksi typical) make this filler metal the most common aluminum/magnesium alloy for general purpose welding. The lower electrical conductivity and thermal conductivity is ideal for the construction industry in fabricating truck trailers, small fishing boats, and in cryogenic applications. Additionally, it offers higher column strength with better feedability and very good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials

#### Typical Applications:

- applications using base metal 5086
- truck frames
- shipbuilding
- railcar
- bus panels

#### Typical Weld Metal Chemistry:

Silicon.....0.25	Zinc.....0.10
Iron.....0.40	Titanium..... 0.06-0.20
Copper.....0.10	Beryllium..... < 0.0003
Manganese .. 0.05-0.20	Others Total.....0.15
Magnesium..... 4.5-5.5	Aluminum..... remainder
Chromium .... 0.05-0.20	

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	38,000 (260 MPa)
Yield Strength (psi)	21,000 (145 MPa)
Elongation % in 2" (50mm)	13%

#### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	100	18	300	
	3/32" (2.4mm)	120	21	400	
	1/8" (3.2mm)	140	21	500	
	3/16" (4.8mm)	160	22	600	
	1/4" (6.4mm)	185	22	700	
0.035"/0.9mm	1/8" (3.2mm)	140	22	450	
	1/4" (6.4mm)	180	23	600	
0.047"/1.2mm	3/32" (2.4mm)	120	24	220	
	1/8" (3.2mm)	160	25	330	
	1/4" (6.4mm)	220	25	370	
0.062"/1.6mm	3/8" (9.5mm)	230	25	450	
	1/2" (12.7mm)	270	26	270	
	3/4" (19.1mm)	290	27	300	
	1.00" (25.4mm)	310	28	320	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.10, ER5356
- ASME SFA 5.10, ER5356
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS
- vdTUV
- DB

## MaxalMig® 5554

### AWS ER5554

With a higher hot cracking sensitivity, this filler metal is the most common aluminum/magnesium alloy for welding 5454 base metal where sustained elevated temperatures above 150 degrees Fahrenheit are experienced. Features include a moderate to high strength (33 ksi / 225 megapascals typical) and a good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- moderate to high strength (33ksi/225 Mpa typical)
- developed for elevated temperature applications
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance

#### Typical Applications:

- applications using 5454 base metal
- automotive
- heat exchangers

#### Typical Weld Metal Chemistry:

Silicon.....0.25	Zinc.....0.25
Iron.....0.40	Titanium..... 0.05-0.20
Copper.....0.10	Beryllium..... < 0.0003
Manganese .... 0.50-1.0	Others Total.....0.15
Magnesium..... 2.4-3.0	Aluminum..... remainder
Chromium .... 0.05-0.20	

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	33,000 (225 MPa)
Yield Strength (psi)	17,000 (115 MPa)
Elongation % in 2" (50mm)	15%

#### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	100	18	300	
	3/32" (2.4mm)	120	21	400	
	1/8" (3.2mm)	140	21	500	
	3/16" (4.8mm)	160	22	600	
	1/4" (6.4mm)	185	22	700	
0.035"/0.9mm	1/8" (3.2mm)	140	22	450	
	1/4" (6.4mm)	180	23	600	
0.047"/1.2mm	3/32" (2.4mm)	120	24	220	
	1/8" (3.2mm)	160	25	330	
	1/4" (6.4mm)	220	25	370	
0.062"/1.6mm	3/8" (9.5mm)	230	25	450	
	1/2" (12.7mm)	270	26	270	
	3/4" (19.1mm)	290	27	300	
	1.00" (25.4mm)	310	28	320	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.10, ER5554
- ASME SFA 5.10, ER5554
- AWS A5.01, Class S1, Schedule F
- CWB

## MaxalMig® 5556

### AWS ER5556

This very high strength (42 ksi typical) filler metal is designed for welding structures where maximum as welded transverse ultimate tensile strength (UTS) and shear strength values are required. It offers equivalent corrosion resistance when welding 5456 base material, higher column strength for better feedability and very good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- very high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance when welded to 5456 base metal

#### Typical Applications:

- applications using base metal with 42ksi (275 Mpa) minimum 5456
- pressure vessels

#### Typical Weld Metal Chemistry:

Silicon.....0.25	Zinc.....0.25
Iron.....0.40	Titanium..... 0.05-0.20
Copper.....0.10	Beryllium..... < 0.0003
Manganese .... 0.50-1.0	Others Total.....0.15
Magnesium..... 4.7-5.5	Aluminum..... remainder
Chromium .... 0.05-0.20	

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	43,000 (295 MPa)
Yield Strength (psi)	23,000 (155 MPa)
Elongation % in 2" (50mm)	12%

#### Suggested GMAW welding procedures:

Diameter	Base Material		Wire Feed		
	Thickness	Amps	Volts	Speed	(ipm)
0.030"/0.8 mm	1/16" (1.6mm)	100	18	300	
	3/32" (2.4mm)	120	21	400	
	1/8" (3.2mm)	140	21	500	
	3/16" (4.8mm)	160	22	600	
	1/4" (6.4mm)	185	22	700	
0.035"/0.9mm	1/8" (3.2mm)	140	22	450	
	1/4" (6.4mm)	180	23	600	
0.047"/1.2mm	3/32" (2.4mm)	120	24	220	
	1/8" (3.2mm)	160	25	330	
	1/4" (6.4mm)	220	25	370	
0.062"/1.6mm	3/8" (9.5mm)	230	25	450	
	1/2" (12.7mm)	270	26	270	
	3/4" (19.1mm)	290	27	300	
	1.00" (25.4mm)	310	28	320	

**Shielding Gas:** 100% Ar, 75% He/25% Ar

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.10, ER5556
- ASME SFA 5.10, ER5556
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

# Aluminum Wires

## MaxalTig® 4043

### AWS R4043

A popular aluminum/silicon filler alloy for general purpose welding applications, this filler metal has moderate strength (28 kips per square inch typical) and low melting temperature with high fluidity. The low welding spatter and discoloration, hot cracking sensitivity and excellent corrosion resistance produce clean, bright welds. Additionally, it offers moderate electrical conductivity and thermal conductivity.

#### Benefits:

- moderate strength (28ksi/190Mpa typical)
- low melting temperature and high fluidity
- minimizes hot cracking and distortion
- clean, bright welds

#### Typical Applications:

- sport products - scooters/bicycles
- general repair and maintenance
- automotive/motorcycle frames and wheels
- welding 6XXX alloys

#### Typical Weld Metal Chemistry:

Silicon.....	4.5-6.0
Iron.....	0.80
Copper.....	0.30
Manganese.....	0.05
Magnesium.....	0.05
Chromium.....	—
Zinc.....	0.10
Titanium.....	0.20
Beryllium.....	< 0.0003
Others Total.....	0.15
Aluminum.....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	28,000 (190 MPa)
Yield Strength (psi)	12,000 (80 MPa)
Elongation % in 2" (50mm)	24%

#### Suggested GTAW welding procedures:

Rod/Tungsten	Base Mat.	Amps	Gas Cup	Arc Diameter	Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm	
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm	
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm	
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm	
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm	

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, ER4043
- ASME SFA 5.10, ER4043
- AWS A5.01, Class S1, Schedule F
- CWB

## MaxalTig® 4047

### AWS R4047

Ideal for thin sections where the higher fluidity and lower shrinkage rate are important for distortion control, this filler metal is also used in applications where excellent wetting action for joint sealing of pressurized fluids and gases is required. It also offers the lowest shrinkage rate and reduced distortion combined with low hot cracking sensitivity. The low melting temperature and high fluidity also appeals to users.

#### Benefits:

- low melting temperature and high fluidity
- excellent wetting action for joint sealing applications
- lowest shrinkage rate/reduced distortion
- minimizes hot cracking

#### Typical Applications:

- welding 6XXX alloys
- radiator and air conditioning components
- general repair and maintenance
- water and gas tight applications

#### Typical Weld Metal Chemistry:

Silicon.....	11.0-13.0
Iron.....	0.80
Copper.....	0.30
Manganese.....	0.15
Magnesium.....	—
Chromium.....	—
Zinc.....	0.10
Titanium.....	—
Beryllium.....	< 0.0003
Others Total.....	0.15
Aluminum.....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	38,000 (260 MPa)
Yield Strength (psi)	20,000 (135 MPa)
Elongation % in 2" (50mm)	11%

#### Suggested GTAW welding procedures:

Rod/Tungsten	Base Mat.	Amps	Gas Cup	Arc Diameter	Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm	
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm	
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm	
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm	
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm	

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, ER4047
- ASME SFA 5.10, ER4047
- AWS A5.01, Class S1, Schedule F

## MaxalTig® 4943

### AWS R4943

This alloy filler metal is formulated to be welded with the same weld procedure specifications as MaxalTig® 4043 and does not depend upon dilution from the base metal during welding to increase the strength of the weld deposit while maintaining the same weld characteristics and benefits. It offers a 25% higher ultimate tensile strength (UTS) and 50% higher yield strength in as-welded condition.

#### Benefits:

- 25% higher UTS and 50% higher yield strength than 4043 in as-welded condition
- moderate to high strength (35ksi/240Mpa typical)
- low melting temperature and high fluidity
- heat treatable

#### Typical Applications:

- current 4043 and 4643 applications, 1XXX, 3XXX, 5XXX with less than 3.0% Mg (example 5052), and 6XXX
- post weld aged, post weld heatreat, and age applications
- automotive/motorcycle frames and wheels
- ladders and furniture

#### Typical Weld Metal Chemistry:

Silicon.....	5.0-6.0
Iron.....	0.40
Copper.....	0.10
Manganese.....	0.05
Magnesium.....	0.30-0.50
Chromium.....	—
Zinc.....	0.10
Titanium.....	0.15
Beryllium.....	< 0.0003
Others Total.....	0.15
Aluminum.....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	35,000 (240 MPa)
Yield Strength (psi)	18,000 (125 MPa)
Elongation % in 2" (50mm)	16%

#### Suggested GTAW welding procedures:

Rod/Tungsten	Base Mat.	Amps	Gas Cup	Arc Diameter	Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm	
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm	
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm	
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm	
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm	

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, ER4943
- ASME SFA 5.10, ER4943
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

## MaxalTig® 5183

### AWS R5183

This filler metal is the most common aluminum/magnesium alloy for welding 5083 base metal in shipbuilding applications. It has higher strength values than MaxalMig® with excellent salt water corrosion resistance when welded to 5083. Additionally, it offers a very good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- very high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance when welded to 5083 base metal

#### Typical Applications:

- applications using base metal with 40ksi (275 Mpa) minimum (5083)
- shipbuilding
- pressure vessels
- cryogenic tanks

#### Typical Weld Metal Chemistry:

Silicon .....	0.40
Iron .....	0.40
Copper .....	0.10
Manganese .....	0.50-1.0
Magnesium .....	4.3-5.2
Chromium .....	0.05-0.25
Zinc .....	0.25
Titanium .....	0.15
Beryllium .....	< 0.0003
Others Total .....	0.15
Aluminum .....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	41,000 (280 MPa)
Yield Strength (psi)	22,000 (150 MPa)
Elongation % in 2" (50mm)	12%

#### Suggested GTAW welding procedures:

Rod/Tungsten Diameter	Base Mat. Thickness	Amps	Gas Cup Diameter	Arc Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, R5183
- ASME SFA 5.10, R5183
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

## MaxalTig® 5356

### AWS R5356

A common aluminum/magnesium alloy for general purpose welding, this filler metal is typically used in the construction industry in fabricating truck trailers, small fishing boats, and in cryogenic applications. With high strength (38 kips per square inch typical) and high ductility, it has fatigue strength and very high toughness. It also offers higher column strength, better feedability, and very good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials

#### Typical Applications:

- applications using base metal 5086
- truck frames
- shipbuilding
- railcar
- bus panels

#### Typical Weld Metal Chemistry:

Silicon .....	0.25
Iron .....	0.40
Copper .....	0.10
Manganese .....	0.05-0.20
Magnesium .....	4.5-5.5
Chromium .....	0.05-0.20
Zinc .....	0.10
Titanium .....	0.06-0.20
Beryllium .....	< 0.0003
Others Total .....	0.15
Aluminum .....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	38,000 (260 MPa)
Yield Strength (psi)	21,000 (145 MPa)
Elongation % in 2" (50mm)	13%

#### Suggested GTAW welding procedures:

Rod/Tungsten Diameter	Base Mat. Thickness	Amps	Gas Cup Diameter	Arc Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, R5356
- ASME SFA 5.10, R5356
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

## MaxalTig® 5554

### AWS R5554

This moderate to high strength (33 kips per square inch / 225 megapascals typical) filler metal is the most common aluminum/magnesium alloy for welding 5454 base metal where sustained elevated temperatures above 150 degrees Fahrenheit are experienced. It also offers higher hot cracking sensitivity and a good color match after anodizing with 5xxx/6xxx base materials.

#### Benefits:

- moderate to high strength (33ksi/225 Mpa typical)
- developed for elevated temperature applications
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance

#### Typical Applications:

- applications using 5454 base metal
- automotive
- heat exchangers

#### Typical Weld Metal Chemistry:

Silicon .....	0.25
Iron .....	0.40
Copper .....	0.10
Manganese .....	0.50-1.0
Magnesium .....	2.4-3.0
Chromium .....	0.05-0.20
Zinc .....	0.25
Titanium .....	0.05-0.20
Beryllium .....	< 0.0003
Others Total .....	0.15
Aluminum .....	remainder

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	33,000 (225 MPa)
Yield Strength (psi)	17,000 (115 MPa)
Elongation % in 2" (50mm)	15%

#### Suggested GTAW welding procedures:

Rod/Tungsten Diameter	Base Mat. Thickness	Amps	Gas Cup Diameter	Arc Travel Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm
3/32"(2.4mm)	.094"(2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm
.156"(4.0mm)	.250"(6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm

**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

#### Approvals and Conformances:

- AWS A5.10, ER5554
- ASME SFA 5.10, ER5554
- AWS A5.01, Class S1, Schedule F
- CWB

# Aluminum Wires

## MaxalTig® 5556

### AWS R5556

This high strength (42 kips per square inch typical) filler metal is designed for welding structures where maximum as welded transverse ultimate tensile strength (UTS) and shear strength values are required. In addition to high ductility, fatigue strength and toughness, it offers excellent corrosion resistance when welded to 5456 base metal and very good color match after anodizing with 5xxx/6xxx base materials.

### Benefits:

- very high strength
- high ductility, fatigue strength and toughness
- very good color match after anodizing with 5XXX/6XXX base materials
- excellent corrosion resistance when welded to 5456 base metal

### Typical Applications:

- applications using base metal with 42ksi (275 Mpa) minimum 5456
- pressure vessels

### Typical Weld Metal Chemistry:

Silicon .....	0.25
Iron .....	0.40
Copper .....	0.10
Manganese .....	0.50-1.0
Magnesium .....	4.7-5.5
Chromium .....	0.05-0.20
Zinc .....	0.25
Titanium .....	0.05-0.20
Beryllium .....	< 0.0003
Others Total .....	0.15
Aluminum .....	remainder

### Typical Mechanical Properties (AW):

Tensile Strength (psi)	43,000 (295 MPa)
Yield Strength (psi)	23,000 (155 MPa)
Elongation % in 2" (50mm)	12%

### Suggested GTAW welding procedures:

Rod/Tungsten	Base Mat.	Amps	Gas Cup	Arc Travel	Speed
1/16"(1.6mm)	.062"(1.6mm)	60-100	3/8"(9.5mm)	8-10 ipm	
3/32"(2.4mm)	.094" (2.4mm)	85-115	3/8"(9.5mm)	10-12 ipm	
.125"(3.2mm)	.1875"(4.8mm)	155-190	7/16"(0.4mm)	10-12 ipm	
.156"(4.0mm)	.250" (6.4mm)	190-275	1/2"(12.7mm)	8-10 ipm	
.187"(1.6mm)	.375"(9.5mm)	240-375	5/8"(15.9mm)	14-32 ipm	

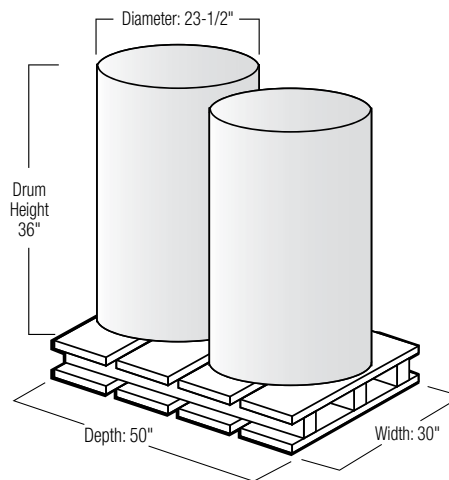
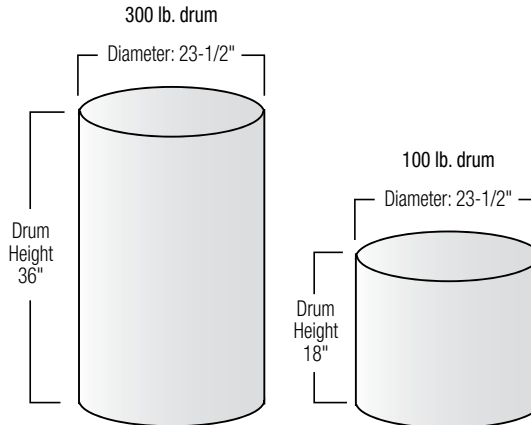
**Shielding Gas:** 100% Ar, 25% He/75% Ar

**Type of Current:** AC

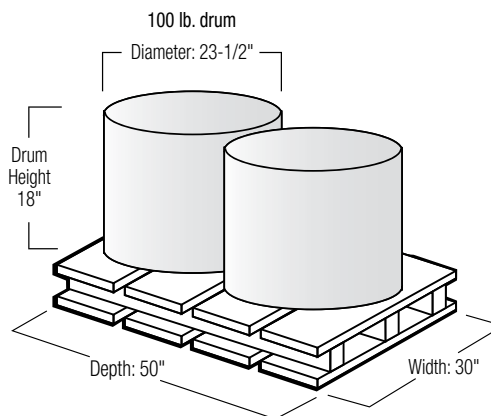
### Approvals and Conformances:

- AWS A5.10, R5556
- ASME SFA 5.10, R5556
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

### Maxal PAC Drum



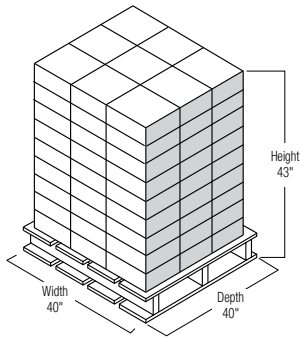
**Weight:** 600 lbs.  
**Master pallet dimensions:** 30" x 50"



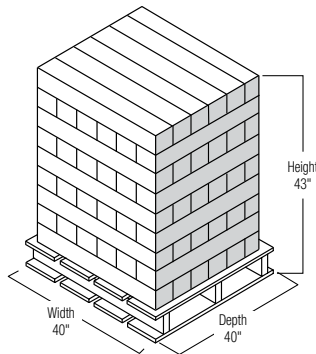
**Weight:** 200 lbs.  
**Master pallet dimensions:** 30" x 50"



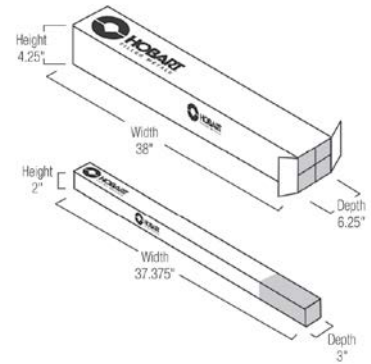
## Pallet Information



1-lb. Carton Weight: 1,728 lbs. gross; 1,458 lbs. net  
 16-lb. Carton Weight: 1,518 lbs. gross; 1,296 lbs. net  
 22-lb. Carton Weight: 2,012 lbs. gross; 1,782 lbs. net  
 Stacking sequence: 3 wide, 3 deep and 9 high

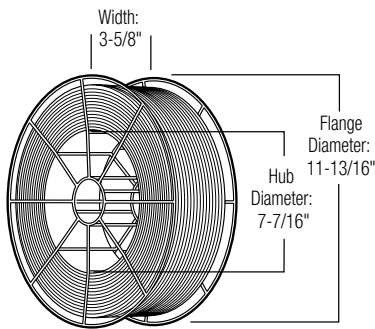


Weight: 2,320 lbs. gross; 2,160 lbs. net  
 Stacking sequence: 6 wide, 1 deep and 9 high

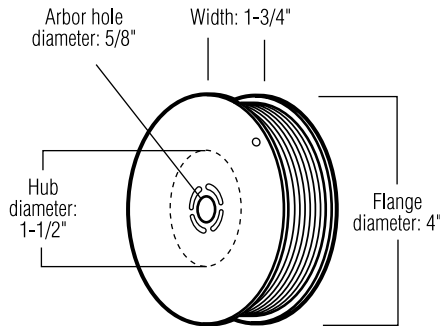


Master Box (4-10 Lb. Boxes): 38" x 4.25" x 6.25"  
 10 Lb. Box: 37.375" x 2" x 3"

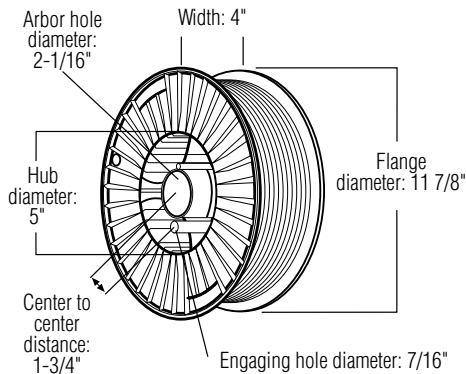
## 16-lb. Wire Basket & 1-lb., 16-lb., 22-lb. Plastic Spool



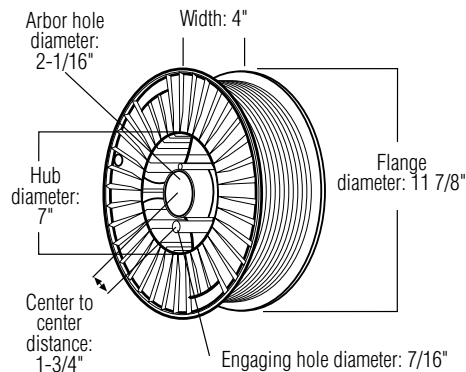
**16-lb.**



**1-lb.**

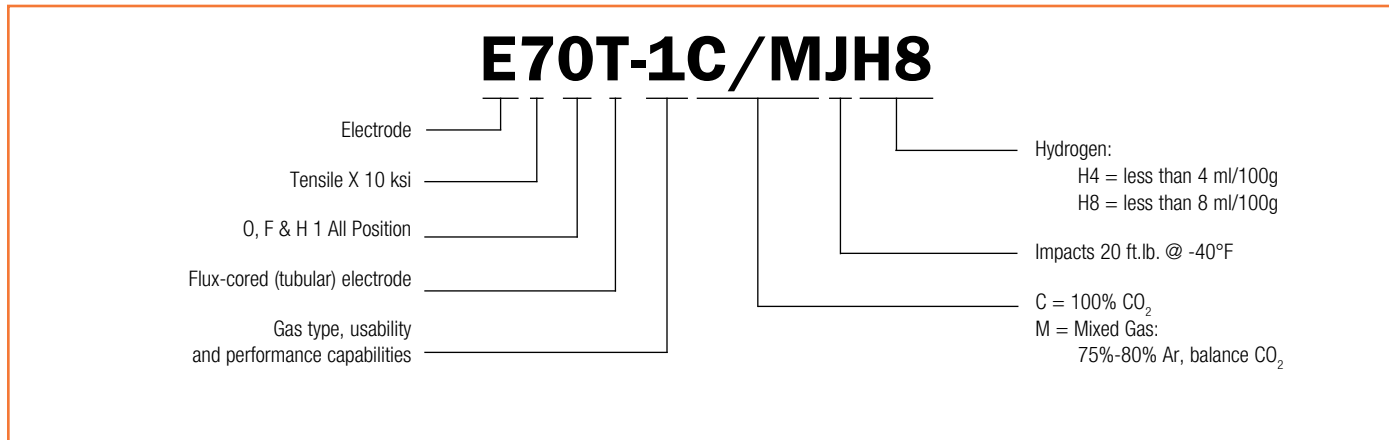


**22-lb.**



**12-lb.  
14-lb.  
16-lb.**

## How AWS Classifies Mild Steel Flux-Cored (Tubular) Wires, FCAW Process (AWS A5.20)



### Position of Welding, Shielding, Polarity, and Application Requirements

AWS Classification	Welding Position <sup>a</sup>	Shielding <sup>b</sup>	Current <sup>c</sup>	Application <sup>d</sup>	AWS Classification	Welding Position <sup>a</sup>	Shielding <sup>b</sup>	Current <sup>c</sup>	Application <sup>d</sup>
E70T-1C	H and F	CO <sub>2</sub>	DCEP	M	E70T-9C	H and F	CO <sub>2</sub>	DCEP	M
E70T-1M	H and F	75-80% Ar/bal CO <sub>2</sub>	DCEP	M	E70T-9M	H and F	75-80% Ar/bal CO <sub>2</sub>	DCEP	M
E71T-1C	H, F, VU, OH	CO <sub>2</sub>	DCEP	M	E71T-9C	H, F, VU, OH	CO <sub>2</sub>	DCEP	M
E71T-1M	H, F, VU, OH	75-80% Ar/bal CO <sub>2</sub>	DCEP	M	E71T-9M	H, F, VU, OH	75-80% Ar/bal CO <sub>2</sub>	DCEP	M
E70T-2C	H and F	CO <sub>2</sub>	DCEP	S	E70T-10	H and F	None	DCEN	S
E70T-2M	H and F	75-80% Ar/bal CO <sub>2</sub>	DCEP	S	E70T-11	H and F	None	DCEN	M
E71T-2C	H, F, VU, OH	CO <sub>2</sub>	DCEP	S	E71T-11	H, F, VD, OH	None	DCEN	M
E71T-2M	H, F, VU, OH	75-80% Ar/bal CO <sub>2</sub>	DCEP	S	E70T-12C	H and F	CO <sub>2</sub>	DCEP	M
E70T-3	H and F	None	DCEP	S	E70T-12M	H and F	75-80% Ar/bal CO <sub>2</sub>	DCEP	M
E70T-4	H and F	None	DCEP	M	E71T-12C	H, F, VU, OH	CO <sub>2</sub>	DCEP	M
E70T-5C	H and F	CO <sub>2</sub>	DCEP	M	E71T-12M	H, F, VU, OH	75-80% Ar/bal CO <sub>2</sub>	DCEP	M
E70T-5M	H and F	75-80% Ar/bal CO <sub>2</sub>	DCEP	M	E61T-13	H, F, VD, OH	None	DCEN	S
E71T-5C	H, F, VU, OH	CO <sub>2</sub>	DCEP or DCEN <sup>e</sup>	M	E71T-13	H, F, VD, OH	None	DCEN	S
E71T-5M	H, F, VU, OH	75-80% Ar/bal CO <sub>2</sub>	DCEP or DCEN <sup>e</sup>	M	E71T-14	H, F, VD, OH	None	DCEN	S
E70T-6	H and F	None	DCEP	M	EX0T-G	H and F	Not Specified	Not Specified	M
E70T-7	H and F	None	DCEN	M	EX1T-G	H, F, VD or VU, OH	Not Specified	Not Specified	M
E71T-7	H, F, VU, OH	None	DCEN	M	EX0T-GS	H and F	Not Specified	Not Specified	S
E70T-8	H and F	None	DCEN	M	EX1T-GS	H, F, VD or VU, OH	Not Specified	Not Specified	S
E71T-8	H, F, VU, OH	None	DCEN	M					

a. H = horizontal position; F = flat position; OH = overhead position; VD = vertical position with downward progression; VU = vertical position with upward progression

b. Properties of weld metal from electrodes that are used with external gas shielding (EXXT-1C, EXXT-1M, EXXT-2C, EXXT-2M, EXXT-5C, EXXT-5M, EXXT-9C, EXXT-9M, EXXT-12C, and EXXT-12M) vary according to the Shielding Gas employed. Electrodes classified with the specified Shielding Gas should not be used with other shielding gases without first consulting the manufacturer of the electrode.

c. The term "DCEP" refers to direct current electrode positive (dc, reverse polarity). The term "DCEN" refers to direct current electrode negative (dc, straight polarity).

d. M = single- or multiple-pass; S = single-pass only

e. Some E71T-5C and E71T-5M electrodes may be recommended for use on DCEN for improved out-of-position welding.

## FabCO® RXR

### FLAT & HORIZONTAL

#### AWS E70T-1C, E70T-9C

This E70T-1 wire has a higher level of deoxidizing elements to handle mill scale, rust and other contaminants with easy slag removal that reduces cleanup time. Its flexible amperage range promotes versatility smooth and stable arc produces an easy-to-control puddle.

#### Benefits:

- outstanding welding performance results in excellent operator appeal
- smooth and stable arc produces an easy to control puddle
- easy slag removal reduces cleanup time
- very flexible amperage range promotes versatility

#### Typical Applications:

- storage vessels
- earthmoving equipment
- heavy fabrication
- railcar

#### Typical Weld Metal Chemistry:

Carbon	0.07
Manganese	1.66
Silicon	0.64
Phosphorus	0.012
Sulphur	0.009

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	86,000 (592 MPa)
Yield Strength (psi)	75,000 (518 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	30 ft.lb. (41J)
Avg. at -20°F (-30°C)	25 ft.lb. (34J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-250	25-29	3/4" (19 mm)
1/16" (1.6 mm)	200-375	25-29	3/4" (19 mm)
5/64" (2.0 mm)	250-400	26-33	1" (25 mm)
3/32" (2.4 mm)	350-550	26-36	1" (25 mm)
7/64" (2.8 mm)	500-700	30-36	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-1C, E70T-9C
- AWS A5.20M, E490T-1C, E490T-9C
- ASME SFA 5.20, E70T-1C, E70T-9C
- ABS, 100% CO<sub>2</sub>, 2YSA H10
- CWB, 100% CO<sub>2</sub>, E492T-9-H8 (1.2 mm - 2.4 mm diameter electrodes)
- AWS D1.8/D1.8M, 100% CO<sub>2</sub>, 1/16" (1.6 mm) & 3/32" (2.4 mm) diameter electrodes
- EN17632-B: T55 2 T1 0 C A H10
- CE Marked per CPR 305/2011 (1.2 mm - 2.4 mm diameter electrodes)
- MIL-E-24403/1, MIL-70T-1C

## FabCO® TR-70

### FLAT & HORIZONTAL

#### AWS E70T-1C H8, E70T-9C H8

For mild and some low alloy steels, this wire has low smoke generation, easy slag removal, and high deposition rates to increase productivity. Additionally, the good bead contour assists in producing quality welds.

#### Benefits:

- low fume generation rates enhance welder appeal
- high deposition rates help increase productivity
- easy slag removal reduces cleanup time
- good bead contour assists in producing quality welds

#### Typical Applications:

- earthmoving equipment
- steel structures
- heavy fabrication
- railcar

#### Typical Weld Metal Chemistry:

Carbon	0.02
Manganese	1.62
Silicon	0.57
Phosphorus	0.013
Sulphur	0.006

**Typical Diffusible Hydrogen:** 6.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000 (579 MPa)
Yield Strength (psi)	77,000 (531 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	55 ft.lb. (75J)
Avg. at -20°F (-30°C)	44 ft.lb. (60J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-280	24-30	1/2" (13 mm)
1/16" (1.6 mm)	170-350	25-34	1" (25 mm)
5/64" (2.0 mm)	250-550	26-34	1" (25 mm)
3/32" (2.4 mm)	350-650	27-40	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-1C H8, E70T-9C H8
- AWS A5.20M, E490T-1C H8, E490T-9C H8
- ASME SFA 5.20, E70T-1C H8, E70T-9C H8
- ABS, 100% CO<sub>2</sub>, E70T-1CJ
- CWB, 100% CO<sub>2</sub>, E492T-9-H8
- AWS D1.8 Conformance, 100% CO<sub>2</sub>, (1/16-3/32" diameter electrodes)

## FabCO® SUPER-COR

### FLAT & HORIZONTAL

#### AWS A5.20: E70T-1C H4, E70T-9C H4

A highly efficient E70T-1 wire that can increase productivity when welding in deep grooves with deposition efficiencies ranging from 88-90%. The diffusible hydrogen level is lower than 4 milliliters / 100 grams of weld metal minimizing the risk of cracking in restrained joints, thick sections and critical applications.

#### Benefits:

- higher-than-usual deposition efficiencies, ranging from 88-90%
- excellent for welding in deep grooves with increased productivity compared to conventional E70T-1 electrodes
- diffusible hydrogen level is lower than 4 ml/100g of weld metal minimizing risk of cracking in restrained joints, thick sections, and critical applications

#### Typical Applications:

- deep groove welds
- locomotive frames
- machine tool bases
- construction equipment fabrication

#### Typical Weld Metal Chemistry:

Carbon (C)	0.06
Manganese (Mn)	1.51
Silicon (Si)	0.72
Sulphur (S)	0.008
Phosphorus (P)	0.010"

**Typical Diffusible Hydrogen:** 2.8 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	91,000 (630 MPa)
Yield Strength (psi)	74,000 (507 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	25 ft.lb. (34 Joules)
Avg. at -20°F (-30°C)	22 ft.lb. (30 Joules)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
3/32" (2.4mm)	300-500	26-33	1" (25mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-1C H4, E70T-9C H4
- AWS A5.20M, E490T-1C H4, E490T-9C H4
- ASME SFA 5.20, E70T-1C H4, E70T-9C H4
- ABS, 100% CO<sub>2</sub> E70T-1

## FabCO® 85

### FLAT & HORIZONTAL AWS E70T-5C/MJ H4

This wire has a basic slag system and is designed for use where deposit quality and properties are of a first concern. Low weld metal hydrogens make it more crack resistant than acid slag types of wires. Additionally, the excellent low-temperature impacts enable use in critical applications.

#### Benefits:

- basic slag system provides increased toughness
- low hydrogen weld deposit increases resistance to cracking
- excellent low temperature impacts allow use in critical applications

#### Typical Applications:

- non-alloyed and fine grain steels
- earthmoving equipment
- heavy fabrication
- severe service

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	80% Ar/20% CO <sub>2</sub>
Carbon	0.04	0.05
Manganese	1.50	1.55
Silicon	0.85	0.88
Phosphorus	0.009	0.008
Sulphur	0.005	0.006

#### Typical Diffusible Hydrogen:

2.2 ml/100g 2.5 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	89,000	91,000
	(614 MPa)	(627 MPa)
Yield Strength (psi)	71,000	71,000
	(490 MPa)	(490 MPa)
Elongation % in 2" (50mm)	24%	24%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C) 51 ft.lb.(69J) 45 ft.lb.(61J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-350	25-28	3/4" (19 mm)
3/32" (2.4 mm)	300-450	26-31	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>,  
75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-5CJ H4, E70T-5MJ H4
- AWS A5.20M, E490T-5CJ H4, E490T-5MJ H4
- ASME SFA 5.20, E70T-5CJ H4, E70T-5MJ H4
- ABS 100% CO<sub>2</sub>, E70T-5CJ H4,  
80% Ar/20% CO<sub>2</sub> E70T-5MJ H4
- CWB 75-80% Ar/Balance CO<sub>2</sub>, E492T-5MJ H4,  
100% CO<sub>2</sub> E492T-5J H4

## FabCO® 73

### FLAT & HORIZONTAL AWS E70T-2

The very high number of deoxidizing elements handles moderately mill scale, rust and other foreign contaminants while low spatter and easy slag removal reduce cleanup time. The bead appearance has a smooth, uniform ripple with excellent tie-in in both flat and horizontal applications.

#### Benefits:

- produces welds with good soundness and bead contour
- excellent arc stability across recommended current range resulting in excellent operator appeal
- low spatter and easy slag removal reduce cleanup time
- bead appearance has a smooth, uniform ripple with excellent tie-in in both flat and horizontal applications

#### Typical Applications:

- intended for single-pass weldments on rusted or scaled steel
- general fabrication
- machine bases

#### Typical Weld Metal Chemistry:

Not required

#### Typical Mechanical Properties (AW):

Tensile Strength (psi) 76,000 (523 MPa)

#### Typical Charpy V-notch Impact Values (AW):

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
7/64" (2.8 mm)	400-650	25-35	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-2C
- AWS A5.20M, E490T-2C
- ASME SFA 5.20, E70T-2C

## FabCO® Excel Arc™ 71

### ALL POSITION

#### AWS E71T-1C/M H8, E71T-9C/M H8

This all position wire for both carbon dioxide and mixed gas is ideal for mild and low alloy steel applications. The low spatter and easy slag removal reduce cleanup time and its good impact toughness at low temperatures resists cracking in severe applications.

#### Benefits:

- low spatter & easy slag removal reduce cleanup time
- increased welder appeal and productivity
- good impact toughness at low temperatures resists cracking in severe applications

#### Typical Applications:

- non-alloyed & fine grain steels
- structural steel
- general fabrication
- heavy equipment

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.021	0.022
Manganese	1.30	1.60
Silicon	0.69	0.82
Phosphorus	0.015	0.014
Sulphur	0.011	0.01

#### Typical Diffusible Hydrogen:

3.8 ml/100g 4.8 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000	90,000
	(579 MPa)	(619 MPa)
Yield Strength (psi)	77,000	83,000
	(531 MPa)	(571 MPa)
Elongation % in 2" (50mm)	28%	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C) 101 ft.lb. (137J) 91 ft.lb. (123J)  
Avg. at -20°F (-30°C) 80 ft.lb. (108J) 69 ft.lb. (94J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.035" (0.9 mm)	125-225	23-28	1/2" (13 mm)
.045" (1.2 mm)	170-300	23-29	3/4" (19 mm)
.052" (1.4 mm)	170-350	24-30	1" (25 mm)
1/16" (1.6 mm)	215-400	24-30	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E71T-1C H8, E71T-1M H8, E71T-9C H8, E71T-9M H8
- AWS A5.20M, E491T-1C H8, E491T-1M H8, E491T-9C H8, E491T-9M H8
- ASME SFA 5.20, E71T-1C H8, E71T-1M H8, E71T-9C H8, E71T-9M H8
- ABS, 100% CO<sub>2</sub> S3YM HH (0.045" - 1/16" dia. electrodes)
- Burea Veritas, 100% CO<sub>2</sub>, S3YM HH (0.045" - 1/16" dia. electrodes)
- CWB, 100% CO<sub>2</sub> E491T-9-H8, 75-80% Ar/Balance CO<sub>2</sub>, E491T-9M-H8 (1.2 mm - 1.6 mm dia. electrodes)
- DNV, 100% CO<sub>2</sub>, Y40MS (H10)
- EN17632-A: T 46 3 P C/M 2 H10
- CE Marked per CPR 305/2011
- Lloyd's Reigster, 100% CO<sub>2</sub>, 3YS H10
- AWS D1.8/D1.8M, 100% CO<sub>2</sub> & 75% Ar/25% CO<sub>2</sub>, (0.045" [1.2 mm] & 1/16" [1.6 mm] dia. electrodes) (0.052" [1.4 mm] dia. 75% Ar/25% CO<sub>2</sub> only)

## FabCO® Triple 7

**ALL POSITION**

**AWS E71T-1C/M H8, E71T-9C/M H8**

Intended for single and multiple pass applications in all positions, it is designed for carbon and higher strength steels for excellent weldability with 75-85% argon/balance carbon dioxide but also runs great on 100% carbon dioxide. The fast freezing slag permits the welder to use a higher current to increase travel speeds while maintaining a flat bead contour in all positions. It offers easy slag removal, even from deep groove weldments.

**Benefits:**

- fast-freezing slag allows good puddle control and bead shape when welding out of position
- excellent slag removal reduces clean-up time and minimizes risk of inclusion
- very low spatter levels reduce clean-up time to help improve productivity
- very smooth, stable "spray-like" arc provides excellent operator appeal and bead appearance
- "H8" low-hydrogen weld deposit helps minimize the risk of hydrogen-induced cracking
- optimal on Argon/CO<sub>2</sub> mixes but also runs great on CO<sub>2</sub> increases flexibility

**Typical Applications:**

- shipbuilding
- railcar
- storage vessels
- general fabrication

**Typical Weld Metal Chemistry:**

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon.....	0.02	0.03
Manganese.....	1.30	1.50
Silicon.....	0.56	0.74
Phosphorus.....	0.012	0.011
Sulphur.....	0.009	0.009
Boron.....	0.0035	0.0045

**Typical Diffusible Hydrogen:**

6.5 ml/100g 6.5 ml/100g

**Typical Mechanical Properties (AW):**

Tensile Strength (psi)	79,000	85,000
	(545 MPa)	(586 MPa)
Yield Strength (psi)	72,500	77,500
	(500 MPa)	(534 MPa)
Elongation % in 2" (50mm)	26%	25%

**Typical Charpy V-notch Impact Values (AW):**

Avg. at 0°F (-20°C)	109 ft.lb. (148J)	93 ft.lb. (126J)
Avg. at -20°F (-30°C)	50 ft.lb. (68J)	67 ft.lb. (91J)

**Typical Operating Range:**

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	145-300	19-31	3/4"-1"(19-25 mm)
.052" (1.4 mm)	150-325	19-29	3/4"-1"(19-25 mm)
1/16" (1.6 mm)	150-350	19-30	3/4"-1"(19-25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-85% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E71T-1C H8, E71T-1M H8, E71T-9C H8, E71T-9M H8
- AWS A5.20M, E491T-1C H8, E491T-1M H8, E491T-9C H8, E491T-9M H8
- ASME SFA 5.20, E71T-1C H8, E71T-1M H8, E71T-9C H8, E71T-9M H8
- ABS, 100% CO<sub>2</sub> 3YSA H10
- ABS, 75% Ar/25% CO<sub>2</sub>, 3YSA H10
- CWB, E491T1-(C1A3, M21A3, M20A3)-CS1-H8 (E491T-9-H8, E491T-9M-H8)
- DNV-GL, (100% CO<sub>2</sub>, M21-Arc-20) III YMS
- EN ISO 17632-A: T46 3 P C1 2, T46 3 P M21 2
- CE Marked per CPR 305/2011

## FabCO® Triple 8

### ALL POSITION

#### AWS E71T-1CJ H8, E71T-9CJ H8

An all-position tubular wire with higher impact values than most other E71T-1 wires. Single or multiple pass welds with easy slag removal and low spatter levels allow this wire to be used in deep groove applications as well as standard joint configurations. The fast-freezing slag permits welder to use higher current to deposit more metal faster and produce a flat bead in all positions. It also offers excellent weldability with 100% carbon dioxide.

#### Benefits:

- excellent weldability with 100% CO<sub>2</sub>
- fast-freezing slag permits welder to use higher current to deposit more metal faster and produce a flat bead in all positions
- easy slag removal and low spatter results in less time on post-weld cleaning activities and more time welding

#### Typical Applications:

- heavy equipment
- shipbuilding
- railcar
- pressure vessels

#### Typical Weld Metal Chemistry:

Carbon .....	0.02
Manganese .....	1.03
Silicon .....	0.45
Phosphorus .....	0.017
Sulphur .....	0.011

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	82,000 (569 MPa)
Yield Strength (psi)	75,000 (519 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	103 ft.lb. (140J)
Avg. at -40°F (-40°C)	43 ft.lb. (58J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	100-340	23-35	3/4"(19 mm)
.052" (1.4 mm)	130-380	22-35	3/4"(19 mm)
1/16" (1.6 mm)	150-460	23-35	3/4"(19 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1CJ H8, E71T-9CJ H8
- AWS A5.20M, E491T-1CJ H8, E491T-9CJ H8
- ASME SFA 5.20, E71T-1CJ H8, E71T-9CJ H8
- ABS, 100% CO<sub>2</sub>, 4YSA H5
- CWB, 100% CO<sub>2</sub>, E491T-9 H8
- DNV, 100% CO<sub>2</sub>, IV YMS H5
- Lloyd's Register, 100% CO<sub>2</sub>, 4YS H5

## FabCO® Element™ 71T1C FabCO® Element™ 71T1M

### ALL POSITION

#### AWS E71T-1C H8, E71T-9C H8

This wire is designed as a low manganese E71T-1C product to assist with conformance to OSHA requirements and NIOSH and ACGIH environmental recommendations for manganese. This product offers reductions of manganese in the weld fume of 60-80% over a standard E71T-1C product with low diffusible hydrogen and excellent out of positional capability. The easy slag release reduces cleanup time and the risk of inclusions.

#### Benefits:

- enhanced out of position capability and low spatter/fume generation results in excellent operator appeal
- extremely low manganese emissions assist with conformance to environmental regulations
- easy slag release reduces cleanup time and the risk of inclusions

#### Typical Applications:

- shipbuilding
- heavy equipment
- structural steel
- general fabrication

#### Typical Weld Metal Chemistry:

Carbon .....	0.06
Manganese .....	0.20
Silicon .....	0.37
Phosphorus .....	0.010
Sulphur .....	0.012
Nickel .....	0.45

**Typical Diffusible Hydrogen:** 3.6 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	73,000 (503 MPa)
Yield Strength (psi)	64,000 (441 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	90 ft.lb. (122J)
Avg. at -20°F (-30°C)	75 ft.lb. (102J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	170-300	24-30	3/4"(19 mm)
.052" (1.4 mm)	180-350	24-30	1"(25 mm)
1/16" (1.6 mm)	215-400	24-31	1"(25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1C H8, E71T-9C H8
- AWS A5.20M, E491T-1C H8, E491T-9C H8
- ASME SFA 5.20, E71T-1C H8, E71T-9C H8
- ABS, 100% CO<sub>2</sub>, 2YSA H10
- CWB, 100% CO<sub>2</sub>, E491T-9-H8

### ALL POSITION

#### AWS E71T-1M H8, E71T-9M H8

Designed with extremely low manganese emissions, this E71T-1C product conforms to environmental OSHA requirements and NIOSH and ACGIH recommendations. It offers reductions of manganese in the weld fume of 60-80% over a standard E71T-1M product with low diffusible hydrogen. The enhanced out-of-position capability, low spatter/fume generation and easy slag release reduces cleanup time while creating a better welding environment.

#### Benefits:

- enhanced out of position capability and low spatter/fume generation results in excellent operator appeal
- extremely low manganese emissions assist with conformance to environmental regulations
- easy slag release reduces cleanup time and the risk of inclusions

#### Typical Applications:

- shipbuilding
- heavy equipment
- structural steel
- general fabrication

#### Typical Weld Metal Chemistry:

75% Ar/25% CO <sub>2</sub>	
Carbon .....	0.05
Manganese .....	0.21
Silicon .....	0.41
Phosphorus .....	0.011
Sulphur .....	0.012
Nickel .....	0.45

**Typical Diffusible Hydrogen:** 7.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	73,000 (503 MPa)
Yield Strength (psi)	62,000 (427 MPa)
Elongation % in 2" (50mm)	29%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	84 ft.lb. (114J)
Avg. at -20°F (-30°C)	65 ft.lb. (88J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	180-305	22-27	3/4"(19 mm)
.052" (1.4 mm)	170-350	23-29	1"(25 mm)
1/16" (1.6 mm)	225-405	22-29	1"(25 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1M H8, E71T-9M H8
- AWS A5.20M, E491T-1M H8, E491T-9M H8
- ASME SFA 5.20, E71T-1M H8, E71T-9M H8
- ABS, 75% Ar/25% CO<sub>2</sub>, 2YSA H10
- CWB, 75-85% Ar/Balance CO<sub>2</sub>, E491T-1M-H8

## FabCO® Element™ 71C

### ALL POSITION

#### AWS A5.29: E71T1-GC H8

An economical replacement for E71T-1C/-9 that conforms to environmental OSHA requirements and NIOSH and ACGIH recommendations. This product offers reductions of manganese in the weld fume of 60-80% over a standard E71T-1C product with low diffusible hydrogen.

#### Benefits:

- extremely low manganese emissions
- economical replacement for e71t-1/-9 that will assist with conformance to environmental regulations
- enhanced out of positional capability resulting in increased operator appeal

#### Typical Applications:

- general fabrication
- shipbuilding
- structural steel
- heavy equipment

#### Typical Weld Metal Chemistry:

Carbon (C) .....	0.05
Manganese (Mn) .....	0.22
Silicon (Si) .....	0.58
Phosphorus (P) .....	0.009
Sulphur (S) .....	0.008
Nickel (Ni) .....	1.43

**Typical Diffusible Hydrogen:** 5.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength	76,000 psi (524 MPa)
Yield Strength	68,600 psi (473 MPa)
Elongation % in 2" (50 mm)	27%"

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 66 ft.lb. (89 Joules)  
Avg. at -40°F (-40°C) 52 ft.lb. (71 Joules)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	175-300	24-29	3/4" (19mm)
.052" (1.4 mm)	175-340	25-30	3/4-1" (19-25mm)
1/16" (1.6 mm)	220-425	24-29	3/4-1" (19-25mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E71T1-GC H8
- AWS A5.29M, E491T1-GC H8
- AWS A5.36, E71T1-C1A4-G H8
- AWS A5.36M, E491T1-C1A4-G H8
- ASME SFA 5.29, E71T1-GC H8
- ABS, 100% CO<sub>2</sub>, 3YSA H10
- CWB, 100% CO<sub>2</sub>, E491T1-G H8

## FabCO® Element™ 71M

### ALL POSITION

#### AWS A5.29: E71T1-GM H8

Designed as a low manganese E71T-1M product to assist with conformance to OSHA requirements and NIOSH and ACGIH recommendations for manganese. This product offers reductions of manganese in the weld fume of 60-80% over a standard E71T-1M product with low diffusible hydrogen. It's capable of use with gas mixtures up to 90% argon, further reducing emissions and improving welding environment.

#### Benefits:

- extremely low manganese emissions economical replacement for e71t-1/-9 that will assist with conformance to environmental regulations
- capable of use with gas mixtures up to 90% argon further reducing emmissions and improving welding environment
- enhanced out of positional capability resulting in increased operator appeal

#### Typical Applications:

- general fabrication
- shipbuilding
- structural steel
- heavy equipment

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon (C).....	0.042.....	0.037
Manganese (Mn) .....	0.22.....	0.22
Silicon (Si) .....	0.67.....	0.69
Phosphorus (P) .....	0.010 .....	0.010
Sulphur (S) .....	0.007 .....	0.007
Nickel (Ni).....	1.86.....	1.87

#### Typical Diffusible Hydrogen:

7.0 ml/100 g                      7.3 ml/100 g

#### Typical Mechanical Properties (AW):

Tensile Strength	77,500 psi (534 MPa)	77,800 psi (536 MPa)
Yield Strength	68,350 psi (471 MPa)	68,150 psi (470 MPa)
Elongation % in 2" (50mm)	26%	27%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 67 ft.lb. (91 Joules) 79 ft.lb. (107 Joules)  
Avg. at -40°F (-40°C) 40 ft.lb. (54 Joules) 42 ft.lb. (57 Joules)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	170-325	23-28	3/4" (19mm)
.052" (1.4 mm)	180-350	25-30	3/4-1" (19-25mm)
1/16" (1.6 mm)	250-500	23-28	3/4-1" (19-25mm)

**Shielding Gas:** 75-90% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

## FabCO® 711M

### ALL POSITION

#### AWS E71T-1C/M H8

The stiff arc action of this wire enhances the deep penetration for out-of-position welding and can be used with straight carbon dioxide or 75-80% argon/balance carbon dioxide. It's designed for use welding carbon steels or higher strength steels where the properties of an E71T-1 are deemed adequate. Additionally, it eliminates fusion problems in all-position weldments.

#### Benefits:

- eliminates lack of fusion problems in all-position weldments
- higher deposition rates than GMAW wires in out of position welding
- stiff arc transfer for overhead welding
- can be used with straight CO<sub>2</sub> or 75-80% Ar/Balance CO<sub>2</sub>

#### Typical Applications:

- shipbuilding
- ship repair
- general structural
- general fabrication

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon .....	0.05	0.06
Manganese .....	1.08	1.33
Silicon .....	0.43	0.60
Phosphorus .....	0.007	0.008
Sulphur .....	0.013	0.014

#### Typical Diffusible Hydrogen:

4.9 ml/100g      7.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	86,000	92,000
	(593 MPa)	(635 MPa)
Yield Strength (psi)	74,000	80,000
	(514 MPa)	(554 MPa)
Elongation % in 2" (50mm)	26%	27%

#### Typical Charpy V-notch Impact Values

Avg. at 0°F (-20°C)      35 ft.lb.(48J)      25 ft.lb.(34J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-320	25-32	3/4"(19 mm)
.052" (1.4 mm)	275-350	27-31	3/4"(19 mm)
1/16" (1.6 mm)	300-400	28-32	3/4"(19 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1C H8, E71T-1M H8
- AWS A5.20M, E491T-1C H8, E491T-1M H8
- ASME SFA 5.20, E71T-1C H8, E71T-1M H8
- ABS, 75% Ar/25% CO<sub>2</sub>

## FabCO® 712M

### ALL POSITION

#### AWS E71T-1MJ H4, E71T-9MJ H4, E71T-12MJ H4

This all-position wire with low hydrogen levels is formulated to allow excellent mechanical toughness properties at lower temperatures in both the as-welded and post-weld heat treatment conditions. The low levels of diffusible hydrogen mess less preheating and a decreased chance of underbead cracking. Its low moisture pickup helps to maintain low diffusible hydrogen levels after exposure and fast freezing slag makes it suitable for all-position welding.

#### Benefits:

- fast freezing slag makes 712M suitable for all position welding
- low levels of diffusible hydrogen equates to less needed preheating and a decreased chance of under-bead cracking
- excellent low temperature CVN impact properties makes 712M resistant to cracking in severe applications
- low moisture pickup helps to maintain low diffusible hydrogen levels after exposure

#### Typical Applications:

- offshore drilling rigs
- jackup rig fabrication
- transmission and process piping
- shipbuilding

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>
Carbon .....	0.05
Manganese .....	1.36
Silicon .....	0.26
Phosphorus .....	0.009
Sulphur .....	0.008
Nickel .....	0.46

**Typical Diffusible Hydrogen:** 3.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	79,000 (544 MPa)
Yield Strength (psi)	70,000 (482 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	100 ft.lb. (135J)
Avg. at -50°F (-45°C)	92 ft.lb. (124J)
Avg. at -76°F (-60°C)	75 ft.lb. (101J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	125-250	24	3/4" (19 mm)
1/16" (1.6 mm)	150-316	24-25	3/4" (19 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP



## FabCO® 712C

### ALL POSITION

#### AWS E71T-1CJ H4, E71T-9CJ H4, E71T-12CJ H4

Formulated to produce excellent mechanical properties at lower temperatures in both the as welded and post weld heat treat conditions. All position wire with low hydrogen levels

#### Benefits:

- resists cracking in severe applications
- resists underbead cracking
- assists in producing smooth weld beads with uniform fusion
- reduces surface preparation requirements, increases productivity
- suitable for all-position welding

#### Typical Applications:

- non-alloyed and fine grain steels
- structural applications
- storage vessels
- single or multi-pass welding
- earthmoving equipment
- shipbuilding

#### Typical Weld Metal Chemistry:

Carbon.....	0.03
Manganese.....	1.50
Silicon.....	0.36
Phosphorus.....	0.011
Sulphur.....	0.010
Nickel.....	0.41

**Typical Diffusible Hydrogen:** 3.2 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	81,000 (558 MPa)
Yield Strength (psi)	75,000 (517 MPa)
Elongation % in 2" (50mm)	27%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	124 ft.lb. (168J)
Avg. at -76°F (-60°C)	105 ft.lb. (142J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
0.045 (1.2mm)	170-280	24-28	3/4" (19mm)
0.052 (1.4mm)	175-285	24-28	3/4" (19mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1CJ H4, E71T-9CJ H4, E71T-12CJ H4
- AWS A5.20M, E491T-1CJ H4, E491T-9CJ H4, E491T-12CJ H4
- ASME SFA 5.20, E491T-1CJ H4, E491T-9CJ H4, E491T-12CJ H4
- CWB, 100% CO<sub>2</sub>, E491T1-C1A4-CS2-H4 (E491T-12J-H4), [1.2 mm - 1.4mm diameter electrodes]
- EN 17632-A: T42 6 P C1 2 H5
- CE Marked per CPR 305/2011 (1.2 - 1.4 mm diameter electrodes)

## FabCO® XL-550

### ALL POSITION

#### AWS E71T-1CJ H4, E71T-9CJ H4, E71T-12CJ H4

Formulated to allow excellent impact values at lower temperatures, this all-position wire with low hydrogen levels has high impact strengths at low temperatures resists cracking in severe applications. The low diffusible hydrogen weld deposit resists underbead cracking and the high-deoxidizer formulation reduces surface preparation requirements. Additionally, excellent arc characteristics assist in producing smooth weld beads with uniform fusion.

#### Benefits:

- high impact strengths at low temperatures resists cracking in severe applications
- low diffusible hydrogen weld deposit resists underbead cracking
- high-deoxidizer formulation reduces surface preparation requirements, increases productivity
- excellent arc characteristics assist in producing smooth weld beads with uniform fusion

#### Typical Applications:

- structural applications
- non-alloyed and fine grain steels
- earthmoving equipment
- shipbuilding

#### Typical Weld Metal Chemistry:

Carbon.....	0.03
Manganese.....	1.15
Silicon.....	0.20
Phosphorus.....	0.007
Sulphur.....	0.007
Nickel.....	0.42

**Typical Diffusible Hydrogen:** 3.6 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	83,000 (572 MPa)
Yield Strength (psi)	76,000 (524 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	90 ft.lb. (122J)
Avg. at -50°F (-45°C)	85 ft.lb. (115J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
0.045 (1.2mm)	200-225	24-26	3/4-1" (19-25mm)
0.052 (1.4mm)	225-250	24-27	3/4-1" (19-25mm)
1/16" (1.6 mm)	225-275	24-26	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1CJ H4, E71T-9CJ H4, E71T-12CJ H4
- AWS A5.20M, E491T-1CJ H4, E491T-9CJ H4, E491T-12CJ H4
- ASME SFA 5.20, E491T-1CJ H4, E491T-9CJ H4, E491T-12CJ H4
- AWS A5.36, E71T1-C1A5-CS2-H4, 71T1-C1P5-CS2-H4
- ABS, 100% CO<sub>2</sub>, 4YSA H5 (1.2mm and 1.4mm diameter electrodes)
- ABS, 100% CO<sub>2</sub>, 4YSA H10 (1.6mm diameter electrodes)
- CWB, 100% CO<sub>2</sub>, E491T-9-H4
- DNV, 100% CO<sub>2</sub>, IV YMS (H5) (1.2mm and 1.4mm diameter electrodes)
- Lloyd's Register, 100% CO<sub>2</sub>, 3Y40S H10 (1.6mm diameter electrodes)

## FabCO® XL-525

### ALL POSITION

#### AWS E71T-1M H8, E71T-9M H8, E71T-12MJ H8

This all-position wire with low hydrogen levels is formulated to allow excellent impact values and toughness at lower temperatures. The low levels of diffusible hydrogen conform to MIL-E-24403/1D and decrease the chance of underbead cracking while outstanding weldability prevents worm tracks under normal welding conditions.

#### Benefits:

- low levels of diffusible hydrogen conforms to MIL-E-24403/1D, and decreases chance of under-bead cracking
- excellent toughness at low temperatures
- outstanding weldability prevents worm tracks under normal welding conditions

#### Typical Applications:

- ship and barge construction
- offshore structures
- general fabrication
- pressure vessels

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>
Carbon	0.04
Manganese	1.24
Silicon	0.29
Phosphorus	0.010
Sulphur	0.015
Nickel	0.37

**Typical Diffusible Hydrogen:** 3.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	82,000 (566 MPa)
Yield Strength (psi)	73,000 (503 MPa)
Elongation % in 2" (50mm)	29%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	100 ft.lb. (136J)
Avg. at -40°F (-40°C)	66 ft.lb. (90)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	100-250	24-27	1/2" (13 mm)
.052" (1.4 mm)	175-400	23-35	3/4" (19 mm)
1/16" (1.6 mm)	250-475	24-29	3/4" (19 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1M H8, E71T-9M H8, E71T-12MJ H8
- AWS A5.20M, E491T-1M H8, E491T-9M H8, 91T-12MJ H8
- ASME SFA 5.20, E71T-1M H8, E71T-9M H8, 71T-12MJ H8
- ABS, 75-80% Ar/Balance CO<sub>2</sub>, 3YSA H5
- CWB, 75-85% Ar/Balance CO<sub>2</sub>, E491T-12MJ H4
- DNV, 75-85% Ar/Balance CO<sub>2</sub>, III Y40MS
- Lloyd's Register, 80% Ar/20% CO<sub>2</sub>, 3YS H15
- Bureau Veritas, 80% Ar/20% CO<sub>2</sub>, S3YM

## FabCO® 910

### ALL POSITION

#### AWS E71T-1MJ, E71T-9MJ, E71T-12MJ

With excellent out-of-position capability, this wire is specially designed for use with high argon shielding mixes, such as 95% argon/5% carbon dioxide. Its arc characteristics provide consistent appearance and weld quality while the enhanced slag release and low spatter reduce post-weld cleanup.

#### Benefits:

- excellent arc characteristics provide consistent appearance and weld quality
- excellent out-of-position capability
- enhanced slag release
- low spatter for reduced post weld cleanup

#### Typical Applications:

- shipbuilding
- railcar
- pressure vessels
- heavy equipment

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	95% Ar/5% CO <sub>2</sub>
Carbon	0.04	0.07
Manganese	0.72	0.90
Silicon	0.35	0.47
Phosphorus	0.007	0.014
Sulphur	0.01	0.011
Nickel	0.44	0.48

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	80,000 (550 MPa)	84,800 (585 MPa)
Yield Strength (psi)	66,000 (456 MPa)	77,100 (532 MPa)
Elongation % in 2" (50mm)	29%	25.5%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -0°F (-20°C)	89 ft.lb.(121J)	109 ft.lb.(148J)
Avg. at -40°F (-40°C)	35 ft.lb.(47J)	47 ft.lb.(64J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-325	23-27	3/4" (19 mm)
1/16" (1.6 mm)	200-350	23-26	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E71T-1M, E71T-9M, E71T-12MJ
- AWS A5.20M, E491T-1M, E491T-9M, E491T-12MJ
- ASME SFA 5.20, E71T-1M, E71T-9M, E71T-12MJ
- CWB, 75-92% Ar/Balance CO<sub>2</sub>, E491T-12MJ
- MIL-E-24403/1, MIL-71T-1-HYR

## Fabshield® 4

### FLAT & HORIZONTAL

#### AWS E70T-4

This self-shielding tubular wire is designed for high deposition rates and used for mild steel applications. It can also be used outdoors without shelter. The large diameter and high deposition rates help increase productivity while easy slag removal reduces cleanup time. Its desulfurizer weld metal also helps minimize the risk of cracking.

#### Benefits:

- self-shielded; can be used outdoors without sheltering
- large diameter and high deposition rates help increase productivity
- easy slag removal reduces cleanup time
- desulfurizes weld metal to help minimize risk of cracking

#### Typical Applications:

- machine fabrication and repair
- industrial equipment
- heavy equipment
- foundry/steel mill

#### Typical Weld Metal Chemistry:

Carbon	.....0.27
Manganese	.....0.73
Phosphorus	.....0.011
Sulphur	.....0.005
Aluminum	.....1.42

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	93,000 (641 MPa)
Yield Strength (psi)	62,000 (427 MPa)
Elongation % in 2" (50mm)	24%

#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	250-375	28-31	2" (50 mm)
3/32" (2.4 mm)	250-500	28-34	2 1/2" (65mm)
.120" (3.0 mm)	450-675	28-37	2 3/4" (70mm)

**Shielding Gas:** None required

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-4
- AWS A5.20M, E490T-4
- ASME SFA 5.20, E70T-4

## Fabshield® XLNT-6

### FLAT & HORIZONTAL

#### AWS E70T-6

Designed for use outside, self-shielded high-deposition wire with low-temperature impact toughness optimized performance for flat and horizontal welding. The large diameters with high deposition rates improve productivity while good slag release reduces cleanup time and minimizes the risk of inclusion.

#### Benefits:

- large diameters with high deposition rates provide improved productivity
- good slag release reduces cleanup time and minimizes risk of inclusion
- optimized performance for flat & horizontal welding provides improved operator appeal
- self-shielded; can be used outdoors without sheltering

#### Typical Applications:

- structural steel fabrication
- AWS D1.8 Demand Critical welds
- ship and barge construction
- heavy equipment repair

#### Typical Weld Metal Chemistry:

Carbon	.....0.10
Manganese	.....1.34
Silicon	.....0.18
Phosphorus	.....0.010
Sulphur	.....0.004
Nickel	.....0.42
Aluminum	.....1.00

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	85,000 (586 MPa)
Yield Strength (psi)	64,000 (441 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	45 ft.lb. (61J)
Avg. at -20°F (-30°C)	35 ft.lb. (47J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	270-450	21-27	1" (25 mm)
3/32" (2.4 mm)	300-500	22-26	1" (25 mm)

**Shielding Gas:** None required

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-6
- AWS A5.20M, E490T-6
- ASME SFA A5.20, E70T-6
- AWS D1.8/D1.8M Conformance, [3/32" (2.4 mm) diameter]

## Fabshield® 7027

### FLAT & HORIZONTAL

#### AWS E70T-7

This straight polarity, self-shielded tubular wire has low spatter with easy slag removal for carbon steels and can be used outdoors without shelter. An excellent arc stability helps maintain consistent weld appearance and quality and offers an optimized performance for flat and horizontal welding. The large diameters with high deposition rates provide improved productivity.

#### Benefits:

- large diameters with high deposition rates provide improved productivity
- excellent arc stability helps maintain consistent weld appearance and quality
- optimized performance for flat & horizontal welding provides improved operator appeal
- self-shielded; can be used outdoors without sheltering

#### Typical Applications:

- shipbuilding
- barge repair
- machine fabrication and repair
- general fabrication

#### Typical Weld Metal Chemistry:

Carbon	.....0.33
Manganese	.....0.28
Silicon	.....0.05
Phosphorus	.....0.014
Sulphur	.....0.005
Aluminum	.....1.30

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	92,200 (6364 MPa)
Yield Strength (psi)	63,200 (434 MPa)
Elongation % in 2" (50mm)	23%

#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
3/32" (2.4 mm)	250-550	27-32	1 3/4" (44 mm)
7/64" (2.8 mm)	325-600	24-32	1 3/4" (44 mm)

**Shielding Gas:** None required

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.20, E70T-7
- AWS A5.20M, E490T-7
- ABS, E70T-7 (5/64" - 7/64" diameters)
- ASME SFA A5.20, E70T-7

## Fabshield® XLR-8

### ALL POSITION

#### AWS E71T-8JD H8

Ideal for use outside, this wire is used for almost any general-purpose welding application and in any position. It welds out-of-position at high currents with excellent slag removal to increase productivity and reduce the risk of inclusion. Additionally, it offers excellent mechanical properties within a wide range of heat inputs.

#### Benefits:

- welds out of position at high currents for high productivity
- excellent mechanical properties within a wide range of heat inputs
- self-shielded; can be used outdoors without sheltering
- excellent slag removal reduces cleanup time and risk of inclusion

#### Typical Applications:

- structural steel fabrication
- AWS D1.8 Demand Critical welds
- ship and barge construction
- heavy equipment repair

#### Typical Weld Metal Chemistry:

Carbon	.....0.19
Manganese	.....0.51
Silicon	.....0.17
Phosphorus	.....0.009
Sulphur	.....0.006
Aluminum	.....0.51

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000 (579 MPa)
Yield Strength (psi)	68,000 (469 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	40 ft.lb. (54J)
Avg. at -40°F (-40°C)	30 ft.lb. (41J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	175-275	18-23	1" (25 mm)
.072" (1.8 mm)	175-315	18-23	1" (25 mm)
5/64" (2.0 mm)	200-340	18-24	1 1/4" (32 mm)

**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.20, E71T-8JD H8
- AWS A5.20M, E491T-8JD H8
- ASME SFA 5.20, E71T-8JD H8
- ABS, 3YSA H10 (1/16" - 5/64" diameters)
- CWB, E491T-8J-H8 (1.6 - 2.0 mm diameters)
- EN 17632-A: T42 2 Y N 2 H10
- CE Marked per CPR 305/2011 (1.6 - 2.0 mm diameters)
- AWS D1.8/D1.8M Conformance [1/16" - 5.64" (1.6 - 2.0 mm) diameters]

## Fabshield® 21B

### ALL POSITION

#### AWS E71T-11

This wire is used for almost any general-purpose welding application outdoors and in any position. The deoxidizer content provides quality welds on dirty, rusty, or coated materials and it works well on coated steels. Small diameters are available for thin materials and light-duty power supplies.

#### Benefits:

- self-shielded; can be used outdoors
- small diameters available for thin materials and light-duty power supplies
- excellent arc characteristics promote ease of use
- deoxidizer content provides quality welds on dirty, rusty, or coated materials

#### Typical Applications:

- general fabrication
- light structurals (under 3/4") & ancillary connections
- light-duty agricultural equipment repair
- galvanized sheet metal

#### Typical Weld Metal Chemistry:

Carbon	.....0.28
Manganese	.....0.34
Silicon	.....0.15
Phosphorus	.....0.008
Sulphur	.....0.003
Aluminum	.....1.72

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	91,000 (627 MPa)
Yield Strength (psi)	62,000 (427 MPa)
Elongation % in 2" (50mm)	22%

#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.030" (0.8 mm)	25-125	14-16	1/2" (13mm)
.035" (0.9 mm)	55-120	17-20	1/2" (13mm)
.045" (1.2mm)	115-200	15-18	1/2" (13mm)
1/16" (1.6 mm)	160-260	17-20	3/4" (19 mm)
.068" (1.8 mm)	145- 315	17-22	3/4" (19 mm)
5/64" (2.0 mm)	185-315	16-22	1" (25 mm)

**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.20, E71T-11
- AWS A5.20M, E491T-11
- ASME SFA 5.20, E71T-11
- ABS, E71T-11 (0.045" - 3/32" diameters)
- CWB, E491T-11 H8 (1.2 - 1.6 mm diameters)

## Fabshield® 23

### ALL POSITION

#### AWS E71T-14

Designed for use outdoors, the higher deoxidizing elements make this an excellent choice for welds on coated materials and the soft arc makes this a good choice for thin gauge steels. Small diameters are available for thin materials and light-duty power supplies and the excellent operating characteristics suitable for hobbyist use. The very high deoxidizer content provides quality welds on dirty, rusty or coated materials.

#### Benefits:

- self-shielded; can be used outdoors
- small diameters available for thin materials and light-duty power supplies
- excellent operating characteristics suitable for hobbyist use
- very-high deoxidizer content provides quality welds on dirty, rusty, or coated materials

#### Typical Applications:

- single-pass welding ONLY
- automotive & galvanized sheet metal
- ornamental iron
- light-duty repairs

#### Typical Weld Metal Chemistry:

Carbon	.....0.18
Manganese	.....0.65
Silicon	.....0.40
Phosphorus	.....0.01
Sulphur	.....0.01
Aluminum	.....1.30

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	77,000 (531 MPa)
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#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	125-150	15-17	1/2" (13 mm)
1/16" (1.6 mm)	150-250	18-20	3/4" (19 mm)

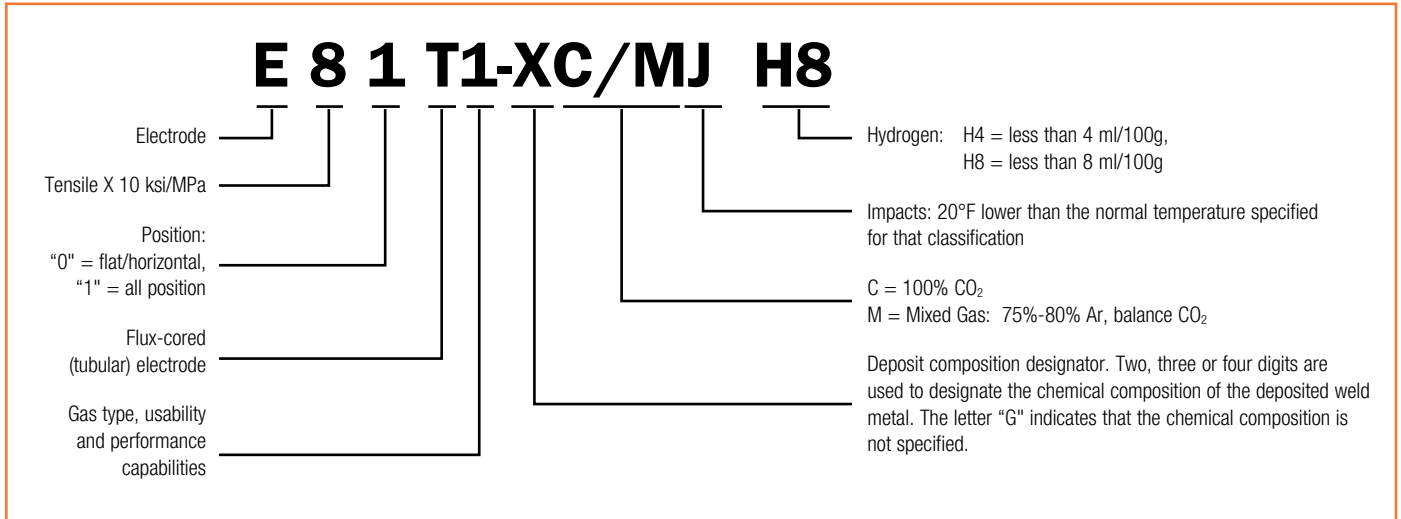
**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.20, E71T-14
- AWS A5.20M, E491T-14
- ASME SFA 5.20, E71T-14
- CWB, E491T-GS (1.2 mm diameter)

## How AWS Classifies Low Alloy Flux Cored (Tubular) Wires, FCAW Process (AWS A5.29)



### Low Alloy Flux Cored Designator Chart

#### Carbon-Molybdenum Weld Metal

**A1** .12% Max Carbon, .40 - .65% Molybdenum

#### Chromium-Molybdenum Weld Metal

**B2** 1.00 - 1.50% Chromium, .40 - .65% Molybdenum

**B3** 2.00 - 2.50% Chromium, .90 - 1.20% Molybdenum

**B6** 4.00 - 6.00% Chromium, .45 - .65% Molybdenum

**B9** 8.00 - 10.50% Chromium, .85 - 1.20% Molybdenum, .15 - .30% Vanadium

#### Nickel Weld Metal

**Ni1** .80 - 1.20% Nickel

**Ni2** 1.75 - 2.25% Nickel

#### Manganese-Molybdenum Weld Metal

**D2** 1.60 - 2.25% Manganese, .25 - .55% Molybdenum

#### Manganese-Nickel-Molybdenum Weld Metal

**K2** .50 - 1.75% Manganese, 1.00 - 2.00% Nickel, .35% Max. Molybdenum

**K3** .75 - 2.25% Manganese, 1.20 - 2.60% Nickel, .25 - .65% Molybdenum

**K4** 1.20 - 2.25% Manganese, 1.75 - 2.60% Nickel, .20 - .65% Molybdenum, .20 - .60% Chromium

#### Weld Metal for Weathering Steels

**W2** Addition of Copper for Weathering Steels

## FabCO® 81N1

### FLAT & HORIZONTAL

#### AWS E80T1-Ni1C/MJ H8

With 1% nickel weld deposit and an excellent CVN toughness for critical applications, this wire provides atmospheric corrosion resistance. Additionally, the low hydrogen minimizes the risk of hydrogen embrittlement. It is ideal for applications where low temperature notch toughness is required and can be used on weathering types of steel where color match is not required.

#### Benefits:

- excellent CVN toughness for critical applications
- high deposition rates help increase productivity
- low hydrogen to minimize risk of hydrogen embrittlement
- 1% nickel weld deposit provides atmospheric corrosion resistance

#### Typical Applications:

- structural fabrication
- bridge fabrication
- weathering steels
- heavy equipment

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.075	0.06
Manganese	1.26	1.40
Silicon	0.54	0.65
Phosphorus	0.011	0.007
Sulphur	0.008	0.011
Nickel	0.98	0.91

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	91,000	96,000
	(628 MPa)	(662 MPa)
Yield Strength (psi)	80,000	88,000
	(552 MPa)	(607 MPa)
Elongation % in 2" (50mm)	26%	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	37 ft.lb. (50J)	45 ft.lb. (61J)
Avg. at -40°F (-40°C)	22 ft.lb. (30J)	35 ft.lb. (48J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	240-520	26-31	1"(25 mm)
3/32" (2.4 mm)	400-650	27-35	1-1/4"(32 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E80T1-Ni1C H8, E80T1-Ni1M H8
- AWS A5.29M, E550T1-Ni1C H8, E550T1-Ni1M H8
- ASME SFA 5.29, E80T1-Ni1C H8, E80T1-Ni1M H8
- CWB, 100% CO<sub>2</sub>, E550T-Ni1C H8
- CWB, 75-90% Ar/Balance CO<sub>2</sub>, E550T-Ni1M-H8
- ABS, 100% CO<sub>2</sub>, E80T1-Ni1CJ H8

## FabCO® 811N1

### ALL POSITION

#### AWS E81T1-Ni1C/MJ H4

This all-position, flux-cored wire can be used in applications where low-temperature notch toughness is required and on weathering steels when a color match is not required. The 1% nickel weld deposit provides atmospheric corrosion resistance and the low hydrogen minimizes the risk of hydrogen embrittlement.

#### Benefits:

- excellent CVN toughness for critical applications
- high deposition rates help increase productivity
- low hydrogen to minimize risk of hydrogen embrittlement
- 1% nickel weld deposit provides atmospheric corrosion resistance

#### Typical Applications:

- structural fabrication
- bridge fabrication
- weathering steels
- heavy equipment

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.03	0.06
Manganese	1.09	1.39
Silicon	0.32	0.53
Phosphorus	0.007	0.009
Sulphur	0.005	0.008
Nickel	1.01	1.00

#### Typical Diffusible Hydrogen:

2.4 ml/100g	3.0 ml/100g
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#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	83,000	93,000
	(572 MPa)	(641 MPa)
Yield Strength (psi)	73,000	85,000
	(503 MPa)	(586 MPa)
Elongation % in 2" (50mm)	26%	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	65 ft.lb. (88J)	40 ft.lb. (54J)
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#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	125-250	24-28	3/4"(19 mm)
1/16" (1.6 mm)	150-300	24-27	1"(25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E71T1-Ni1CJ H4, E81T1-Ni1MJ H4
- AWS A5.29M, E551T1-Ni1CJ H4, E551T1-Ni1MJ H4
- ASME SFA 5.29, E81T1-Ni1CJ H4, E81T1-Ni1MJ H4
- CWB, 100% CO<sub>2</sub>, E551T-Ni1CJ-H4
- CWB, 75-80% Ar/Balance CO<sub>2</sub>, E551T-Ni1M-JH8
- ABS, 100% CO<sub>2</sub>, 3YSA
- AWS D1.8, 75% Ar/25% CO<sub>2</sub> (1/16" diameter electrode)

## FabCO® 812-Ni1M

### ALL POSITION

#### AWS A5.29: E81T1-Ni1 MJ H4

This all-position wire with low hydrogen levels is formulated to allow excellent mechanical toughness properties at lower temperatures in both the as-welded and post-weld heat treatment conditions. It has a high average Crack Tip Opening Displacement (CTOD) value that meets NACE requirements required by many oil and gas applications.

#### Benefits:

- excellent low-temperature impact toughness
- consistently maintains good mechanical properties & toughness following extended post-weld stress relief
- high average Crack Tip Opening Displacement (CTOD) value meets NACE requirements demanded by many oil and gas applications
- low diffusible hydrogen electrode with low moisture pickup

#### Typical Applications:

- offshore drilling rigs
- transmission and process piping
- jackup rig fabrication
- shipbuilding

#### Typical Weld Metal Chemistry:

Carbon	0.07	Sulphur	0.008
Manganese	1.36	Phosphorus	0.009
Silicon	0.31	Nickel	0.85

#### Typical Diffusible Hydrogen:

As Received	24 Hr. Exposure
3.4 ml/100 g	3.7 ml/100 g

#### Typical Mechanical Properties (AW):

	As Welded	PWHT 8 Hrs @1150° (620°C)
Tensile Strength (psi)	93,000	82,000
	(640 MPa)	(566 MPa)
Yield Strength	80,000	73,000
	(552 MPa)	(504 MPa)
Elongation % in 2"(50 mm)	24%	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	90 ft.lb.	80 ft.lb.
	(121 Joules)	(108 Joules)
Avg. at -50°F (-45°C)	82 ft.lb.	70 ft.lb.
	(108 Joules)	(95 Joules)
Avg. at -76°F (-60°C)	60 ft.lb.	45 ft.lb.
	(81 Joules)	(60 Joules)

#### Typical Operating Range:

Diameter	Amps	Volts	CTWD
0.045"	125-280	24-25	3/4" (19mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-Ni1 M H4
- AWS A5.29M, E551T1-Ni1 M H4
- ASME SFA 5.29, E81T1-Ni1 M H4
- ABS, 75% Ar/25% CO<sub>2</sub>, 5Y400 H5

## FabCO® 803

### ALL POSITION

#### AWS E81T1-Ni2C/MJ H4

This wire is especially suited for those fine-grained steels where low-temperature CVN toughness is needed and ideal for welding 2% nickel steels. It provides a fast-freezing slag, low spatter, excellent arc characteristics, and high impact strengths at low temperatures.

#### Benefits:

- fast-freezing slag for excellent out-of-position performance
- low spatter for reduced post weld cleanup
- excellent arc characteristics for enhanced operator appeal
- high impact strengths at low temperatures for severe applications

#### Typical Applications:

- weathering steels
- offshore construction
- shipbuilding
- HSLA steels

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.04	0.05
Manganese	1.00	1.25
Silicon	0.20	0.40
Phosphorus	0.010	0.010
Sulphur	0.012	0.010
Nickel	1.84	2.00

#### Typical Diffusible Hydrogen:

2.6 ml/100g 2.7 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	88,000 (609 MPa)	96,000 (660 MPa)
Yield Strength (psi)	81,000 (535 MPa)	86,000 (596 MPa)
Elongation % in 2" (50mm)	27%	24%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	72 ft.lb. (98J)	55 ft.lb. (74J)
Avg. at -60°F (-50°C)	68 ft.lb. (92J)	44 ft.lb. (60J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	100-250	22-28	3/4" (19 mm)
.052" (1.4 mm)	200-300	25-28	3/4" (19 mm)
1/16" (1.6 mm)	150-300	25-27	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-Ni2CJ H4, E81T1-Ni2MJ H4
- AWS A5.29M, E551T1-Ni2CJ H4, E551T1-Ni2MJ H4
- ASME SFA 5.29, E81T1-Ni2CJ H4, E81T1-Ni2MJ H4
- CWB, 100% CO<sub>2</sub>, E551T1-Ni2C-JH4
- CWB, 75-80% Ar/Balance CO<sub>2</sub>, E551T1-Ni2M-JH4
- DNV, 100% CO<sub>2</sub>, III Y40MS
- DNV, 75% Ar/25% CO<sub>2</sub>, III Y40MS
- ABS, 100% CO<sub>2</sub>, 3YSA
- Lloyd's Register, 100% CO<sub>2</sub>, 3YS H15
- Lloyd's Register, 75% Ar/25% CO<sub>2</sub>, 3YS H15
- AWS D1.8, 100% CO<sub>2</sub> (1/16" diameter electrode)

## FabCO® 881K2

### ALL POSITION

#### AWS E81T1-K2C/MJ H8

Designed for use in the offshore market, this wire has excellent low-temperature impact properties in both as-welded and stress-relieved conditions. Low hydrogen increases resistance to hydrogen cracking and low spatter decreases post-weld cleanup.

#### Benefits:

- low spatter for decreased post weld cleanup
- excellent low temperature impact properties in both as welded and stress relieved conditions
- low hydrogen for increased resistance to hydrogen cracking

#### Typical Applications:

- HSLA steels
- offshore construction
- shipbuilding
- heavy equipment

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	80% Ar/20% CO <sub>2</sub>
Carbon	0.04	0.06
Manganese	0.97	1.23
Silicon	0.19	0.29
Phosphorus	0.010	0.009
Sulphur	0.015	0.015
Molybdenum	0.01	0.01
Nickel	1.62	1.52

#### Typical Diffusible Hydrogen:

3.5 ml/100g 4.0 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	88,000 (607 MPa)	96,000 (662 MPa)
Yield Strength (psi)	79,000 (545 MPa)	86,000 (593 MPa)
Elongation % in 2" (50mm)	24%	21%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	82 ft.lb. (111J)	66 ft.lb. (89J)
Avg. at -76°F (-60°C)	—	53 ft.lb. (71J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	100-300	22-30	7/8" (22 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-K2CJ H8, E81T1-K2MJ H8
- AWS A5.29M, E551T1-K2CJ H8, E551T1-K2MJ H8
- ASME SFA 5.29, E81T1-K2CJ H8, E81T1-K2MJ H8
- ABS, 80% Ar/20% CO<sub>2</sub>, E81T1-K2M
- Lloyd's Register, 80% Ar/20% CO<sub>2</sub>, 4Y42S H10
- Bureau Veritas, 75-80% Ar/Balance CO<sub>2</sub>, S5Y42M
- DNV, 75-80% Ar/Balance CO<sub>2</sub>, V Y42MS (H10)
- EN17632-A: T 46 6 1.5Ni P M 2 H5
- CE Marked per CPR 305/2011

## FabCO® 81K2-C

### ALL POSITION

#### AWS E81T1-K2CJ H8

Ideal for mild and low alloy steel applications, this all-position wire is designed for 100% carbon dioxide gas. The fast freezing slag provides superior out-of-position performance and low spatter reduces post-weld cleanup. Additionally, it offers excellent toughness at low temperatures.

#### Benefits:

- fast freezing slag for superior out-of-position performance
- excellent operator appeal
- low spatter for reduced post weld cleanup
- excellent toughness at low temperatures

#### Typical Applications:

- HSLA steels
- offshore construction
- shipbuilding
- heavy equipment

#### Typical Weld Metal Chemistry:

Carbon	0.07
Manganese	1.13
Silicon	0.27
Phosphorus	0.015
Sulphur	0.014
Nickel	1.67

**Typical Diffusible Hydrogen:** 3.9 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	87,000 (600 MPa)
Yield Strength (psi)	78,000 (538 MPa)
Elongation % in 2" (50mm)	27%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C) 91 ft.lb. (123J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-300	23-30	1" (25 mm)
1/16" (1.6 mm)	175-400	23-31	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-K2CJ H8
- AWS A5.29M, E551T1-K2CJ H8
- ASME SFA 5.29, E81T1-K2CJ H8
- ABS, 100% CO<sub>2</sub>, 3YSA H10 (0.045" diameter electrode)
- ABS, 100% CO<sub>2</sub>, 3Y400S H5

## FabCO® 991K2

### ALL POSITION

#### AWS E91T1-K2C/M H8

This all-position wire can be used with mixed gas as well as 100% carbon dioxide. It offers fast freezing slag for enhanced out-of-position performance, enhanced slag release and low smoke and spatter.

#### Benefits:

- low smoke and spatter
- fast freezing slag for enhanced out-of-position performance
- enhanced slag release

#### Typical Applications:

- HSLA or Q&T steels
- ideal for A514, A710, and HY-80 steels
- shipbuilding
- heavy equipment

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.05	0.06
Manganese	1.04	1.57
Silicon	0.19	0.35
Phosphorus	0.009	0.009
Sulphur	0.014	0.015
Nickel	1.92	1.69
Molybdenum	0.01	0.01

#### Typical Diffusible Hydrogen:

5.0 ml/100g 6.5 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	92,000	101,800
	(635 MPa)	(702 MPa)
Yield Strength (psi)	80,000	93,400
	(552 MPa)	(644 MPa)
Elongation % in 2" (50mm)	27%	24%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	63 ft.lb. (85J)	52 ft.lb. (71J)
Avg. at -60°F (-50°C)	—	26 ft.lb. (35J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-300	23-30	1/2" (13 mm)
1/16" (1.6 mm)	175-350	23-29	1/2" (13 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E91T1-K2C H8, E91T1-K2M H8
- AWS A5.29M, E621T1-K2C H8, E621T1-K2M H8
- ASME SFA 5.29, E91T1-K2C H8, E91T1-K2M H8
- CWB, 100% CO<sub>2</sub>, E621T1-K2C-H8
- ABS, 100% CO<sub>2</sub>, E91T1-K2C H8
- ABS, 75% Ar/25% CO<sub>2</sub>, E91T1-K2M H8

## FabCO® 95K2

### FLAT & HORIZONTAL

#### AWS E90T5-K2C/M H4

Excellent for high tensile strength and low-temperature impact properties, the basic slag formulation also ensures that the weld deposit will be low in diffusible hydrogen. It provides great fracture toughness, increased toughness at low temperature and increased resistance to cracking.

#### Benefits:

- excellent fracture toughness
- outstanding resistance to cracking
- versatile chemistry

#### Typical Applications:

- HSLA or Q&T steels
- ideal for A514, A709 gd HPS70W, A710, and HY-80 steels
- shipbuilding
- offshore construction

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.05	0.05
Manganese	0.91	1.10
Silicon	0.45	0.60
Phosphorus	0.010	0.009
Sulphur	0.009	0.008
Molybdenum	0.19	0.19
Nickel	1.56	1.64

#### Typical Diffusible Hydrogen:

1.1 ml/100g 1.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	90,000	98,000
	(637 MPa)	(673 MPa)
Yield Strength (psi)	78,000	88,000
	(540 MPa)	(605 MPa)
Elongation % in 2" (50mm)	26%	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	74 ft.lb.(100J)	75 ft.lb.(102J)
Avg. at -60°F (-50°C)	66 ft.lb.(90J)	63 ft.lb.(85J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-485	25-34	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E90T5-K2C H4, E90T5-K2M H4
- AWS A5.29M, E620T5-K2C H4, E620T5-K2M H4
- ASME SFA 5.29, E90T5-K2C H4, E90T5-K2M H4

## FabCO® 101K3

### FLAT & HORIZONTAL

#### AWS E100T1-K3C

Optimized for performance with 100% carbon dioxide, this wire offers excellent properties on many higher strength steels. The 100 ksi tensile strength and versatile chemistry make it ideal for critical applications.

#### Benefits:

- 100 ksi tensile strength for critical applications
- versatile chemistry
- optimized for performance with 100% CO<sub>2</sub>

#### Typical Applications:

- intended for HSLA and Q&T steels
- offshore construction
- shipbuilding

#### Typical Weld Metal Chemistry:

Carbon	0.043
Manganese	1.27
Silicon	0.74
Phosphorus	0.014
Sulphur	0.013
Molybdenum	0.43
Nickel	2.29
Vanadium	0.017

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	107,500 (741 MPa)
Yield Strength (psi)	96,700 (667 MPa)
Elongation % in 2" (50mm)	20%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C) 30 ft.lb. (41J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-400	24-32	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E100T1-K3C
- AWS A5.29M, E690T1-K3C
- ASME SFA 5.29, E100T1-K3C



## FabCO® 115K3

### FLAT & HORIZONTAL

#### AWS E110T5-K3C/M H4

This wire is used for welding high strength quench and tempered and low alloy steels like T-1, A514, A517, and HY-100. The basic slag keeps hydrogen content extremely low, reducing the chance for cracking.

#### Benefits:

- extremely low hydrogen for improved crack resistance
- excellent low temperature impact properties
- versatile chemistry

#### Typical Applications:

- intended for HSLA and Q&T steels
- offshore construction
- shipbuilding

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>
Carbon	0.05	0.08
Manganese	1.49	2.04
Silicon	0.33	0.62
Phosphorus	0.011	0.014
Sulphur	0.017	0.012
Molybdenum	0.37	0.41
Nickel	2.24	1.84

#### Typical Diffusible Hydrogen:

2.1 ml/100g 2.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	112,000	126,800
	(772 MPa)	(875 MPa)
Yield Strength (psi)	98,000	105,800
	(676 MPa)	(730 MPa)
Elongation % in 2" (50mm)	22%	22%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-51°C) 57 ft.lb. (77J) 47 ft.lb. (64J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-425	25-34	1" (25 mm)
3/32" (2.4 mm)	300-600	26-35	1-1/4" (32 mm)

**Shielding Gas:** 100% CO<sub>2</sub>,  
75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E110T5-K3C H4, E110T5-K3M H4
- AWS A5.29M, E760T5-K3C H4, E760T5-K3M H4
- ASME SFA 5.29, E110T5-K3C H4, E110T5-K3M H4
- ABS, 100% CO<sub>2</sub>, E110T5-K3C H4

## FabCO® 110

### ALL POSITION

#### AWS E111T1-K3MJ H8

This wire's low hydrogen minimizes the crack sensitivity in quench and tempered low alloy steels. Additionally, it offers enhanced slag release and fast freezing slag for enhanced out-of-position capability.

#### Benefits:

- enhanced slag release
- fast freezing slag for enhanced out-of-position capability
- low hydrogen to reduce risk of hydrogen cracking

#### Typical Applications:

- intended for HSLA and Q&T steels
- offshore construction
- shipbuilding

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>
Carbon	0.06
Manganese	1.60
Silicon	0.40
Phosphorus	0.008
Sulphur	0.010
Chromium	0.05
Nickel	1.90
Molybdenum	0.30
Vanadium	0.02

**Typical Diffusible Hydrogen:** 4.2 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	120,000 (827 MPa)
Yield Strength (psi)	112,000 (772 MPa)
Elongation % in 2" (50mm)	21%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 30 ft.lb. (41J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-300	23-28	1" (25 mm)
1/16" (1.6 mm)	175-400	23-32	1" (25 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E111T1-K3MJ H8
- AWS A5.29M, E761T1-K3MJ H8
- ASME SFA 5.29, E111T1-K3MJ H8
- CWB, 75-80% Ar/Balance CO<sub>2</sub>, E761T1-K3MJ-H8

## FabCO® 115

### FLAT & HORIZONTAL

#### AWS E110T5-K4C

This wire is primarily used in the welding of T-1, A514, A517, HY-100, and similar quenched and tempered high strength and low alloy steels. The basic slag system produces a low hydrogen weld deposit reducing the chance of cracking. It also features higher deposition rates.

#### Benefits:

- comparable to E11018M but with higher deposition rates
- increased weld toughness for critical welds at low temperatures
- produces a low hydrogen deposit with basic slag to minimize cracking

#### Typical Applications:

- mining equipment
- earthmoving equipment
- off-road vehicles
- single and multiple pass applications

#### Typical Weld Metal Chemistry:

Carbon	0.04
Manganese	1.50
Silicon	0.41
Phosphorus	0.012
Sulphur	0.014
Chromium	0.42
Nickel	2.37
Chromium	0.42
Molybdenum	0.42

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	126,000 (869 MPa)
Yield Strength (psi)	102,000 (701 MPa)
Elongation % in 2" (50mm)	18%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-51°C) 48 ft.lb. (65J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	120-220	22-27	3/4" (19 mm)
1/16" (1.6 mm)	190-350	22-30	3/4" (19 mm)
3/32" (2.4 mm)	290-525	25-32	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E110T5-K4C
- ASME SFA 5.29, E110T5-K4C
- ABS 100% CO<sub>2</sub> E110T5-K4C
- CWB 100% CO<sub>2</sub> E7605-K4C H4

## FabCO® 125K4

### FLAT & HORIZONTAL

#### AWS E120T5-K4C H4

Ideal for the welding of quenched and tempered low alloy grades of steels, this wire is designed for semi-automatic and automatic welding of high strength steels where minimum tensile of 120,000 psi is required. It has excellent impact values at low temperatures (60 degrees Fahrenheit) along with a low diffusible hydrogen content due to the basic slag system.

#### Benefits:

- designed for semi-automatic and automatic welding of high strength steels where minimum tensile of 120,000 psi is required
- good impact values at low temperatures, down to -60°F
- basic slag produces low diffusible hydrogen and promotes resistance to cracking
- high deposition rates and high efficiency

#### Typical Applications:

- casting repair
- single and multiple pass applications with 100% CO<sub>2</sub> Shielding Gas
- welding of quenched and tempered steels and HSLA steels

#### Typical Weld Metal Chemistry:

Carbon	0.07
Manganese	1.88
Silicon	0.42
Phosphorus	0.010
Sulphur	0.016
Chromium	0.52
Nickel	2.13
Molybdenum	0.61
Vanadium	0.01

**Typical Diffusible Hydrogen:** 1.5 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	133,000 (917 MPa)
Yield Strength (psi)	118,000 (814 MPa)
Elongation % in 2" (50mm)	20%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-51°C) 57 ft.lb. (77J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-425	25-34	3/4" (19 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E120T5-K4C H4
- AWS A5.29M, E831T5-K4C H4
- ASME SFA 5.29, E120T5-K4C H4

## FabCO® 105D2

### FLAT & HORIZONTAL

#### AWS E100T5-D2C

This wire can be used for the repair of manganese-moly castings, or components that must undergo post weld heat treatment and maintain a tensile strength in the neighborhood of 100,000 psi. The basic slag system ensures a low hydrogen weld deposit.

#### Benefits:

- excellent low temperature toughness
- low weld metal hydrogen
- wire composition is well suited for the repair of manganese-moly castings
- weld metal maintains strength after several hours of stress relieving

#### Typical Applications:

- manganese-moly casting repair
- single or multiple pass applications with 100% CO<sub>2</sub> Shielding Gas

#### Typical Weld Metal Chemistry:

Carbon	0.11
Manganese	2.00
Silicon	0.55
Phosphorus	0.009
Sulphur	0.010
Molybdenum	0.44

#### Typical Mechanical Properties

##### (PWHT 1 Hr. at 1150°F/621°C):

Tensile Strength (psi)	111,000 (765 MPa)
Yield Strength (psi)	97,000 (669 MPa)
Elongation % in 2" (50mm)	24%

#### Typical Charpy V-notch Impact Values (PWHT 1 Hr. at 1150°F/621°C):

Avg. at -40°F (-40°C) 49 ft.lb. (66J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	200-425	25-34	3/4" (19 mm)
3/32" (2.4 mm)	300-600	26-35	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E1005-D2C
- AWS A5.29M, E690T5-D2C
- ASME SFA 5.29, E1005-D2C

## FabCO® 811A1

### ALL POSITION

#### AWS E81T1-A1C

All-position flux-cored welding electrode is designed for welding the 0.50% molybdenum steel and other low alloy steels. The molybdenum content of weld metal deposit helps maintain tensile strength after stress relief and the fast-freezing slag removes easily.

#### Benefits:

- molybdenum content of weld metal deposit helps maintain tensile strength after stress relief
- good weldability in all positions
- fast-freezing slag removes easily

#### Typical Applications:

- boilers
- pressure vessels
- pressure piping
- single and multiple pass applications with 100% CO<sub>2</sub> Shielding Gas

#### Typical Weld Metal Chemistry:

Carbon	0.04
Manganese	0.83
Silicon	0.26
Phosphorus	0.014
Sulphur	0.016
Molybdenum	0.48

#### Typical Mechanical Properties

##### (PWHT 1 Hr. at 1150°F/621°C):

Tensile Strength (psi)	94,000 (648 MPa)
Yield Strength (psi)	83,000 (572 MPa)
Elongation % in 2" (50mm)	26%

#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	115-325	20-30	1/2" (13 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-A1C
- AWS A5.29M, E551T5-A1C
- ASME SFA 5.29, E81T1-A1C

## FabCO® 911B3

### ALL POSITION

#### AWS E91T1-B3C/M H8

Ideal for use on materials having a similar composition, this wire also appropriate for extended service at elevated temperature. It provides good puddle control, some corrosion resistance, and bead contour when welding in all positions. It also offers versatility in procedure and application development.

#### Benefits:

- high temperature creep resistance and some corrosion resistance
- excellent welder appeal with good bead geometry in all positions
- can be used for all position welding

#### Typical Applications:

- welding of 2.25 Cr and 1 Mo steels
- single or multiple pass applications with 100% CO<sub>2</sub> or mixed gas

#### Typical Weld Metal Chemistry:

	100% CO <sub>2</sub>	80% Ar/20% CO <sub>2</sub>
Carbon	0.05	0.05
Manganese	0.64	0.92
Silicon	0.27	0.38
Phosphorus	0.011	0.010
Sulphur	0.013	0.011
Molybdenum	0.93	0.97
Chromium	2.04	2.30

#### Typical Diffusible Hydrogen:

2.8 ml/100g	3.1 ml/100g
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#### Typical Mechanical Properties (PWHT 1 Hr. at 1275°F/691°C):

Tensile Strength (psi)	100,000	109,000
	(689 MPa)	(752 MPa)
Yield Strength (psi)	86,000	86,000
	(593 MPa)	(593 MPa)
Elongation % in 2" (50mm)	20%	18%

#### Typical Charpy V-notch Impact Values:

Not required

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	115-325	20-30	1/2" (13 mm)
1/16" (1.6 mm)	150-425	21-31	3/4" (19 mm)

**Shielding Gas:** 100% CO<sub>2</sub>, 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E91T1-B3C/M H8
- AWS A5.29M, E621T1-B3 C/M H8
- ASME SFA 5.29, E91T1-B3C/M H8

## FabCO® Element™ 81K2C

### ALL POSITION

#### AWS E81T1-GC H8

This wire is designed as a low manganese replacement for E81T1-K2C products and meets all requirements of E81T1-K2C classification, except for the minimum manganese requirement. This product offers reductions of manganese in the weld fume of 60-80% over a standard E81T1-K2C with low diffusible hydrogen as well as excellent out-of-position capability.

#### Benefits:

- extremely low manganese emissions
- low spatter and fume
- improved operator comfort and productivity
- enhanced out-of-position capability

#### Typical Applications:

- applications where compliance with OSHA regulations or NIOSH and ACGIH recommendations for Manganese could be a concern
- heavy equipment
- general fabrication
- shipbuilding
- railcar

#### Typical Weld Metal Chemistry:

Carbon	0.06
Manganese	0.25
Silicon	0.47
Phosphorus	0.010
Sulphur	0.009
Nickel	1.84
Chromium	0.02
Molybdenum	0.02
Vanadium	0.006

**Typical Diffusible Hydrogen:** 6.1 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	82,000 (565 MPa)
Yield Strength (psi)	71,000 (490 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	81 ft.lb. (117J)
Avg. at -40°F (-40°C)	57 ft.lb. (83J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	165-320	24-30	3/4" (19 mm)
.052" (1.4 mm)	170-350	24-30	3/4" (19 mm)
1/16" (1.6 mm)	170-400	24-31	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-GC H8
- AWS A5.29M, E551T1-GC H8
- ASME SFA 5.29, E81T1-GC H8
- ABS, 100% CO<sub>2</sub> 3YSA-H10

## FabCO® Element™ 81K2M

### ALL POSITION

#### AWS E81T1-GM H8

This wire is designed as a low manganese replacement for E81T1-K2M products and meets all requirements of E81T1-K2M classification, except for the minimum manganese requirement. This product offers reductions of manganese in the weld fume of 60-80% over a standard E81T1-K2M with low diffusible hydrogen as well as excellent out-of-position capability and low spatter.

#### Benefits:

- extremely low manganese emissions
- low spatter and fume
- improved operator comfort and productivity
- enhanced out-of-position capability

#### Typical Applications:

- applications where compliance with OSHA regulations or NIOSH and ACGIH recommendations for Manganese could be a concern
- heavy equipment
- general fabrication
- shipbuilding
- railcar

#### Typical Weld Metal Chemistry:

Carbon	0.07
Manganese	0.40
Silicon	0.56
Phosphorus	0.010
Sulphur	0.010
Nickel	1.89
Chromium	0.035
Molybdenum	0.004
Vanadium	0.007

**Typical Diffusible Hydrogen:** 6.2 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	84,000 (579 MPa)
Yield Strength (psi)	73,000 (503 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	76 ft.lb. (103J)
Avg. at -40°F (-40°C)	66 ft.lb. (89J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	170-300	22-27	3/4" (19 mm)
.052" (1.4 mm)	170-350	23-29	3/4" (19 mm)
1/16" (1.6 mm)	185-400	22-28	1" (25 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E81T1-GM H8
- AWS A5.29M, E551T1-GM H8
- ASME SFA 5.29, E81T1-GM H8
- ABS, 75% Ar/25% CO<sub>2</sub> 3YSA-H10

### FabCO® 101

#### ALL POSITION

#### AWS E101T1-GM

This low diffusible hydrogen wire minimizes the crack sensitivity in quench and tempered low alloy steels and offers excellent impact properties at low temperatures. It also provides a smooth stable arc, low smoke generation, smooth bead profile and low spatter.

#### Benefits:

- provides excellent welder appeal through a smooth stable arc, low smoke generations and smooth bead profile
- exceptional low temperature impact toughness
- excellent all-position performance with low spatter
- low diffusible hydrogen

#### Typical Applications:

- welding of HSLA steels and Q&T steels
- single and multiple pass applications with mixed gas

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>
Carbon .....	0.06
Manganese .....	1.60
Silicon .....	0.38
Phosphorus .....	0.011
Sulphur .....	0.011
Nickel.....	1.95
Molybdenum.....	0.01

**Typical Diffusible Hydrogen:** 3.8 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	110,000 (758 MPa)
Yield Strength (psi)	102,000 (703 MPa)
Elongation % in 2" (50mm)	20%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C)	78 ft.lb. (106J)
Avg. at -20°F (-30°C)	70 ft.lb. (95J)
Avg. at -40°F (-40°C)	52 ft.lb. (71J)
Avg. at -60°F (-50°C)	35 ft.lb. (47J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-300	22-28	3/4" (19 mm)
1/16" (1.6 mm)	170-400	22-32	1" (25 mm)

**Shielding Gas:** 75-80% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E101T1-GM
- AWS A5.29M, E691T1-GM
- ASME SFA 5.29, E101T1-GM
- ABS, 75% Ar/25% CO<sub>2</sub>, ISO-18276-B, T694T1-1MA-N3M1-UH5 (0.045")

### FabCO® XTREME™ 120

#### ALL POSITION

#### AWS E121T5-GC H4

This all-position gas shielding flux-cored wire is designed for welding of offshore jack-up rigs and high strength steels. The low-hydrogen minimizes the risk of hydrogen-induced cracking and the unique fast-freezing slag provides out-of-position capability.

#### Benefits:

- unique fast-freezing slag provides out-of-position capability
- low-hydrogen to minimize risk of hydrogen-induced cracking
- excellent impact toughness to resist cracking in severe applications
- high strength deposit for joining high strength steels

#### Typical Applications:

- welding of HSLA steels and Q&T steels
- heavy equipment & machinery repair
- shipbuilding
- offshore platforms

#### Typical Weld Metal Chemistry:

Carbon .....	0.07
Manganese .....	1.35
Silicon .....	0.14
Phosphorus .....	0.008
Sulphur .....	0.005
Nickel.....	3.90
Chromium .....	0.33
Molybdenum.....	0.22
Aluminum.....	0.45

**Typical Diffusible Hydrogen:** 3.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	125,000 (862 MPa)
Yield Strength (psi)	110,000 (758 MPa)
Elongation % in 2" (50mm)	17%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C)	100 ft.lb. (136J)
Avg. at -76°F (-60°C)	90 ft.lb. (122J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	175-300	22-25	3/4" (19mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.29, E121T5-GC H4
- AWS A5.29M, E831T5-GC H4
- ASME SFA5.29, E121T5-GC H4
- ABS, E121T5-GC H4
- DNV, V Y69MS (H5)

### Fabshield® 71T8

#### ALL POSITION

#### AWS E71T8-Ni1J H8

Designed for use on grade X70 pipe and below for onshore transmission pipelines, this wire is good for a variety of structural steel and general fabrication applications or applications requiring high impact toughness at low temperatures. It can be used outdoors without sheltering and has an optimized performance for welding in the vertical-down position on a pipe. The 1/16-inch (1.6 millimeters) diameter electrode provides an additional option in procedure development.

#### Benefits:

- self-shielded; can be used outdoors without sheltering
- 1/16" (1.6 mm) diameter electrode provides an additional option in procedure development
- excellent impact toughness minimizes risk of cracking in severe applications
- optimized performance for welding in the vertical-down position on pipe

#### Typical Applications:

- API 5L grade X70 and below (with proper procedures)
- oil and gas transmission pipelines
- oil and gas distribution pipelines

#### Typical Weld Metal Chemistry:

Carbon .....	0.02
Manganese .....	1.44
Silicon .....	0.06
Phosphorus .....	0.01
Sulphur .....	0.004
Nickel.....	0.95
Aluminum.....	1.00

**Typical Diffusible Hydrogen:** 3.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	80,000 (552 MPa)
Yield Strength (psi)	71,000 (490MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	255 ft.lb. (346J)
Avg. at -40°F (-40°C)	135 ft.lb. (183J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	150-225	17-21	3/4" (19 mm)
5/64" (2.0 mm)	175-250	17-20	1" (25 mm)

**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.29, E71T8-Ni1J H8
- AWS A5.29M, E491T8-Ni1J H8
- ASME SFA 5.29, E71T8-Ni1J H8

## Fabshield® 81N1

### ALL POSITION

#### AWS E71T8-Ni1J H8

Designed for use on Grade X65 pipe and below for onshore transmission pipelines, this wire is good for a variety of structural steel and general fabrication applications and applications requiring high impact toughness at low temperatures. The fast-freezing slag is suitable for welding in all positions and optimized for vertical-down. It can be used outdoors without sheltering and the low-hydrogen electrode helps minimize the risk of hydrogen-induced cracking.

#### Benefits:

- self-shielded; can be used outdoors without sheltering
- fast-freezing slag is suitable for welding in all positions, and optimized for vertical-down
- excellent impact toughness minimizes risk of cracking in severe applications
- low-hydrogen electrode helps minimize the risk of hydrogen-induced cracking

#### Typical Applications:

- API 5L transmission pipeline
- grade X65 and below steels (with proper procedures)
- shipbuilding & offshore

#### Typical Weld Metal Chemistry:

Carbon	0.03
Manganese	0.87
Silicon	0.05
Phosphorus	0.01
Sulphur	0.004
Nickel	0.95
Aluminum	0.67

**Typical Diffusible Hydrogen:** 6.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	71,000 (490 MPa)
Yield Strength (psi)	60,000 (414 MPa)
Elongation % in 2" (50mm)	29%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C) 205 ft.lb. (278J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	175-250	17-20	1" (25 mm)

**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.29, E71T8-Ni1J H8
- AWS A5.29M, E491T8-Ni1J H8
- ASME SFA 5.29, E71T8-NiJ H8
- ABS, E71T8-Ni1J (5/64" diameter)
- EN758 T 38 4 1Ni Y N 1 H10

## Fabshield® X80

### ALL POSITION

#### AWS E81T8-Ni2J H8

Designed for use on Grade X80 pipe for onshore transmission pipelines, this wire is good for structural steel, general fabrication or any application requiring high impact toughness at low temperatures. The low-hydrogen electrode minimizes the risk of hydrogen-induced cracking and the high strength deposit is suitable for welding a wide range of materials.

#### Benefits:

- high-strength deposit suitable for welding a wide range of materials
- low-hydrogen electrode minimizes the risk of hydrogen-induced cracking
- formulated for optimal performance in pipe-welding applications
- good impact toughness to minimize risk of cracking in critical applications

#### Typical Applications:

- API 5L grade X80 and below (with proper procedures)
- oil and gas transmission pipeline
- oil and gas storage tanks
- certain structural applications

#### Typical Weld Metal Chemistry:

Carbon	0.04
Manganese	1.37
Silicon	0.06
Phosphorus	0.011
Sulphur	0.002
Nickel	2.38
Aluminum	0.93

**Typical Diffusible Hydrogen:** 7.3 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	94,000 (648 MPa)
Yield Strength (psi)	84,000 (579 MPa)
Elongation % in 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 105 ft.lb. (142J)  
Avg. at -40°F (-40°C) 95 ft.lb. (129J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	175-225	18-19	1" (25 mm)

**Shielding Gas:** None required

**Type of Current:** DCEN

#### Approvals and Conformances:

- AWS A5.29, E81T8-Ni2J H8
- AWS A5.29M, E551T8-Ni2J H8
- ASME SFA 5.29, E81T8-Ni2J H8

## Fabshield® 71K6-NP

### ALL POSITION

#### AWS E71T8-K6J H8

Designed for use on offshore drilling rigs as well as structural steel and general fabrication applications. Designed for applications requiring high impact toughness at low temperatures.

#### Benefits:

- reduces fatigue and increases productivity
- allows for all-position welding
- reduces time spent cleaning weld beads
- welds remain ductile at cold temperatures
- great for outdoor welding

#### Typical Applications:

- offshore drilling rigs
- ships
- construction
- transportation
- structural and general fabrication
- barges
- piping

#### Typical Weld Metal Chemistry:

Carbon	0.053
Manganese	1.141
Silicon	0.068
Phosphorus	0.009
Sulphur	0.005
Nickel	0.812
Chromium	0.145
Molybdenum	0.007
Aluminum	0.891

**Typical Diffusible Hydrogen:** 4.7 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	82,100 (565 MPa)
Yield Strength (psi)	69,400 (478 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -40°F (-40°C) 127 ft.lb. (172J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
5/64" (2.0 mm)	175-270	18-20	1" (25 mm)

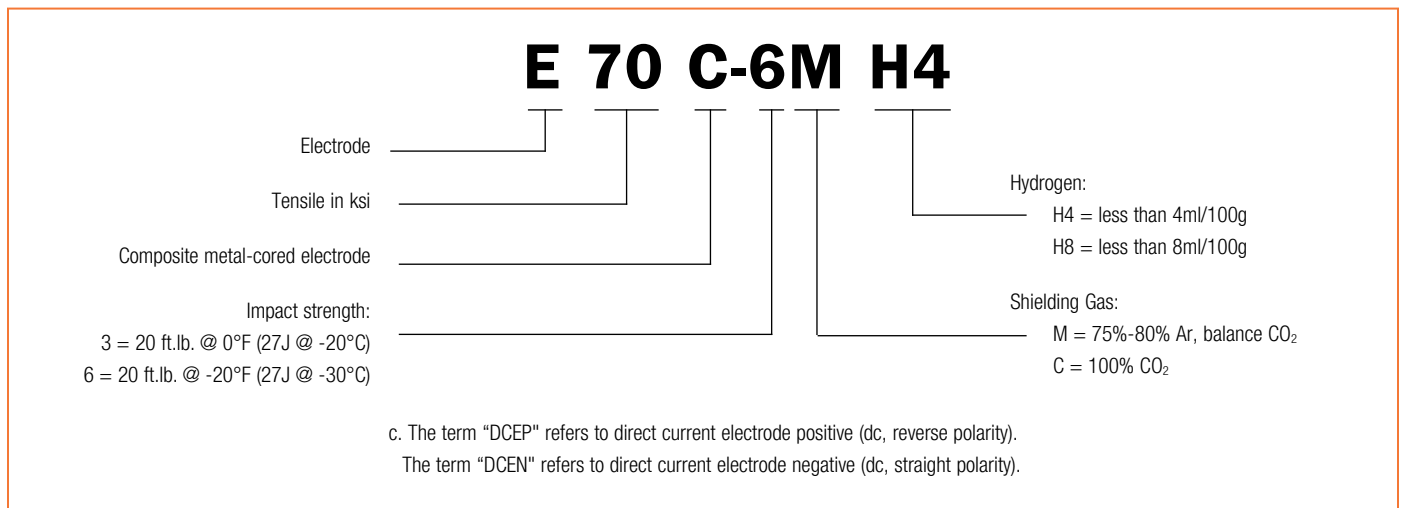
**Shielding Gas:** None required

**Type of Current:** DCEN

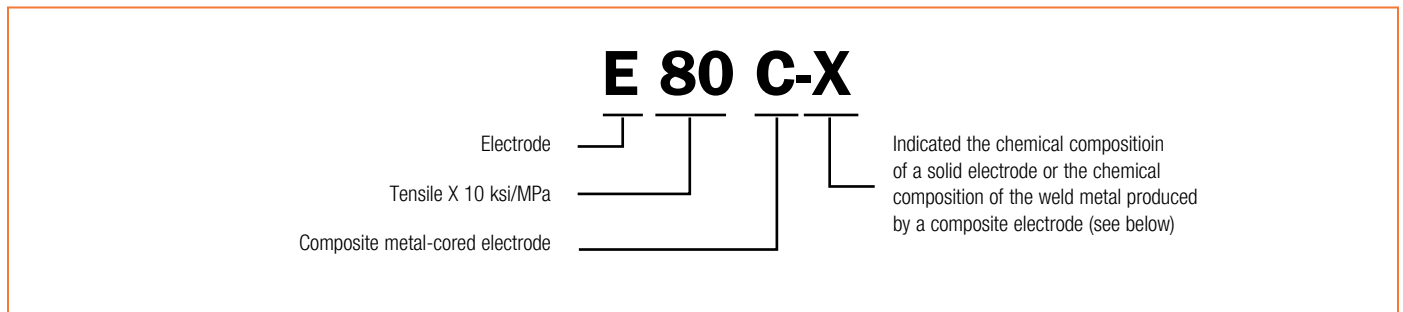
#### Approvals and Conformances:

- AWS A5.29, E71T8-K6J H8
- AWS A5.29M, E491T8-K6J H8
- AWS A5.36, E71T8-A4K6-H8, E71T8-P4K6-H8
- AWS A5.36M, E491T8-A4K6-H8, E491T8-P4K6-H8
- ASME SFA 5.29, E71T8-K6J H8
- EN ISO 17632-A: T 42 4 1Ni Y 1 H10
- ABS, E71T8-K6J H8 [5/64" (2.0 mm) only]
- Lloyd's Register, 4Y H10 [5/64" (2.0 mm) only]
- DNV-GL, IV YMS H10 [5/64" (2.0mm) only]

## How AWS Classifies Metal-Cored Wires, GMAW Process (AWS A5.18)



## How AWS Classifies Low Alloy Metal-Cored (Composite) Wires, GMAW Process (AWS A5.28)



### Composite Electrode Alloy Designator Chart

#### Chromium-Molybdenum Weld Metal

**B2** 1.00 - 1.50% Chromium, 0.40 - 0.65% Molybdenum

#### Nickel Weld Metal

**Ni1** 0.80 - 1.10% Nickel

**Ni2** 1.75 - 2.75% Nickel

#### Manganese-Molybdenum Weld Metal

**D2** 1.00 - 1.90% Manganese, 0.40 - 0.60% Molybdenum

#### Manganese-Nickel-Molybdenum Weld Metal

**K3** 0.75 - 2.25% Manganese, 0.50 - 2.50% Nickel, 0.25 - 0.65% Molybdenum

**K4** 0.75 - 2.25% Manganese, 0.50 - 2.50% Nickel, 0.25 - 0.65% Molybdenum, 0.15 - 0.65% Chromium

## FabCOR® 86R

### AWS E70C-6M H4

Higher deoxidizing elements allow this metal-cored wire to have more tolerance for mill scale welding applications. The high deposition rates and efficiencies improve productivity while virtually no slag coverage and low spatter levels reduce cleanup time. A low diffusible hydrogen weld deposit minimizes the risk of cracking.

#### Benefits:

- high deposition rates and efficiencies improving productivity
- virtually no slag coverage and low spatter reduce cleanup time
- smooth arc characteristics improve operator appeal
- low diffusible hydrogen weld deposit minimizes risk of cracking

#### Typical Applications:

- railcar
- storage vessels
- steel structures
- earthmoving equipment

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	95% Ar/5% CO <sub>2</sub>
Carbon	0.03	0.03
Manganese	1.44	1.68
Silicon	0.67	0.78
Phosphorus	0.008	0.002
Sulphur	0.015	0.009
Hydrogen	2.0 ml/100g	2.7 ml

#### Typical Mechanical Properties (AW):

	75% Ar/25% CO <sub>2</sub>	95% Ar/5% CO <sub>2</sub>
Tensile Strength (psi)	81,000	85,000
	(558 MPa)	(586 MPa)
Yield Strength (psi)	69,000	75,000
	(476 MPa)	(517 MPa)
Elongation % in 2" (50mm)	30%	27%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	74 ft.lb. (101J)	50 ft.lb. (68J)
Avg. at -40°F (-40°C)	40 ft.lb. (54J)	32 ft.lb. (43J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.035" (0.9 mm)	200-300	25-36	1/2" (13 mm)
.045" (1.2 mm)	200-400	27-36	3/4" (19 mm)
.052" (1.4 mm)	200-400	25-36	1" (25 mm)
1/16" (1.6 mm)	250-500	29-36	1" (25 mm)
5/64" (2.0 mm)	300-500	29-34	1 1/4" (31 mm)
3/32" (2.4 mm)	350-550	29-34	1 1/4" (31 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>, 95% Ar/5% O<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.18, E70C-6M H4
- AWS A5.18M, E48C-6M H4
- ASME SFA 5.18, E70C-6M H4
- ABS, 80% Ar/20% CO<sub>2</sub>, 3YSA H5 (0.035" - 1/16" diameters)
- Bureau Veritas, 80% Ar/20% CO<sub>2</sub>, S3YMH5 (0.035" - 1/16" diameters)
- CWB, 75-95% Ar/Balance CO<sub>2</sub>, E491C-6MJ-H4 (0.9 mm - 1.6 mm diameters)
- CWB, 95% Ar/5% O<sub>2</sub>, E491C-6MJ-H4 (1.2 mm - 1.6 mm diameters)
- DNV, 80% Ar/20% CO<sub>2</sub>, III Y40MS(H5)
- Lloyd's Register, 80% Ar/20% CO<sub>2</sub>, 3Y40S H5
- AWS D1.8/D1.8M, 75% Ar/25% CO<sub>2</sub>, [0.045" (1.2 mm), 1/16" (1.6 mm) diameter]
- EN17632-A: T 46 2 M M 3 H5
- CE Marked per CPR 305/2011 (1.2 mm - 1.6 mm diameters)

## FabCOR® Edge™

### AWS E70C-6M H4

This metal-cored wire has fewer silicon islands than other metal-cored wires and on clean material, weld bead toe lines are almost completely free of silicon deposits. Together with exceptional low spatter rates, it saves time and money spent cleaning prior to painting, coating, or plating. The recommended shielding gas is a mixture of argon and carbon dioxide, with a minimum of 75% argon and a maximum of 95% argon. Arc characteristics improve with richer argon gases while spatter and fume levels decrease.

#### Benefits:

- higher deposition rates help increase travel speed and productivity
- excellent wetting characteristics and gap bridging capabilities
- virtually no silicon deposits at weld bead toe lines reduces cleanup time and minimizes risk of inclusions

#### Typical Applications:

- heavy equipment
- agriculture
- robotic and mechanized welding
- non-alloyed and fine grain steels

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon	0.05	0.03
Manganese	1.33	1.50
Silicon	0.63	0.72
Phosphorus	0.006	0.001
Sulphur	0.007	0.012
Nickel	0.42	0.42
Hydrogen	1.5 ml/100g	2.1 ml

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	91,000	97,000
	(630 MPa)	(669 MPa)
Yield Strength (psi)	81,000	87,000
	(561 MPa)	(600 MPa)
Elongation % in 2" (50mm)	25%	22%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -0°F (-20°C)	50 ft.lb. (68J)	56 ft.lb. (76J)
Avg. at -20°F (-30°C)	38 ft.lb. (52J)	47 ft.lb. (64J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.035" (0.9 mm)	150-250	26-29	1/2" (13 mm)
.045" (1.2 mm)	200-375	25-30	3/4" (19 mm)
.052" (1.4 mm)	250-400	24-30	3/4" (19 mm)
1/16" (1.6 mm)	250-450	25-32	3/4" (19 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

## FabCOR® Element™ 70C6 FabCOR® F6

### Approvals and Conformances:

- AWS A5.18, E70C-6M H4
- AWS A5.18M, E48C-6M H4
- ASME SFA 5.18, E70C-6M H4
- ABS, 80% Ar/20% CO<sub>2</sub>, 3YSA H5 (0.045" - 1/16" diameters, flat position)
- ABS, 90% Ar/10% CO<sub>2</sub>, 3YSA H5 (0.035" - 0.045" diameters, all position)
- AWS D1.8/D1.8M, 75% Ar/25% CO<sub>2</sub> [0.052" (1.4 mm) diameter]
- CWB, 75-95% Ar/Balance CO<sub>2</sub>, E492C-6MJ-H4 (1.4 - 1.6 mm diameter)
- CWB, 75-95% Ar/Balance CO<sub>2</sub>, E491C-6MJ-H4 (1.2 mm diameter)
- EN17632-A: T 46 3 M M 3 H5
- CE Marked per CPR 305/2011 (0.9 - 1.6 mm diameter)

### AWS E70C-6M H4

This mild-steel metal-cored wire is designed for the heavy equipment, shipbuilding, railcar and general fabrication industries that, along with all the benefits of metal-cored wire, also offers extremely low manganese emissions. Formulated for improved silicon removal, it also provides balanced arc characteristics: smooth and penetrating.

### Benefits:

- extremely low manganese emissions assist with conformance to environmental regulations
- provides higher deposition rates than solid wires
- formulated for improved silicon removal
- balanced arc characteristics, smooth and penetrating

### Typical Applications:

- heavy equipment
- shipbuilding
- general fabrication
- railcar

### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon (C).....	0.05	0.06
Manganese (Mn).....	0.53	0.58
Silicon (Si).....	0.80	0.76
Phosphorus (P).....	0.009	0.009
Sulphur (S).....	0.012	0.012
Nickel (Ni).....	0.45	0.49

### Typical Diffusible Hydrogen:

2.0 ml/100g

### Typical Mechanical Properties (AW):

Tensile Strength	79,000 psi (545 MPa)	84,000 psi (579 MPa)
Yield Strength	68,000 psi (469 MPa)	71,000 psi (490 MPa)
Elongation % in 2" (50mm)	23%	23%

### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 35 ft.lb. (47J) 20 ft.lb. (27J)

### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045"	200-350	25-30	3/4" (19mm)
.052"	250-400	26-30	3/4" (19mm)
1/16"	250-450	27-31	1" (25mm)

### Shielding Gas: 75-90% Argon (Ar)/

Balance Carbon Dioxide (CO<sub>2</sub>), 35-50 cfm (17-24 l/min)

### Type of Current: DCEP

### Approvals and Conformances:

- AWS A5.18, E70C-6M H4
- AWS A5.18M, E48C-6M H4
- ASME SFA 5.18, E70C-6M H4
- CWB, Ar + 5%-25% CO<sub>2</sub>, E492C-6M-H4

### AWS E70C-GS

This extremely high deposition metal-cored wire is designed primarily for automotive and galvanized applications. Formulated for use with DCEN polarity, it minimizes the risk of burn-through. It offers higher deposition rates than solid wire, excellent gap-bridging capabilities, and a very high-strength deposit that maintains excellent ductility and impact toughness. This wire is intended for single-pass joining applications using a wide range of thin-gauge carbon and HSLA steels.

### Benefits:

- intended for single-pass joining applications using a wide range of thin-gauge carbon and HSLA steels
- higher deposition rates than solid wire increases productivity
- excellent gap-bridging capabilities suitable for automated and mechanized application
- formulated and intended for use with DCEN polarity minimizes risk of burn-through, improves deposition rate

### Typical Applications:

- galvanized and zinc coated steels
- aluminum coated steels
- HVAC fabrication
- automotive and transportation
- thin-gauge steels

### Typical Weld Metal Chemistry:

	80% Ar/20% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon.....	0.13	0.13
Manganese.....	1.55	1.64
Silicon.....	0.84	0.89
Phosphorus.....	0.009	0.010
Sulphur.....	0.016	0.012

### Typical Mechanical Properties:

Tensile Strength (psi)	76,000 (524 MPa)	76,500 (527 MPa)
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### Typical Charpy V-notch Impact Values:

Not required

### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.035" (0.9 mm)	100-250	17-24	1/2" (13 mm)
.039" (1.0 mm)	150-300	18-24	5/8" (16 mm)
.045" (1.2 mm)	150-350	17-23	5/8" (16 mm)

### Shielding Gas: 75-95% Ar/Balance CO<sub>2</sub>

### Type of Current: DCEN & DCEP

### Approvals and Conformances:

- AWS A5.18, E70C-GS
- AWS A5.18M, E48C-GS
- ASME SFA 5.18, E70C-GS
- EN 17632-A: T3T Z Z M M 3
- EN 17632-B: T43 Z TG O M A
- CE Marked per CPR 305/2011



## FabCOR® 702

### AWS E70C-3C

This metal-cored gas-shielded wire combines the high deposition rates of a flux-cored wire with the high efficiencies of a solid wire. Increased deposition rates and higher travel speeds improve productivity while slag free welds reduce cleanup time. The excellent sidewall and root penetration provide better fusion patterns than solid wire and the low hydrogen weld deposit results in high crack resistant welds.

#### Benefits:

- metal-cored wire producing high deposition rates and high travel speeds Increased productivity over solid wire
- excellent side wall and root penetration provides better fusion patterns than solid wire
- slag free welds reduce cleanup time compared to flux-core wire
- low hydrogen weld deposit results in high crack resistant welds

#### Typical Applications:

- steel structures
- storage vessels
- earthmoving equipment
- railcar

#### Typical Weld Metal Chemistry:

Carbon .....	0.09
Manganese .....	1.30
Silicon .....	0.56
Phosphorus .....	0.011
Sulphur .....	0.018

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	85,500 (590 MPa)
Yield Strength (psi)	73,000 (503 MPa)
Elongation % in 2" (50mm)	28%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at 0°F (-20°C) 66 ft.lb. (77J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
1/16" (1.6 mm)	300-450	30-37	3/4" (19 mm)
7/64" (2.8 mm)	450-650	29-38	1" (25 mm)

**Shielding Gas:** 100% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.18, E70C-3C
- AWS A5.18M, E48C-3C
- ASME SFA 5.18, E70C-3C
- ABS, 100% CO<sub>2</sub>, 3YSA H10 (0.045" - 1/16" diameter electrodes, all positions)

## FabCOR® Edge™ Ni1

### AWS E80C-Ni1 H4

Developed for the welding of nickel-molybdenum steels, this wire can also be used for weathering steel applications where color match is not critical. Virtually no silicon deposits at weld bead toe lines reduces cleanup time, minimizes risk of inclusions while excellent gap bridging capabilities minimize burn-through and reduce part rejection. Additionally, the higher deposition rates and travel speeds than solid wire increases productivity and the high impact strengths at low temperatures helps resist cracking in severe applications.

#### Benefits:

- virtually no silicon deposits at weld bead toe lines reduces cleanup time, minimizes risk of inclusions
- excellent gap-bridging capabilities minimizes burn-through, reduces part rejection
- higher deposition rates and travel speeds than solid wire increases productivity, more parts per hour
- high-impact strengths at low temperatures helps resist cracking in severe applications

#### Typical Applications:

- high-strength low-alloy steels
- structural applications
- nickel-molybdenum steels
- weathering steel
- utility poles

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	95% Ar/5% O <sub>2</sub>
Carbon .....	0.05	0.04
Manganese .....	1.10	1.24
Silicon .....	0.57	0.65
Phosphorus .....	0.013	0.008
Sulphur .....	0.011	0.009
Nickel .....	1.00	1.01

#### Typical Diffusible Hydrogen:

2.1 ml/100g 3.4 ml/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	92,000	85,000
	(634 MPa)	(586 MPa)
Yield Strength (psi)	81,000	73,000
	(558 MPa)	(503 MPa)
Elongation % in 2" (50mm)	25%	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -50°F (-45°C) 44 ft.lb. (60J) 41 ft.lb. (56J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	25-29	5/8" (16 mm)
.052" (1.4 mm)	250-400	26-31	1" (25 mm)
1/16" (1.6 mm)	250-450	25-30	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>,  
95-99% Ar/Balance O<sub>2</sub>

### FabCOR® 80N2

#### AWS E80C-Ni2 H4

This wire has a higher nickel alloying content that results in superior mechanical properties. Its High Charpy impacts toughness at sub-zero temperatures reduces the potential of weld bead cracking and the high deposition rates allow faster travel speed.

#### Benefits:

- high deposition rates allow faster travel speed and higher productivity
- high Charpy-impacts toughness at sub-zero temperatures reduces potential of weld bead cracking
- higher nickel alloying content results in superior mechanical properties

#### Typical Applications:

- sub-zero temperature environments
- offshore
- shipbuilding

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	98% Ar/2% O <sub>2</sub>
Carbon	0.03	0.04
Manganese	0.77	1.09
Silicon	0.28	0.34
Nickel	2.23	2.26
Hydrogen	3.0 ml/100g	

#### Typical Mechanical Properties (PWHT 1 Hr @ 1150°F/620°C):

Tensile Strength (psi)	78,200 (539 MPa)	90,000 (621 MPa)
Yield Strength (psi)	65,800 (454 MPa)	77,000 (531 MPa)
Elongation % in 2" (50mm)	30%	26%

#### Typical Charpy V-notch Impact Values

##### (PWHT 1 Hr @ 1150°F/620°C):

Avg. at -50°F (-45°C)	38 ft.lb. (52J)	—
Avg. at -80°F (-62°C)	—	48 ft.lb. (65J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	27-35	5/8" (16 mm)

**Shielding Gas:** 98% Ar/2% O<sub>2</sub>, 75% Ar/25% CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E80C-Ni2 H4
- AWS A5.28M, E55C-Ni2 H4
- ASME SFA 5.28, E80C-Ni2 H4
- CWB, 85% Ar/15% CO<sub>2</sub>, 98% Ar/2% CO<sub>2</sub>, E55C-Ni2 H4/E80C-Ni2 H4

### FabCOR® 90

#### AWS E90C-K3 H4

Used with standard CV equipment, this high tensile strength electrode has excellent wetting characteristics assists in producing smooth weld beads with uniform fusion and is suitable for quench and temper high-strength low-alloy steels. It also offers high deposition rates at low heat inputs which increases productivity while minimizing Heat Affected Zone (HAZ).

#### Benefits:

- excellent wetting characteristics assists in producing smooth weld beads with uniform fusion
- high-tensile strength electrode suitable for quench and temper high-strength low-alloy steels
- high deposition rates possible at low heat inputs increasing productivity, minimizes Heat Affected Zone (HAZ)
- can be used with standard CV equipment promotes versatility, reduces equipment cost

#### Typical Applications:

- high-strength low-alloy steels
- quench and temper steels
- single or multi-pass welding
- heavy equipment

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon	0.06	0.06
Manganese	1.19	1.41
Silicon	0.25	0.31
Phosphorus	0.009	0.006
Sulphur	0.012	0.012
Nickel	1.84	1.83
Chromium	0.08	0.08
Molybdenum	0.34	0.34
Vanadium	0.00	0.01
Copper	0.06	0.06

#### Typical Diffusible Hydrogen:

2.3 ml/100g	4.0 ml/100g
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#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	102,000 (703 MPa)	110,000 (758 MPa)
Yield Strength (psi)	94,000 (648 MPa)	104,000 (717 MPa)
Elongation % in 2" (50mm)	23%	22%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-50°C)	71 ft.lb. (96J)	23 ft.lb. (31J)
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#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	27-30	5/8" (16 mm)
1/16" (1.6 mm)	300-450	29-31	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E90C-K3 H4
- AWS A5.28M, E62C-K3 H4
- ASME SFA 5.28, E90C-K3 H4

### FabCOR® 100

#### AWS E100C-K3

This wire produces weld metal with a minimum of 100 ksi tensile strength and has an excellent low-temperature toughness to -60 Fahrenheit. Higher deposition rates and travel speeds than solid wire increases productivity and it maintains acceptable properties over a wide heat input range.

#### Benefits:

- higher deposition rates and travel speeds than solid wire increases productivity, more parts per hour
- high-tensile strength deposit suitable for high-strength materials
- excellent toughness helps minimize risk of cracking in severe applications
- maintains acceptable properties over a wide heat input range

#### Typical Applications:

- high-strength low-alloy steels
- quench and temper steels
- single or multi-pass welding
- structural applications

#### Typical Weld Metal Chemistry:

Carbon	0.07
Manganese	1.50
Silicon	0.38
Nickel	1.58
Molybdenum	0.34

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	113,300 (781 MPa)
Yield Strength (psi)	103,300 (712 MPa)
Elongation % in 2" (50mm)	21%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-51°C)	49 ft.lb. (66J)
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#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	27-35	1/2" (13 mm)
.052" (1.4 mm)	250-400	28-34	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E100C-K3
- AWS A5.28M, E69C-K3
- ASME SFA 5.28, E100C-K3

## FabCOR® 1100

### AWS E110C-K4

This 110,000-psi tensile, high-performance metal-cored wire can be used with high strength, low alloy steels such as ASTM 514, HY-100 and T1 steels. It is formulated to have low smoke and fume levels while maintaining excellent chemical and mechanical properties. High deposition rates are possible at low heat inputs which increases productivity and minimizes Heat Affected Zone (HAZ). Excellent wetting characteristics assist in producing smooth weld beads with uniform fusion. It can be used with standard CV equipment promoting versatility, reducing equipment cost.

#### Benefits:

- excellent wetting characteristics assist in producing smooth weld beads with uniform fusion
- high-tensile strength electrode suitable for quench and temper high-strength low-alloy steels
- high deposition rates possible at low heat inputs increase productivity, minimize Heat Affected Zone (HAZ)
- can be used with standard CV equipment promoting versatility, reducing equipment cost

#### Typical Applications:

- high-strength low-alloy steels
- quench and temper steels
- single or multi-pass welding
- heavy equipment

#### Typical Weld Metal Chemistry:

	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon	0.07	0.08
Manganese	1.52	1.50
Silicon	0.52	0.50
Phosphorus	0.004	0.003
Sulphur	0.007	0.005
Nickel	1.92	1.84
Chromium	0.18	0.24
Molybdenum	0.47	0.46

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	118,000	128,000
	(814 MPa)	(883 MPa)
Yield Strength (psi)	105,000	116,000
	(724 MPa)	(800 MPa)
Elongation % in 2" (50mm)	19%	17%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -60°F (-50°C) 43 ft.lb. (58J) 28 ft.lb. (38J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	150-280	24-30	1/2" (13 mm)
1/16" (1.6 mm)	170-350	25-34	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E110C-K4
- AWS A5.28M, E76C-K4
- ASME SFA 5.28, E110C-K4
- CWB, 75-95% Ar/Balance CO<sub>2</sub>, E76C-K4-H4

## FabCOR® 80D2

### AWS E90C-D2

This wire is developed for high strength, low alloy steels found in heavy equipment or structural parts. The all-position capability with pulsed-spray transfer increases productivity and reduces cleanup time. Good wetting characteristics assist in producing smooth weld beads with uniform fusion.

#### Benefits:

- improved deposition rates compared to E80S-D2 solid wire increases productivity, produces more parts per hour
- good wetting characteristics assists in producing smooth weld beads with uniform fusion
- all-position capability with pulsed-spray transfer increases productivity, reduces cleanup time

#### Typical Applications:

- high-strength low-alloy steels
- single or multi-pass welding
- heavy equipment fabrication
- structural applications

#### Typical Weld Metal Chemistry:

	90% Ar/10% CO <sub>2</sub>	95% Ar/5% O <sub>2</sub>
Carbon	0.08	0.08
Manganese	1.80	1.34
Silicon	0.66	0.53
Phosphorus	0.005	0.003
Sulphur	0.008	0.006
Molybdenum	0.50	0.50
Copper	0.02	0.502

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	106,000	105,000
	(731 MPa)	(724 MPa)
Yield Strength (psi)	98,000	96,000
	(676 MPa)	(662 MPa)
Elongation % in 2" (50mm)	19%	17%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 42 ft.lb. (57J) 40 ft.lb. (54J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	24-29	5/8" (16 mm)
.052" (1.4 mm)	250-400	25-30	3/4" (19 mm)
1/16" (1.6 mm)	250-450	24-29	1" (25 mm)

**Shielding Gas:** 75-95% Ar/Balance CO<sub>2</sub>,

95-99% Ar/Balance O<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E90C-D2
- AWS A5.28M, E62C-D2
- ASME SFA 5.28, E90C-D2

## FabCOR® Edge™ D2

### AWS E90C-D2

This low alloy metal-cored wire is designed for welding mild and high strength low alloy steels and produces .5% molybdenum weld deposit. Virtually no silicon deposits at weld bead toe lines reduce cleanup time and minimize the risk of inclusion. Higher deposition rates and travel speeds than solid wire increases productivity and excellent gap bridging capabilities minimizes burn-through to reduce part rejection.

#### Benefits:

- virtually no silicon deposits at weld bead toe lines reduce cleanup time, minimize risk of inclusions
- excellent gap bridging capabilities minimize burn-through, reduce part rejection
- higher deposition rates and travel speeds than solid wire increase productivity, more parts per hour

#### Typical Applications:

- high-strength low-alloy steels
- single or multi-pass welding
- heavy equipment fabrication

#### Typical Weld Metal Chemistry:

	98% Ar/2% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon	0.05	0.05
Manganese	1.50	1.45
Silicon	0.50	0.45
Phosphorus	0.009	0.009
Sulphur	0.012	0.012
Molybdenum	0.50	0.45
Copper	0.05	0.05

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	98,000	107,000
	(676 MPa)	(738 MPa)
Yield Strength (psi)	90,000	95,000
	(621 MPa)	(655 MPa)
Elongation % in 2" (50mm)	25%	22%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C) 55 ft.lb. (75J) 45 ft.lb. (61J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
.045" (1.2 mm)	200-350	25-28	5/8" (16 mm)
.052" (1.4 mm)	250-400	26-29	3/4" (19 mm)
1/16" (1.6 mm)	300-450	26-29	1" (25 mm)

**Shielding Gas:** 95-98% Ar/Bal O<sub>2</sub>,

75-95% Ar/Bal CO<sub>2</sub>

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.28, E90C-D2
- AWS A5.28M, E62C-D2
- ASME SFA 5.28, E90C-D2

# Tubular Wires

Carbon-Steel & Low-Alloy Gas-Shielded Flux-Cored Electrodes						
AWS Classification		Manufacturer				
		Hobart Filler Metals	Lincoln Electric	ESAB	Select Arc	
All Position	E70T-1C/9C E70T-2C E70T-5CJ E70T-5MJ	FabCO® RXR, FabCO® TR-70	Outershield® 70, Outershield® XLH-70, UltraCore® 70C	Dual Shield 700X	Select 71, Select 71A, Select 70TR	
		FabCO® 73	—	—	Select 72, Select Super 72	
		FabCO® 85	UltraCore® 75C	Dual Shield T-75	Select 75	
	E71T-1M E71T-1M/9M E71T-1M/9M/12M E71T-1M/9M/12M H4 E71T-1C E71T-1C/9C E71T-1C/9C/12C J	FabCO® 711M	—	—	Select 710	
		FabCO® Triple 7, FabCO® Excel-Arc™ 71, FabCO® Element™ E71T1M	UltraCore® 71A75 Dual, UltraCore® 71A85, UltraCore HD-M	Dual Shield 7100 LC, Dual Shield 7100 Ultra®, Dual Shield 710X, Dual Shield 710X-M	Select 720A, Select 727, Select 717, Select 721	
		FabCO® XL-525, FabCO® 910	UltraCore® 712A80, UltraCore® HD-12M	Dual Shield II 712X, Dual Shield II 70 Ultra®	Select 737	
		FabCO® 712M	UltraCore® 712A80-H, UltraCore® SR-12	Dual Shield II 70T-12H4	—	
		FabCO® Triple 7, FabCO® 711M	—	Dual Shield 7100 Ultra®	Select 710	
		FabCO® Excel-Arc™ 71, Element™ E71T1C, FabCO® Triple 8	UltraCore® 71A75 Dual	Dual Shield 7100 LC, Dual Shield 710X, Dual Shield 710X-M	Select 720A, Select 727	
		FabCO® XL-550, FabCO® 771	UltraCore® 712C, UltraCore® HD-12C	Dual Shield II 71 Ultra®, Dual Shield II 711X	—	
	Low-Alloy	Ni	FabCO® 81N1	—	—	Select 81-Ni1
			FabCO® 811N1	—	Dual Shield 810X-Ni1	Select 810-Ni1, Select 820-Ni1
			FabCO® 811N1	UltraCore® 81Ni1C-H	—	—
FabCO® 811N1			—	Dual Shield 810X-Ni1	Select 810-Ni1, Select 820-Ni1	
FabCO® 811N1			UltraCore® 81Ni1A75-H	Dual Shield 80-NiH4	—	
FabCO® 803			UltraCore® 81Ni2C-H	Dual Shield 8000-Ni2	Select 810-Ni2, Select 820-Ni2	
K		FabCO® 803	UltraCore® 81Ni2A75-H	—	Select 810-Ni2, Select 820-Ni2	
		FabCO® 95K2	—	—	Select 95-K2	
		FabCO® 95K2	—	—	—	
		FabCO® 991K2	Outershield® 91K2-H	Dual Shield II 90-K2	Select 910-K2, Select 920-K2	
		FabCO® 991K2	—	—	Select 910-K2, Select 920-K2	
		FabCO® 101K3	—	—	Select 100-K3	
		FabCO® 115-K3	—	—	Select 115	
		FabCO® 115-K3	—	—	—	
		FabCO® 110	Pipeliner® G90M	Dual Shield II 110	Select 111-K3M	
		FabCO® 115	—	Dual Shield T-115	Select 115-K4	
A		FabCO® 125K4	—	—	Select 125-K4	
		FabCO® 911B3	Cormet® 2	Dual Shield 9000-B3	Select 910 B3	
		FabCO® 811A1	—	Dual Shield 7000-A1	Select 810-A1	

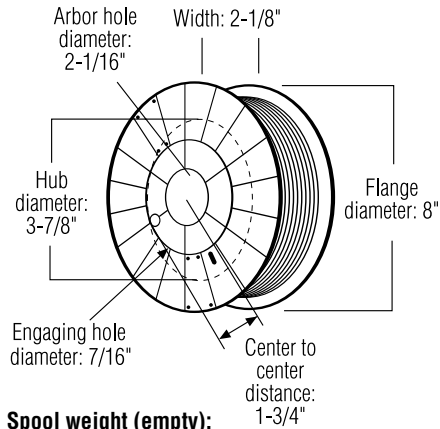
Carbon-Steel & Low-Alloy Self-Shielded Flux-Cored Electrodes					
AWS Classification		Manufacturer			
		Hobart Filler Metals	Lincoln Electric	ESAB	Select Arc
Carbon Steel	<b>E70T-4</b>	Fabshield® 4	Innershield® NS-3M	Coreshield® 40	Select 74
	<b>E70T-6</b>	Fabshield® XLNT-6	Innershield® NR®-305	Coreshield® 6	—
	<b>E70T-7</b>	Fabshield® 7027	Innershield® NR®-311 Innershield® NR®-FAB 70	Coreshield® 7	—
	<b>E71T-8</b>	Fabshield® XLR-8	Innershield® NR®-203 MP Innershield® NR®-232 Innershield® NR®-233	Coreshield® 8	—
	<b>E71T-11</b>	Fabshield® 21B	Innershield® NR®-211MP Innershield® NR®-212	Coreshield® 11	Select 701
	<b>E71T-14</b>	Fabshield® 23	Innershield® NR®-52	Coreshield® 14	Select 700GS
Low-Alloy	<b>E71T8-Ni1</b>	Fabshield® 71T8 Fabshield® 81N1	Innershield® NR®-203 Nickel (1%)	Coreshield® 8-Ni1 H5	—
	<b>E81T8-Ni2</b>	Fabshield® X80	Pipelinor® 81M	—	—
	<b>E71T8-K6</b>	Fabshield® 71K6	Innershield® NR®-207 Pipelinor® NR®-207+	—	—

Carbon-Steel & Low-Alloy Metal-Cored Electrodes					
AWS Classification		Manufacturer			
		Hobart Filler Metals	Lincoln Electric	ESAB	Select Arc
Carbon Steel	<b>E70C-6M</b>	FabCOR® 86R	Metalshield® MC®-6 Metalshield® MC®-706 Metalshield® MC®-710XL®	Coreweld® 70 Coreweld® C6	Endurance Select 70C-6 Select 70C-8 Select 70C-10 Select 70C-T
	<b>E70C-6M</b>	FabCOR® Edge	—	Coreweld® 77-HS	Select 70C-6LS
	<b>E70C-3C</b>	FabCOR® 702	—	—	—
	<b>E70C-GS</b>	FabCOR® F6	Metalshield® Z	—	—
Low-Alloy	<b>E80C-Ni1</b>	FabCOR® Edge Ni1	Metalshield® MC®-80Ni1	Coreweld® 80C-Ni1 Coreweld® 88HS Ni1	Select 80C-Ni1 Select 80C-Ni1LS
	<b>E80C-Ni2</b>	FabCOR® 80N2	—	—	Select 80C-Ni2
	<b>E90C-K3</b>	FabCOR® 90	Metalshield® MC®-90	—	Select 90C-M2
	<b>E110C-K3</b>	FabCOR® 100	—	Coreweld® 110	—
	<b>E110C-K4</b>	FabCOR® 1100	Metalshield® MC®-110	—	Select 110C-M2
	<b>E90C-D2</b>	FabCOR® 80D2 FabCOR® Edge™ D2	—	—	Select 80C-D2

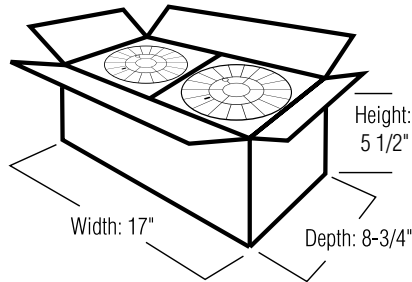
# Tubular Wires

## 10-lb. Spool

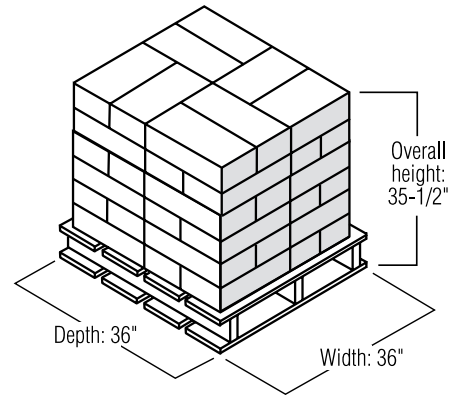
- Color-coded labels for easy wire identification
- Colorful packaging—great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection



**Spool weight (empty):**  
0.8 lbs.



**Weight:** 40 lbs.  
**Spools per master carton:** 4

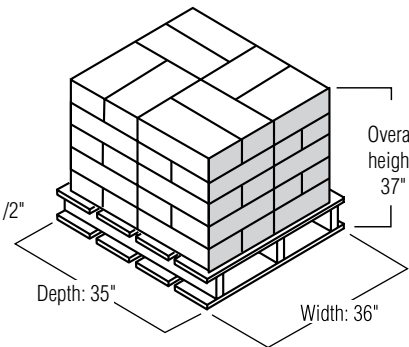
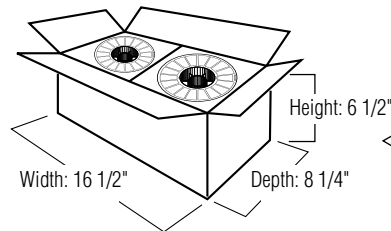
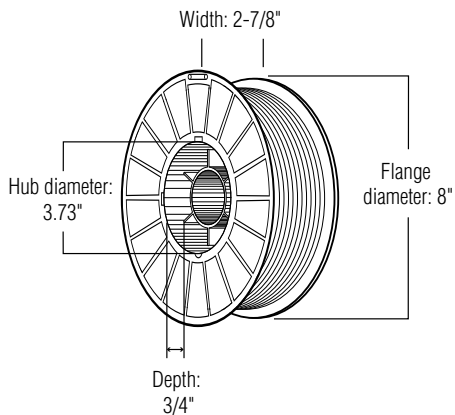


**Weight:** 1,920 lbs. net, 2,115 lbs. gross  
**Stacking sequence:** 4 wide, 4 deep and 6 high  
**Master cartons per pallet:** 48  
**Spools per pallet:** 192

## 12-lb. Spool

### Product Numbers -079

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over



**Weight:**  
1,920 lbs. net,  
2,155 lbs. gross  
(est.)

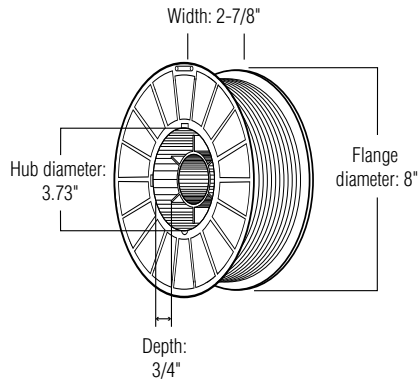
**Stacking sequence:**  
4 wide, 2 deep  
and 5 high

**Spools per pallet:**  
160

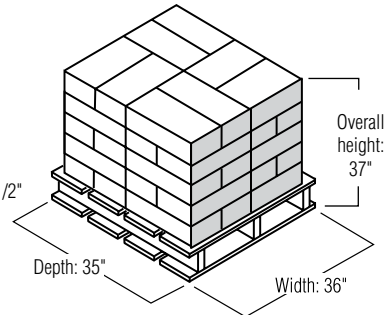
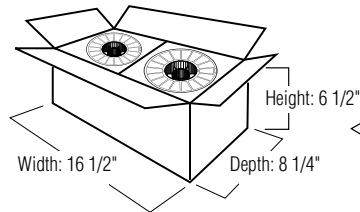
# Tubular Wires

## 15-lb. Spool

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over



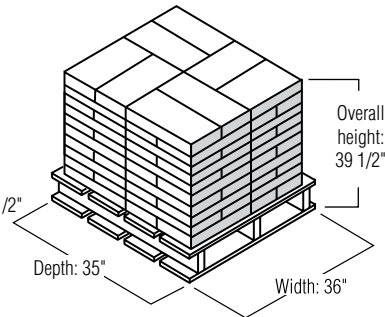
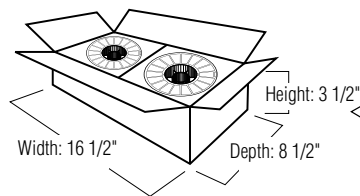
### Product Numbers -023



Weight:  
2,400 lbs. net,  
2,635 lbs. gross  
(est.)  
Stacking sequence:  
4 wide, 2 deep  
and 5 high  
Spools per pallet:  
160

### Product Numbers -025

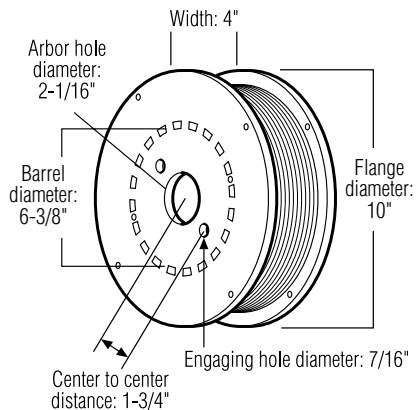
- Each spool is in a vacuum sealed bag



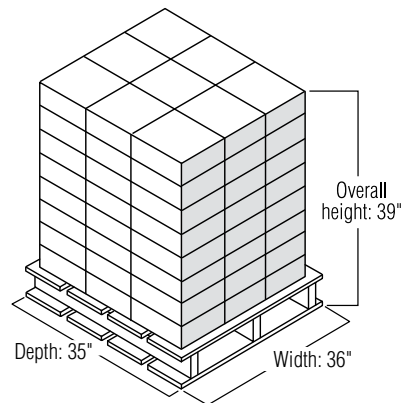
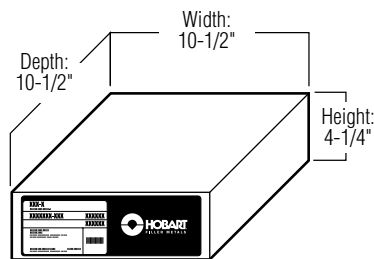
Weight:  
2,400 lbs. net,  
2,635 lbs. gross  
(est.)  
Stacking sequence:  
4 wide, 2 deep  
and 10 high  
Spools per pallet:  
160

## 20-lb. Fiber Spool

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over



Spool weight (empty): 1.8 lbs.

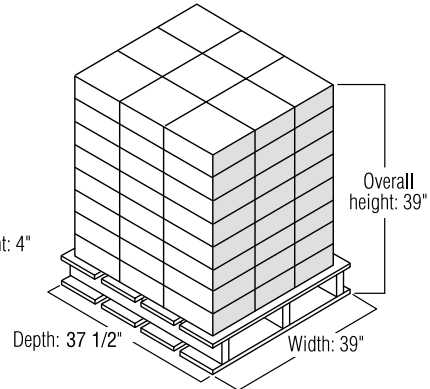
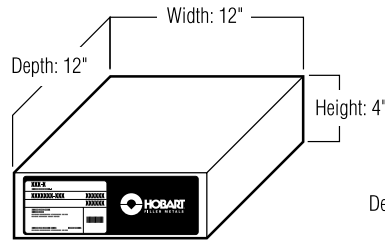
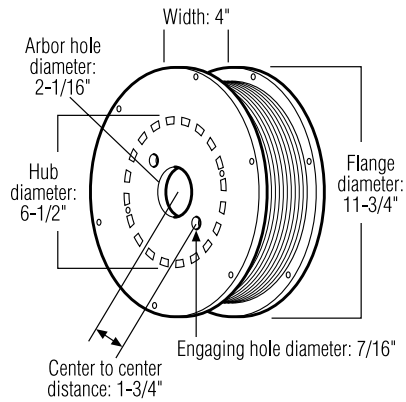


Weight: 1,440 lbs. net, 1,635 lbs. gross (est.)  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72

# Tubular Wires

## 33-lb. & 44-lb. Spool

- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over

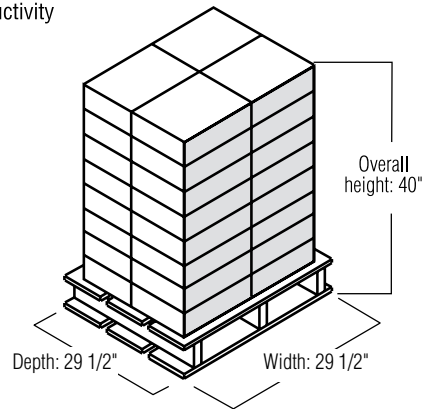
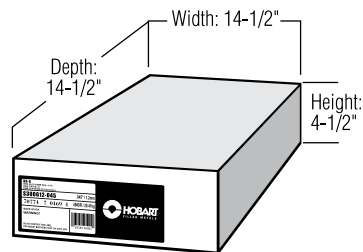
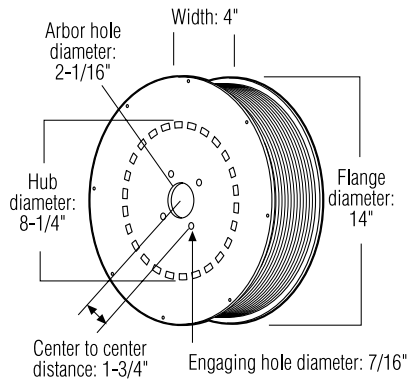


**Spool weight (empty): 2.6 lbs.**

*Weight: 2,376 lbs. net, 2,645 lbs. gross (est.)  
Stacking sequence: 3 wide, 3 deep and 8 high  
Spools per pallet: 72*

## 50-lb. Spool

- Convenient, easy to change over
- Simplicity reduces change over time, increases productivity
- More wire on spool means fewer change overs



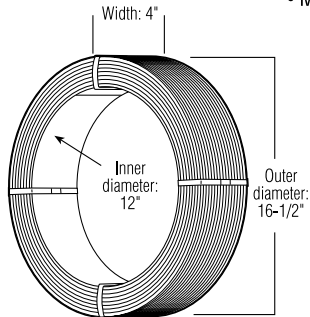
**Spool weight (empty): 3 lbs.**

*Weight: 1,600 lbs. net, 1770 lbs. gross (est.)  
Stacking sequence: 2 wide, 2 deep and 8 high  
Spools per pallet: 32*

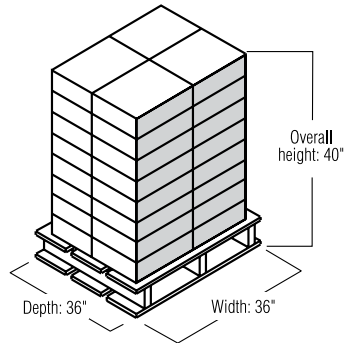
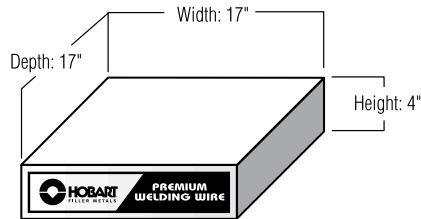


## 60-lb. Coil

- No spool to dispose of after wire is consumed
- Uses standard coil adapters
- More wire on coil means fewer changeovers



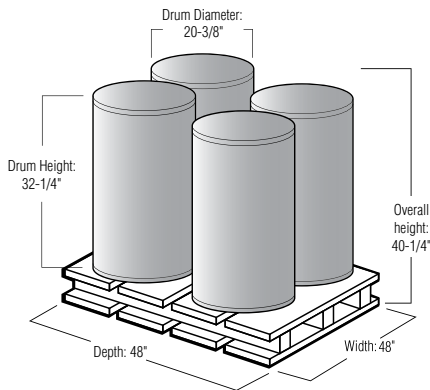
Coil weight (empty): 4 oz.



Weight: 1,920 lbs. net, 1,987 lbs. gross (est.)  
Stacking sequence: 2 wide, 2 deep and 8 high  
Spools per pallet: 32

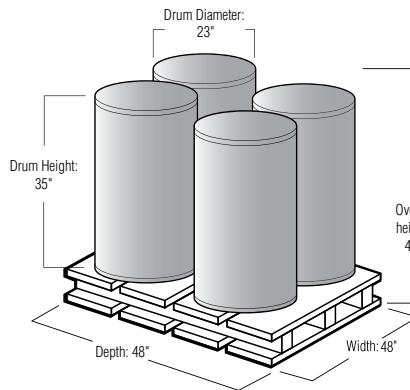
## 500-lb. 750-lb. & 1000-lb. X-Pak™

- Precision straight wire payout for robotic & automatic welding
- Wire wander is essentially eliminated
- Requires cone/bonnet direct pull type (no arm recommended)
- Lazy susan not recommended



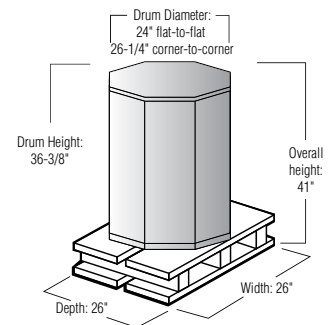
### 500-lb. X-Pak™

Drum weight (empty): 19 lbs.  
Weight: 2,000 lbs. net, 2,050 lbs. gross (est.)  
Drums per pallet: 4



### 750-lb. X-Pak™

Drum weight (empty): 20 lbs.  
Weight: 3,000 lbs. net, 3,050 lbs. gross (est.)  
Drums per pallet: 4



### 1000-lb. X-Pak™

Drum weight (empty): 19 lbs.  
Weight: 1,000 lbs. net, 1,025 lbs. gross (est.)  
Drums per pallet: 1

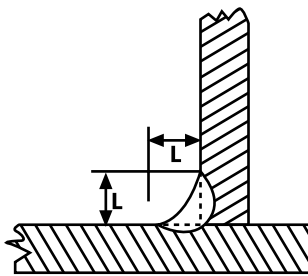
# Tubular Wires

## How to Calculate

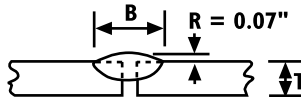
Use the tables below to estimate the quantity of filler metal required for horizontal fillet welds, and square groove and V-groove butt joints. In cases where joint information differs from the tables, simply substitute your numbers in the following formula:

$$W = D \\ (1-L)$$

### HORIZONTAL FILLET WELD

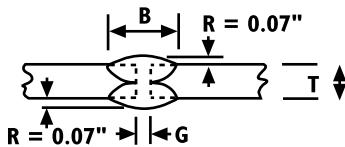


### SQUARE GROOVE BUTT JOINT ...welded one side

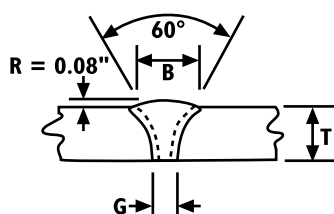


### ...welded two sides

If root of top weld is chipped or flame gouged and welded, add 0.07 lb. to steel deposited (equivalent to approx. 0.13 lb. of wires).



### "V" GROOVE BUTT JOINT



Where:

**W** is the weight of the wire consumed

**D** is the weight of the steel deposited\*

**L** is the total amount of wire losses

To determine D, calculate the area of the groove multiplied by the length; then multiply the result by 0.283, the volume-to-weight conversion factor for steel. If weld reinforcement is involved, be sure to add this amount into your calculation,

e.g.,  $D = [(Area\ of\ groove \times Length\ of\ groove \times 0.283) + Reinforcement\ (if\ applicable)]$

**Table data for square and V-groove joints are based on the efficiency of stick electrodes. To calculate for flux-cored wires, divide D by .80; for solid wire, divide D by .90.**

Size of fillet L (in inches)	Steel deposited per linear foot of weld (lb.)	Pounds of wires required per linear foot of weld (approx.)		
		Stick* (SMAW)	Flux-Cored (FCAW)	Solid (GMAW)
1/8	0.027	.049	.034	.03
3/16	0.063	.114	.079	.07
1/4	0.106	.193	.133	.118
5/16	0.166	.302	.208	.184
3/8	0.239	.434	.298	.265
1/2	0.425	.773	.531	.472
5/8	0.663	1.205	.829	.737
3/4	0.955	1.736	1.194	1.061
1	1.698	3.087	2.123	1.890

Joint Dimensions (in inches)			Steel deposited per linear foot of weld (lbs.)		Pounds of wires required per linear foot of weld (approx.)	
Metal Thick T	Bead Width B	Root Open G	Without reinforcement	With reinforcement (R**=0.08")	Without reinforcement	With reinforcement (R**=0.08")
3/16	3/8	0	—	0.088	—	0.16
		1/16	0.020	0.109	0.04	0.20
1/4	7/16	1/16	0.027	0.129	0.05	0.23
		3/32	0.039	0.143	0.07	0.26
5/16	1/2	1/16	0.033	0.153	0.06	0.27
		3/32	0.050	0.170	0.09	0.30
1/8	1/4	0	—	0.119	—	0.21
		1/32	0.013	0.132	0.03	0.24
3/16	3/8	1/32	0.020	0.199	0.04	0.36
		1/16	0.040	0.218	0.07	0.39
1/4	7/16	1/16	0.053	0.261	0.10	0.47
		3/32	0.080	0.288	0.14	0.53

Joint Dimensions (in inches)			Steel deposited per linear foot of weld (lb.)		Pounds of wires required per linear foot of weld (approx.)	
Metal Thick T	Bead Width B	Root Open G	Without reinforcement	With reinforcement (R**=0.08")	Without reinforcement	With reinforcement (R**=0.08")
1/4	0.207	1/16	0.085	0.143	0.15	0.25
5/16	0.311	3/32	0.173	0.258	0.31	0.46
3/8	0.414	1/8	0.282	.0394	0.50	0.70
1/2	0.558	1/8	0.489	0.641	0.87	1.15
5/8	0.702	1/8	0.753	0.942	1.35	1.68
3/4	0.847	1/8	1.088	1.320	1.94	2.35
1	1.138	1/8	1.930	2.240	3.45	4.00

\*Includes scrap end and spatter loss. \*\*R=Height of reinforcement.

# Tubular Wires

Wire Diameter Inches (mm)	Solid Wire, in/lb	Flux-Cored, in/lb	Product Metal-Cored & Sub Arc, in/lb	Self-Shielded, in/lb
.030 (0.8 mm)	4,960	—	—	5,910
.035 (0.9 mm)	3,650	4,785	3,750	4,350
.045 (1.2 mm)	2,210	2,750	2,550	2,500
.052 (1.4 mm)	1,930	2,000	1,800	—
1/16 (1.6 mm)	1,160	1,450	1,300	1,300
5/64 (2.0 mm)	730	1,000	850	925
3/32 (2.4 mm)	520	625	590	615
7/64 (2.8 mm)	440	480	—	550
.120 (3.0 mm)	—	—	—	420
1/8 (3.2 mm)	350	355	320	—
5/32 (4.0 mm)	—	—	205	—

*The inches per pound values may vary with each AWS class and wire type.*

To Convert From	To	Multiply By
in	m	.0254
in	cm	2.54
in	mm	25.4
in <sup>2</sup>	mm <sup>2</sup>	645.2
mm <sup>2</sup>	in <sup>2</sup>	.00155
lb.	kg	.454
kg	lb.	2.2
ton (2,000 lb.)	kg	907.2
kg	ton	.0011
metric ton (2,200 lb.)	kg	998.8
kg	metric ton	.0010

To Convert From	To	Multiply By
lb./hr.	kg/hr.	.454
kg/hr.	lb./hr.	2.2
liters/min.	cu. ft./hr.	2.119
cu. ft./hr.	liters/min.	.4719
psi	kPa	6.895
kPa	psi	.145
MPa	psi	145
psi	MPa	.0069
ipm	mm/sec.	.423
ft.lb.	Joule (J)	1.356
Joule (J)	ft.lb.	.737

Wire Diameters	Approximate Equivalents in mm for Standard AWS Wire Diameters												
in	.024	.030	.035	.045	.052	1/16	5/64	3/32	7/64	1/8	5/32		
mm	.6	.8	.9	1.2	1.4	1.6	2.0	2.4	2.8	3.2	4.0		

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## MEGAFIL 550R

### ALL POSITION

#### AWS E91T1-K2 M J H4

#### EN17632-A: T55 6 Mn1Ni P M 1 H5

This all-position gas-shielded flux-cored wire maintains acceptable toughness at very low temperatures, making it desirable for use in the critical applications of the offshore and shipbuilding industries. It minimizes the risk of hydrogen cracking, even after considerable atmospheric exposure and has a very low moisture re-absorption after extended exposure.

#### Benefits:

- very low moisture reabsorption after extended exposure
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- weld deposit is able to absorb energy and resist crack formation and propagation
- excellent out of position performance

#### Typical Applications:

- offshore/onshore pipe
- HSLA steels
- heavy equipment
- storage and pressure vessels
- structural fabrication

#### Typical Weld Metal Chemistry:

... 80% Ar/ 20% CO <sub>2</sub>	
Carbon .....	0.05
Manganese .....	1.47
Silicon .....	0.36
Phosphorus .....	0.010
Sulphur .....	0.010

#### Typical Diffusible Hydrogen:

2.9 mL/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	96,000
	(661 MPa)
Yield Strength (psi)	88,500
	(610 MPa)
Elongation % 2" (50mm)	25%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	96 ft.lb. (130J)
Avg. at -40°F (-40°C)	84 ft.lb. (114J)

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
0.045" (1.2 mm)	125-250	24-28	3/4" (19 mm)

**Shielding Gas:** 75-85% Argon (Ar) / Balance Carbon Dioxide (CO<sub>2</sub>)

**Type of Current:** DCEP

#### Approvals and Conformances:

- AWS A5.29, E91T1-K2 MJ H4
- AWS A5.29M, E621T1-K2 MJ H4
- ASME SFA 5.29, E91T1-K2 MJ H4
- ABS, 82% Ar/18% CO<sub>2</sub>, 5YQ550SA H5
- DNV, 82% Ar/18% CO<sub>2</sub>, V Y55MS
- Lloyd's Register, 82% Ar/18% CO<sub>2</sub>, 5Y55S H5

## MEGAFIL 713R

### ALL POSITION

#### AWS E71T-1M J H4, E71T-1C H4, E71T-9M J

#### H4, E71T-9C H4, E71T-12M J H4, E71T-12C H4, EN 17632-A: T 46 4 P M 1 H5, T 46 2 P C 1 H5

This rutile flux-cored wire for carbon steel applications offers fast freezing slag for higher deposition rates in all positions. It minimizes the risk of hydrogen cracking, even after considerable atmospheric exposure and has a very low moisture re-absorption after extended exposure.

#### Benefits:

- provides consistent chemical and mechanical properties
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- excellent out of position performance
- very low moisture reabsorption after extended exposure

#### Typical Applications:

- automatic & mechanized welding
- process pipe / pipe shops
- non-alloyed and fine grain steel
- offshore/onshore pipe

#### Typical Weld Metal Chemistry:

80% Ar/20% CO <sub>2</sub>		100% CO <sub>2</sub>	
Carbon .....	0.02	Carbon .....	0.02
Manganese .....	1.18	Manganese .....	0.90
Silicon .....	0.46	Silicon .....	0.29
Phosphorus .....	0.012	Phosphorus .....	0.012
Sulphur .....	0.011	Sulphur .....	0.011

#### Typical Diffusible Hydrogen:

1.6 mL/100g                      1.5 mL/100g

#### Typical Mechanical Properties (AW):

Tensile Strength (psi)	88,000	86,000
	(607 MPa)	(593 MPa)
Yield Strength (psi)	81,000	79,000
	(558 MPa)	(545 MPa)
Elongation % 2" (50mm)	26%	26%

#### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	65 ft.lb. (89J)	25 ft.lb. (34J)
Avg. at -40°F (-40°C)	60 ft.lb. (81J)	-

#### Typical Operating Range:

Dia.	Amps	Volts	CTWD
0.045" (1.2 mm)	160-230	22-26	3/4" (19 mm)

**Shielding Gas:** 100% Carbon Dioxide (CO<sub>2</sub>), 75-80% Argon (Ar)/Balance Carbon Dioxide (CO<sub>2</sub>)

**Type of Current:** DCEP

## MEGAFIL 819R

### ALL POSITION

**AWS A5.29: E81T1-Ni1C H4, E81T1-Ni1MJ H4**

**EN 17632-A: T 50 6 1Ni P M 1 H5**

This all-position flux-cored wire can be used with mixed gas or 100% carbon dioxide shielding gas in applications where low-temperature notch toughness or long stress-relief cycle times are required.

Seamless technology provides extremely low hydrogen levels giving more resistance to cracking. It also offers out-of-position welding with a flat bead contour.

### Benefits:

- provides consistent chemical and mechanical properties
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- weld deposit is able to absorb energy and resist crack formation and propagation
- allows out-of-position welding with a flat bead contour

### Typical Applications:

- offshore/onshore pipe
- HSLA steels
- heavy equipment
- storage & pressure vessels

### Typical Weld Metal Composition (%):

	80%Ar/20% CO <sub>2</sub>	100% CO <sub>2</sub>
Carbon .....	0.03	0.02
Manganese .....	1.30	0.80
Silicon .....	0.49	0.23
Phosphorus .....	0.012	0.014
Sulphur .....	0.011	0.011
Nickel.....	0.86	0.87
Vanadium .....	0.02	0.02

### Typical Diffusible Hydrogen:

2.3 ml/100g	2.3 ml/100g
-------------	-------------

### Typical Mechanical Properties (AW):

Tensile Strength (psi)	88,000	82,000
	(607 MPa)	(565 MPa)
Yield Strength (psi)	81,000	74,000
	(558 MPa)	(510 MPa)
Elongation in 2" (50mm)	26%	27%

### Typical Charpy V-notch Impact Values (AW):

Avg. at -20°F (-30°C)	25 ft.lb. (34J)	85 ft.lbs (115J)
Avg. at -40°F (-40°C)		56 ft-lbs (76J)
Avg. at -60°F (-50°C)		30 ft-lbs (41J)

### Typical Operating Range:

Dia.	Amps	Volts	CTWD
0.045" (1.2 mm)	150-300	22.5-28	5/8-3/4" (16-19mm)
1/16" (1.6 mm)	200-400	23.5-28	¾-1" (19-25mm)

**Shielding Gas:** 80% Argon (Ar)/20% Carbon Dioxide (CO<sub>2</sub>), 100% (CO<sub>2</sub>)

**Type of Current:** DCEP

### Approvals and Conformances:

- AWS A5.29: E81T1-Ni1C H4, E81T1-Ni1MJ H4
- AWS A5.29M: E551T1-NiC H4, E551T1-Ni1MJ H4
- EN 17632-A: T 50 6 1Ni P M 1 H5

## SWX 120

**EN ISO 14174: S A AB 1 57 AC H5**

Ideal for wind tower fabrication, this flux offers circumferential and longitudinal multi-layer welds and good impact toughness down to -60 degrees Fahrenheit (-50 degrees Celsius) using standard quality S2 and S2Si solid wires. The high current carrying capacity allows the use of high productivity parameters and multiple torches and excellent slag detachment is suitable for narrow and tubular joints. The formulation provides uniform deposit properties when welding thick sections. Moisture-proof packaging eliminates the need to re-dry unopened product.

**Benefits:**

- moderate basicity balances good weldability and mechanical properties
- high current carrying capacity allows the use of high productivity parameters and multiple torches
- formulation provides uniform deposit properties when welding thick sections
- excellent slag detachment is suitable for narrow and tubular joints
- supplied in moisture-proof packaging that eliminates the need to re-dry unopened product

**Typical Applications:**

- wind towers
- pressure vessels
- storage tanks
- heavy equipment
- shipbuilding

**Flux Type:**

Agglomerated aluminate-basic flux

**Basicity Index (Boniszewski):** 1.9

**Alloy Transfer:** Slightly Mn Alloying

**AWS Wall Neutrality Number:** 18 (Neutral)

**Density:** ~1.2 kg/L

**Grain Size:** 0.2 – 2.0 mm/ 10 – 70 mesh

**Type of Current:** DCEP, AC

**Typical Diffusible Hydrogen:**

<5 mL/100g

**Primary Flux Composition:**

Al<sub>2</sub>O<sub>3</sub> + MnO ..... ~35%  
 CaO + MgO..... ~25%  
 SiO<sub>2</sub> + TiO<sub>2</sub>..... ~20%  
 CaF<sub>2</sub>..... ~20%

**Packaging Available:**

- 50 lb. (22.5 kg) EAE Bag

## SWX 150

**EN ISO 14174: S A FB 1 55 AC H5**

This High basicity flux is ideal for demanding applications such as offshore, pressure vessel, cryogenic and nuclear fabrication. With excellent low temperature toughness, it has a wide range of flux/wire combinations, including for high strength, low-temperature and creep resistant applications. The formulation provides uniform deposit properties when welding thick sections and works well for narrow gap welding. The moisture-proof packaging eliminates the need to re-dry the unopened product.

**Benefits:**

- formulated to provides uniform deposit properties when welding thick sections
- high basicity performance provides excellent toughness for demanding applications
- suitable for use with many wires intended for high-strength low-alloy steels
- supplied in moisture-proof packaging that eliminates the need to re-dry unopened product

**Typical Applications:**

- offshore structures
- offshore wind towers
- civil construction
- boiler and pressure vessels
- power generation
- double-jointing
- high-strength high-toughness applications

**Flux Type:**

Agglomerated fluoride-basic flux

**Basicity Index (Boniszewski):** 3.3

**Alloy Transfer:** None

**AWS Wall Neutrality Number:** 4 (Neutral)

**Density:** ~1.1 kg/L

**Grain Size:** 0.2 – 2.0 mm/ 10 – 70 mesh

**Type of Current:** DCEP, AC

**Typical Diffusible Hydrogen:**

<5 mL/100g

**Primary Flux Composition:**

Al<sub>2</sub>O<sub>3</sub> + MnO ..... ~20%  
 CaO + MgO..... ~35%  
 SiO<sub>2</sub> + TiO<sub>2</sub>..... ~15%  
 CaF<sub>2</sub>..... ~25%

**Packaging Available:**

- 50 lb. (22.5 kg) EAE Bag

### SWX 160

#### EN ISO 14174: S A FB 1 55 AC H5

This high-basicity, fluoride-basic agglomerated flux is ideal for joining of a wide range of carbon and low-alloy steels. It provides excellent impact toughness at low temperatures, but also provides good welding characteristics and slag release. The very low content of residual (tramp) elements, making it well suited for applications requiring a low X-Factor (< 15). The moisture-proof packaging eliminates the need to re-dry the unopened product.

#### Benefits:

- specially formulated for low residual (tramp) element content; excellent for applications requiring low X-factor
- high-basicity flux offers very high impact toughness; suitable for use in demanding applications
- intended for use with a wide variety of Hobart low-alloy wires.
- supplied in moisture-proof packaging that eliminates the need to re-dry unopened product

#### Typical Applications:

- pressure vessels
- nuclear applications
- high-strength low-alloy steels
- chrome-moly steels
- offshore fabrication

#### Flux Type:

Agglomerated fluoride-basic flux

#### Basicity Index (Boniszewski): 2.7

#### Alloy Transfer: None

#### AWS Wall Neutrality Number: 4 (Neutral)

#### Density: ~1.1 kg/L

#### Grain Size: 0.2 – 2.0 mm/ 10 – 70 mesh

#### Type of Current: DCEP, AC

#### Typical Diffusible Hydrogen: <5 mL/100g

#### Primary Flux Composition:

Al<sub>2</sub>O<sub>3</sub> + MnO ..... ~20%  
CaO + MgO ..... ~35%  
SiO<sub>2</sub> + TiO<sub>2</sub> ..... ~15%  
CaF<sub>2</sub> ..... ~25%

#### Packaging Available:

- 50 lb. (22.5 kg) EAE Bag

### HA-495

#### EN ISO 14174: S A AR 1 88 AC

Primarily used for single and double pass fillet welds, this agglomerated active type flux has excellent resistance to rust, mill scale excellent wetting of fillet weld toes and excellent slag removal. The active flux formulation provides excellent bead appearance and wetting action, even when welding at very high travel speeds.

#### Benefits:

- active flux formulation provides excellent bead appearance and wetting action, even when welding at very high travel speeds
- active flux formula provides excellent resistance to porosity caused by rust or mill scale
- excellent slag removal helps reduce clean up time to improve productivity

#### Typical Applications:

- single or double-pass fillet groove welds
- thin-wall tanks and pressure vessels
- light structural fabrication
- railcar
- utility pole fabrication

#### Flux Type:

Agglomerated aluminate-rutile flux

#### Basicity Index (Boniszewski): ~0.8

#### Alloy Transfer: Si & Mn Alloying

#### AWS Wall Neutrality Number: 48 (Active)

#### Grain Size: 0.2 – 1.7 mm/ 12 – 65 mesh

#### Type of Current: DCEP, AC

#### Typical Composition:

Al<sub>2</sub>O<sub>3</sub> + TiO<sub>2</sub> ..... ~60%  
CaO + MgO + CaF ..... ~20%  
SiO<sub>2</sub> ..... ~5%  
MnO + FeO ..... ~15%

#### Packaging Available

- 50 lb. (22.5 kg) Bag

### HN-590

#### EN ISO 14174: S A AB 1 68 AC

This basic agglomerated type flux produces weld deposits with good mechanical properties at low temperatures. It provides good slag removal for reduced clean-up time and minimizes the risk of inclusion in narrow-groove applications. It also offers good resistance to cracking and porosity to help minimize the risk of part rework during welding or in service.

#### Benefits:

- moderate basicity balances good mechanical properties and good welding characteristics
- provides good slag removal for reduced clean-up time, and minimized risk of inclusion in narrow-groove applications
- provides good resistance to cracking and porosity to help minimize risk of part rework during welding or in service

#### Typical Applications:

- structural and bridge fabrication
- high-strength low-alloy (HSLA) steels
- general fabrication

#### Flux Type:

Agglomerated aluminate-basic flux

#### Basicity Index (Boniszewski): ~1.7

#### Alloy Transfer: Slightly Si & Mn Alloying

#### Grain Size: 0.3 – 1.3 mm/ 15 – 60 mesh

#### Type of Current: DCEP, AC

#### Typical Composition:

Al<sub>2</sub>O<sub>3</sub> + TiO<sub>2</sub> ..... ~35%  
CaO + MgO + CaF ..... ~38%  
SiO<sub>2</sub> ..... ~10%  
MnO + FeO ..... ~15%

#### Packaging Available

- 50 lb. (22.5 kg) Bag



## AWS A5.17: Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding

### SWX 150 / SubCOR™ EM13K-S MOD

EXAMPLE CLASSIFICATION: **F 7 A 8-EC1**

#### F — Flux for Submerged Arc welding

#### Tensile properties (multi-run)

	Tensile strength		Min. yield strength		Elongation, Min. %
	psi	(MPa)	psi	(MPa)	
6	60,000–80,000	(414-551)	48,000	(331)	22
7	70,000–95,000	(483-655)	58,000	(400)	22

#### Heat treatment

A	As welded
P	Post weld heat treated (PWHT) at 1150°F (620°C)1h

#### Impact toughness properties

	Temperature		Min. Absorbed Energy, Charpy V-Notch	
	°F	(°C)	ft-lb	(J)
0	0	(-18)	20	(27)
2	-20	(-29)	20	(27)
4	-40	(-40)	20	(27)
5	-50	(-46)	20	(27)
6	-60	(-51)	20	(27)
8	-80	(-62)	20	(27)
10	-100	(-73)	20	(27)
Z	No requirements			

#### Weld deposit chemical composition for composite electrode weld metal (%)

Classification	C	Mn	Si	S	P	Cu
EC1	0.15	1.80	0.90	0.35	0.035	0.35

Note: Single values are maximum.

#### Chemical composition for solid electrodes (%) (extract)

Classification	C	Mn	Si	S	P	Cu
EL12	0.04–0.14	0.25–0.60	0.10	0.030	0.030	0.35
EM12K	0.05–0.15	0.80–1.25	0.10–0.35	0.030	0.030	0.35
EM13K	0.06–0.16	0.90–1.40	0.35–0.75	0.030	0.030	0.35
EH12K	0.06–0.15	1.50–2.00	0.25–0.65	0.025	0.025	0.35

Note: Single values are maximum.

#### Diffusible hydrogen in weld metal (optional)

Hydrogen content	
Symbol	ml/100g weld metal, max.
H4	4
H8	8
H16	16

Wire/Flux Combination Classifications (AWS A5.17)					
Wire Trade Name	Flux Trade Name				
	HA-495	HN-590	SWX 120	SWX 150	SWX 160
SDX S2Si-EM12K	F7A2-EM12K	F7A4-EM12K	F7A6-EM12K	F7A6-EM12K	-
SDX S2Si-EM12K	-	F7P5-EM12K	F7P8-EM12K	F7P8-EM12K	-
SDX EM13K	-	F7A4-EM13K	F7A4-EM13K	F7A4-EM13K	-
SDX EM13K	-	F7P4-EM13K	F7P8-EM13K	F7P8-EM13K	-
SDX S3Si-EH12K	-	-	F7A6-EH12K	F7A8-EH12K	F7A8-EH12K
SDX S3Si-EH12K	-	-	-	F7P8-EH12K	F7P8-EH12K
SubCOR™ EM12K-S	F7A2-EC1	F7A6-EC1	F7A6-EC1	F7A4-EC1	-
SubCOR™ EM12K-S	-	-	F6P8-EC1	-	-
SubCOR™ EM13K-S	F7A4-EC1 H8	F7A8-EC1 H8	F7A8-EC1 H8	F7A8-EC1	-
SubCOR™ EM13K-S	-	F7P8-EC1 H8	F7P8-EC1 H8	F6P8-EC1	-
SubCOR™ EM13K-S MOD	-	F7A8-EC1 H8	F7A8-EC1	F7A8-EC1	-
SubCOR™ EM13K-S MOD	-	F7P4-EC1 H8	F7P8-EC1	F7P8-EC1	-
SubCOR™ SL 731	-	-	F7A8-ECG	-	-

Wire/Flux Combination Classifications (EN ISO 14171-A)		
Wire Trade Name	Flux Trade Name	
	SWX 120	SWX 150
SDX S2Si-EM12K	S 38 5 AB S2Si	-
SDX S3Si-EH12K	-	S 46 6 FB S3Si
SDX S3Si-EH12K	-	-
SubCOR™ SL 731	S 46 4 AB T3	S 46 4 FB T3

Approval Summary: Carbon Steel									
Wire	Flux	ABS	BV	DNV/GL	LR	CWB	DB	TüV	CE
SDX S2Si-EM12K	SWX 120	3YT H5 (TM)				F49A4-EM12K-H8	X	X	X
SDX S2Si-EM12K								X	X
SDX S2Si-EM12K	SWX 150					F49A6-EM12K-H8		X	X
SDX S3Si-EH12K	SWX 120					F49A6-EH12K-H8			X
SDX S3Si-EH12K	SWX 150	5YQ460M H5		6Y46M H5 (SW+TM)	BF 5Y46M H5	F49A6-EH12K-H8		X	X
SubCOR™ EM13K-S	HA-495				F49A4-EC1-H8				
SubCOR™ EM13K-S	HN-590	F7A8-EC1			F49A4-EC1-H8	F49A6-EH12K			
SubCOR™ EM13K-S MOD	SWX 120				F49A6-EC1-H8				
SubCOR™ EM13K-S MOD	SWX 150	4YM H10		4Y40M H10					
SubCOR™ EM13K-S MOD	HN-590				F49A6-EC1-H8				
SubCOR™ SL 731	SWX 150	3YM H5	A3YM	3YM	5Y46 H5	X	X	X	X

Please consult product datasheets for a complete list of product approvals, part numbers for standard packaging, and typical mechanical properties. Product data sheets, and Hobart's comprehensive submerged arc welding handbook, can be found online at <http://www.HobartBrothers.com/Products/Submerged-Arc>

## SDX S2Si-EM12K

**AWS A5.17: EM12K**  
**EN ISO 14174: S2Si**

This copper-coated carbon-steel solid wire is ideal for submerged arc welding. It is a versatile, general purpose product suitable for joining a wide range of non-alloyed steels with a wide variety of flux(es). Moderate manganese and silicon levels provide improved resistance to porosity, improved mechanical properties, and allow faster travel speeds.

**Benefits:**

- moderate manganese and silicon levels provide improved resistance to porosity, improved mechanical properties, and allow faster travel speeds
- suitable for use with a wide variety of Hobart fluxes, making it easy to choose the optimal combination for unique applications
- copper coated for optimal consistency of electrode feeding and electrical transfer

**Typical Applications:**

- general fabrication
- structural and bridge fabrication
- heavy equipment
- storage and pressure vessels

**Recommended Fluxes:**

HA-495, HN-590, SWX 120, SWX 150

**AWS A5.17 Wire/Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
HA-495	F7A2-EM12K	
HN-590	F7A4-EM12K	F7P5-EM12K
SWX 120	F7A6-EM12K	F7P8-EM12K
SWX 150	F7A6-EM12K	F7P8-EM12K

**Typical Weld Metal Chemistry:**

	HA-495	SWX 150
Carbon	0.09	0.07
Manganese	1.50	0.93
Silicon	0.59	0.20
Phosphorus	0.023	0.013
Sulphur	0.018	0.009
Copper	0.22	0.17

**Typical Mechanical Properties (AW/PWHT):**

	HA-495	SWX 150
Tensile Strength	94/- ksi	77/74 ksi
Yield Strength	84/- ksi	68/61 ksi
Elongation in 2"	22%/-	31/32%
Tensile Strength	648/- MPa	531/510 MPa
Yield Strength	579/- MPa	469/421 MPa
Elongation in 50 mm	22/- %	31/32%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	HA-495	SWX 150
Avg. at -20°F	30/- ft-lbs	
Avg. at -60°F		90/- ft-lbs
Avg. at -80°F		--/55 ft-lbs
Avg. at -30°C	41/-	
Avg. at -50°C		122/- J
Avg. at -60°C		--/75 J

**Standard Diameters:**

5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

## SDX EM13K

**AWS A5.17: EM13K**

This copper-coated carbon-steel solid wire is ideal for submerged arc welding. Moderate manganese and silicon contents allow faster travel speeds, resistance to porosity, and improved mechanical properties.

**Benefits:**

- a higher silicon content than EM12K wire helps to provide better deoxidation and porosity resistance when welding over mill scale or light rust.
- copper coated for optimal consistency of electrode feeding and electrical transfer

**Typical Applications:**

- general fabrication
- structural and bridge fabrication
- heavy equipment
- storage and pressure vessels

**Recommended Fluxes:**

HN-590, SWX 120, SWX 150

**AWS A5.17 Wire/Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
HN-590	F7A4-EM13K	F7P4-EM13K
SWX 120	F7A4-EM13K	F7P8-EM13K
SWX 150	F7A4-EM13K	F7P8-EM13K

**Typical Weld Metal Chemistry:**

	SWX 120	SWX 150
Carbon	0.06	0.07
Manganese	1.31	0.93
Silicon	0.17	0.18
Phosphorus	0.014	0.013
Sulphur	0.010	0.007
Copper	0.18	0.17

**Typical Mechanical Properties (AW/PWHT):**

	SWX 120	SWX 150
Tensile Strength	78/78 ksi	77/74 ksi
Yield Strength	66/64 ksi	68/61 ksi
Elongation in 2"	27/28%	31/32%
Tensile Strength	538/538 MPa	531/510 MPa
Yield Strength	455/441 MPa	469/421 MPa
Elongation in 50 mm	27/28%	31/32%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	SWX 120	SWX 150
Avg. at -60°F	75/55 ft-lbs	90/65 ft-lbs
Avg. at -80°F	40/45 ft-lbs	25/55 ft-lbs
Avg. at -50°C		102/5 J
Avg. at -60°C		54/61 J

**Standard Diameters:**

3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

### SDX S3Si-EH12K

**AWS A5.17: EH12K**  
**EN ISO 14174: S3Si**

With comparatively high manganese content, this copper-coated, carbon-steel solid wire for submerged arc welding and is well suited for welding moderate-tensile strength non-alloyed/carbon steels in critical applications.

**Benefits:**

- comparatively high manganese content provides high toughness
- well suited for welding moderate-tensile strength non-alloyed/carbon steels in critical applications
- copper coated for optimal consistency of electrode feeding and electrical transfer

**Typical Applications:**

- structural and bridge fabrication
- offshore fabrication
- heavy equipment
- pressure vessels

**Recommended Fluxes:**

SWX 120, SWX 150, SWX 160

**AWS A5.17 Wire/Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
SWX 120	F7A6-EH12K	
SWX 150	F7A8-EH12K	F7P8-EH12K
SWX 160	F7A8-EH12K	F7P8-EH12K

**Typical Weld Metal Chemistry:**

	SWX 120	SWX 150
Carbon	0.07	0.08
Manganese	1.72	1.45
Silicon	0.27	0.35
Phosphorus	0.014	0.011
Sulphur	0.004	0.004
Copper	0.07	0.07

**Typical Mechanical Properties (AW / PWHT):**

	SWX 120	SWX 150
Tensile Strength	84/-- ksi	83/80 ksi
Yield Strength	73/-- ksi	74/65 ksi
Elongation in 2"	30/--%	31/31%
Tensile Strength	579/-- MPa	572/552 MPa
Yield Strength	503/-- MPa	510/448 MPa
Elongation in 50 mm	30/--%	31/31%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	SWX 120	SWX 150
Avg. at -60°F	50/-- ft-lbs	190/-- ft-lbs
Avg. at -80°F	35/40 ft-lbs	120/215 ft-lbs
Avg. at -50°C	68/-- J	258/-- J
Avg. at -60°C	47/61 J	163/291J

**Standard Diameters:**

5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

### SubCOR™ EM12K-S

**AWS A5.17: EC1**

This composite electrode is ideal for submerged arc welding of carbon steel plates using the recommended fluxes. The electrode chemistry conforms to the solid wire classification EM12K per AWS A5.17. The composite metal-cored wire offers improved deposition rates—improved travel speed and productivity—compared to solid wires at comparable amperages.

**Benefits:**

- composite metal-cored wire offers improved deposition rates—improved travel speed and productivity—compared to solid wires at comparable amperages
- the weld deposit chemistry is specially formulated to be similar to EM12K solid wire to provide a higher-productivity alternative in nearly all of the same applications

**Typical Applications:**

- general fabrication
- structural fabrication
- storage tanks
- rail car
- welding using active fluxes

**Recommended Fluxes:**

HA-495, HN-590, SWX 110, SWX 120, SWX 150

**AWS A5.17 Wire / Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
HA-495	F7A2-EC1	
HN-590	F7A6-EC1	
SWX 120	F7A6-EC1	F6P8-EC1
SWX 150	F7A4-EC1	

**Typical Weld Metal Chemistry:**

	HA-495	HN-590
Carbon	0.05	0.07
Manganese	1.20	1.39
Silicon	0.56	0.33
Phosphorus	0.020	0.020
Sulphur	0.010	0.010
Copper	0.06	0.07

**Typical Mechanical Properties (AW/PWHT):**

	HA-495	HN-590
Tensile Strength	85/-- ksi	79/-- ksi
Yield Strength	76/-- ksi	68/-- ksi
Elongation in 2"	26/--%	28/--%
Tensile Strength	586/-- MPa	545/-- MPa
Yield Strength	524/-- MPa	524/-- MPa
Elongation in 50 mm	26/--%	28/--%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	HA-495	SWX 150
Avg. at -20°F	20/-- ft-lbs	
Avg. at -40°F		45/85 ft-lbs
Avg. at -60°F		25/35 ft-lbs
Avg. at -30°C	27/-- J	
Avg. at -40°C		61/115 J
Avg. at -50°C		34/47 J

**Standard Diameters:**

3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

## SubCOR™ EM13K-S

### AWS A5.17: EC1

This composite electrode for submerged arc welding of carbon steel plates using the recommended fluxes. The electrode chemistry conforms to the solid wire classification EM13K per AWS A5.17. The higher manganese and silicon content compared to SubCOR™ EM12K-S wire improves porosity resistance when welding over scale or light rust.

### Benefits:

- composite metal-cored wire offers improved deposition rates—improved travel speed and productivity—compared to solid wires at comparable amperages
- the weld deposit chemistry is specially formulated to be similar to EM13K solid wire to provide a higher-productivity alternative in nearly all of the same applications
- higher manganese and silicon content compared to SubCOR EM12K-S wire improves porosity resistance when welding over scale or light rust.
- suitable for use with a wide variety of Hobart fluxes, making it easier to choose the optimal combination for unique applications

### Typical Applications:

- general fabrication
- structural fabrication
- storage tanks
- heavy equipment
- rail car

### Recommended Fluxes:

HA-495, HN-590, SWX 120, SWX 150

### AWS A5.17 Wire/Flux Classifications:

	As-Welded (AW)	Stress-Relieved (PWHT)
HA-495	F7A4-EC1 H8	
HN-590	F7A8-EC1 H8	F7P8-EC1 H8
SWX 120	F7A8-EC1 H8	F7P8-EC1 H8
SWX 150	F7A8-EC1	F6P8-EC1

### Typical Weld Metal Chemistry:

	HA-495	SWX 120
Carbon	0.06	0.08
Manganese	1.44	1.36
Silicon	0.57	0.32
Phosphorus	0.020	0.014
Sulphur	0.013	0.012
Copper	0.07	0.06

### Typical Mechanical Properties (AW/PWHT):

	HA-495	SWX 120
Tensile Strength	84/-- ks	76/73 ksi
Yield Strength	72/-- ksi	65/60 ksi
Elongation in 2"	28%	30/32%
Tensile Strength	579/-- MPa	524/503 MPa
Yield Strength	496/-- MPa	448/414 MPa
Elongation in 50 mm	28/--%	30/32%

### Typical Charpy V-Notch Impact Values (AW/PWHT):

	HA-495	SWX 120
Avg. at -40°F	60/-- ft-lbs	
Avg. at -80°F		80/140 ft-lbs
Avg. at -40°C	81/-- J	
Avg. at -60°C		108/190 J

### Standard Diameters:

5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

## SubCOR™ EM13K-S MOD

### AWS A5.17: EC1

This composite electrode is ideal for submerged arc welding of carbon steel plates using the recommended fluxes. This wire is specially formulated to maintain good mechanical properties when welding at high heat (>80 kJ / in) inputs. The electrode chemistry conforms to the solid wire classification EM13K per AWS A5.17.

### Benefits:

- composite metal-cored wire offers improved deposition rates—improved travel speed and productivity—compared to solid wires at comparable amperages
- specially formulated to maintain good mechanical properties when welding at high (>80 kJ / in) heat inputs
- the weld deposit chemistry is specially formulated to be similar to EM13K solid wire to provide a higher-productivity alternative in nearly all of the same applications
- suitable for use with a wide variety of Hobart fluxes, making it easier to choose the optimal combination for unique applications

### Typical Applications:

- general fabrication
- structural fabrication
- bridge fabrication
- offshore fabrication
- pressure vessels and tank car

### Recommended Fluxes:

HN-590, SWX 120, SWX 150

### AWS A5.17 Wire/Flux Classifications:

	As-Welded (AW)	Stress-Relieved (PWHT)
HN-590	F7A8-EC1 H8	
SWX 120	F7A8-EC1	F7P8-EC
SWX 150	F7A8-EC1	F7P8-EC1

### Typical Weld Metal Chemistry:

	HN-590	SWX 120	SWX 150
Carbon	0.08	0.08	0.10
Manganese	1.42	1.15	0.89
Silicon	0.44	0.27	0.47
Phosphorus	0.017	0.014	0.017
Sulphur	0.008	0.008	0.011
Copper	0.08	0.06	0.09
Molybdenum	0.09	0.09	0.11

### Typical Mechanical Properties (AW/PWHT):

	HA-495	SWX 120
Tensile Strength	84/-- ks	76/73 ksi
Yield Strength	72/-- ksi	65/60 ksi
Elongation in 2"	28%	30/32%
Tensile Strength	579/-- MPa	524/503 MPa
Yield Strength	496/-- MPa	448/414 MPa
Elongation in 50 mm	28/--%	30/32%

### SubCOR™ SL 731

#### Typical Charpy V-Notch Impact Values (AW/PWHT):

	HA-495	SWX 120
Avg. at -40°F	60/-- ft-lbs	
Avg. at -80°F		80/140 ft-lbs
Avg. at -40°C	81/-- J	
Avg. at -60°C		108/190 J

#### Standard Diameters:

3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

#### AWS A5.17: EC1/ECG EN ISO 14171: T3

This seamless, carbon-steel, cored wire for submerged arc-welding for welding carbon/non-alloyed steels, and some low-alloy steels. It is specially formulated to provide improved weld metal toughness and ductility compared to solid wire alternatives such as EM12KS, EM13KS, EH12K, etc. The seamless cored wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking. The unique manufacturing process provides unmatched product consistency for excellent uniformity of chemical properties, mechanical properties, and arc characteristics.

#### Benefits:

- specially formulated to offer enhanced impact toughness than can be achieved by carbon steel solid wires such as EM13K, EH12K, etc.
- seamless cored wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking
- unique manufacturing process provides unmatched product consistency for excellent uniformity of chemical properties, mechanical properties, and arc characteristics
- copper coated for optimal consistency of electrode feeding and electrical transfer

#### Typical Applications:

- structural fabrication
- bridge fabrication
- offshore fabrication
- pressure vessels and tank cars

#### Recommended Fluxes:

SWX 110, SWX 120, SWX 150

#### AWS A5.17 Wire/Flux Classifications:

	As-Welded (AW)	Stress-Relieved (PWHT)
SWX 110	F7A6-ECG	F7A8-ECG
SWX 120	F7A8-ECG	F7P10-ECG
SWX 150	F7A8-EC1	F7P10-EC1

#### Typical Weld Metal Chemistry:

	SWX 120	SWX 150
Carbon.....	0.04	0.05
Manganese.....	1.85	1.55
Silicon.....	0.40	0.48
Phosphorus.....	0.011	0.009
Sulphur.....	0.005	0.003
Copper.....	0.07	0.08

#### Typical Mechanical Properties (AW/PWHT):

	SWX 120	SWX 150
Tensile Strength	88/79 ksi	86/80 ksi
Yield Strength	77/65 ksi	75/66 ksi
Elongation in 2"	29/33%	29/31%
Tensile Strength	606/544 MPa	592/551 MPa
Yield Strength	530/448 MPa	517/455 MPa
Elongation in 50 mm	29/33%	29/31%

#### Typical Charpy V-Notch Impact Values (AW/PWHT):

	SWX 120	SWX 150
Avg. at -60°F		118/-- ft-lbs
Avg. at -80°F	87/98 ft-lbs	46/103 ft-lbs
Avg. at -100°F	76/97 ft-lbs	--/84 ft-lbs
Avg. at -60°C	118/132 J	160/- J
Avg. at -70°C	103/131 J	62/39 J

#### Standard Diameters:

5/32" (4.0 mm)

## AWS A5.23: Specification for Low-Alloy Steel Electrodes and Fluxes For Submerged Arc Welding

### SWX 150 / SubCOR™ 92-S

EXAMPLE CLASSIFICATION: **F8A10-ECM2-M2**

#### F — Flux for Submerged Arc welding

#### Tensile properties (multi-run)

	Tensile strength psi	(MPa)	Min. yield strength psi	(MPa)	Elongation, Min. %
7	70,000–95,000	(483–655)	58,000	(400)	22
8	80,000–100,000	(552–698)	68,000	(469)	20
9	90,000–110,000	(621–758)	78,000	(538)	17
10	100,000–120,000	(689–827)	88,000	(607)	16
11	110,000–130,000	(758–896)	98,000	(676)	15
12	120,000–140,000	(827–965)	108,000	(745)	14
13	130,000–150,000	(896–1034)	118,000	(814)	14

#### Heat treatment

A	As welded
P	Post weld heat treated (PWHT) — time and temperature varies by alloy

#### Impact toughness properties

	Temperature		Min. Absorbed Energy, Charpy V-Notch	
	°F	(°C)	ft-lb	(J)
0	0	(-18)	20	(27)
2	-20	(-29)	20	(27)
4	-40	(-40)	20	(27)
5	-50	(-46)	20	(27)
6	-60	(-51)	20	(27)
8	-80	(-62)	20	(27)
<b>10</b>	<b>-100</b>	<b>(-73)</b>	<b>20</b>	<b>(27)</b>
15	-150	(-101)	20	(27)
Z	No requirements			

#### Chemical composition for solid electrodes (%) (extract)

Classification	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
EA2	0.05–0.17	0.95–1.35	0.20	0.025	0.025	0.45–0.65	—	0.45–0.65	—
EF3	0.10–0.18	1.50–2.40	0.30	0.025	0.025	—	0.70–1.10	0.40–0.65	0.35
ENi1	0.12	0.75–1.25	0.05–0.30	0.020	0.020	0.15	0.75–1.25	0.30	0.35
ENi5	0.12	1.20–1.60	0.05–0.30	0.020	0.020	0.75–1.25	0.75–1.25	0.10–0.30	0.35
EC	Composite electrode (see chemical composition of weld deposit)								
EG	Not specified, as agreed upon between purchaser and supplier								

Note: Single values are maximum.

#### Chemical composition of weld metal deposit (%) (extract)

Classification	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Other
A4	0.15	1.60	0.80	0.030	0.030	—	—	0.40–0.65	0.35	—
F2	0.17	1.25–2.25	0.80	0.030	0.030	—	0.40–0.80	0.40–0.65	0.35	—
F3	0.17	1.25–2.25	0.80	0.030	0.030	—	0.70–1.10	0.40–0.65	0.35	—
F5	0.17	1.20–1.80	0.80	0.020	0.020	0.65	2.00–2.80	0.30–0.80	0.50	—
M2	0.10	0.90–1.80	0.80	0.020	0.020	0.35	1.40–2.10	0.25–0.65	0.30	Ti+V+Zr: 0.03
M4	0.10	1.30–2.25	0.80	0.020	0.020	0.80	2.00–2.80	0.30–0.80	0.30	Ti+V+Zr: 0.03
Ni1	0.12	1.60	0.80	0.025	0.030	0.15	0.75–1.10	0.35	0.35	Ti+V+Zr: 0.05
Ni5	0.12	1.60	0.80	0.025	0.030	—	0.70–1.10	0.10–0.30	0.35	—
EG	Not specified									

Note: Single values are maximum.

#### Diffusible hydrogen in weld metal (optional)

Hydrogen content	
Symbol	ml/100g weld metal, max.
H4	4
H8	8
H16	16

# Submerged Arc

## Wire/Flux Combination Classifications (AWS A5.23)

Wire Trade Name	Flux Trade Name				
	HA-495	HN-590	SWX 120	SWX 150	SWX 160
SDX S3Ni1Mo-EF3		F10A6-EF3-F3	F10A8-EF3-F3	F10A8-EF3-F3	
SDX S3Ni1Mo-EF3		F10P4-EF3-F3		F10P8-EF3-F3	
SubCOR™ N1-S			F7A8-ECNi1-Ni1	F7A8-ECNi1-Ni1	
SubCOR™ N1-S			F6P10-ECNi1-Ni1	F7P10-ECNi1-Ni1	
SubCOR™ 92-S	F8TA4-ECG	F8A8-ECM1-M1 H8	F8A10-ECM1-M1	F8A10-ECM1-M1	
SubCOR™ 92-S		F8P8-ECM1-M1 H8	F8P8-ECM1-M1		
SubCOR™ 100F3-S		F10A4-ECF3-F3	F10A8-ECF3-F3	F10A10-ECF3-F3	
SubCOR™ 100F3-S		F10P2-ECF3-F3	F10P8-ECF3-F3	F10P10-ECF3-F3	
SubCOR™ 120-S				F11A10-ECM4-M4	F11A6-ECM4-M4
SubCOR™ SL 742				F11A8-ECF5-F5	
SubCOR™ SL 742				F11P6-ECF5-F5	
SubCOR™ SL 745					
SubCOR™ SL 745					

## Wire/Flux Combination Classifications (EN ISO)

Wire Trade Name	Specification	Flux Trade Name		
		SWX 120	SWX 150	SWX 160
SDX S3Ni1Mo-EF3	14171-A	-	S 62 6 FB S3Ni1Mo	-
SubCOR™ SL 742	26304-A	-	S 69 6 FB T3 Ni2.5CrMo	S69 6FB T3 Ni2.5CrMo
SubCOR™ SL 745	16304-A	-	S 89 4 FB T3Ni2.5Cr1Mo	-

## Approval Summary: Low-Alloy & Stainless

Wire	Flux	ABS	BV	DNV/GL	LR	CWB	TüV	CE
SDX S3Ni1Mo-EF3	SWX 150							X
SubCOR™ 120-S	SWX 150	F11A10-ECM4-M4						
SubCOR™ 92-S	SWX 150	4Y400M H10 (SW+TM) 4YT H10 (SW+TM)						
SubCOR™ 92-S	HA-495					F55TA4-ECG-H8		
SubCOR™ 92-S	HN-590					F55A5-ECM1-M1-H8		
SubCOR™ N1-S	HN-590					F49A6-ECNi1-Ni1-H8		
SubCOR™ SL 742	SWX 150	5YQ690M H5	A 5Y69M H5	V Y69MS (H5)	BF 5Y69M H5		X	X

Please consult product datasheets for a complete list of product approvals, part numbers for standard packaging, and typical mechanical properties. Product data sheets, and Hobart's comprehensive submerged arc welding handbook, can be found online at <http://www.HobartBrothers.com/Products/Submerged-Arc>



## SDX S3Ni1Mo-EF3

**AWS A5.23: EF3**

**EN ISO 14174: S3NiMo**

The nominal nickel-molybdenum composition of this copper-coated, low alloy, solid wire provides good low-temperature toughness and is suitable for welding many high-strength low-alloy (HSLA). It is ideal for submerged arc welding.

**Benefits:**

- nominal 1% Ni / 0.5% Mo composition is suitable for welding a wide range of High-Strength Low-Alloy (HSLA steels of similar composition)
- provides good low-temperature toughness required in many demanding service conditions
- copper coated for optimal consistency of electrode feeding and electrical transfer

**Typical Applications:**

- offshore structures
- heavy equipment
- structural fabrication
- pressure vessels
- welding HSLA steels with impact toughness requirements down to -60°C (-76°F)

**Recommended Fluxes:**

SWX 120, SWX 150

**AWS A5.23 Wire / Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
SWX 120	F10A8-EF3-F3	F9P8-EF3-F3
SWX 150	F10A8-EF3-F3	F10P8-EF3-F3

**Typical Weld Metal Chemistry:**

	SWX 120	SWX 150
Carbon	0.06	0.08
Manganese	2.01	1.55
Silicon	0.31	0.31
Phosphorus	0.013	0.013
Sulphur	0.007	0.006
Copper	0.06	0.06
Nickel	0.86	0.45
Molybdenum	0.81	0.44

**Typical Mechanical Properties (AW/PWHT):**

	SWX 120	SWX 150
Tensile Strength	106/106 ksi	107/105 ksi
Yield Strength	92/86 ksi	98/92 ksi
Elongation in 2"	26/24%	24/26%
Tensile Strength	731/731 MPa	738/724 MPa
Yield Strength	634/593 MPa	676/634 MPa
Elongation in 50 mm	26/24%	24/26%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	SWX 120	SWX 150
Avg. at -60°F	55 / 35 ft-lbs	85 / 65 ft-lbs
Avg. at -80°F	45 / 35 ft-lbs	75 / 45 ft-lbs
Avg. at -50°C	75 / 47 J	115 / 88 J
Avg. at -60°C	61 / 47 J	XX / 61 J

**Standard Diameters:**

3/32" (2.4 mm), 1/8" (3.2 mm)

## SubCOR™ N1-S

**AWS A5.23: ECNi1**

This low-alloy composite metal-cored wire electrode is ideal for submerged arc welding in high strength applications. It meets AWS A5.23 chemistry Ni1 and is designed for tensile strength levels above 70 ksi. The nominal 1% nickel weld deposit provides atmospheric corrosion resistance to welds and offers improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity.

**Benefits:**

- composite metal-cored wires offer improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity
- a higher-productivity alternative in virtually all applications currently using ENi1 solid wire; weld deposit chemistry requirements are identical
- provides excellent low-temperature toughness without excessive tensile strength; suitable for welding a range of non-alloyed steels in low-temperature or critical service environments
- nominal 1% nickel weld deposit provides atmospheric corrosion resistance to welds made on weathering steels

**Typical Applications:**

- structural and bridge fabrication
- weathering steels
- non-alloyed and fine grain steels
- storage tanks
- shipbuilding
- offshore
- heavy equipment

**Recommended Fluxes:**

HN-590, SWX 120, SWX 150

**AWS A5.23 Wire / Flux Classifications:**

	As-Welded (AW)	Stress-Relieved (PWHT)
HN-590	F7A8-ECNi1-Ni1	F6P10-ECNi1-Ni1
SWX 120	F7A10-ECNi1-Ni1	
SWX 150	F7A8-ECNi1-Ni1	F7P10-ECNi1-Ni1

**Typical Weld Metal Chemistry:**

	HN-590	SWX 150
Carbon	0.06	0.07
Manganese	1.45	0.82
Silicon	0.34	0.20
Phosphorus	0.019	0.010
Sulphur	0.014	0.006
Copper	0.06	0.05
Chromium	0.03	0.04
Nickel	0.95	0.88
Molybdenum	0.01	0.01

**Typical Mechanical Properties (AW/PWHT):**

	HN-590	SWX 150
Tensile Strength	79/77 ksi	72/70 ksi
Yield Strength	63/63 ksi	62/58 ksi
Elongation in 2"	31/31%	30/31%
Tensile Strength	45/531 MPa	545/531 MPa
Yield Strength	448/434 MPa	427/393 MPa
Elongation in 50 mm	31/31%	30/31%

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

	HN-590	SWX 150
Avg. at -80°F	45/-- ft-lbs	95/155 ft-lbs
Avg. at -100°F	--/40 ft-lbs	15/115 ft-lbs
Avg. at -60°C	61/-- J	129/210 J
Avg. at -70°C	--/54 J	20/169 J

**Standard Diameters:**

1/8" (3.2 mm), 5/32" (4.0 mm)

### SubCOR™ 92-S

#### AWS A5.23: ECM1

Ideal for submerged arc welding in high strength applications, this low-alloy composite metal-cored wire electrode meets AWS A5.23 chemistry M1 and is designed for tensile strength levels above 80 ksi. It offers improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity.

#### Benefits:

- composite metal-cored wires offer improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity
- a higher-productivity alternative in virtually all applications currently using EM1 solid wire; weld deposit chemistry requirements are identical
- provides very good low-temperature toughness in both the as-welded and stress-relieved conditions for good performance in critical applications & harsh service environments
- suitable for use with a wide variety of Hobart fluxes, making it easier to choose the optimal combination for unique applications

#### Typical Applications:

- high-strength low-alloy (HSLA steels)
- structural and bridge fabrication
- heavy equipment
- offshore fabrication
- wind tower and utility poles
- shipbuilding
- weathering steels

#### Recommended Fluxes:

HA-495 (Two-Run Only), HN-590, SWX 120, SWX 150

#### AWS A5.23 Wire / Flux Classifications:

	As-Welded (AW)		Stress-Relieved (PWHT)	
HA-495	F8TA4-ECG			
HN-590	F8A8-ECM1-M1 H8		F8P8-ECM1-M1 H8	
SWX 120	F8A10-ECM1-M1		F8P8-ECM1-M1	
SWX 150	F8A10-ECM1-M1		F8P8-ECM1-M1	

#### Typical Weld Metal Chemistry:

	HN-590	SWX 120	SWX 150
Carbon	0.04	0.08	0.07
Manganese	1.51	1.25	1.09
Silicon	0.36	0.21	0.31
Phosphorus	0.017	0.012	0.012
Sulphur	0.011	0.007	0.007
Copper	0.05	0.04	0.05
Chromium	0.05	0.07	0.12
Nickel	1.70	1.60	1.50
Molybdenum	0.23	0.23	0.22

#### Typical Mechanical Properties (AW/PWHT):

	HN-590	SWX 120	SWX 150
Tensile Strength	95/94 ksi	93/84 ksi	92/90 ksi
Yield Strength	86/82 ksi	79/71 ksi	83/79 ksi
Elongation in 2"	25/26%	26/27%	25/28%
Tensile Strength	655/648 MPa	641/579 MPa	634/621 MPa
Yield Strength	593/565 MPa	545/490 MPa	572/545 MPa
Elongation in 50 mm	25/26%	26/27%	25/28%

#### Typical Charpy V-Notch Impact Values (AW/PWHT):

	HN-590	SWX 120	SWX 150
Avg. at -80°F	40/35 ft-lbs	85/75 ft-lbs	90/100 ft-lbs
Avg at -100°F		50/-- ft-lbs	80/-- ft-lbs
Avg. at -60°C	54/47 J	115/102 J	122/136 J
Avg. at -70°C		68/-- J	108/-- J

#### Standard Diameters:

5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

### SubCOR™ 100F3-S

#### AWS A5.23: ECF3

This low-alloy composite metal-cored wire electrode is ideal for submerged arc welding in high strength applications. It meets AWS A5.23 chemistry F3 and is designed for tensile strength levels above 100 ksi. The composite metal-cored wires offer improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity.

#### Benefits:

- composite metal-cored wires offer improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity
- a higher-productivity alternative in virtually all applications currently using EF3 solid wire; weld deposit chemistry requirements are identical
- weld deposit chemistry consists of less than 1% Ni, suitable for use in applications where stress-corrosion cracking caused by H<sub>2</sub>S is a concern

#### Typical Applications:

- high-strength low-alloy (HSLA steels)
- ~ 100 KSI 620 MPa Q&T steels
- oil and gas pipe double jointing
- sour gas applications
- pressure vessels
- heavy equipment

#### Recommended Fluxes:

HN-590, SWX 120, SWX 150

#### AWS A5.23 Wire / Flux Classifications:

	As-Welded (AW)		Stress-Relieved (PWHT)	
HN-590	F10A6-ECF3-F3		F10P2-ECF3-F3	
SWX 120	F10A10-ECF3-F3		F10P8-ECF3-F3	
SWX 150	F10A10-ECF3-F3		F10P10-ECF3-F3	

#### Typical Weld Metal Chemistry:

	HN-590	SWX 120	SWX 150
Carbon	0.06	0.08	0.09
Manganese	1.90	2.01	1.43
Silicon	0.42	0.46	0.36
Phosphorus	0.023	0.015	0.020
Sulphur	0.008	0.011	0.009
Copper	0.06	0.05	0.06
Nickel	0.87	0.84	0.90
Molybdenum	0.45	0.56	0.54

#### Typical Mechanical Properties (AW/PWHT):

	HN-590	SWX 120	SWX 150
Tensile Strength	112/108 ksi	108/105 ksi	108/104 ksi
Yield Strength	101/94 ksi	98/95 ksi	100/96 ksi
Elongation in 2"	23/22%	24/25%	23/24%
Tensile Strength	772/745 MPa	745/724 MPa	745/717 MPa
Yield Strength	696/648 MPa	676/655 MPa	689/662 MPa
Elongation in 50 mm	23/22%	24/25%	23/24%

## SubCOR™ 120-S

## SubCOR™ SL 742

### Typical Charpy V-Notch Impact Values (AW/PWHT):

	HA-495	SWX 120
Avg. at -40°F	60/-- ft-lbs	
Avg. at -80°F		80/140 ft-lbs
Avg. at -40°C	81/-- J	
Avg. at -60°C		108/190 J

### Standard Diameters:

3/32" (2.4 mm)

### AWS A5.23: ECM4

Ideal for submerged arc welding in high strength applications, this low-alloy composite metal-cored wire electrode offers improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity. It meets AWS A5.23 chemistry M4 and is designed for tensile strength levels above 110 ksi.

### Benefits:

- composite metal-cored wires offer improved deposition rates than solid wires at comparable welding parameters, allowing for increased travel speeds and productivity
- a higher-productivity alternative in virtually all applications currently using EM4 solid wire; weld deposit chemistry requirements are identical
- very tough, high-strength weld deposit for welding a wide variety of 110+ KSI (760+ MPa) HSLA and Q&T steels

### Typical Applications:

- high-strength low-alloy (HSLA steels)
- ~ 110 KSI 760 MPa Q&T steels
- ASTM A514 [ $< (2.5" \ 63\text{mm})$ ]
- jack-up rig fabrication
- heavy equipment
- shipbuilding
- structural and bridge fabrication

### Recommended Fluxes:

SWX 150

### AWS A5.23 Wire / Flux Classifications:

As-Welded (AW)

SWX 150 F11A10-ECM4-M4

### Typical Weld Metal Chemistry:

SWX 150

Carbon.....	0.06
Manganese.....	1.45
Silicon.....	0.27
Phosphorus.....	0.012
Sulphur.....	0.010
Copper.....	0.06
Chromium.....	0.31
Nickel.....	2.25
Molybdenum.....	0.47

### Typical Mechanical Properties (AW):

SWX 150

Tensile Strength	113 ksi
Yield Strength	106 ksi
Elongation in 2"	20%
Tensile Strength	779 MPa
Yield Strength	731 MPa
Elongation in 50 mm	20%

### Typical Charpy V-Notch Impact Values (AW):

SWX 150

Avg. at -60°F	55 ft-lbs
Avg. at -100°F	45 ft-lbs
Avg. at -50°C	75 J
Avg. at -70°C	61 J

### Standard Diameters:

1/8" (3.2 mm)

### AWS A5.23: ECF5

This seamless low-alloy cored wire is ideal for welding base materials with a yield strength of up to 100 ksi (690 MPa). The seamless wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking.

### Benefits:

- provides good toughness and high strength in the as-welded condition, making it a good candidate for welding fine-grain structural and cryogenic steels with yield strengths up to 690 MPa (100 ksi)
- seamless wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking
- unique manufacturing process provides unmatched product consistency for excellent uniformity of chemical properties, mechanical properties, and arc characteristics
- specially formulated to provide improved weld toughness and ductility than solid wire alternatives for enhanced performance in demanding applications

### Typical Applications:

- cranes
- structural fabrication
- heavy equipment
- transportation frames
- pipelines
- casting repair

### Recommended Fluxes:

SWX 150

### AWS A5.23 Wire / Flux Classifications:

As-Welded (AW)

Stress-Relieved

(PWHT)

SWX 150 F11A8-ECF5-F5 F11P6-ECF5-F5

### Typical Weld Metal Chemistry: SWX 150

Carbon.....	0.07	Copper.....	0.06
Manganese.....	1.57	Chromium.....	0.40
Silicon.....	0.38	Nickel.....	2.25
Phosphorus.....	0.012	Molybdenum.....	0.33
Sulphur.....	0.008		

### Typical Mechanical Properties (AW/PWHT):

SWX 150

Tensile Strength	122/120 ksi
Yield Strength	112/110 ksi
Elongation in 2"	22/22%
Tensile Strength	841/827 MPa
Yield Strength	772/758 MPa
Elongation in 50 mm	22/22%

### Typical Charpy V-Notch Impact Values (AW/PWHT):

SWX 150

Avg. at -40°F	65/55 ft-lbs
Avg. at -80°F	54/28 ft-lbs
Avg. at -40°C	88/75 J
Avg. at -60°C	73/37 J

### Standard Diameters:

3/32" (2.4 mm), 5/32" (4.0 mm)

### SubCOR™ SL 745

This seamless low-alloy cored wire is ideal for welding base materials with a yield strength of up to 130 ksi (890 MPa). The seamless wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking.

#### Benefits:

- provides VERY high strength in the as-welded and stress-relieved conditions, making it a suitable candidate for welding HSLA, Q&T, and cryogenic fine-grain structural steels with yield strengths up to 890 MPa (120 ksi)
- seamless wire design virtually eliminates moisture absorption and produces low diffusible-hydrogen weld deposit for a continually minimized risk of hydrogen-induced cracking
- unique manufacturing process provides unmatched product consistency for excellent uniformity of chemical properties, mechanical properties, and arc characteristics
- specially formulated to provide improved weld toughness and ductility than solid wire alternatives for enhanced performance in demanding applications

#### Typical Applications:

- cranes
- transport vehicle frames
- industrial machinery
- pipelines
- HSLA / Q&T casting repair

#### Recommended Fluxes:

SWX 150

#### Typical Weld Metal Chemistry: SWX 150

Carbon.....0.10	Copper.....0.11
Manganese.....1.35	Chromium.....0.79
Silicon.....0.44	Nickel.....2.59
Phosphorus.....0.013	Molybdenum.....0.53
Sulphur.....0.009	

#### Typical Mechanical Properties (AW/PWHT):

	SWX 150
Tensile Strength	155/154 ksi
Yield Strength	130/129 ksi
Elongation in 2"	18/17%
Tensile Strength	1068/1061 MPa
Yield Strength	896/889 MPa
Elongation in 50 mm	18/17%

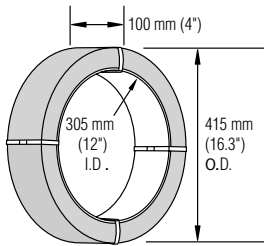
#### Typical Charpy V-Notch Impact Values (AW/PWHT):

	SWX 150
Avg. at -4°F	40/-- ft-lbs
Avg. at -20°F	--/21 ft-lbs
Avg. at -40°F	27/20 ft-lbs
Avg. at -20°C	54/-- J
Avg. at -30°C	--/28 J
Avg. at -40°C	36/27 J

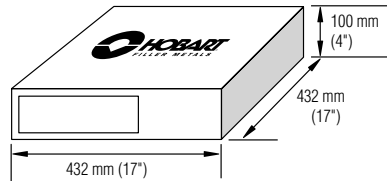
#### Standard Diameters:

3/32" (2.4 mm)

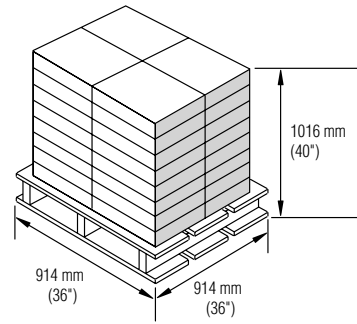
### 27 kg (60-lb.) Coil



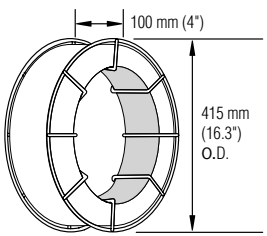
Weight: 27 kg (60 lbs)



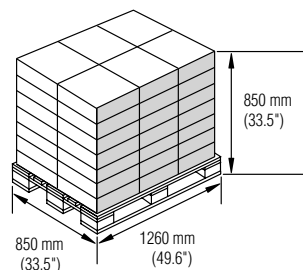
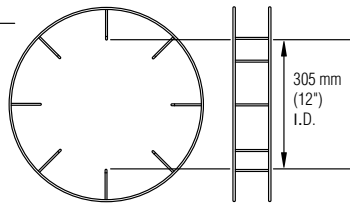
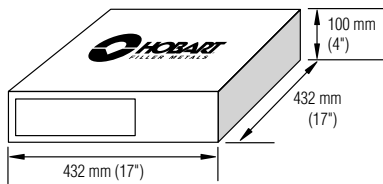
Items per pallet: 32  
Pallet net weight: 871 kg (1920 lbs)



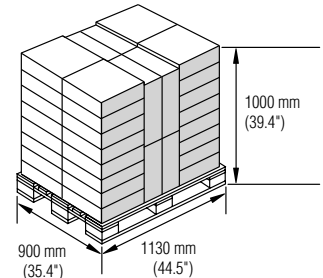
### 25 kg (55-lb.) Spool — Wire Basket K-415



Weight: 25 kg (55 lbs)

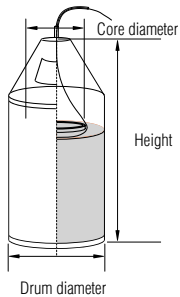


Items per pallet: 42  
Pallet net weight:  
1050 kg  
(2310 lbs)



Items per pallet: 40  
Pallet net weight:  
1000 kg  
(2200 lbs)

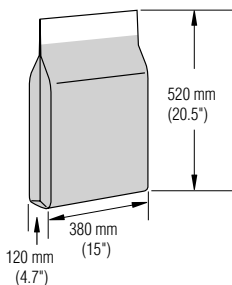
### Pay-off Drums



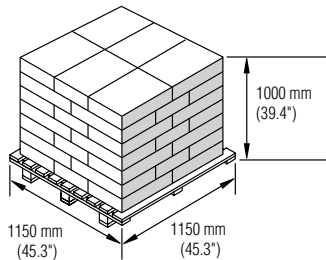
Drum weight	Drum diameter	Core diameter	Drum height	Items per pallet	Pallet net weight	Pallet width	Pallet depth	Overall height
272 kg (600 lbs)	585 mm (23")	410 mm (16")	890 mm (35")	2	545 kg (1200 lbs)	660 mm (26")	1220 mm (48")	910 mm (35.8")
454 kg (1000 lbs)	650 mm (25.6")	450 mm (17.7")	950 mm (37.4")	2	910 kg (2000 lbs)	700 mm (27.6")	1320 mm (52")	1070 mm (42.1")

Note: Standard pay-off direction is clockwise. **Requires a turntable.**

### EAE (Aluminium Foil) Flux Bags



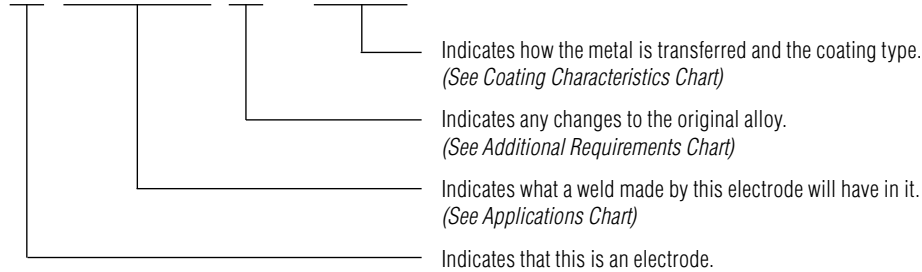
Weight:  
22.7 kg  
(50 lbs)



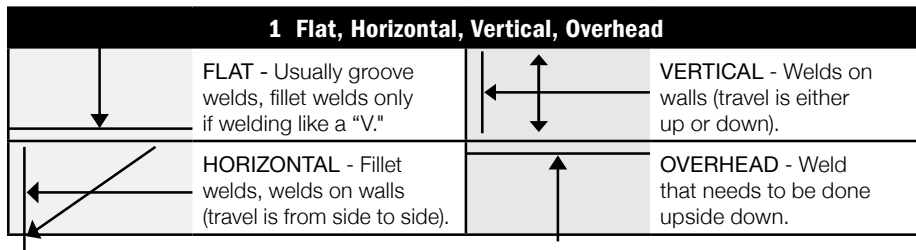
Items per pallet: 40  
Pallet net weight:  
907 kg  
(2000 lbs)

### AWS Classification of Stainless Steel Coated Electrodes

# E 3 0 8 L - 1 6



### Positions



### Coating Characteristics

Coating	Dash Number	Out of Position	Bead Ripple	Slag Removal	Spatter Level	Crack Resistance	Transfer Type	Operating Current	Bead Profile
AC-DC	-16	2	2	2	2	2	Globular	AC/DCEP	Flat
Sterling®	-17	3	1	1	1	3	Spray	AC/DCEP	Concave

Ratings:  
1 = the best  
3 = the least

### Additional Requirements

Suffix	Additional Requirements
L	Has a lower carbon content
H	Limited to the upper range on the carbon content
Mo	Molybdenum added—pitting resistance, creep strength, ferrite increased
Ni	Nickel added—high temperature strength, corrosion resistance, added toughness

### AWS Class and Applications

Class	Brief Description
A E308	Used for welding many dissimilar 300 series stainless steels
A E309	Used for welding many dissimilar metals—mild steel to stainless steel
A E310	Used to join similar alloys—some dissimilar metals
A E312	Excellent for welding dissimilar metals
A E316	Mo added to help prevent pitting and increase creep resistance
A E317	Even more Mo than E316
A E347	Cb added to prevent corrosion just outside of the weld bead
M E410	For welding martensitic stainless steels and used for surfacing carbon steels
D E2209	For welding similar duplex stainless steels

A—Austenitic M—Martensitic D—Duplex

### AWS (A5.4) Stainless Steel Stick Electrode Chemical Composition of Weld Metal Deposit, %

AWS Class	Carbon C	Chromium Cr	Nickel Ni	Molybdenum Mo	Manganese Mn	Silicon Si	Phosphorous P	Copper Cu
E308-XX	0.08 Max.	18.0–21.0	9.0–11.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E308H-XX	0.04–0.08	18.0–21.0	9.0–11.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E308L-XX	0.04 Max.	18.0–21.0	9.0–11.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E309-XX	0.15 Max.	22.0–25.0	12.0–14.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E309L-XX	0.04 Max.	22.0–25.0	12.0–14.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E309Mo	0.08 Max.	22.0–25.0	12.0–14.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E309MoL	0.08 Max.	22.0–25.0	12.0–14.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E310-XX	0.08–0.20	25.0–28.0	20.0–22.5	0.75 Max.	1.0–2.5	0.75 Max.	0.03 Max.	0.75 Max.
E312-XX	0.15 Max.	28.0–32.0	8.0–10.5	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E316-XX	0.08 Max.	17.0–20.0	11.0–14.0	2.0–3.0	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E316L-XX	0.04 Max.	17.0–20.0	11.0–14.0	2.0–3.0	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E317L-XX	0.04 Max.	18.0–21.0	12.0–14.0	2.0–3.0	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E330-XX	0.18–0.25	14.0–17.0	33.0–37.0	0.75 Max.	1.0–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E347-XX	0.08 Max.	18.0–21.0	9.0–11.0	0.75 Max.	0.5–2.5	0.90 Max.	0.04 Max.	0.75 Max.
E410-XX	0.12 Max.	11.0–13.5	0.7 Max.	0.75 Max.	1.0 Max.	0.90 Max.	0.04 Max.	0.75 Max.
E410NiMo-XX	0.06 Max.	11.0–12.5	4.0–5.0	0.40–0.70	1.0 Max.	0.90 Max.	0.04 Max.	0.75 Max.
E2209-XX**	0.04 Max.	21.5–23.5	8.5–10.5	2.5–3.5	0.5–2.0	0.90 Max.	0.04 Max.	0.75 Max.

## 308/308L Sterling® AP

### AWS E308-16, E308L-16

Primarily designed for welding type 308L base metal with low or medium carbon content, this stainless-steel electrode contains low carbon to avert carbide precipitation during welding as well as weld service. Excellent for welding 18 chromium-8 nickel steels. A smooth-running arc results in a uniform weld bead that is flat to slightly convex.

#### Typical Deposit Analysis %

Carbon	0.03
Manganese	1.14
Silicon	0.43
Chromium	19.68
Nickel	9.89
Iron	Balance

#### Typical Properties and Ferrite Number of Weld Deposit as Welded

Tensile Strength (psi)	83,000 (572 MPa)
Yield Strength (psi)	64,000 (441 MPa)
Elongation in 2"	37%
DeLong Ferrite Number	9

## 309/309L Sterling® AP

### AWS E309-16, E309L-16, E309L-17

This lower carbon version of the 309(H) Sterling® AP is excellent for applications where reduced susceptibility to sensitization during high-temperature service is necessary. It is outstanding for dissimilar metal welding such as weld overlay or for welding type 309 stainless steel to mild or low alloy steels. It has a smooth-running arc that results in a uniform weld bead that is flat to slightly convex.

#### Typical Deposit Analysis %

Carbon	0.03
Manganese	1.32
Silicon	0.41
Chromium	23.00
Nickel	13.50
Iron	Balance

#### Typical Properties and Ferrite Number of Weld Deposit as Welded

Tensile Strength (psi)	79,000 (545 MPa)
Yield Strength (psi)	64,000 (441 MPa)
Elongation in 2"	41%
DeLong Ferrite Number	13

## 310 Sterling® AP

### AWS E310-16

Used as a transition layer for high restrained joints of high carbon steels, this stainless-steel electrode joins 310 stainless as well as for the welding of steels with 20%-27% chromium and 18%-22% nickel.

#### Typical Deposit Analysis %

Carbon	0.14
Manganese	2.02
Silicon	0.46
Chromium	26.12
Nickel	21.00
Iron	Balance

#### Typical Properties and Ferrite Number of Weld Deposit as Welded

Tensile Strength (psi)	86,000 (593 MPa)
Yield Strength (psi)	63,000 (434 MPa)
Elongation in 2"	40%
DeLong Ferrite Number	0

## 312 Sterling® AP

### AWS E312-16

Designed for welding dissimilar joints of Type 312 metals, this stainless-steel electrode can be used on harden-able steels, steel armor and generally hard-to-weld steels. It offers outstanding performance with a directional arc and self-detaching slag.

#### Typical Deposit Analysis %

Carbon	0.07
Manganese	0.80
Silicon	0.40
Chromium	28.50
Nickel	9.10
Iron	Balance

#### Typical Properties and Ferrite Number of Weld Deposit as Welded

Tensile Strength (psi)	115,000 (793 MPa)
Yield Strength (psi)	95,000 (655 MPa)
Elongation in 2"	25%
DeLong Ferrite Number	45

## 316/316L Sterling® AP

### AWS 316-17, E316L-16, E316L-17

A lower carbon content in this stainless-steel electrode reduces susceptibility to sensitization during welding. The welds show high resistance to corrosion and fissuring. It is excellent for welding stainless steel types 316, 316L and 318. It has a smooth-running arc that results in a uniform weld bead that is flat to slightly convex.

#### Typical Deposit Analysis %

Carbon	0.02
Manganese	1.55
Silicon	0.48
Chromium	18.20
Nickel	13.00
Molybdenum	2.27
Iron	Balance

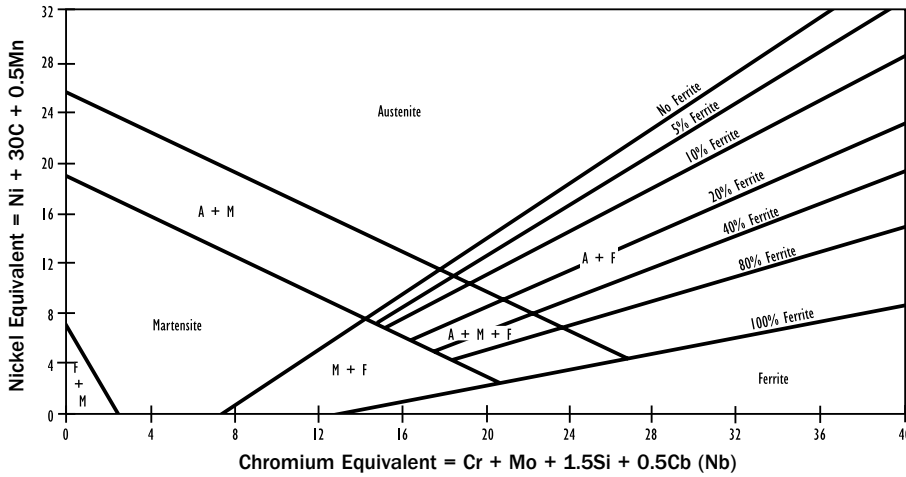
#### Typical Properties and Ferrite Number of Weld Deposit as Welded

Tensile Strength (psi)	82,000 (565 MPa)
Yield Strength (psi)	61,000 (421 MPa)
Elongation in 2"	42%
DeLong Ferrite Number	2

# Stainless Steel

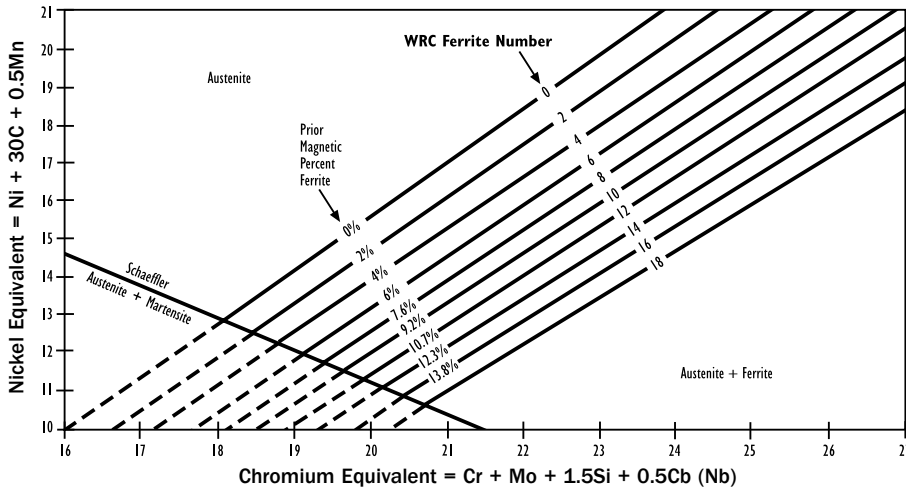
## TECHNICAL SECTION

### Schaeffler Constitution Diagram



Calculate the nickel and chromium equivalents from the weld metal analysis. If nitrogen analysis of the weld metal is not available, assume 0.06% for GTAW and covered electrodes or 0.08% for GMAW weld metals. If the chemistry is accurate, the diagram predicts the WRC Ferrite Number within  $\pm 3$  in approximately 90% of the tests for the 308, 309, 316, and 317 families.

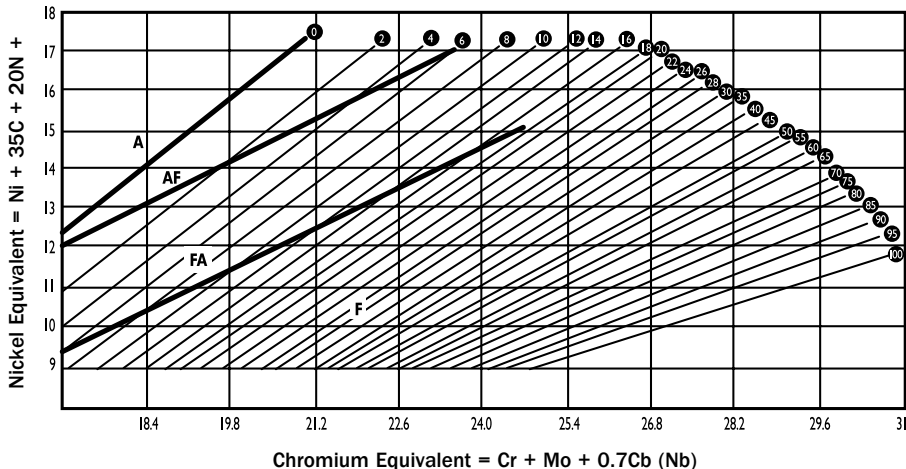
### DeLong Constitution Diagram



#### Comparison with Schaeffler Diagram:

1. The Nickel Equivalent allows for a nitrogen pick-up of 30N.
2. Ferrite Numbers for 308, 308L, and 347 covered electrodes are similar. The higher alloy 309, 316, and 317 families have about 2 to 4 higher FN on this diagram.
3. Generally, this diagram correlates better with GTAW and GMAW weld metals because it allows for nitrogen pick-up.
4. The Schaeffler austenite-martensite boundary has been included here for reference.

### 1992 WRC Constitution Diagram



#### Comparison with Schaeffler and DeLong Diagrams:

1. Considered more accurate for predicting ferrite in higher-alloyed stainless steels.
2. Copper (Cu) has been added to help determine the FN of duplex stainless steel welds.
3. This diagram should be limited to welds that contain less than 3Mo, less than 1Si, less than 10Mn and less than 0.2N.
4. A = Entirely austenite  
AF = Austenite with some ferrite  
FA = Ferrite with islands of austenite  
F = Ferrite alone



### Comparative Index of Stainless Steel Electrodes

AWS Class	Hobart®	Techalloy	Sandvik	Lincoln
E308L-16	308/308L Sterling® AP	Tech Rod 308L-16	–	Red Baron 308L MR
E309L-16	309/309L Sterling® AP	Tech Rod 309L-16	–	Red Baron 309/309L MR
E310-16	310 Sterling® AP	Tech Rod 310-16	–	Red Baron 310 MR
E312-16	312 Sterling® AP	Tech Rod 312-16	29.9 R	–
E316L-16	316/316L Sterling® AP	Tech Rod 316L-16	19.12.3. LRV	Red Baron 316/316L MR

### Stainless Steel Stick Electrode Suggested Operating Ranges

ELECTRODE DIAMETER		STERLING® AP		STERLING®	
inches	mm	Flat and Horizontal Welding	Vertical Up Welding	Flat and Horizontal Welding	Vertical Up Welding
3/32"	2.4	60–80	60-70	40-60	40-50
1/8"	3.2	80-100	80-90	40-80	40-50
5/32"	4.0	100-140	100-110	80-120	80-90
3/16"	4.8	140–220	NR	150-190	NR

NR = Not Recommended

### Stainless Steel Electrodes Per Pound

Hobart® Type	Diameter: Length:	3/32" (2.4mm) 12"	1/8" (3.2mm) 14"	5/32 (4.0mm) 14"	3/16" (4.8mm) 14"
Sterling® AP (-16)		32	13	9	6

### Stainless Steel Stick Electrode Pallet Information

Length	Hobart® Type	PALLET WEIGHT (LB)		PALLET DIMENSIONS			Number of Units Per Pallet
		Net	Gross (est.)	Depth	Width	Height	
3/32"–12"	Sterling® AP	1155	1225	38"	45"	39"	231 (5-lb. Cans)
1/8"–14"		1260	1330	38"	45"	39"	210 (6-lb. Cans)
5/32"–14"		1260	1330	38"	45"	39"	210 (6-lb. Cans)
3/16"–14"		1470	1540	38"	45"	39"	210 (7-lb. Cans)

Stainless Steel

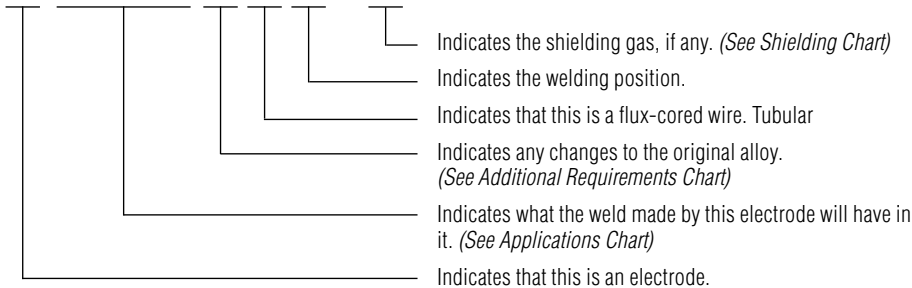
### Packaging Options

All Hobart® stainless steel electrodes are stamped with product name and lot number for complete traceability.



### Stainless Steel Tubular Wires AWS Classification of Stainless Steel Tubular Wires

# E 3 0 8 L T 1 - 1



### Positions

1 Flat, Horizontal, Vertical, Overhead		0 Flat and Horizontal Only	
	<b>FLAT</b> - Usually groove welds, fillet welds only if welding like a "V."		<b>VERTICAL</b> - Welds on walls (travel is either up or down).
	<b>HORIZONTAL</b> - Fillet welds, welds on walls (travel is from side to side).		<b>OVERHEAD</b> - Weld that needs to be done upside down.

### Chemical Symbols

C	Carbon	Increases strength and hardness—reduces corrosion resistance.
Mn	Manganese	Improves crack resistance in fully austenitic welds.
Si	Silicon	Increased corrosion and scaling resistance.
P	Phosphorus	Causes cracking if too high.
S	Sulfur	Aids in machining. Cracking problems like P.
Cr	Chromium	Main corrosion and scaling resistance element.
Ni	Nickel	Better cold toughness—corrosion resistance.
Mo	Molybdenum	High temperature tensile/creep strength pitting corrosion resistance.
Ti	Titanium	High temperature stabilizer—age hardening.
N	Nitrogen	Raises strength—minimize grain growth.

### Additional Requirements

Suffix	Additional Requirements
L	Has a lower carbon content
H	Limited to the upper range on the carbon content
Mo	Molybdenum added—pitting resistance, creep strength, ferrite increased
Ni	Nickel added—high temperature strength, corrosion resistance, + ductility

### AWS Class and Applications

Class	Brief Description
A E308	Used for welding many dissimilar 300 series stainless steels
A E309	Used for welding many dissimilar metals—mild steel to stainless steel
A E316	Mo added to help prevent pitting and increase creep resistance
A E317	Even more Mo than E316
A E347	Cb added to prevent corrosion just outside of the weld bead
M E410	For welding martensitic stainless steels and used for surfacing carbon steels
F E430	For welding similar alloys and corrosion-resistant surfacing
D E2209	For welding similar duplex stainless steels

A—Austenitic M—Martensitic D—Duplex

### Shielding Gas and Current

Dash Number	Shielding Gas	Welding Current
-1	CO <sub>2</sub>	DCEP
-3	None (Self-Shielded)	DCEP
-4	75-80% Ar/ Balance CO <sub>2</sub>	DCEP

### AWS (A5.22) Stainless Steel Tubular Wire Chemical Composition of Weld Metal Deposit, %

AWS Class	Carbon C	Chromium Cr	Nickel Ni	Molybdenum Mo	Manganese Mn	Silicon Si
<b>Open-Arc</b>						
E309LT0-3	0.03 Max.	23.0–25.5	12.0–14.0	0.5 Max.	0.5–2.5	1.0
<b>Gas-Shielded</b>						
E308LT1- 4/-1	0.04 Max.	18.0–21.0	9.0–11.0	0.5 Max.	0.5–2.5	1.0
E309LT1- 4/-1	0.04 Max.	22.0–25.0	12.0–14.0	0.5 Max.	0.5–2.5	1.0
E316LT1- 4/-1	0.04 Max.	17.0–20.0	11.0–14.0	2.0–3.0	0.5–2.5	1.0
E410NiMoT1- 4/-1	0.06 Max.	11.0–12.5	4.0–5.0	0.40–0.70	1.0 Max.	1.0

Note: All products listed above also require the following: 0.04 Max. Phosphorus, 0.5 Max. Copper, 0.03 Max. Sulfur

### Stainless Steel Open-Arc Tubular Wires

Hobart® Fabshield® Wires are designed for joining and cladding in the flat and horizontal positions. These products perform well in field fabrication or in drafty shop conditions, because they do not require external shielding gas.

Hobart® Product	AWS Class	Positions
Fabshield® 309L-0	E309LT0-3	Flat, Horizontal

### Stainless Steel Gas-Shielded Flux-Cored Tubular Wires

Hobart® FabCO® LT0 and LT1 Stainless wires are truly a premium stainless gas shielded flux-cored product. FabCO® features a bright, flat bead profile, clean easy slag release, minimal spatter, higher moisture resistance, and excellent overall weld bead appearance combined with excellent welder appeal.

Hobart® Product	AWS Class	Positions
FabCO® 308LT1	E308LT1-4/-1	All
FabCO® 309LT1	E309LT1-4/-1	All
FabCO® 316LT1	E316LT1-4/-1	All
FabCO® 410NiMoT1	E410NiMoT1-4/-1	All

### STAINLESS STEEL OPEN-ARC FLUX-CORED WIRES

#### Fabshield® 309L-0

##### FLAT & HORIZONTAL

##### AWS E309LT0-3

This austenitic stainless-steel deposit can be used for joining common austenitic stainless steels such as Types 304, 304L, 309, and 309L. It is often used for overlaying carbon steel and low alloy steel, as well as for joining stainless steel to carbon or low alloy steel.

##### Typical Deposit Analysis %

Carbon .....	0.03
Manganese .....	1.73
Silicon .....	0.58
Chromium .....	23.10
Nickel.....	12.90
Iron .....	Balance

##### Typical Weld Metal Properties

Tensile Strength (psi)	91,000 (627 MPa)
Yield Strength (psi)	70,000 (483 MPa)
Elongation in 2"	40%
DeLong Ferrite Number	11

**Diameters** 3/32"

##### Approvals and conformance:

- AWS Spec A5.22
- ASME SFA5.22 (F-6, A-8)

### GAS-SHIELDED STAINLESS STEEL FLUX-CORED WIRES

#### FabCO® 410NiMoT1

##### ALL POSITION

##### AWS E410NiMoT1-4/-1

This low carbon martensitic stainless steel can be used for joining Type CA-6NM stainless steel castings as well as for joining Types 409, 410, 410S and 405 stainless steels. It provides better crack resistance than a 410-weld metal. Preheat of 300 degrees Fahrenheit is generally sufficient for crack-free welds.

##### Typical Deposit Analysis %

Carbon .....	0.03
Manganese .....	0.30
Silicon.....	0.38
Chromium .....	11.50

##### Typical Weld Metal Properties

##### (Heat Treated for 1 hr. @ 1150°F):

Tensile Strength (psi)	131,000 (903 MPa)
Yield Strength (psi)	111,000 (765 MPa)
Elongation in 2"	21%

##### As Welded:

Tensile Strength (psi)	161,900 (1116 MPa)
Yield Strength (psi)	144,900 (999 MPa)
Elongation in 2"	20%
75/25 (Ar/CO <sub>2</sub> ) or 100% CO <sub>2</sub>	

**Diameters** 1/16", 3/32"

##### Approvals and conformance:

- AWS Spec A5.22
- ASME SFA5.22 (F-6)

## FabCO® STAINLESS STEEL GAS-SHIELDED FLUX-CORED WIRES

### FabCO® 308LT1

**ALL POSITION**

**AWS E308LT1-1/-4**

This low carbon martensitic stainless-steel deposit can be used for joining Type CA-6NM stainless steel castings as well as for joining Types 409, 410, 410S, and 405 stainless steels. The 410NiMoT1 has been tested to and has met hardness requirements set forth by NACE MRO175-95, with a PWHT procedure.

**Features**

- self-detaching slag
- spray-like arc transfer
- high moisture resistance

**Benefits**

- welds well in vertical (up) position, as well as flat & horizontal
- excellent welder appeal
- low spatter and less clean-up
- good weld soundness & extended shelf-life

**Typical Deposit Analysis %**

Carbon .....	0.025
Manganese .....	1.40
Silicon .....	0.52
Chromium .....	19.22
Nickel.....	10.05
Iron .....	Balance

**Typical Weld Metal Properties**

Tensile Strength (psi)	79,000 (544 MPa)
Yield Strength (psi)	59,000 (407 MPa)
Elongation in 2"	42%
DeLong Ferrite Number	10
75% Ar-25% CO <sub>2</sub> or 100% CO <sub>2</sub>	

**Diameters** .045", 1/16"

### FabCO® 309LT1

**ALL POSITION**

**AWS E309LT1-1/-4**

This austenitic stainless-steel all-position gas shielded flux-cored wire with low carbon is used for joining common austenitic stainless steels such as Types 304, 304L, 309 and 309L. It is often used for joining stainless steel to carbon and low alloy steel, as well as for overlaying carbon steel and low alloy steel.

**Features**

- self-detaching slag
- spray-like arc transfer
- high moisture resistance

**Benefits**

- welds extremely well in vertical (up) position, as well as flat and horizontal
- excellent welder appeal
- low spatter and less clean-up
- good weld soundness & extended shelf-life

**Typical Deposit Analysis %**

Carbon .....	0.027
Manganese .....	1.23
Silicon .....	0.53
Chromium .....	23.95
Nickel.....	12.65
Iron .....	Balance

**Typical Weld Metal Properties**

Tensile Strength (psi)	81,000 (558 MPa)
Yield Strength (psi)	61,000 (421 MPa)
Elongation in 2"	42%
DeLong Ferrite Number	17
75% Ar/25% CO <sub>2</sub> or 100% CO <sub>2</sub>	

**Diameters** .045", 1/16"

### FabCO® 316LT1

**ALL POSITION**

**AWS E316T1-1/-4**

This austenitic stainless-steel all-purpose gas shielded flux-cored wire with low carbon is used for joining Types 316, 316L, CF-8M and CF-3M stainless steels.

**Features**

- self-detaching slag
- spray-like arc transfer
- high moisture resistance

**Benefits**

- welds well in vertical (up) position, as well as flat & horizontal
- excellent welder appeal
- low spatter and less clean-up
- good weld soundness & extended shelf-life

**Typical Deposit Analysis %**

Carbon .....	0.028
Manganese .....	1.25
Silicon .....	0.55
Chromium .....	18.80
Nickel.....	12.60
Molybdenum.....	2.65
Iron .....	Balance

**Typical Weld Metal Properties**

Tensile Strength (psi)	82,000 (565 MPa)
Yield Strength (psi)	60,000 (414 MPa)
Elongation in 2"	39%
DeLong Ferrite Number	9
75% Ar/25% CO <sub>2</sub> or 100% CO <sub>2</sub>	

**Diameters** .045", 1/16"

## TECHNICAL SECTION

### Comparative Index of Stainless Steel Open-Arc Tubular Wires

AWS Class	Hobart®	ESAB	Stoody
E309LT0-3	Fabshield® 309L-0	Core-Bright 309L	SOS 309L

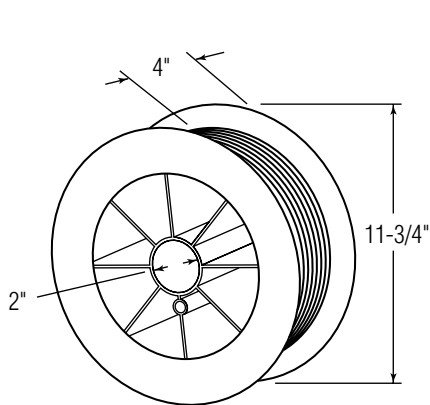
### Comparative Index of Stainless Steel Gas-Shielded Tubular Wires

AWS Class	Hobart®	ESAB	Kobelco	Lincoln	Sandvik
E308LT1-4/-1	FabCO® 308LT1	Shield-Bright 308L	DW-308LP	UltraCore® FCP 308L	308LT-1AP
E309LT1-4/-1	FabCO® 309LT1	Shield-Bright 309L	DW-309LP	UltraCore® FCP 309L	309LT-1AP
E316LT1-4/-1	FabCO® 316LT1	Shield-Bright 316L	DW-316LP	UltraCore® FCP 316L	316LT-1AP
E410NiMoT1-4/-1	FabCO® 410NiMoT1	—	—	—	—

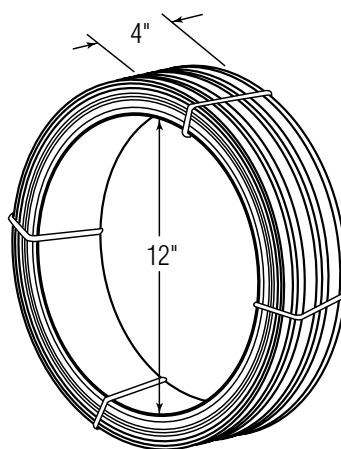
### Stainless Steel Tubular Wire Pallet Information

Hobart® Type	Pallet Weight (lb)		Pallet Dimensions			Number of Items Per Pallet
	Net	Gross (est.)	Depth	Width	Height	
30-lb. Spool	1440	1545	24"	24"	27"	48 (30 lb Spools)
27.5-lb. Spool	2310	2390	31"	47"	32"	84 (27.5 lb Spools)
60-lb. Coil	1680	1743	36"	36"	35"	28 (60 lb Spools)

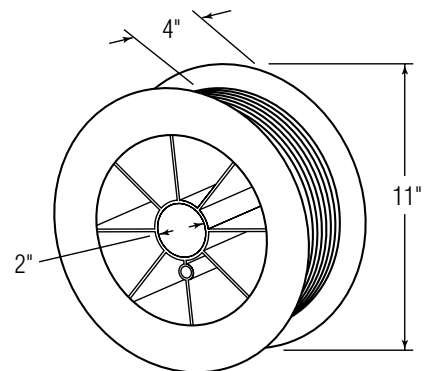
### Packaging Options



30-lb. Plastic Spool



60-lb. Coil



27.5-lb. Plastic Spool

# TECHNICAL SECTION

## Stainless Steel Dissimilar Welding Chart

Base Metals	201	202	301	302	302B	303	304	304L	305	308	309	309S	310	310S	314	316	316L	317	317L	321	330	347	348	403	405	410	414	416	420	430	430F	431	440A	440B	440C	446	Base Metals						
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																										309	312 309	410	430	309	410	410	410	410	410	410	410	410	414				
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																														309	309	309	309	309	309	309	309	309	309	431			
																															309	309	309	309	309	309	309	309	309	309	440A		
																																309	309	309	309	309	309	309	309	309	309	440B	
																																	309	309	309	309	309	309	309	309	309	309	440C
																																								312 310	446		

Stainless Steel

This chart is only a suggestion of which filler metals should be adequate for the joining of the stainless steels. This does not mean that other filler metal alloys are not recommended or of less quality. In all instances the chart should be used as a reference only. Actual application should dictate the proper alloy choice.

The gray sections of the chart indicate "free-matching" alloys, which are considered not weldable. This is due to the high percentage of sulfur or other low melting point elements that cause hot cracking. If high-quality joints are required welding is not generally recommended.

This chart does not indicate welding procedure. Some stainless steels require preheat while others should not have a preheat. Some welds require a buttering layer or other more rigid procedure. Suppliers may be contacted regarding procedure recommendations.

## TECHNICAL SECTION

### Suggested Parameters and Typical Deposition Data for Fabshield®, FabCO® Stainless Flux-Cored Wires

Diameter	Electrical Stick-Out*	Voltage* Range	Current Range* (amps)	Deposition Rate (lb/hr)	Deposition Efficiency %
1/16"	1/2"-1"	26-32	150-275	9-15	85-88
3/32"	1"-1-1/2"	26-32	225-350	13-17	85-88

\*For 410-0 and 410 NiMo-0, stick-out should be 1-1/2" for all diameters (these martensitic grades, being lower in Cr, have less tolerance for N).  
 †Note: Voltage and current should be in phase. If voltage is at the low end of the range, current also should be at the low end. Same way for high-side settings.

### Operating Ranges and Deposition Rates for FabCO® Wires

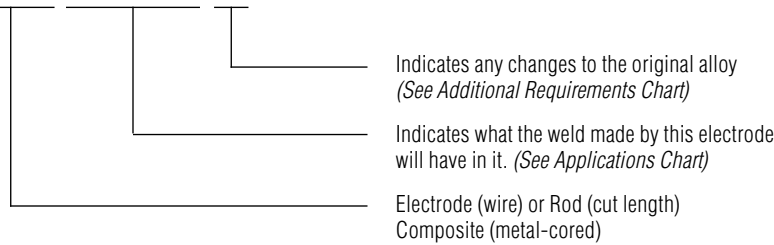
Diameter Electric Stick-Out Position	Arc Voltage (volts)	Current DCEP (+) (amps)	Approximate Wire Feed Speed (in/min)	Deposition Rates (lb./hr)
.045" (1.2 mm)	24	140	210	5.0
5/8" - 3/4" (16 mm - 19 mm) Flat, Horizontal & Vertical Up	<b>25 - 29</b> 33	<b>160 - 200</b> 300	<b>275 - 380</b> 680	<b>6.0 - 8.0</b> 15.0
1/16" (1.6 mm) 3/4" - 1" (19 - 25.4 mm) Flat, Horizontal & Vertical Up	28 <b>29 - 33</b> 35	200 <b>240 - 280</b> 350	155 <b>230 - 290</b> 420	6.5 <b>8.5 - 11.0</b> 16.0

\*When using CO<sub>2</sub> shielding gas, add 1-2 volts.      **BOLD** - Optimum parameters for welder appeal.



## Metal-Cored/Solid Wire AWS Classification of Stainless Steel Solid Wires

### ER308L



### Positions

1 Flat, Horizontal, Vertical, Overhead		0 Flat and Horizontal Only	
	FLAT - Usually groove welds, fillet welds only if welding like a "V."		VERTICAL - Welds on walls (travel is either up or down).
	HORIZONTAL - Fillet welds, welds on walls (travel is from side to side).		OVERHEAD - Weld that needs to be done upside down.

### Chemical Symbols

C	Carbon	Increases strength and hardness—reduces corrosion resistance.
Mn	Manganese	Improves crack resistance in fully austenitic welds.
Si	Silicon	Increased corrosion and scaling resistance.
P	Phosphorus	Causes cracking if too high.
S	Sulfur	Aids in machining. Cracking problems like P.
Cr	Chromium	Main corrosion and scaling resistance element.
Ni	Nickel	Better cold toughness—corrosion resistance.
Mo	Molybdenum	High temperature tensile/creep strength pitting corrosion resistance.
Ti	Titanium	High temperature stabilizer—age hardening.
N	Nitrogen	Raises strength—minimize grain growth.
Cb	Columbium	High temperature stabilizer—hardening—strengthening.

### Additional Requirements

Suffix	Additional Requirements
L	Has a lower carbon content
H	Limited to the upper range on the carbon content
Mo	Molybdenum added—pitting resistance, creep strength, ferrite increased
Ni	Nickel added—high temperature strength, corrosion resistance, added toughness

### AWS Class and Applications

Class	Brief Description
A E308	Used for welding many dissimilar 300 series stainless steels
A E309	Used for welding many dissimilar metals—mild steel to stainless steel
A E310	Used to join similar alloys—some dissimilar metals
A E316	Mo added to help prevent pitting and increase creep resistance
A E317	Even more Mo than E316
A E347	Cb added to prevent corrosion just outside of the weld bead
M E410	For welding martensitic stainless steels and used for surfacing carbon steels
F E430	For welding similar alloys and corrosion-resistant surfacing
D E2209	For welding similar duplex stainless steels

A—Austenitic M—Martensitic F—Ferritic D—Duplex

### Stainless Steel Cut Lengths Per Pound

Diameter:	1/16" (1.6mm)	3/32" (2.4mm)	1/8" (3.2mm)
Length 36"	31	14	8

## AWS (A5.9) Stainless Steel Solid Wire Chemical Composition Requirements, %

AWS Class	Carbon C	Chromium Cr	Nickel Ni	Molybdenum Mo	Manganese Mn	Silicon Si	Phosphorus P	Copper Cu
ER308	0.08 Max.	19.5–22.0	9.0–11.0	0.75 Max.	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER308H	0.04–0.08	19.5–22.0	9.0–11.0	0.50 Max.	1.0–2.5	0.20–0.65	0.03 Max.	0.75 Max.
ER308L	0.03 Max.	19.5–22.0	9.0–11.0	0.75 Max.	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER308LSi	0.03 Max.	19.5–22.0	9.0–11.0	0.75 Max.	1.0–2.5	0.65–1.00	0.03 Max.	0.75 Max.
ER309	0.12 Max.	23.0–25.0	12.0–14.0	0.75 Max.	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER309L	0.03 Max.	23.0–25.0	12.0–14.0	0.75 Max.	1.0–2.5	0.20–0.65	0.03 Max.	0.75 Max.
ER309LSi	0.03 Max.	23.0–25.0	12.0–14.0	0.75 Max.	1.0–2.5	0.65–1.00	0.03 Max.	0.75 Max.
ER316	0.08 Max.	18.0–20.0	11.0–14.0	2.0–3.0	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER316H	0.04–0.08	18.0–20.0	11.0–14.0	2.0–2.0	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER316L	0.03 Max.	18.0–20.0	11.0–14.0	2.0–3.0	1.0–2.5	0.30–0.6	0.03 Max.	0.75 Max.
ER316LSi	0.08 Max.	18.0–20.0	11.0–14.0	2.0–3.0	1.0–2.5	0.65–1.00	0.03 Max.	0.75 Max.
ER347*	0.08 Max.	19.0–21.5	9.0–11.0	0.75 Max.	1.0–2.5	0.30–0.65	0.03 Max.	0.75 Max.
ER410	0.12 Max.	11.5–13.5	0.6 Max.	0.75 Max.	0.6 Max.	0.5 Max.	0.03 Max.	0.75 Max.

## STAINLESS STEEL SOLID WIRES — SPOOLED/COILED/CUT LENGTHS

### 308/308L

#### AWS ER308, ER308L

With a lower range carbon to help prevent intergranular corrosion, this wire is used to weld Types 201, 302, 304, and 308 stainless steels. It can also be used for joining some dissimilar 300 series stainless steels.

#### Typical Deposit Analysis %

Carbon .....	0.02	Manganese .....	1.70
Chromium .....	20.50	Silicon .....	0.40
Nickel .....	10.50	Iron .....	Balance
Mo .....	0.30		

#### Typical Weld Metal Properties

Tensile Strength (psi)	85,000 (586 MPa)
Yield Strength (psi)	58,000 (400 MPa)
Elongation in 2"	36%
Impact Resistance RT	90 ft.lb.
(Charpy V Notch) -320°F	43 ft.lb.
DeLong Ferrite Number	11

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

Cut lengths available.

### 308L HiSi

#### AWS ER308LSi

The higher silicon level in this wire increases weld puddle fluidity to ensure better tie-ins and potentially higher welding speeds.

#### Typical Deposit Analysis %

Carbon .....	0.02
Chromium .....	20.00
Nickel .....	10.00
Molybdenum .....	0.30
Manganese .....	1.60
Silicon .....	0.80
Iron .....	Balance

#### Typical Weld Metal Properties

Tensile Strength (psi)	86,000 (593 MPa)
Yield Strength (psi)	57,000 (393 MPa)
Elongation in 2"	42%
Impact Resistance RT	92 ft.lb.
(Charpy V Notch) -320°F	33 ft.lb.
DeLong Ferrite Number	12

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

### 309/309L

#### AWS ER309, ER309L

This wire is used for joining similar alloys or for joining 300-series stainless steels to carbon or low alloy steels.

#### Typical Deposit Analysis %

Carbon .....	0.02
Chromium .....	24.00
Nickel .....	13.50
Molybdenum .....	0.20
Manganese .....	2.10
Silicon .....	0.40
Iron .....	Balance

#### Typical Weld Metal Properties

Tensile Strength (psi)	87,000 (600 MPa)
Yield Strength (psi)	59,000 (407 MPa)
Elongation in 2"	40%
Impact Resistance RT	100 ft.lb.
(Charpy V Notch)	
DeLong Ferrite Number	12

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

Cut lengths available

### 309L HiSi

#### AWS ER309LSi

The higher silicon level in this wire helps to overcome the typical sluggish nature of 300 series stainless steel welding puddles.

#### Typical Deposit Analysis %

Carbon .....	0.02
Chromium .....	24.00
Nickel .....	13.00
Molybdenum .....	0.20
Manganese .....	1.70
Silicon .....	0.85
Iron .....	Balance

#### Typical Weld Metal Properties

Tensile Strength (psi)	87,000 (600 MPa)
Yield Strength (psi)	56,000 (386 MPa)
Elongation in 2"	36%
Impact Resistance RT	92 ft.lb.
(Charpy V Notch)	
DeLong Ferrite Number	10

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

### 316/316L

#### AWS ER316, ER316L

Formulated with molybdenum, this wire offers increased pitting corrosion resistance and low carbon for better intergranular corrosion.

#### Typical Deposit Analysis %

Carbon .....	0.02
Chromium .....	19.00
Nickel .....	12.50
Molybdenum .....	2.50
Manganese .....	1.70
Silicon .....	0.40
Iron .....	Balance

#### Typical Weld Metal Properties

Tensile Strength (psi)	86,000 (593 MPa)
Yield Strength (psi)	57,000 (393 MPa)
Elongation in 2"	36%
Impact Resistance RT	82 ft.lb.
(Charpy V Notch) -320°F	34 ft.lb.
DeLong Ferrite Number	10

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

Cut lengths available

### 316L HiSi

#### AWS ER316LSi

Higher levels of silicon in this wire offers better wetting action when using the GMAW process.

#### Typical Deposit Analysis %

Carbon .....	0.02
Chromium .....	19.00
Nickel .....	12.50
Molybdenum .....	2.50
Manganese .....	1.70
Silicon .....	0.85
Iron .....	Balance

#### Typical Weld Metal Properties

Tensile Strength (psi)	87,000 (600 MPa)
Yield Strength (psi)	57,000 (393 MPa)
Elongation in 2"	38%
Impact Resistance RT	95 ft.lb.
(Charpy V Notch) -320°F	36 ft.lb.
DeLong Ferrite Number	10

#### Approvals and conformance:

AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

## Comparative Index of Stainless Steel Solid Wires

AWS Class	Hobart®	ESAB	Harris Welco	Lincoln	National Standard	Sandvik	Techalloy
ER308 & ER308L	308/308L	Arcaloy ER308L	ER308L	Blue Max S308/308L	308L	Techalloy 308L	
ER308LSi	308L HiSiL	Arcaloy ER308LSi	ER308LSi	Blue Max MIG 308LSi	308L Hi Sil	19.9LSi	Techalloy 308L HS
ER309 & ER309L	309/309L	Arcaloy ER309L	ER309L	Blue Max S309/309L	309L	24.13.L	Techalloy 309L
ER309LSi	309L HiSiL	Arcaloy ER309LSi	ER309LSi	Blue Max MIG 309LSi	309L Hi Sil	24.13.LSi	Techalloy 309L HS
ER316 & ER316L	316/316L	Arcaloy ER316L	ER316L	Blue Max S316/316L	316L		Techalloy 316L
ER316LSi	316L HiSiL	Arcaloy ER316LSi	ER316LSi	Blue Max MIG 316LSi	316L Hi Sil	19.12.3.NDSi	Techalloy 316L HS

## Typical Parameters for Short-Circuiting Welding with Bare Stainless Wires

Wire Diameter	Amperes DCEP	Voltage	Electrical Stick-Out	90% He— 7-1/2% Ar — 2-1/2% CO2 Flow Rate
.030"	50-150	14-20	3/8"-1/2"	25
.035"	60-200	14-22	3/8"-1/2"	25
.045"	75-225	15-23	3/8"-1/2"	25
1/16"	100-250	16-23	3/8"-1/2"	25

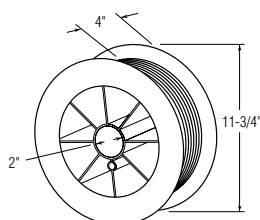
## Typical Parameters for Spray Transfer Welding with Bare Stainless Wires

Wire Diameter	Amperes DCEP	Voltage	Electrical Stick-Out	Ar + 2% O2 Flow Rate
.030"	130-200	23-27	3/8"-1/2"	35
.035"	150-225	23-26	1/2"-3/4"	35
.045"	200-325	24-28	1/2"-3/4"	35
1/16"	300-350	24-27	1/2"-3/4"	35

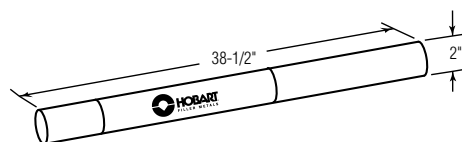
## Recommended Operating Parameters

Diameter Electric Stick-Out Pos.	Arc Voltage (volts)	Current DCEP (+) (amps)	Approximate Wire Feed Speed (In./min)	Deposition Rates (lb./hr)
.045" (1.2 mm)	23	140	260	5.5
3/4" - 1" (19 mm)	<b>26</b>	<b>190</b>	<b>390</b>	<b>9.0</b>
Flat and Horizontal	33	300	490	11.6
1/16" (1.6 mm)	26	180	152	6.0
3/4" - 1" (19 - 25.4 mm)	<b>29</b>	<b>250</b>	<b>250</b>	<b>11.0</b>
Flat and Horizontal	32	390	442	18.0

## Packaging Options

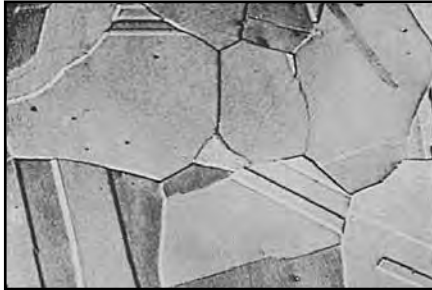


30-lb. Plastic Spool



10-lb. Tube (Cut Lengths)

### Hardfacing Stick Electrode Alloy Classification



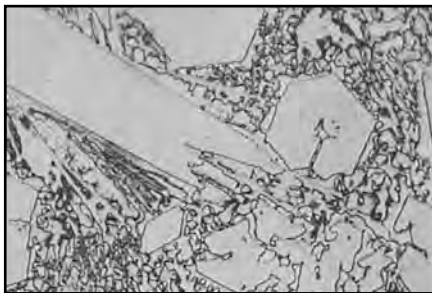
Photomicrograph of austenite.

#### Austenitic Alloys

Austenitic alloys are extremely tough, ductile and workhardenable. They offer excellent impact resistance and fair abrasion resistance (which improves as it work-hardens). These alloys will normally work-harden to a surface hardness up to 50 HRC and still retain their good impact resistance.

#### Hobart® Austenitic Products

Hardalloy® 118



Photomicrograph of large carbides in a carbide eutectic matrix.

#### Carbide Alloys

Carbide alloys are very much like asphalt. There are carbides (gravel) and matrix (tar). The carbides are what give the excellent abrasion resistance while the matrix (tar) holds the carbides in place and offers some impact resistance. Carbides are extremely hard and brittle. They cannot handle impact. The more carbides there are the higher the abrasion resistance but the lower the impact resistance.

#### Hobart® Carbide Products

Hardalloy® 148

Hardalloy® 140

#### Martensitic Alloys

Martensitic is formed in steels by rapid cooling rates. Most of the hardfacing alloys are air hardenable and heat treatable. They provide a good balance of impact and abrasion resistance. Martensitic alloys also have relatively high compression strength and excellent metal-to-metal wear resistance.

#### Hobart® Martensitic Products

Hardalloy® 32

# Hardfacing Stick Electrode Product Line

## Build-Up Restoring worn parts to their original dimensions

Hobart® Product		Description	Manganese	Carbon
	Hardalloy® 32	Excellent build-up and overlay alloy for carbon steels.	o	•

## Overlay Providing additional resistance to wear

Application	Hobart® Product	Description	Characteristics	
			Manganese	Carbon
<b>Impact</b>	Hardalloy® 118	For build-up & joining of manganese steels only.	•	o
			Abrasion Resistance (Carbon Content %)	
<b>Abrasion</b>	Hardalloy® 148	For abrasion and impact resistance.	[Bar chart showing low abrasion resistance]	
	Hardalloy® 140	For heavy abrasion and moderate impact.	[Bar chart showing moderate abrasion resistance]	
			0	2
			4	6
<b>Metal to Metal</b>	Hardalloy® 32	Excellent build-up and overall alloy for carbon steels	[Bar chart showing high metal-to-metal compatibility]	
			0	20
			40	60

• Compatible    o incompatible

### Hardalloy® 32

This heat treatable alloy steel suited for the build-up of carbon and low alloy steels only. High compressive strength makes it an excellent base for harder or more abrasion-resistant overlay alloys. It has good resistance to cracking even in multiple-pass deposits. It is not limited to a maximum number of layers of build-up.

#### Typical Applications

- bucket teeth and lips
- coupling boxes
- crane wheels
- dragline buckets and chain
- dredge ladder rolls
- gear teeth
- grizzly bars and fingers
- kiln trunnions
- mine car wheels
- steel shafts
- tractor idlers and rollers
- wobbler ends

#### Typical Deposit Analysis %

Carbon .....	0.18
Manganese .....	0.90
Silicon .....	0.60
Chromium .....	0.70
Molybdenum.....	0.30
Iron .....	Balance

#### Typical Properties

Machinability	Excellent
Typical Hardness, Rc	
No. of Layers	1020 Steel
1-2	17-20
3-8	25-30

Can be flame cut  
Deposit is strongly magnetic  
Deposit is heat treatable and forgeable

#### Optimum Current

Diameter	Amps
1/8" .....	140
5/32" .....	180
3/16" .....	220

Polarity: DCEP Preferred or AC

### Hardalloy® 118

This is a work-hardening austenitic manganese steel alloy designed for the build-up and joining of austenitic manganese steels only. It provides a good wear resistance under heavy impact conditions. Weld deposits are extremely tough, and work hardens rapidly.

#### Typical Applications

- crusher jaws and cones
- crusher rolls
- dredge pump casings, impellers, and side plates
- gyratory crusher mantles and cones
- hammer mill hammers
- impactor crusher bars
- manganese bucket teeth
- manganese steel railroad crossovers and frogs
- sizing screens

#### Typical Deposit Analysis %

Carbon .....	0.80
Manganese .....	16.50
Silicon .....	0.50
Chromium .....	5.00
Nickel.....	0.30
Iron .....	Balance

#### Typical Properties

Tensile Strength (psi)	127,000 (876 MPa)
Yield Strength (psi)	78,000 (538 MPa)
Elongation in 2"	50%
Machinability	Difficult
Hardness:	
As Deposited	18-22 Rc
Work Hardened	50-55 Rc
Flame cutting is difficult	
Nonmagnetic	

#### Optimum Current

Diameter	Amps
1/8" .....	120
5/32" .....	180
3/16" .....	230
1/4" .....	280

Polarity: DCEP Preferred or AC

### Hardalloy® 140

The high chromium carbide alloy steel deposit can be used to overlay surfaces subjected to high abrasion coupled with some impact. It maintains its wear resistance to a temperature of 1200 degrees Fahrenheit and offers some corrosion resistance. It is designed for carbon, low alloy or austenitic manganese base metals or a weld metal base of Hardalloy® 32, Hardalloy® 118, or Chrome-Mang™.

#### Typical Applications

- ammonia knives
- augers
- bucket teeth and lips
- bulldozer blades
- cement chutes
- crusher jaws and cones
- crusher rolls
- cultivator chisels and sweeps
- dredge cutter heads and teeth
- dredge pump side plates
- grizzly bars and fingers
- hammer mill hammers
- impactor crusher bars
- manganese pump sheels
- mill guides
- muller tires
- pipeline ball joints
- plow shares
- scraper blades
- screw conveyers
- sheepsfoot tampers
- sizing screens

#### Typical Deposit Analysis %

Carbon .....	3.00
Manganese .....	0.40
Silicon .....	2.00
Chromium .....	30.00
Molybdenum.....	0.70
Iron .....	Balance

#### Typical Properties

Machinability: Grinding only		
Typical Hardness, Rc		
No. of Layers	1020 Steel	12-14% Mn Steel
1	53	50
2	57	55
3	54	56

Cannot be flame cut  
Deposit will relief-check crack  
Deposit maintains hot hardness to 1200°F

#### Optimum Current

Diameter	Amps
1/8" .....	120
5/32" .....	155
3/16" .....	190

Polarity: DCEP Preferred or AC

## Hardalloy® 148

This stick electrode deposits a high carbon-chromium austenitic plus carbide alloy steel suited to overlay surfaces subjected to light abrasion accompanied by impact. It is excellent for metal-to-metal frictional wear resistance and the deposit will retain its hardness at temperatures up to 1200 degrees Fahrenheit.

### Typical Applications

- gyratory crusher mantles & cones
- ingot tongs
- mill guides
- pulleys
- slurry mixer paddles

### Typical Deposit Analysis %

Carbon .....	1.80
Manganese .....	0.60
Silicon .....	1.80
Chromium .....	30.00
Nickel.....	3.00
Molybdenum.....	1.50
Iron .....	Balance

### Typical Properties

Low stress abrasion: Excellent  
 Machinability: Grinding only  
 Typical Hardness, Rc

No. of Layers	1020 Steel	12-14% Mn Steel
1	36RC	35RC
2	39RC	38RC
3	43RC	40RC

Cannot be flame cut  
 Little or no relief-check cracks  
 Maintains hot hardness to 1200°F

### Optimum Current

Diameter	Amps
1/8" .....	120
5/32" .....	160
3/16" .....	175

Polarity: DCEP Preferred or AC

## TECHNICAL SECTION

### Comparative Index of Hardfacing Electrodes

Hobart®	Certanium	Lincoln	Stoody
Hardalloy® 32	283 FC	BU	Build-Up LH
Hardalloy® 118	262 FC	Mangjet	Dynamang
Hardalloy® 140	247, 248 FC	ME	31, 19, 21
Hardalloy® 148	246	ABR	31, 33, 77

### Hardfacing Electrodes Per Pound

Hobart® Type	Diameter:	1/8" (3.2mm)	5/32" (4.0mm)	3/16" (4.8mm)	1/4" (6.4mm)
	Length:	14"	14"	14"	18"
Hardalloy® 148		9	6	5	—
Hardalloy® 118		12	8	5	2
Hardalloy® 140		9	6	4	—

For other product comparisons, please go to our Hardfacing Product Cross-Reference Guide at [www.hobartbrothers.com](http://www.hobartbrothers.com)



## Suggested Hobart Stick Electrode per Industry Application

### Agriculture

Application Overlay	Hobart® Electrode
Ammonia Knives	140
Cultivator Chisels & Sweeps	140
Plow Shares	140

### Dredging Industry

Application Build Up	Overlay	Hobart® Electrode
Dredge Bucket Lips	—	140
Dredge Cutter Heads & Teeth	118	140
Dredge Ladder Rolls	32	—
Dredge Pump Casings	118	—
Dredge Pump Impellers	118	140
Dredge Pump Side Plates	118	140
Pipeline Ball Joints	—	140
Pump Shells (Manganese)	—	140

### Heavy Equipment/Mining Industries

Application Build-Up	Overlay	Hobart® Electrode
Augers	—	140
Bucket Teeth/Lips	32	140
Bulldozer Blades	—	140
Crane Wheels	32	—
Dragline Buckets	32	—
Dragline Car Wheels	32	—
Dragline Chain	32	—
Power Shovel Bucket Teeth/Lips	32	140
Scraper Blades	—	140
Sheepsfoot Tampers	—	140
Steel Shafts	32	—
Tractor Idlers/Rollers	32	—
Tractor Idlers/Roller	32	—

### Power Generation Industry

Application Overlay	Hobart® Electrode
Hydroelectric Turbines	118

### Crushing/Quarry Industries

Application Build-Up	Overlay	Hobart® Electrode
Bucket Lips	32	140
Bucket Teeth (Manganese Steel)	118	140
Cement Chutes	—	140
Crusher Jaws/Cones	118	140
Crusher Rolls	118	140
Gear Teeth	32	—
Gyratory Crusher Mantles/Cones	118	—
Hammer Mill Hammers	118	140
Impactor Crusher Bars	118	140
Kiln Trunnions	32	—
Muller Tires	—	140
Sizing Screens	118	140
Steel Shafts	32	—

### Iron & Steel Industry

Application Build-Up	Overlay	Hobart® Electrode
Coupling Boxes	32	—
Gear Teeth	32	—
Grizzly Bars & Fingers	—	140
Ingot Tongs	—	148
Mill Guides	—	140
Pulleys	—	148
Screw Conveyors	—	140
Steel Shafts	32	—
Wobbler Ends	32	—

### Railroad Industry

Application Overlay	Hobart® Electrode
Crossovers (Low Alloy Steel)	118
Crossovers (Manganese Steel)	118
Frogs (Carbon Steel)	118
Frogs (Manganese Steel)	118
Rail Ends (Low Alloy Steel)	118
Switch Points (Low Alloy Steel)	118

## TECHNICAL SECTION

### Hardfacing Stick Electrode/Wire Equivalent

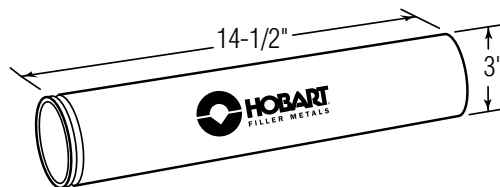
Stick Electrode	Open-Arc Wire	Gas-Shielded Wire	
		Flux-Cored	Metal-Cored
Hardalloy® 118	Tube-Alloy® 218-O, AP-0	Vertiwear® AP	—
Hardalloy® 32	Tube-Alloy® Build Up-0	—	Tube-Alloy® Build Up-G
—	—	—	—
Hardalloy® 140	Tube-Alloy® 240-0	—	—
—	Tube-Alloy® 255-0	—	Tube-Alloy® 255-G
Hardalloy® 148	—	—	—
—	—	—	—

### Hardfacing Electrode Pallet Information

Length	Hobart® Type	PALLET WEIGHT (LB)		PALLET DIMENSIONS			Number of Units Per Pallet
		Net	Gross (est.)	Depth	Width	Height	
3/32"–10"	Hardalloy® Electrodes	660	760	38"	45"	39"	132 (5 lb Cans)
1/8"–14"		1320	1420	38"	45"	39"	132 (10 lb Cans)
5/32"–14"		1320	1420	38"	45"	39"	132 (10 lb Cans)
3/16"–14"		1320	1420	38"	45"	39"	132 (10 lb Cans)
1/4"–18"		2450	2539	38"	40"	24"	49 (50 lb Cans)

### Packaging Options

#### 14-Inch Electrodes



10-Lb. Hermetically Sealed Can

# Hardfacing Wires Product Line

Restoring worn parts to their original dimensions

Open-Arc Tubular Wires	Gas-Shielded Tubular Wires
Tube-Alloy® Build Up-O* Tube-Alloy® AP-O* Tube-Alloy® 218-O* Tube-Alloy® 242-O	Tube-Alloy® Build Up-G*

## Overlay

Providing additional resistance to wear

Application	Open-Arc Tubular Wires	Gas-Shielded Tubular Wires	Metal-Cored Submerged-Arc Tubular Wires
<b>Metal to Metal</b>	Tube-Alloy® Build Up-O* Tube-Alloy® 258-O* Tube-Alloy® 242-O	Tube-Alloy® Build Up-G* Tube-Alloy® 258-G* VertiWear® 600 FabTuf® 960	Tube-Alloy® 242-S Mod Tube-Alloy® 877-S Tube-Alloy® 952-S Tube-Alloy® A2JL-S Tube-Alloy® 887-S Tube-Alloy® A250-S Tube-Alloy® 865-S Mod
<b>Impact</b>	Tube-Alloy® AP-O* Tube-Alloy® 218-O*		
<b>Abrasion</b>	Tube-Alloy® 255-O* Tube-Alloy® 240-O* Tube-Alloy® 258TiC-O Tube-Alloy® 244-O	Tube-Alloy® 255-G*	

Flux
HF-N

### Tube-Alloy® Build Up-O

Designed for build-up on mild and low alloy steels only, this low alloy steel deposit has good compressive strength and impact resistance making it an excellent base for abrasion resistant alloys.

#### Typical Applications

- bucket teeth and lips
- crane wheels
- dragline buckets
- dragline chain
- dredge ladder rolls
- gear teeth
- kiln trunnion
- mine car wheels
- spindles
- steel shafts
- wobbler ends

#### Typical Deposit Analysis %

Carbon .....	0.12
Manganese .....	2.80
Silicon .....	0.80
Chromium .....	1.20
Iron .....	Balance

#### Typical Properties

Abrasion Resistance	Fair	
Impact Resistance	Very Good	
Machinability	Excellent	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	4130 Steel
1	30	36
2	28	30
3	25	26
Can be flame cut		
Magnetic		
Heat Treatable		

#### Diameter and Polarity

1/16"  
DCEP

### Tube-Alloy® 218-O

This work hardening austenitic manganese steel alloy is designed for the build-up and joining of austenitic manganese steels only. It provides wear resistance under heavy impact conditions. Weld deposits are extremely tough, and work hardens rapidly.

#### Typical Applications

- bucket teeth
- crusher jaws and cones
- dredge pump casings
- gyratory crusher mantles and cones
- hammer mill hammers
- impactor crusher bars
- manganese steel railroad crossovers and frogs

#### Typical Deposit Analysis %

Carbon .....	1.00
Manganese .....	15.00
Silicon .....	0.40
Chromium .....	3.10
Nickel .....	0.40
Iron .....	Balance

#### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Excellent
Tensile Strength (psi)	120,000 (XX MPa)
Yield Strength (psi)	80,000 (XX MPa)
Elongation in 2"	32%
Machinability	Difficult
Hardness:	
As Deposited	15-22 Rc
Work Hardened	50-55 Rc
Flame cutting	Difficult
Nonmagnetic	

#### Diameter and Polarity

.045"  
1/16"  
7/64"  
DCEP

### Tube-Alloy® AP-O

This premium work hardening austenitic manganese steel alloy can be used for build-up or overlay on austenitic manganese steel, carbon steel and low alloy steel. It can also be used for joining austenitic manganese steel to manganese steel, carbon steel and low alloy steel. The weld metal has higher toughness than conventional manganese steel weld metal.

#### Typical Applications

- bucket teeth and lips
- crusher jaws and cones
- dragline buckets
- dredge cutter heads and teeth
- grizzly bars & fingers
- gyratory crusher mantles and cones
- hammer mill hammers
- hydroelectric turbines
- impactor crusher bars
- muller tires
- pulverizer hammers
- similar to those for Tube-Alloy® 218-O, especially where the base metal verification is questionable or where contamination may be an issue
- sizing screens

#### Typical Deposit Analysis %

Carbon .....	0.42
Manganese .....	16.50
Silicon .....	0.30
Chromium .....	13.00
Iron .....	Balance

#### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Excellent
Tensile Strength (psi)	124,000 (XX MPa)
Yield Strength (psi)	83,000 (XX MPa)
Elongation in 2"	40%
Machinability	Difficult
Hardness:	
As Deposited	18-24 Rc
Work Hardened	50-55 Rc
Cannot be flame cut	
Nonmagnetic	

#### Diameter and Polarity

1/16"  
7/64"  
DCEP

## Tube-Alloy® 258-0

This deposit is a premium martensitic alloy steel of the hard, tough H-12 tool steel composition. It has excellent resistance to adhesive (metal-to-metal) wear. It is designed to surface mild and low alloy steel components subject to moderate abrasive wear and/or high temperature (up to 1000 degrees Fahrenheit). Proper preheat is required for crack-free deposits.

### Typical Applications

- coupling boxes
- dragline chain
- kiln trunnions
- mill guides
- spindles
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.45
Manganese .....	1.40
Silicon .....	0.80
Chromium .....	6.00
Molybdenum.....	1.50
Tungsten .....	1.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Grind only	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	4130 Steel
1	49	51
2	53	54
3	57	57

Flame cutting is difficult  
 Magnetic  
 Heat Treatable and Forgeable  
 Maintains Hot Hardness to 1000°F

### Diameter and Polarity

.045"  
 1/16"  
 7/64"  
 DCEP

## Tube-Alloy® 240-0

With a chromium carbide surfacing alloy deposit, this wire can be used on components subject to severe abrasive wear and heavy impact. The weld metal has higher toughness than conventional chromium carbide due to fewer stress relief-check cracks.

### Typical Applications

- ammonia knives
- augers
- bucket teeth and lips
- bulldozer end bits and blades
- conveyer screws
- crusher jaws and cones
- crusher rolls
- cultivator chisels and sweeps
- dragline buckets
- dredge pump impellers and side plates
- hammer mill hammers
- impactor crusher bars
- manganese pump shells
- mill guides
- muller tires
- pipeline ball joints
- pulverizer hammers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- sizing screens

### Typical Deposit Analysis %

Carbon .....	3.20
Manganese .....	0.80
Silicon .....	1.90
Chromium .....	15.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Very Good	
Impact Resistance	Fair	
Machinability	Grinding only	
Thickness	3-5 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	12-14% Manganese
1	40	35
2	48	42
3	52	50

Can be flame cut  
 Deposit will relief-check crack

### Diameter and Polarity

.045"  
 1/16"  
 7/64"  
 DCEP

## Tube-Alloy® 255-0

This deposit is a premium high chromium carbide surfacing alloy that can be used on components subject to extremely severe abrasive wear and moderate impact. It can also be used where high temperature (up to 1250 degrees Fahrenheit) wear resistance is required. The weld metals will stress relief-check crack. It can be run as submerged arc by using MK-N neutral flux.

### Typical Applications

- ammonia knives
- augers
- bucket teeth and lips
- bulldozer blades
- bulldozer end bits and blades
- cement chutes
- coal feeder screws
- coal pulverizer hammers, rolls and table
- coke chutes
- coke pusher shoes
- conveyor screws
- dredge pump inlet nozzle and side plates
- fan blades
- grizzlybars and fingers
- gyratory crusher
- mantles and cones
- manganese pump shells
- muller tires
- ore and coal chutes
- pipeline ball joints
- pug mill paddles
- ripper shanks
- road rippers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- similar to those for Tube-Alloy® 240-0 where additional abrasion resistance is required
- sizing screens
- subsoiler teeth

### Typical Deposit Analysis %

Carbon .....	4.50
Manganese .....	0.90
Silicon .....	0.50
Chromium .....	26.50
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent	
Impact Resistance	Poor	
Machinability	Grinding only	
Thickness	3 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel*	12-14% Manganese
1	54	48
2	56	50
3	58	53

Cannot be flame cut  
 Deposit will relief-check crack readily  
 Maintains Hot Hardness to 1250°F

### Diameter and Polarity

7/64"  
 DCEP

### Tube-Alloy® 242-0

This self-shielded, flux cored wire deposits a premium martensitic alloy steel and has excellent resistance to adhesive (metal-to-metal) wear. The deposit has good resistance to abrasion and impact making it a versatile overlay alloy. It is designed for use as an overlay on carbon and low alloy steels or as a base of Tube-Alloy® Build Up-0. With proper preheating, crack-free deposits can be obtained. Tube-Alloy® 242-0 should never be used for joining.

#### Typical Applications

- carbon steel rolls
- crane wheels
- dragline chain
- frogs and switch points
- idlers
- low alloy steel railroad crossovers and rail ends
- steel shafts
- tractor rollers

#### Typical Deposit Analysis %

Carbon	0.25
Manganese	1.30
Silicon	0.70
Chromium	4.00
Molybdenum	0.50
Iron	Balance

#### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinable	
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	36
2	39
3	42
Can be flame cut	
Magnetic	

#### Diameter and Polarity

1/16"  
DCEP

### Tube-Alloy® 258TiC-0

With a deposit of martensitic alloy steel containing a high-volume fraction of titanium carbides, this wire is particularly good for resisting high-stress abrasive wear. The alloy has good hot hardness and deposits can be applied crack-free with proper procedures.

#### Typical Applications

- paving agitator screws

#### Typical Deposit Analysis %

Carbon	2.10
Manganese	1.30
Silicon	1.80
Chromium	7.00
Molybdenum	1.60
Titanium	6.00
Iron	Balance

#### Typical Properties

Abrasion Resistance	Excellent
Impact Resistance	Good
Machinability	Grinding only
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	60
2	55
3-8	48
Cannot be flame cut	
Magnetic	
Maintains hot hardness to 1000°F	

#### Diameter and Polarity

1/16"  
DCEP

### Tube-Alloy® 244-0

This wire deposit is a medium alloy carbide steel. It is designed primarily for the automatic rebuilding of dredge pump shells. Deposits do stress relief-check crack.

#### Typical Applications

- dredge pump impellers and side plates
- pipeline ball joints
- pump shells

#### Typical Deposit Analysis %

Carbon	2.50
Manganese	1.60
Silicon	2.00
Chromium	9.00
Copper	0.50
Iron	Balance

#### Typical Properties

Abrasion Resistance	Very Good	
Impact Resistance	Fair	
Machinability	Very Difficult	
Thickness	3-5 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	12-14% Manganese
1	34	24
2	37	33
3	40	38
Cannot be flame cut		
Slightly Magnetic		
Deposit will relief-check crack		

#### Diameter and Polarity

7/64"  
DCEP

## VertiWear® 600

With a deposit of multipurpose martensitic steel alloy, this wire can be used to surface mild and low alloy components subject to moderate abrasive wear and medium to high impact. It also offers excellent operator appeal in all positions.

### Typical Applications

- coupling boxes
- dragline chain
- dredge ladder rolls
- kiln trunnions
- mill guides
- sliding metal parts
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.40
Manganese .....	0.75
Silicon .....	0.60
Chromium .....	6.50
Molybdenum .....	1.00
Vanadium .....	0.05
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Very Good
Machinability	Good
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	52
2	56
3-8	57
Flame cutting is difficult	
Magnetic	

### Diameter and Polarity

.045"  
1/16"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

## Tube-Alloy® 255-G

This small-diameter, gas-shielded premium hardfacing wire deposits an extremely wear-resistant chromium-carbide overlay. It is designed for overlay on carbon, low alloy, cast iron, and austenitic manganese base metals. It outlasts competitive wires which deposit martensitic deposits 9 to 1.

### Typical Applications

- ammonia knives
- augers
- bucket teeth and lips
- bulldozer end bits and blades
- cement chutes
- coal feeder screws
- coal pulverizer hammers, rolls and table
- coke chutes
- coke pusher shoes
- conveyer screws
- crusher jaws and cones
- cultivator chisels and sweeps
- dragline buckets
- dredge cutter heads and teeth
- dredge pump inlet nozzle and side plates
- fan blades
- grizzly bars and fingers
- gyratory crusher mantles and cones
- manganese pump shells
- muller tires
- ore and coal chutes
- pipeline ball joints
- pug mill paddles
- ripper shanks
- road rippers
- scraper blades
- screw conveyors
- sheepsfoot tampers
- sizing screens
- subsoiler teeth

### Typical Deposit Analysis %

Carbon .....	5.30
Manganese .....	1.00
Silicon .....	0.40
Chromium .....	18.00
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Excellent	
Impact Resistance	Poor	
Machinability	Grinding is Difficult	
Thickness	3 Layers Maximum	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	Manganese Steel
1	58	47
2	61	51
3	65	54

Cannot be flame cut  
Deposit will relief-check crack readily  
Maintains hot hardness to 1250°F

### Diameter and Polarity

.045"  
DCEP  
Gas-Shielded  
98/2 (Ar/CO<sub>2</sub>)  
75/25 (Ar/CO<sub>2</sub>)

## Tube-Alloy® Build Up-G

This gas-shielded, metal-cored wire designed for build-up on carbon and low alloy steels. The weld metals have good compressive strength and impact resistance, making them excellent bases for more abrasion-resistant alloys.

### Typical Applications

- bucket teeth and lips
- crane wheels
- dragline buckets
- dragline chain
- dredge ladder rolls
- gear teeth
- kiln trunnions
- mine car wheels
- spindles
- steel shafts
- wobbler ends

### Typical Deposit Analysis %

Carbon .....	0.26
Manganese .....	1.73
Silicon .....	0.32
Chromium .....	1.85
Iron .....	Balance

### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Good
Hardness	25 Rc
Can be flame cut	
Magnetic	

### Diameter and Polarity

.045"  
DCEP  
Gas-Shielded  
75/25 (Ar/CO<sub>2</sub>)  
or 100% CO<sub>2</sub>

### Tube-Alloy® 258-G

(Formerly known as HW-T)

This metal-cored, gas-shielded wire which deposits a sound hot work tool steel alloy of the AISI H-12 type. It is extremely resistant to thermal shock and erosion at working temperatures. The alloy has good dimensional stability and uniform heat-treatment response, making it ideally suited for fabrication, modification, and repair of dies and other tool steel parts.

#### Typical Applications

- clean out rings
- die holders
- dummy blocks
- extrusion dies
- forming dies
- forging dies
- gripper dies
- guide rolls
- header dies
- hot forming dies
- mandrels
- swaging dies

#### Typical Deposit Analysis %

Carbon	0.40
Manganese	1.00
Silicon	0.55
Chromium	5.00
Molybdenum	1.45
Tungsten	1.25
Vanadium	0.40
Iron	Balance

#### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Nonmachinable in As-Welded Condition	Grinding only
Hardness, as deposited, RC	
No. of Layers	A36 Plate
1	52
2	53
3	57
Temp.	Typical Hardness
950°F	54

Flame Cutting Difficult  
 Good Resistance to softening at elevated temperatures  
 Heat treatable  
 Good Dimensional Stability

#### Diameter and Polarity

.045"  
 DCEP  
 Gas-Shielded  
 75/25 (Ar/CO<sub>2</sub>)  
 or 100% CO<sub>2</sub>

### FabTuf® 960

This gas-shielded, metal-cored wire that deposits a martensitic alloy steel. It is designed for use as an overlay on carbon and low alloy steels. It has very good resistance to adhesive (metal-to-metal) wear and good resistance to abrasion and impact.

#### Typical Applications

- coupling boxes
- dragline chain
- kiln trunnions
- mill guides
- spindles
- wobblers ends

#### Typical Deposit Analysis %

Carbon	0.70
Manganese	2.00
Silicon	1.00
Chromium	8.00
Iron	Balance

#### Typical Properties

Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Grinding only
Hardness:	
As Deposited	55-60 RC
Cannot be flame cut	
Magnetic	

#### Diameter and Polarity

.045"  
 1/16"  
 DCEP  
 Gas-Shielded  
 75/25 (Ar/CO<sub>2</sub>)  
 or 100% CO<sub>2</sub>

### Tube-Alloy® 877-S

With a low alloy steel deposit composition, this wire is a sound, tough, build-up alloy designed for use on steel mill con-cast rolls. Its mechanical properties are outstanding.

#### Typical Applications

- continuous caster rolls

#### Typical Deposit Analysis %

Carbon	0.10
Manganese	1.00
Silicon	0.60
Chromium	1.00
Molybdenum	0.40
Nickel	1.30
Iron	Balance
HF-N Flux	

#### Typical Properties

Abrasion Resistance	Fair
Impact Resistance	Very Good
Machinability	Excellent
Thickness	As required

#### Hardness, as deposited, Rc

No. of Layers	1020 Steel
1	22
2	23
3-8	24

Can be flame cut  
 Strongly Magnetic

#### Diameter and Polarity

1/8" (3.2 mm)  
 3/32" (2.4 mm)  
 DCEP



## Tube-Alloy® 242-S MOD

This wire has a low alloy medium hardness martensitic steel deposit. It can be used as a hard-facing overlay where good abrasion resistance and machinability are required.

### Typical Applications

- crane wheels
- tractor idlers and rollers

### Typical Deposit Analysis %

Carbon	0.14
Manganese	1.90
Silicon	0.80
Chromium	3.00
Molybdenum	0.80
Iron	Balance
HF-N Flux	

### Typical Properties

Abrasion Resistance	Good	
Impact Resistance	Good	
Machinability	Good	
Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	29	44
2	38	45
3	39	40

Can be flame cut  
Strongly magnetic

### Diameter and Polarity

1/8" (3.2 mm)  
DCEP

## Tube-Alloy® A2JL-S

This wire's deposit has a modified stainless-steel composition. It offers good resistance to metal-to-metal wear corrosion and thermal fatigue fire cracking.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon	0.04
Manganese	0.80
Silicon	0.60
Chromium	13.50
Molybdenum	1.00
Nickel	2.00
Iron	Balance
HF-N Flux	

### Typical Properties

Microstructure	Martensitic
w/controlled ferrite	
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Good with carbide tools
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1-3	40
4-8	33
Cannot be flame cut	
Slightly Magnetic	

### Diameter and Polarity

1/8" (3.2 mm)  
DCEP

## Tube-Alloy® 887-S

This wire is a premium martensitic stainless-steel alloy. It is a hard, tough composition that offers good resistance to metal-to-metal wear, corrosion and thermal fatigue.

### Typical Applications

- continuous caster rolls

### Typical Deposit Analysis %

Carbon	0.14
Manganese	0.88
Silicon	0.55
Chromium	12.50
Vanadium	0.23
Nickel	3.13
Molybdenum	1.50
Nb	0.18
HF-N Flux	

### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Fair
Thickness	As required
Hardness, as deposited, Rc	
No. of Layers	1020 Steel
1	32
2	38
3	40

Cannot be flame cut  
Magnetic

### Diameter and Polarity

3/32" (2.4 mm)  
DCEP

### Tube-Alloy® A250-S

With a deposit of modified 420 stainless steel composition, this wire offers good resistance to fire cracking and corrosion frequently encountered by steel mill rolls.

#### Typical Applications

- continuous caster rolls
- table rolls

#### Typical Deposit Analysis %

Carbon	0.19
Manganese	1.00
Silicon	0.50
Chromium	12.30
Iron	Balance
HF-N Flux	

#### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Good with carbide tools
Thickness	As required

Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	44	46
2	46	50
3	48	50

Cannot be flame cut  
Slightly Magnetic

#### Diameter and Polarity

1/8" (3.2 mm)  
DCEP

### Tube-Alloy® 865-S MOD

This wire's deposit is a modified stainless-steel composition. It offers good resistance to metal-to-metal wear, corrosion and the ultimate resistance to thermal fatigue fire cracking frequently encountered by steel mill rolls.

#### Typical Applications

- continuous caster rolls

#### Typical Deposit Analysis %

Carbon	0.18
Manganese	1.10
Silicon	0.40
Chromium	13.50
Molybdenum	1.00
Nickel	2.70
Vanadium	0.20
Columbium	0.20
Iron	Balance
HF-N Flux	

#### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Fair with carbide tools
Thickness	As required

Hardness, as deposited, Rc		
No. of Layers	1020 Steel	
1	45	
2	46	
3-8	48	

Cannot be flame cut  
Magnetic

#### Diameter and Polarity

1/8" (3.2 mm)  
3/32" (2.4 mm)  
DCEP

### Tube-Alloy® 952-S

This premium modified high carbon martensitic stainless steel produces higher hardness than standard 420 types. It offers excellent toughness for higher impact applications along with good resistance to abrasive wear. This alloy can be used in higher temperature applications (up to 1050 degrees Fahrenheit). It should not be used where thermal fatigue fire cracking is the prime consideration. It is a high-deposition rate wire that produces sound, porosity-free, crack-free weld deposits.

#### Typical Applications

- straightener rolls
- plate leveler rolls
- edger rolls
- descale rolls
- back-up rolls
- aluminum caster rolls cores

#### Typical Deposit Analysis %

Carbon	0.27
Manganese	1.45
Silicon	0.60
Chromium	12.80
Molybdenum	1.80
Nickel	0.60
Vanadium	0.19
Niobium	0.18
Iron	Balance
HF-N Flux	

#### Typical Properties

Microstructure	Martensitic
Abrasion Resistance	Good
Impact Resistance	Good
Machinability	Good with carbide tools
Thickness	As required

Hardness, as deposited, Rc		
No. of Layers	1020 Steel	1045 Steel
1	40	44
2	45	49
3	49	49

Flame cutting is difficult  
Magnetic

#### Diameter and Polarity

1/8" (3.2 mm)  
DCEP

## HF-N

This submerged arc flux designed for use with solid and tubular 400 series stainless wires. It provides excellent recovery of alloying elements such as chromium, nickel, molybdenum, niobium, and vanadium. It offers excellent slag removal at high temperatures with oscillated welding technique. It can be used with an oscillating technique and twin-wire torch configuration for maximized bead width and productivity.

### Benefits:

- provides excellent element recovery; suitable for use with the entire range of Hobart SAW hardfacing wires
- offers good wetting action to provide smooth, uniform, hardfacing weld beads
- provides excellent slag release, even at high currents
- can be used with an oscillating technique and twin-wire torch configuration for maximized bead width and productivity

### Typical Applications:

- SAW hardfacing
- steel mills
- continuous casting rolls

### Flux Type:

Agglomerated fluoride-basic flux

**Basicity Index (Boniszewski):** 2.6

**Alloy Transfer:** None

**Density:** ~1.2 kg/L

**Grain Size:** 0.2 – 1.6 mm/ 10 – 65 mesh

**Type of Current:** DCEP

### Primary Flux Composition:

Al<sub>2</sub>O<sub>3</sub> + MnO ..... ~19%  
 CaO + MgO ..... ~34%  
 SiO<sub>2</sub> + TiO<sub>2</sub> ..... ~18%  
 CaF<sub>2</sub> ..... ~29%

### Commonly Used With:

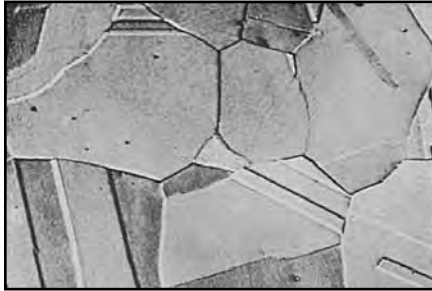
- Tube-Alloy® 242-S MOD
- Tube-Alloy® 865-S MOD
- Tube-Alloy® 952-S
- Tube-Alloy® A250-S
- Tube-Alloy® A2JL-S

### Packaging Available:

- HF-N
- 50 lb. (22.7 kg) Bag

## TECHNICAL SECTION

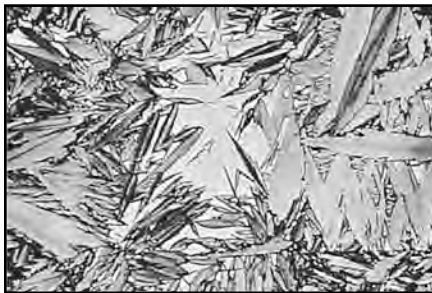
### Hardfacing Wire Alloy Classification



Photomicrograph of austenite.

#### Austenitic Alloys

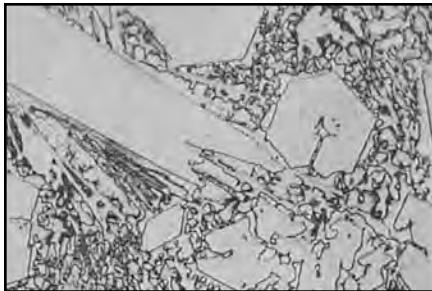
Austenitic alloys are extremely tough, ductile and workhardenable. They offer excellent impact resistance and fair abrasion resistance (which improves as it work-hardens). These alloys will normally work-harden to a surface hardness up to 50 HRC and still retain their good impact resistance.



Photomicrograph of martensite.

#### Martensitic Alloys

Martensite is formed in steels by rapid cooling rates. Most of the hardfacing alloys are air hardenable and heat treatable. They provide a good balance of impact and abrasion resistance. Martensitic alloys also have relatively high compression strength and excellent metal-to-metal wear resistance.



Photomicrograph of large carbides in a carbide eutectic matrix.

#### Carbide Alloys

Carbide alloys are very much like asphalt. There are carbides (gravel) and matrix (tar). The carbides are what give the excellent abrasion resistance while the matrix (tar) holds the carbides in place and offers some impact resistance. Carbides are extremely hard and brittle. They cannot handle impact. The more carbides there are the higher the abrasion resistance but the lower the impact resistance.

Hobart® Austenitic Products
Tube-Alloy® 218-O
Tube-Alloy® AP-O
VertiWear® AP
Hobart® Martensitic Products
Tube-Alloy® Build Up-O
Tube-Alloy® Build Up-G
Tube-Alloy® 242-O
Tube-Alloy® 258-O
Tube-Alloy® 258-G
FabTuf® 960
VertiWear® 600
ArmorWear™
Hobart® Carbide Products
Tube-Alloy® 244-O
Tube-Alloy® 258 TiC-O
Tube-Alloy® 240-O
Tube-Alloy® 255-O
Tube-Alloy® 255-G
Tube-Alloy® A43-O

### Hardfacing Wire/Stick Electrode Equivalent

Open- Arc Wire	Gas-Shielded Wire		Stick Electrode
	Flux-Cored	Metal-Cored	
Tube-Alloy® AP-O		—	—
Tube-Alloy® Build Up-O	—	Tube-Alloy® Build Up-G	—
Tube-Alloy® 258-O	—	Tube-Alloy® 258-G	—
	VertiWear® 600	—	—
	FabTuf® 960	—	—
Tube-Alloy® 240-O	—	—	Hardalloy® 140
Tube-Alloy® 255-O	—	Tube-Alloy® 255-G	—
Tube-Alloy® 242-O	—	—	—

**General Operating Parameters of Tube-Alloy® G Flux-Cored Gas-Shielded Surfacing Wires**

<b>.045" Diameter</b>		<b>1/16" Diameter</b>	
Use 1/2" to 1" wire stickout DC (electrode positive)		Use 1" to 1-1/2" wire stickout DC (electrode positive)	
Amps	Volts	Amps	Volts
120-160	19-23	225-275	23-25
160-190	24-25	275-350	24-27
190-230	26-27	350-400	26-29

**Typical Deposition Rates of Tube-Alloy® G Flux-Cored Gas-Shielded Surfacing Wires**

<b>.045" Diameter</b>		<b>1/16" Diameter</b>	
Amps	lb/hr	Amps	lb/hr
130	4	220	6
180	7	250	10
220	10	300	14

**General Operating Parameters of Tube-Alloy® O Flux-Cored Open-Arc Surfacing Wires**

<b>.045" Diameter</b>		<b>1/16" Diameter</b>		<b>7/64" Diameter</b>	
Use 1/2" to 1" wire stickout DC (electrode positive)		Use 1" to 1-1/2" wire stickout DC (electrode positive)		Use 1-1/2" to 2" wire stickout DC (electrode positive)	
Amps	Volts	Amps	Volts	Amps	Volts
120-160	19-23	225-275	23-25	350-400	24-27
160-190	24-25	275-350	24-27	400-450	26-29
190-230	26-27	350-400	26-29	450-500	28-32
With slight weave and 7 ipm travel speed average bead height will be 1/8" and width 3/8".					

**Typical Deposition Rates of Tube-Alloy® O Flux-Cored Open-Arc Surfacing Wires**

<b>.045" Diameter</b>		<b>1/16" Diameter</b>		<b>7/64" Diameter</b>	
Amps	lb/hr	Amps	lb/hr	Amps	lb/hr
130	4	220	6	300	11
180	7	250	10	350	14
220	10	300	14	400	18

**General Operating Parameters of Tube-Alloy® O Flux-Cored Open-Arc Surfacing Wires**

<b>3/32" (2.4 mm)</b>			<b>1/8" (3.2 mm)</b>			<b>5/32" (4.0 mm)</b>		
Use 1" to 1-1/4" (25-32 mm) wire stickout. Travel speed of 12" - 16" (305 - 406 mm) per minute.			Use 1-1/4" to 1-1/2" (32-38 mm) wire stickout. Travel speed of 14" - 18" (356-456 mm) per minute.			Use 1-1/4" to 1-1/2" (32-38 mm) wire stickout. Travel speed of 16" - 20" (406 - 508 mm) per minute.		
Amps	Volts	lb/hr	Amps	Volts	lb/hr	Amps	Volts	lb/hr
350-500	25-29	14-22	400-450	26-28	16	450-500	28-30	18
			450-500	27-30	20	500-600	29-32	23
			500-550	29-32	24			

### Comparative Index of Flux-Cored Open-Arc Hardfacing Wires

Hobart®	Certanium	Eutectic	Lincoln	Stoody	Welding Alloys
Tube-Alloy® AP-O	282 FC	3005-A, 3302	15CrMn	110	19/9/6-O, AP-O
Tube-Alloy® Build Up-O	283 FC	3110, 3010-A	BU, 33	Build-Up	T-O
Tube-Alloy® 218-O	—	3220-A	M	Dynamang, Nicro-Mang, Foundry Co-Mang	NM-O
Tube-Alloy® 240-O	284 FC	4025-A	50	12, SA/53, 131, 133,134	MC-O, HC333-O/G
Tube-Alloy® 242-O	—	—	40-O	Super Build-Up, Rail End 932	P-O, R-O
Tube-Alloy® 244-O	—	—	—	117	—
Tube-Alloy® 255-O	247 FC	4601-A	60-O	100HC, 101HC, 101HD, 100XHP	HC2-O, HC3-O, HC333-O/G
Tube-Alloy® 258-O/	281 FC	4415	55, T&D	102, 965-O	R-O, W-O, L-O
Tube-Alloy® 258 TiC-O	246 FC	—	—	600	TiC-O

### Comparative Index of Flux-Cored Gas-Shielded Hardfacing Wires

Hobart®	Certanium	Lincoln	Stoody
Tube-Alloy® Build Up-G	283 FC	—	Build-Up AP-G
Tube-Alloy® 255-G	—	—	—
Tube-Alloy® 258-G	—	T&D	102
VertiWear® 600/FabTuf® 960	—	55	695AP-G

### Comparative Index of Submerged Arc Hardfacing Wires and Fluxes

Hobart®	Lincoln	Stoody	Select Arc	Welding Alloys	Voestalpine Bohler/UTP
HF-N	801, 802 (Lincolnweld)	Stoody S-Type Stoody R-20	—	???	UTP UP FX 603 SA, SK, SR (RECORD)
Tube-Alloy® 242-S MOD	35-S, 40-S, 42-S (Lincore)	42, 104TJ, 105, 105B, 107 (Stoody Thermaclad)	—	HARDFACE T HARDFACE P	RECORD SA
Tube-Alloy® A250-S	—	Stoody Thermaclad 420	SelectWear 420	—	RECORD SK
Tube-Alloy® A2JL-S	Lincore 410NiMo	—	—	—	RECORD SR
Tube-Alloy® 865-S MOD	420, 423Cr, 423L (Lincore)	Stoody Thermaclad 4552	SelectWear 423-S	CHROMECORE 420	SK 415-SA
Tube-Alloy® 877-S	20-S, 30-S, 32-S 4130, 8620 (Lincore)	Stoody/Thermaclad 104 ThermaClad Roll Build 3	SelectWear BU-S	HARDFACE B	UP DUR 250 SK BU-S SK SOUDOCORE D-SA??
Tube-Alloy® 887-S	—	—	—	CHROMECORE 414	—
Tube-Alloy® 952-S	Lincore 96-S	—	—	—	SK 420-SA

For other product comparisons, please go to our Hardfacing Product Cross-Reference Guide at [www.hobartbrothers.com](http://www.hobartbrothers.com)

## Suggested Hobart® Tubular Wire per Industry Application

### Dredging Industry

Application Build-Up	Overlay	Hobart® Wire
Dredge Bucket Lips	—	240-O, 255-O, 255-G
Dredge Cutter Heads & Teeth	AP-O	255-O, 255-G
Dredge Pump Casings	218-O	—
Dredge Pump Inlet Nozzle	—	255-O, 255-G
Dredge Ladder Rolls	BU-O, BU-G	—
Dredge Pump Impellers	—	244-O, 240-O
Dredge Pump Side Plates	—	244-O, 240-O, 255-O, 255-G, A43-O
Pipeline Ball Joints	—	244-O, 240-O, 255-O, 255-G
Pump Shells (Carbon Steel)	—	244-O
Pump Shells (Manganese)	—	244-O, 240-O, 255-O, 255-G

### Heavy Equipment/Mining Industries

Application Build-Up	Overlay	Hobart® Wire
Augers	—	240-O, 255-O, 255-G
Bucket Lips/Teeth	BU-O, BU-G	240-O, 255-O, 255-G
Bulldozer Blades	—	240-O, 255-O, 255-G
Bulldozer End Bits	—	240-O, 255-O, 255-G
Crane Wheels	BU-O, BU-G	242-O, 242-S MOD
Dragline Buckets	BU-O, BU-G, AP-O	240-O, 255-O, 255-G
Dragline Chain	BU-O, BU-G	242-O, 258-O, 258-G, VertiWear® 600
Mine Car Wheels	BU-O, BU-G	242-S MOD
Ore/Coal Chutes	—	255-O, 255-G
Paving Agitator Screws	—	258 TiC-O
Power Shovel Bucket Lips/Teeth	BU-O, BU-G, AP-O	240-O, 255-O, 255-G
Pug Mill Paddles	—	255-O, 255-G
Road Rippers	—	255-O, 255-G
Scraper Blades	—	240-O, 255-O, 255-G
Sheepsfoot Tampers	—	240-O, 255-O, 255-G
Steel Shafts	BU-O, BU-G	242-O
Tractor Idlers/Rollers	—	242-S MOD

### Crushing/Quarry Industries

Application Build-Up	Overlay	Hobart® Wire
Bucket Lips	—	240-O, 255-O, 255-G
Bucket Teeth (Manganese Steel)	218-O, AP-O	240-O, 255-O, 255-G
Bulldozer End Bits	—	240-O, 255-O, 255-G
Cement Chutes	—	255-O, 255-G
Conveyor Screws	—	240-O, 255-O, 255-G
Crusher Jaws/Cones	218-O, AP-O	240-O, 255-O, 255-G
Crusher Rolls	—	240-O
Gear Teeth	BU-O, BU-G	—
Gyratory Crusher Mantles/Cones	218-O, AP-O	255-O, 255-G
Hammer Mill Hammers	218-O, AP-O	240-O
Impactor Crusher Bars	218-O, AP-O	240-O
Kiln Trunnions	BU-O, BU-G	258-O, 258-G
Muller Tires	AP-O	240-O, 255-O, 255-G
Pug Mill Paddles	—	255-O, 255-G
Pulverizer Hammers	AP-O	240-O
Sizing Screens	AP-O	240-O, 255-O, 255-G
Steel Shafts	BU-O, BU-G	242-O

### Iron & Steel Industry

Application Build-Up	Overlay	Hobart® Wire
Coke Chutes	—	255-O, 255-G
Coke Pusher Shoes	—	255-O, 255-G
Con Caster Rolls	8620-S	865-S Mod
Coupling Boxes	BU-O	258-O, 258-G, VertiWear® 600
Crane Wheels	BU-O, BU-G	242-S MOD
Gear Teeth	BU-O, BU-G	—
Grizzly Bars & Fingers	AP-O	255-O, 255-G
Mill Guides	—	258-O, 258-G, 240-O
Pug Mill Paddles	—	255-O, 255-G
Screw Conveyors	—	240-O, 255-O, 255-G
Sheets in Blast Furnace Bell	—	—
Sinter Breaker Bars	—	—
Sinter Plant Parts	—	—
Spindles	BU-O, BU-G	258-O, 258-G
Steel Shafts	BU-O, BU-G	242-O
Straightener Rolls	861-S	—
Table Rolls	8620-S	A250-S
Wobbler Ends	BU-O, BU-G	258-O, 258-G

### Agriculture

Application Overlay	Hobart® Wire
Ammonia Knives	240-O, 255-O, 255-G
Cultivator Chisels & Sweeps	240-O, 255-O, 255-G
Mill Hammers	258 TiC-O
Ripper Shanks	255-O, 255-G
Steel Shafts	242-O
Subsoiler Teeth	255-O, 255-G

### Railroad Industry

Application Overlay	Hobart® Wire
Crossovers (Low Alloy Steel)	242-O
Crossovers (Manganese Steel)	218-O, AP-O
Frogs (Carbon Steel)	242-O
Frogs (Manganese Steel)	218-O, AP-O
Rail Ends (Low Alloy Steel)	242-O
Switch Points (Low Alloy Steel)	242-O

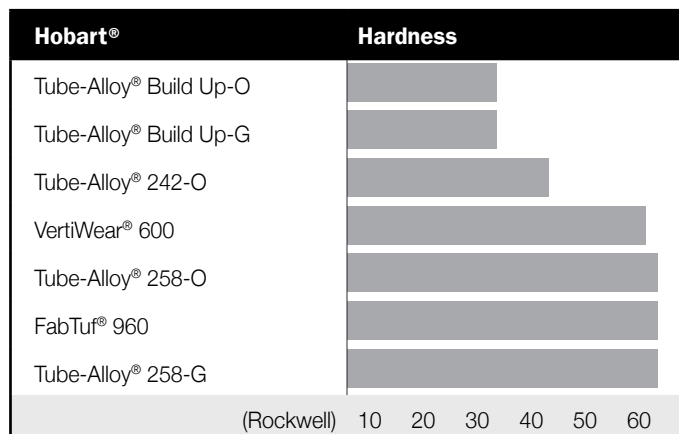
### Power Generation Industry

Application Overlay	Hobart® Wire
Coal Feeder Screws	255-O, 255-G
Coal Pulverizer Hammers	255-O, 255-G
Coal Pulverizer Rolls	255-O, 255-G
Coal Pulverizer Table	255-O, 255-G
Fan Blades	255-O, 255-G
Hydroelectric Turbines	AP-O

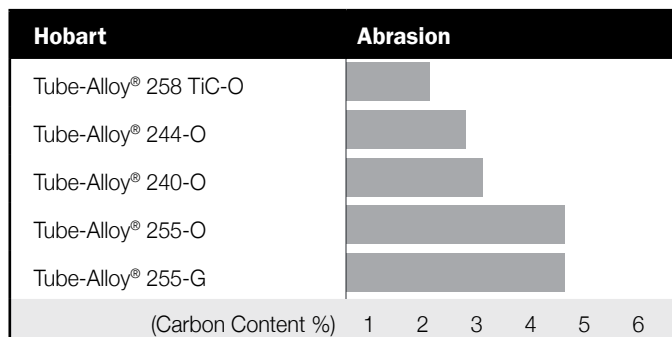
BU = Build-Up, O = Open Arc, -G = Gas Shielded, -S = Sub-Arc

## TECHNICAL SECTION

### Metal-to-Metal Wear Resistance



### Abrasion Resistance





Tensile Strength to Hardness Conversion Chart

Brinell Hardness No. (BHN)	Vickers Hardness No. (VHN)	Rockwell		Approximate Tensile Strength, 1000psi
		C (HRC)	B (HRB)	
898	—	—	—	440
857	—	—	—	420
817	—	—	—	401
780	1150	70	—	384
745	1050	68	—	368
712	960	66	—	352
682	885	64	—	337
653	820	62	—	324
627	765	60	—	311
601	717	58	—	298
578	675	57	—	287
555	633	55	120	276
534	598	53	119	266
514	567	52	119	256
495	540	50	117	247
477	515	49	117	238
461	494	47	116	229
444	472	46	115	220
429	454	45	115	212
415	437	44	114	204
401	420	42	113	196
388	404	41	112	189
375	389	40	112	182
363	375	38	110	176
352	363	37	110	170
341	350	36	109	165
331	339	35	109	160
321	327	34	108	155
311	316	33	108	150
302	305	32	107	146
293	296	31	106	142
285	287	30	105	138
277	279	29	104	134
269	270	28	104	131
262	263	26	103	128
255	256	25	102	125
248	248	24	102	122
241	241	23	100	119
235	235	22	99	116
229	229	21	98	113

Brinell Hardness No. (BHN)	Vickers Hardness No. (VHN)	Rockwell		Approximate Tensile Strength, 1000psi
		C (HRC)	B (HRB)	
223	223	20	97	110
217	217	18	96	107
212	212	17	96	104
207	207	16	95	101
202	202	15	94	99
197	197	13	93	97
192	192	12	92	95
187	187	10	91	93
183	183	9	90	91
179	179	8	89	89
174	174	7	88	87
170	170	6	87	85
166	166	4	86	83
163	163	3	85	82
159	159	2	84	80
156	156	1	83	78
153	153	—	82	76
149	149	—	81	75
146	146	—	80	74
143	143	—	79	72
140	140	—	78	71
137	137	—	77	70
134	134	—	76	68
131	131	—	74	66
128	128	—	73	65
126	126	—	72	64
124	124	—	71	63
121	121	—	70	62
118	118	—	69	61
116	116	—	68	60
114	114	—	67	59
112	112	—	66	58
109	109	—	65	56
107	107	—	64	56
105	105	—	62	54
103	103	—	61	53
101	101	—	60	52
99	99	—	59	51
97	97	—	57	50
95	95	—	56	49

## TECHNICAL SECTION

### Typical Composition and Suggested Preheat Temperatures for Several Steel Mill Roll Alloys

Alloy	C	Mn	Si	Cr	Ni	Mo	V	W	Suggested Pre-heat (°F) *
AISI 1020	.20	.45	.25						300-500
AISI 1030	.30	.75	.25						400-550
AISI 1040	.40	.75	.25						450-600
AISI 8620	.20	.80	.28	.50	.55	.20			500-700
AISI 4130	.30	.50	.28	.90		.20			600-700
AISI 4140	.40	.55	.28	.90		.20			650-700
AISI 4320	.20	.55	.28	.50	1.80	.25			600-700
AISI 4340	.40	.70	.28	.80	1.80	.25			650-700
H-12	.35	.30	1.00	5.00		1.50	.30	1.40	700-800
52100	1.00	.30	.28	1.40					700-800
CAST IRON†	3.25	.80	2.00						700-800
INTERNATIONAL	.40	.55	.30	1.10	1.40	.15			700-800
DIN 21 Cr.Mo.V.5-11	.20	.40	.45	1.35	.20	1.10	.30		700-800
DIN 1700G 13Cr.Mo 44	.15	.55	.25	.85		.45			600-800
EFC 21	.23	.40	.45	1.35		1.10	.30		700-800

† Gray or unalloyed ductile (nodular) iron.  
 • Soak time varies with Roll Mass (usually 1/2 hour per inch of roll diameter once the surface has reached soak temperature).

### Oven Storage and Reconditioning of Filler Metals

Welding electrodes, wire, and flux may be damaged by atmospheric moisture. The following table recommends proper storage conditions, and time and temperature for reconditioning electrodes that have absorbed excess moisture.

Notes for table: Pallets and unopened cartons of electrodes and wire should be stored away from exposure to water in the form of rain, snow, spray, or humidity. Only hermetically sealed cans are safe against these conditions. Damaged cartons permit entry of damp air which may be picked up by the product and lower its quality. Humidity below 50% should be avoided for 6010, 6011, 6012 and 6013 electrodes. At no times should these classes of electrodes be stored in an oven above 175°F.

The instruction, "Dry at Room Temperature" in the table signifies that the humidity should be below 70% and the temperature should be within the limits 40°F and 120°F.

When reconditioning flux, it is important that the complete mass be brought up to the temperature desired. If the flux is held in large containers, this can take a very long time – perhaps over 24 hours. In thin layers, reduction in moisture can be accomplished in as little as one hour, for example, in layers one to two inches thick. Fossil fuel burners (natural gas, oil, etc.) are not recommended.

CAUTION: Welding characteristics of agglomerated flux may suffer if temperature exceeds 650°F.

Item Designation	Storage of Contents of Open Cartons*	Reconditioning*
Sub-Arc Fluxes	250°F	600°F
Mild Steel Solid Wire	Dry at room temperature	Not recommended
Tubular Wires – Tube-Alloy®, FabCO®, Fabshield®, FabCOR®, MEGAFIL	Dry at room temperature	Not recommended

## Stick part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Pipemaster® Pro-60</b>	<b>E6010</b>			<b>3</b>
S129132-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S129144-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S129151-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hobart® 610</b>	<b>E6010</b>			<b>3</b>
S129432-045	3/32"	2.4	5 Lb (2 Kg) Plastic Pak	
S129432-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S129432-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S129432-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S129444-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S129444-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S129444-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S129444-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S129451-045	5/32"	4.0	5 Lb (2 Kg) Plastic Pak	
S129451-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S129451-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S129451-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Pipemaster® 70</b>	<b>E7010-P1</b>			<b>7</b>
S116644-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S116651-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S116658-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Pipemaster® 80</b>	<b>E8010-P1</b>			<b>7</b>
S116744-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S116751-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S116758-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hobart® 335A</b>	<b>E6011</b>			<b>3</b>
S112232-045	3/32"	2.4	5 Lb (2 Kg) Plastic Pak	
S112232-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S112232-031	3/32"	2.4	50 Lb (22.7 Kg) Carton	
S112244-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S112244-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S112244-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S112244-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S112251-045	5/32"	4.05	5 Lb (2 Kg) Plastic Pak	
S112251-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S112251-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
S112251-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S112258-031	3/16"	4.8	50 Lb (22.7 Kg) Carton	
S112258-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hobart® 447A</b>	<b>E6013</b>			<b>4</b>
S113832-045	3/32"	2.4	5 Lb (2 Kg) Plastic Pak	
S113832-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
S113832-031	3/32"	2.4	50 Lb (22.7 Kg) Carton	
S113844-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S113844-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S113844-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S113851-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S113851-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
S113858-031	3/16"	4.8	50 Lb (22.7 Kg) Carton	
<b>Hobart® Deckmaster™ 1139</b>	<b>E6022</b>			<b>4</b>
S113244-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S113251-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
<b>Hobart® 14A</b>	<b>E7014</b>			<b>4</b>
S114232-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S114232-031	3/32"	2.4	50 Lb (22.7 Kg) Carton	
S114244-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S114244-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S114244-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S114251-045	5/32"	4.0	5 Lb (2 Kg) Plastic Pak	
S114251-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S114251-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
S114258-031	3/16"	4.8	50 Lb (22.7 Kg) Carton	
<b>Hobart® 24</b>	<b>E7024 / E7024-1</b>			<b>5</b>
S114844-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S114851-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
S114859-031	3/16"	4.8	50 Lb (22.7 Kg) Carton	
S114870-031	7/32"	5.6	50 Lb (22.7 Kg) Carton	
S114881-031	1/4"	6.4	50 Lb (22.7 Kg) Carton	
<b>Hobart® 418</b>	<b>E7018 H4R / E7018-1 H4R</b>			<b>5</b>
S119932-045	3/32"	2.4	5 Lb (2 Kg) Plastic Pak	
S119932-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S119932-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S119932-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119944-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S119944-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S119944-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S119944-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119951-045	5/32"	4.0	5 Lb (2 Kg) Plastic Pak	
S119951-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S119951-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S119951-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119958-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119981-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	

## Stick part numbers ... cont'd

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Hobart® 718MC</b>	<b>E7018 H4R / E7018-1 H4R</b>			<b>5</b>
S115932-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S115932-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S115944-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S115944-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S115951-089	5/32"	4.0	10 Lb (4.5 Kg) Plastic Pak	
S115951-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S115958-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S115981-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hobart® 7018 XLM</b>	<b>E7018 H4R / E7018-1 H4R</b>			<b>6</b>
S422032-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S422032-031	3/32"	2.4	50 Lb (22.7 Kg) Carton	
S422032-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S422044-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S422044-031	1/8"	3.2	50 Lb (22.7 Kg) Carton	
S422044-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S422051-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S422051-031	5/32"	4.0	50 Lb (22.7 Kg) Carton	
S422051-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S422058-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	
S422058-031	3/16"	4.8	50 Lb (22.7 Kg) Carton	
S422058-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S422081-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hobart® 18AC</b>	<b>E7018 H8</b>			<b>6</b>
S119832-045	3/32"	2.4	5 Lb (2 Kg) Plastic Pak	
S119832-089	3/32"	2.4	10 Lb (4.5 Kg) Plastic Pak	
S119832-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119844-045	1/8"	3.2	5 Lb (2 Kg) Plastic Pak	
S119844-089	1/8"	3.2	10 Lb (4.5 Kg) Plastic Pak	
S119844-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S119851-045	5/32"	4.0	5 Lb (2 Kg) Plastic Pak	
S119851-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 7018A1</b>	<b>E7018-A1 H4R</b>			<b>7</b>
S125032-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125032-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125044-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125051-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125051-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 8018B2</b>	<b>E8018-B2 H4R</b>			<b>8</b>
S125432-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125432-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125444-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125451-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125458-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Hoballoy® 8018C1</b>	<b>E8018-C1 H4</b>			<b>8</b>
S125132-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125144-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125151-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125158-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 8018C3</b>	<b>E8018-C3 H4</b>			<b>8</b>
S125332-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125332-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125344-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125344-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125351-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125351-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125358-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125381-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 9018B3</b>	<b>E9018-B3 H4R</b>			<b>9</b>
S125532-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125544-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125544-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125551-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125558-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125581-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 9018M</b>	<b>E9018-M H4R</b>			<b>9</b>
S125632-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125644-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125644-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125651-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S125651-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125681-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 10018D2</b>	<b>E10018-D2 H4R</b>			<b>9</b>
S125732-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125744-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125751-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125758-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	
S125781-035	1/4"	6.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
<b>Hoballoy® 11018M</b>	<b>E11018-M H4R</b>			<b>10</b>
S126032-033	3/32"	2.4	10 Lb (4.5 Kg) Hermetically Sealed Can	
S126032-035	3/32"	2.4	50 Lb (22.7 Kg) Hermetically Sealed Can	
S126044-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S126044-035	1/8"	3.2	50 Lb (22.7 Kg) Hermetically Sealed Can	
S126051-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S126051-035	5/32"	4.0	50 Lb (22.7 Kg) Hermetically Sealed Can	
S126058-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	
S126058-035	3/16"	4.8	50 Lb (22.7 Kg) Hermetically Sealed Can	

## Solid Wire part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Quantum Arc™ 3</b>	<b>ER70S-3</b>			<b>16</b>
S307308-033	0.035"	0.9	33 Lb (15 Kg) Steel Reel	
S307308-045	0.035"	0.9	45 Lb (20.4 Kg) Steel Reel	
S307308-085	0.035"	0.9	45 Lb (20.4 Kg) Fiber Spool	
S307308-011	0.035"	0.9	600 Lb (272 Kg) Robo-Pak	
S307308-070	0.035"	0.9	950 Lb (431 Kg) Recyclable Robo-Pak	
S307312-045	0.045"	1.2	45 Lb (20.4 Kg) Steel Reel	
S307312-028	0.045"	1.2	60 Lb (27 Kg) Fiber Spool	
S307312-011	0.045"	1.2	600 Lb (272 Kg) Robo-Pak	
S307312-070	0.045"	1.2	950 Lb (431 Kg) Recyclable Robo-Pak	
<b>Quantum Arc™ 6</b>	<b>ER70S-6</b>			<b>16</b>
S307608-033	0.035"	0.9	33 Lb (15 Kg) Steel Reel	
S307608-045	0.035"	0.9	45 Lb (20.4 Kg) Steel Reel	
S307608-085	0.035"	0.9	45 Lb (20.4 Kg) Fiber Spool	
S307608-073	0.035"	0.9	300 Lb (136 Kg) Recyclable Robo-Pak	
S307608-011	0.035"	0.9	600 Lb (272 Kg) Robo-Pak	
S307608-074	0.035"	0.9	600 Lb (272 Kg) Recyclable Robo-Pak	
S307608-070	0.035"	0.9	950 Lb (431 Kg) Recyclable Robo-Pak	
S307610-085	0.040"	1.0	45 Lb (20.4 Kg) Fiber Spool	
S307610-028	0.040"	1.0	60 Lb (27 Kg) Fiber Spool	
S307610-070	0.040"	1.0	950 Lb (431 Kg) Recyclable Robo-Pak	
S307612-033	0.045"	1.2	33 Lb (15 Kg) Steel Reel	
S307612-045	0.045"	1.2	45 Lb (20.4 Kg) Steel Reel	
S307612-085	0.045"	1.2	45 Lb (20.4 Kg) Fiber Spool	
S307612-028	0.045"	1.2	60 Lb (27 Kg) Fiber Spool	
S307612-073	0.045"	1.2	300 Lb (136 Kg) Recyclable Robo-Pak	
S307612-011	0.045"	1.2	600 Lb (272 Kg) Robo-Pak	
S307612-074	0.045"	1.2	600 Lb (272 Kg) Recyclable Robo-Pak	
S307615-074	0.052"	1.4	600 Lb (272 Kg) Recyclable Robo-Pak	
S307612-070	0.045"	1.2	950 Lb (431 Kg) Recyclable Robo-Pak	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>HB-28</b>	<b>ER70S-6</b>			<b>16</b>
S305401-019	0.024"	0.6	2 Lb (0.9 Kg) Spool	
S305401-022	0.024"	0.6	10 Lb (4.5 Kg) Spool	
S305406-019	0.030"	0.8	2 Lb (0.9 Kg) Spool	
S305406-022	0.030"	0.8	10 Lb (4.5 Kg) Spool	
S305406-033	0.030"	0.8	33 Lb (15 Kg) Spool	
S305408-019	0.035"	0.9	2 Lb (0.9 Kg) Spool	
S305408-022	0.035"	0.9	10 Lb (4.5 Kg) Spool	
S305408-033	0.035"	0.9	33 Lb (15 Kg) Spool	
S305408-045	0.035"	0.9	45 Lb (20.4 Kg) Spool	
S305412-045	0.045"	1.2	45 Lb (20.4 Kg) Spool	
<b>Quantum Arc™ D2</b>	<b>ER80S-D2 / ER90S-G</b>			<b>17</b>
S307208-033	0.035"	0.9	33 Lb (15 Kg) Steel Reel	
S307208-045	0.035"	0.9	45 Lb (20.4 Kg) Steel Reel	
S307208-011	0.035"	0.9	600 Lb (272 Kg) Robo-Pak	
S307212-033	0.045"	1.2	33 Lb (15 Kg) Steel Reel	
S307212-045	0.045"	1.2	45 Lb (20.4 Kg) Steel Reel	
S307212-028	0.045"	1.2	60 Lb (27 Kg) Fiber Spool	
S307212-011	0.045"	1.2	600 Lb (272 Kg) Robo-Pak	

## Aluminum part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Wire</b>				
<b>MaxalMig ER4043</b>	<b>ER4043</b>			<b>25</b>
404303004	0.030"	0.8	1 Lb (0.45 Kg) Plastic Spool	
404303012	0.030"	0.8	12 Lb (5.4 Kg) Wire Basket	
404303504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
404303512	0.035"	0.9	16 Lb (7.3 Kg) Wire Basket	
404303512P	0.035"	0.9	16 Lb (7.3 Kg) Plastic Spool	
404303523	0.035"	0.9	300 Lb (136 Kg) Drum	
404304012	0.040"	1.0	16 Lb (7.3 Kg) Wire Basket	
404304704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
404304712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
404304712P	3/64"	1.2	16 Lb (7.3 Kg) Plastic Spool	
404304712P22	3/64"	1.2	22 Lb (10 Kg) Plastic Spool	
404304723L	3/64"	1.2	100 Lb (45 Kg) Drum	
404304723	3/64"	1.2	300 Lb (136 Kg) Drum	
404306212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	
404306212P22	1/16"	1.6	22 Lb (10 Kg) Plastic Spool	
404306223	1/16"	1.6	300 Lb (136 Kg) Drum	
404306230	1/16"	1.6	350 Lb (159 Kg) Wooden Reel	
<b>MaxalMig ER4047</b>	<b>ER4047</b>			<b>25</b>
404703512	0.035"	0.9	16 Lb (7.3 Kg) Wire Basket	
404704712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
404704723	3/64"	1.2	300 Lb (136 Kg) Drum	
404706212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	
404706223	1/16"	1.6	300 Lb (136 Kg) Drum	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>MaxalMig ER4943</b>	<b>ER4943</b>			<b>26</b>
494303004	0.030"	0.8	1 Lb (.45 Kg) Plastic Spool	
494303504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
494303512	0.035"	0.9	16 Lb (7.3 Kg) Wire Basket	
494303512P	0.035"	0.9	16 Lb (7.3 Kg) Plastic Spool	
494304704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
494304712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
494304712B	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket Bulk	
494304712P	3/64"	1.2	16 Lb (7.3 Kg) Plastic Spool	
494304712P22	3/64"	1.2	22 Lb (10 Kg) Plastic Spool	
494304723L	3/64"	1.2	100 Lb (45 Kg) Drum	
494304723	3/64"	1.2	300 Lb (136 Kg) Drum	
494306212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	
494306223	1/16"	1.6	300 Lb (136 Kg) Drum	
<b>MaxalMig ER5183</b>	<b>ER5183</b>			<b>26</b>
518303504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
518303512	0.035"	0.9	16 Lb (7.3 Kg) Wire Basket	
518304704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
518304712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
518304712P22	3/64"	1.2	22 Lb (10 Kg) Plastic Spool	
518306212P	1/16"	1.6	16 Lb (7.3 Kg) Plastic Spool	
<b>MaxalMig ER5356</b>	<b>ER5356</b>			<b>27</b>
535603004	0.030"	0.8	1 Lb (0.45 Kg) Plastic Spool	
535603012	0.030"	0.8	12 Lb (5.4 Kg) Wire Basket	
535603504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
535603512	0.035"	0.9	16 Lb (7.3 Kg) Wire Basket	
535603512P	0.035"	0.9	16 Lb (7.3 Kg) Plastic Spool	
535603523L	0.035"	0.9	100 Lb (45 Kg) Drum	
535603523	0.035"	0.9	300 Lb (136 Kg) Drum	
535604012	0.040"	1.0	16 Lb (7.3 Kg) Wire Basket	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
535604704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
535604712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
535604712B	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket Bulk	
535604712P	3/64"	1.2	16 Lb (7.3 Kg) Plastic Spool	
535604712P22	3/64"	1.2	22 Lb (10 Kg) Plastic Spool	
535604723L	3/64"	1.2	100 Lb (45 Kg) Drum	
535604723	3/64"	1.2	300 Lb (136 Kg) Drum	
535606212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	
535606223	1/16"	1.6	300 Lb (136 Kg) Drum	
<b>MaxalMig ER5554</b>	<b>ER5554</b>			<b>27</b>
555403004	0.030"	0.8	1 Lb (0.45 Kg) Plastic Spool	
555403504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
555403508	0.035"	0.9	5 Lb (2 Kg) Plastic Spool	
555404704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
555404708	3/64"	1.2	5 Lb (2 Kg) Plastic Spool	
555404712	3/64"	1.2	16 Lb (7.3 Kg) Wire Basket	
555404712P22	3/64"	1.2	22 Lb (10 Kg) Plastic Spool	
555404723	3/64"	1.2	300 Lb (136 Kg) Drum	
555406212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	
<b>MaxalMig ER5556</b>	<b>ER5556</b>			<b>27</b>
555603504	0.035"	0.9	1 Lb (0.45 Kg) Plastic Spool	
555603508	0.035"	0.9	5 Lb (2 Kg) Plastic Spool	
555604704	3/64"	1.2	1 Lb (0.45 Kg) Plastic Spool	
555604708	3/64"	1.2	5 Lb (2 Kg) Plastic Spool	
555604712P	3/64"	1.2	16 Lb (7.3 Kg) Plastic Spool	
555606212	1/16"	1.6	16 Lb (7.3 Kg) Wire Basket	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Cut Lengths</b>				
<b>MaxalTig 4043</b>	<b>R4043</b>			<b>28</b>
404306271	1/16"	1.6	1 Lb (0.45 Kg) Tube	
404306270	1/16"	1.6	10 Lb (4.5 Kg) Carton	
404309471	3/32"	2.4	1 Lb (0.45 Kg) Tube	
404309470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
404312571	1/8"	3.2	1 Lb (0.45 Kg) Tube	
404312570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
404315670	5/32"	4.0	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 4047</b>	<b>R4047</b>			<b>28</b>
404709470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 4943</b>	<b>R4943</b>			<b>28</b>
494306270	1/16"	1.6	10 Lb (4.5 Kg) Carton	
494309470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
494312570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
494315670	5/32"	4.0	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 5183</b>	<b>R5183</b>			<b>29</b>
518312570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 5356</b>	<b>R5356</b>			<b>29</b>
535606271	1/16"	1.6	1 Lb (0.45 Kg) Tube	
535606270	1/16"	1.6	10 Lb (4.5 Kg) Carton	
535609471	3/32"	2.4	1 Lb (0.45 Kg) Tube	
535609470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
535609470B	3/32"	2.4	10 Lb (0.45 Kg) Bulk Tig	
535612571	1/8"	3.2	1 Lb (0.45 Kg) Tube	
535612570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
535615670	5/32"	4.0	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 5554</b>	<b>R5554</b>			<b>29</b>
555409470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
555412570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
<b>MaxalTig 5556</b>	<b>R5556</b>			<b>30</b>
555609470	3/32"	2.4	10 Lb (4.5 Kg) Carton	
555612570	1/8"	3.2	10 Lb (4.5 Kg) Carton	
555606270	1/16"	1.6	10 Lb (4.5 Kg) Carton	

## Flux-Cored part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Mild Steel FCAW(gas)</b>				
<b>FabCO® RXR</b>	<b>E70T-1C/-9C</b>			<b>33</b>
S246512-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S246519-044	1/16"	1.6	44 Lb. (20 Kg) Spool	
S246519-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S246519-061	1/16"	1.6	250 Lb. (113 Kg) Exacto-Pak	
S246519-056	1/16"	1.6	600 Lb. (272 Kg) X-Pak™	
S246525-002	5/64"	2.0	60 Lb. (27 Kg) Coil	
S246525-008	5/64"	2.0	600 Lb. (272 Kg) Drum	
S246529-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
S246529-065	3/32"	2.4	250 Lb. (114 Kg) Drum	
S246529-008	3/32"	2.4	600 Lb. (272 Kg) Drum	
S246529-069	3/32"	2.4	800 Lb. (363 Kg) Flat Reel	
S246539-002	7/64"	2.8	60 Lb. (27 Kg) Coil	
<b>FabCO® TR-70</b>	<b>E70T-1C H8/-9C H8</b>			<b>33</b>
S247012-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S247019-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S247019-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S247019-056	1/16"	1.6	600 Lb. (272 Kg) X-Pak™	
S247025-002	5/64"	2.0	60 Lb. (27 Kg) Coil	
S247025-008	5/64"	2.0	600 Lb. (272 Kg) Drum	
S247029-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
S247029-069	3/32"	2.4	800 Lb. (363 Kg) Flat Reel	
S247029-008	3/32"	2.4	600 Lb. (272 Kg) Drum	
<b>FabCO® SUPER-COR</b>	<b>E70T-1C H4/E70T-9C H4</b>			<b>33</b>
S647129-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
S647129-008	3/32"	2.4	600 Lb. (272 Kg) Drum	
<b>FabCO® 85</b>	<b>E70T-5CJ H4/-5MJ H4</b>			<b>34</b>
S647519-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S647529-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
<b>FabCO® 73</b>	<b>E70T-2C</b>			<b>34</b>
S248239-002	7/64"	2.8	60 Lb. (27 Kg) Coil	
<b>FabCO® Excel-Arc™ 71</b>	<b>E71T-1C/M H8, E71T-9C/M H8</b>			<b>34</b>
S247108-029	0.035"	0.9	33 Lb. (15 Kg) Spool	
S247112-023	0.045"	1.2	15 Lb. (7 Kg) Spool	
S247112-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S247112-044	0.045"	1.2	44 Lb. (20 Kg) Spool	
S247112-020	0.045"	1.2	500 Lb. (227 Kg) X-Pak™	
S247115-023	0.052"	1.4	15 Lb. (7 Kg) Spool	
S247115-029	0.052"	1.4	33 Lb. (15 Kg) Spool	
S247115-027	0.052"	1.4	50 Lb. (22.7 Kg) Spool	
S247115-056	0.052"	1.4	600 Lb. (272 Kg) X-Pak™	
S247119-023	1/16"	1.6	15 Lb. (7 Kg) Spool	
S247119-029	1/16"	1.6	33 Lb. (15 Kg) Spool	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
S247119-044	1/16"	1.6	44 Lb. (20 Kg) Spool	
S247119-027	1/16"	1.6	50 Lb. (22.7 Kg) Spool	
S247119-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S247119-056	1/16"	1.6	600 Lb. (272 Kg) X-Pak™	
S247125-002	5/64"	2.0	60 Lb. (27 Kg) Coil	
S247125-008	5/64"	2.0	600 Lb. (272 Kg) Drum	
S247125-069	5/64"	2.0	800 Lb. (363 Kg) Flat Reel	
<b>FabCO® Triple 7</b>	<b>E71T-1C/M H8, E71T-9C/M H8</b>			<b>35</b>
S246312-023	0.045"	1.2	15 Lb. (7 Kg) Spool	
S246312-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S246312-027	0.045"	1.2	50 Lb. (22.7 Kg) Spool	
S246312-050	0.045"	1.2	500 Lb. (181 Kg) X-Pak™	
S246315-023	0.052"	1.4	15 Lb. (7 Kg) Spool	
S246315-029	0.052"	1.4	33 Lb. (15 Kg) Spool	
S246315-027	0.052"	1.4	50 Lb. (22.7 Kg) Spool	
S246315-050	0.052"	1.4	500 Lb. (181 Kg) X-Pak™	
S246319-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S246319-027	1/16"	1.6	50 Lb. (22.7 Kg) Spool	
S246319-002	1/16"	1.6	60 Lb. (27 Kg) Spool	
S246319-056	1/16"	1.6	600 Lb. (272 Kg) X-Pak™	
<b>FabCO® Triple 8</b>	<b>E71T-1CJ/-9CJ H8</b>			<b>36</b>
S288812-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S288819-027	1/16"	1.6	50 Lb. (22.7 Kg) Spool	
S288819-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S288819-056	1/16"	1.6	0600 Lb (272 Kg) Exacto-Pak	
<b>FabCO® Element™ 71T1C</b>	<b>E71T-1C/-9C H8</b>			<b>36</b>
S292112-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S292115-002	0.052"	1.4	60 Lb. (27 Kg) Coil	
S292119-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S292119-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® Element™ 71T1M</b>	<b>E71T-1M/-9M H8</b>			<b>36</b>
S294112-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S294115-029	0.052"	1.4	33 Lb. (15 Kg) Spool	
S294119-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® Element™ 71C</b>	<b>E71T-1C H8/E71T-9C H8</b>			<b>37</b>
S297912-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S297919-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® Element™ 71M</b>	<b>E71T-1M H8/E71T-9M H8</b>			<b>37</b>
S294712-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S294719-029	1/16"	1.6	33 Lb. (15 Kg) Spool	



Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>FabCO® 711M</b>	<b>E71T-1C H8/-1M H8</b>			<b>38</b>
S248812-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S248812-027	0.045"	1.2	50 Lb. (22.7 Kg) Spool	
S248815-029	0.052"	1.4	33 Lb. (15 Kg) Spool	
S248819-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S248819-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCo® 712C</b>	<b>E71T-1CJ H4/-9CJ H4/-12CJ H4</b>			<b>39</b>
S292812-053	.045	1.2	33 Lb. (15 Kg) Vacuum Pkgd Spool	
S292815-053	.052	1.4	33 Lb. (15 Kg) Vacuum Pkgd Spool	
<b>FabCO® 712M</b>	<b>E71T-12MJ H4</b>			<b>38</b>
S237512-053	0.045"	1.2	33 Lb. (15 Kg) Vacuum Pkgd Spool	
S237515-053	0.052"	1.4	33 Lb. (15 Kg) Vacuum Pkgd Spool	
<b>FabCO® XL®-550</b>	<b>E71T-1CJ/-9CJ/-12CJ H4</b>			<b>39</b>
S245112-053	0.045"	1.2	33 Lb. (15 Kg) Vacuum Pkgd Spool	
S245115-053	0.052"	1.4	33 Lb. (15 Kg) Vacuum Pkgd Spool	
S245019-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S245019-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® XL®-525</b>	<b>E71T-1M/-12MJ H8</b>			<b>40</b>
S283212-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S283212-056	0.045"	1.2	600 Lb. (272 Kg) X-Pak™	
S283215-029	0.052"	1.4	33 Lb. (15 Kg) Spool	
S283219-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S283219-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® 910</b>	<b>E71T-1M/-12MJ</b>			<b>40</b>
S288412-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S288419-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>Mild Steel FCAW(self)</b>				
<b>Fabshield® 4</b>	<b>E70T-4</b>			<b>41</b>
S224525-082	5/64"	2.0	20 Lb. (9 Kg) Spool	
S224525-029	5/64"	2.0	33 Lb. (15 Kg) Spool	
S224525-014	5/64"	2.0	50 Lb. (22.7 Kg) Coil	
S224525-008	5/64"	2.0	600 Lb. (272 Kg) Drum	
S224529-V14	3/32"	2.4	50 Lb. (22.7 Kg) Coil	
S224529-008	3/32"	2.4	600 Lb. (272 Kg) Drum	
S224541-008	0.120"	3.0	600 Lb. (272 Kg) Drum	
<b>Fabshield® XLNT-6</b>	<b>E70T-6</b>			<b>41</b>
S225625-H82	5/64"	2.0	20 Lb. (9 Kg) Vacuum Pkgd Spool	
S225629-H82	3/32"	2.4	20 Lb. (9 Kg) Vacuum Pkgd Spool	
S225629-014	3/32"	2.4	50 Lb. (22.7 Kg) Coil	
<b>Fabshield® 7027</b>	<b>E70T-7</b>			<b>41</b>
S222729-V14	3/32"	2.4	50 Lb. (22.7 Kg) Coil	
S222739-014	7/64"	2.8	50 Lb. (22.7 Kg) Coil	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Fabshield® XLR-8</b>	<b>E71T-8JD H8</b>			<b>42</b>
S225719-070	1/16"	1.6	12 Lb. (5.4 Kg) VC Spool	
S225719-082	1/16"	1.6	20 Lb. (9 Kg) VC Spool	
S225719-053	1/16"	1.6	33 Lb. (15 Kg) VC Spool	
S225724-082	0.072"	1.8	20 Lb. (9 Kg) VC Spool	
S225724-053	0.072"	1.8	33 Lb. (15 Kg) VC Spool	
S225725-082	5/64"	2.0	20 Lb. (9 Kg) VC Spool	
S225725-053	5/64"	2.0	33 Lb. (15 Kg) VC Spool	
<b>Fabshield® 21B</b>	<b>E71T-11</b>			<b>42</b>
S222106-019	0.030"	0.8	2 Lb. (0.9 Kg) Spool	
S222106-022	0.030"	0.8	10 Lb. (4.5 Kg) Spool	
S222108-019	0.035"	0.9	2 Lb. (0.9 Kg) Spool	
S222108-022	0.035"	0.9	10 Lb. (4.5 Kg) Spool	
S222108-029	0.035"	0.9	33 Lb. (15 Kg) Spool	
S222112-022	0.045"	1.2	10 Lb. (4.5 Kg) Spool	
S222112-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S222119-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S222125-029	5/64"	2.0	33 Lb. (15 Kg) Spool	
S222125-014	5/64"	2.0	50 Lb. (22.7 Kg) Coil	
<b>Fabshield® 23</b>	<b>E71T-14</b>			<b>42</b>
S222312-056	0.045"	1.2	600 Lb. (272 Kg) X-Pak™	
S222319-056	1/16"	1.6	600 Lb. (272 Kg) X-Pak™	
<b>Low-Alloy FCAW(gas)</b>				
<b>FabCO® 81N1</b>	<b>E80T1-Ni1CJ H8/-Ni1MJ H8</b>			<b>44</b>
S284225-V14	5/64"	2.0	50 Lb. (22.7 Kg) Coil	
S284229-002	3/32"	2.4	50 Lb. (22.7 Kg) Coil	
S284229-018	3/32"	2.4	600 Lb. (272 Kg) Drum	
<b>FabCO® 811N1</b>	<b>E81T1-Ni1CJ H4/-Ni1 MJ H4</b>			<b>44</b>
S283612-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S283619-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
S283619-027	1/16"	1.6	50 Lb. (22.7 Kg) Spool	
S283619-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® 812-Ni1M</b>	<b>E81T1-Ni1 MJ H4</b>			<b>44</b>
S298012-032	0.045"	1.2	10 Lb. (4.5 Kg) Spool	
S298012-053	0.045"	1.2	33 Lb. (15 Kg) Spool	
<b>FabCO® 803</b>	<b>E81T1-Ni2CJ H4/-Ni2MJ H4</b>			<b>45</b>
S283712-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S283715-002	0.052"	1.4	60 Lb. (27 Kg) Coil	
S283715-057	0.052"	1.4	600 Lb. (272 Kg) X-Pak™	
S283719-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S273719-029	1/16"	1.6	33 Lb. (15 Kg) Spool	

## Flux-Cored part numbers ... cont'd

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>FabCO® 881K2</b>	<b>EE81T1-K2CJ H8/-K2MJ H8</b>			<b>45</b>
S284812-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
<b>FabCO® 81K2-C</b>	<b>E81T1-K2CJ H8</b>			<b>45</b>
S288112-023	0.045"	1.2	15 Lb (7 Kg) Spool	
S288112-053	0.045"	1.2	33 Lb. (15 Kg) Vacuum Pkgd Spool	
S288115-050	0.052"	1.4	500 Lb (227 Kg) Exacto-Pak	
<b>FabCO® 991K2</b>	<b>E91T1-K2C H8/-K2M H8</b>			<b>46</b>
S285612-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S285619-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® 95K2</b>	<b>E90T5-K2C H4/-K2M H4</b>			<b>46</b>
S659519-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® 101K3</b>	<b>E100T1-K3C</b>			<b>46</b>
S282419-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® 115K3</b>	<b>E110T5-K3C/-K3M H4</b>			<b>47</b>
S651519-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S651529-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
<b>FabCO® 110</b>	<b>E111T1-K3 MJ H8</b>			<b>47</b>
S282812-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S282819-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® 115</b>	<b>E110T5-K4C</b>			<b>47</b>
S243512-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S243519-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S243529-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
<b>FabCO® 125K4</b>	<b>E120T5-K4C H4</b>			<b>48</b>
S655519-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S655519-056	1/16"	1.6	600 Lb (272 Kg) Exacto-Pak	
<b>FabCO® 105D2</b>	<b>E100T5-D2C</b>			<b>48</b>
S650419-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
S650429-002	3/32"	2.4	60 Lb. (27 Kg) Coil	
<b>FabCO® 811A1</b>	<b>E81T1-A1C</b>			<b>48</b>
S653212-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
<b>FabCO® 911B3</b>	<b>E91T1-B3C H4/-B3M H4</b>			<b>49</b>
S285012-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
S285012-050	0.045"	1.2	500 Lb. (227 Kg) X-Pak™	
S285019-029	1/16"	1.6	33 Lb. (15 Kg) Spool	
<b>FabCO® Element™ 81K2C</b>	<b>E81T1-GC H8</b>			<b>49</b>
S292419-029	1/16"	1.6	33 Lb. (15 Kg) Spool	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>FabCO® Element™ 81K2M</b>	<b>E81T1-GM H8</b>			<b>49</b>
S294412-029	0.045"	1.2	33 Lb. (15 Kg) Spool	
<b>FabCO® 101</b>	<b>E101T1-GM</b>			<b>50</b>
S241012-032	0.045"	1.2	10 Lb (4.5 Kg) Spool	
S241012-053	0.045"	1.2	33 Lb (15 Kg) Vacuum Packaged Spool	
S241019-002	1/16"	1.6	60 Lb. (27 Kg) Coil	
<b>FabCO® XTREME® 120</b>	<b>E121T5-GC H4</b>			<b>50</b>
S290019-053	1/16"	1.6	33 Lb. (15 Kg) Vacuum Pkgd Spool	
<b>Low-Alloy FCAW(self)</b>				
<b>Fabshield® 71T8</b>	<b>E71T8-Ni1 J H8</b>			<b>50</b>
S228519-P01	1/16"	1.6	14 Lb. (6 Kg) Coil	
S228525-P01	5/64"	2.0	14 Lb. (6 Kg) Coil	
<b>Fabshield® 81N1</b>	<b>E71T8-Ni1 J H8</b>			<b>51</b>
S228125-P01	5/64"	2.0	14 Lb. (6 Kg) Coil	
<b>Fabshield® X80</b>	<b>E81T8-Ni2 J H8</b>			<b>51</b>
S228825-P01	5/64"	2.0	14 Lb. (6 Kg) Coil	
<b>Fabshield® 71K6-NP</b>	<b>E71T8-K6 J H8</b>			<b>51</b>
S228425-P01	5/64"	2.0	14 Lb. (6 Kg) Coil	
S228425-053	5/64"	2.0	33 Lb (15 Kg) Vacuum Packaged Spool	

## Metal-Cored part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Mild Steel Metal-Cored</b>				
<b>FabCOR® 86R</b>	<b>E70C-6M H4</b>			<b>53</b>
S249408-029	0.035"	0.9	33 Lb (15 Kg) Spool	
S249408-050	0.035"	0.9	500 Lb (227 Kg) Exacto-Pak	
S249412-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S249412-044	0.045"	1.2	44 Lb (20 Kg) Spool	
S249412-027	0.045"	1.2	50 Lb (22.7 Kg) Spool	
S249412-050	0.045"	1.2	500 Lb (227 Kg) X-Pak™	
S249412-075	0.045"	1.2	750 Lb (340 Kg) X-Pak™	
S249412-058	0.045"	1.2	1000 Lb (454 Kg) Recyclable X-Pak™	
S249415-029	0.052"	1.4	33 Lb (15 Kg) Spool	
S249415-044	0.052"	1.4	44 Lb (20 Kg) Spool	
S249415-027	0.052"	1.4	50 Lb (22.7 Kg) Spool	
S249415-002	0.052"	1.4	60 Lb (27 Kg) Coil	
S249415-050	0.052"	1.4	500 Lb (227 Kg) X-Pak™	
S249415-075	0.052"	1.4	750 Lb (340 Kg) X-Pak™	
S249415-058	0.052"	1.4	1000 Lb (454 Kg) Recyclable X-Pak™	
S249419-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S249419-044	1/16"	1.6	44 Lb (20 Kg) Spool	
S249419-002	1/16"	1.6	60 Lb (27 Kg) Coil	
S249419-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	
S249419-058	1/16"	1.6	1000 Lb (454 Kg) Recyclable Exacto-Pak	
S249425-002	5/64"	2.0	60 Lb (27 Kg) Coil	
S249425-008	5/64"	2.0	600 Lb (272 Kg) Drum	
S249425-096	5/64"	2.0	950 Lb (431 Kg) Flat Reel	
S249429-V14	3/32"	2.4	50 Lb (22.7 Kg) Coil	
S249429-008	3/32"	2.4	600 Lb (272 Kg) Drum	
<b>FabCOR® Edge™</b>	<b>E70C-6M H4</b>			<b>53</b>
S279312-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S279312-027	0.045"	1.2	50 Lb (22.7 Kg) Spool	
S279312-050	0.045"	1.2	500 Lb (227 Kg) X-Pak™	
S279312-075	0.045"	1.2	750 Lb (340 Kg) X-Pak™	
S279312-058	0.045"	1.2	1000 Lb (454 Kg) Recyclable X-Pak™	
S279315-029	0.052"	1.4	33 Lb (15 Kg) Spool	
S279315-027	0.052"	1.4	50 Lb (22.7 Kg) Spool	
S279315-002	0.052"	1.4	60 Lb (27 Kg) Coil	
S279315-050	0.052"	1.4	500 Lb (227 Kg) X-Pak™	
S279315-075	0.052"	1.4	750 Lb (340 Kg) X-Pak™	
S279315-058	0.052"	1.4	1000 Lb (454 Kg) Recyclable X-Pak™	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
S279319-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S279319-027	1/16"	1.6	50 Lb (22.7 Kg) Spool	
S279319-002	1/16"	1.6	60 Lb (27 Kg) Coil	
S279319-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	
S279319-058	1/16"	1.6	1000 Lb (454 Kg) Recyclable X-Pak™	
<b>FabCOR® 702</b>	<b>E70C-3C</b>			<b>55</b>
S248439-010	7/64"	2.8	60 Lb (27 Kg) Bulk Coil	
<b>FabCOR® Element™ 70C6</b>	<b>E70C-6M H4</b>			<b>54</b>
S294612-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S294619-029	1/16"	1.6	33 Lb (15 Kg) Spool	
<b>FabCOR® F6</b>	<b>E70C-GS</b>			<b>54</b>
S278308-029	0.035"	0.9	33 Lb (15 Kg) Spool	
S278308-075	0.035"	0.9	750 Lb (340 Kg) X-Pak™	
S278310-075	0.039"	1.0	750 Lb (340 Kg) X-Pak™	
S278312-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S278312-050	0.045"	1.2	500 Lb (227 Kg) Exacto-Pak	
S278312-058	0.045"	1.2	1000 Lb (454 Kg) Recyclable Exacto-Pak	
<b>Low-Alloy Metal-Cored</b>				
<b>FabCOR® Edge™ Ni1</b>	<b>E80C-Ni1 H4</b>			<b>55</b>
S279512-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S279512-027	0.045"	1.2	50 Lb (22.7 Kg) Spool	
S279512-075	0.045"	1.2	750 Lb (340 Kg) X-Pak™	
S279515-029	0.052"	1.4	33 Lb (15 Kg) Spool	
S279515-075	0.052"	1.4	750 Lb (340 Kg) X-Pak™	
S279515-058	0.052"	1.4	1000 Lb (454 Kg) Recyclable Exacto-Pak	
S279519-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S279519-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	
<b>FabCOR® 80N2</b>	<b>E80C-Ni2 H4</b>			<b>56</b>
S281412-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S281419-002	1/16"	1.6	60 Lb (27 Kg) Coil	

## Seamless (MEGAFIL) part numbers

**Note: The following part numbers are exclusive to North American orders. For a complete list of international products please visit, <http://www.itw-welding.de/1/>**

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>FabCOR® 90</b>	<b>E90C-K3 H4</b>			<b>56</b>
S281612-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S281612-075	0.045"	1.2	750 Lb (340 Kg) X-Pak™	
S281619-075	1/16"	1.6	750 Lb (340 Kg) Exacto-Pak	
<b>FabCOR® 100</b>	<b>E100C-K3</b>			<b>56</b>
S280112-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S280115-029	0.052"	1.4	33 Lb (15 Kg) Spool	
S280115-050	0.052"	1.4	500 Lb (227 Kg) Exacto-Pak	
<b>FabCOR® 1100</b>	<b>E110C-K4</b>			<b>57</b>
S280212-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S280212-090	0.045"	1.2	900 Lb (408 Kg) Recyclable Exacto-Pak	
S280212-058	0.045"	1.2	1000 Lb (454 Kg) Recyclable Exacto-Pak	
S280215-029	0.052"	1.4	33 Lb (15 Kg) Spool	
S280214-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S280212-090	0.045"	1.2	900 Lb (408 Kg) Recyclable X-Pak™	
S280219-002	1/16"	1.6	60 Lb (27 Kg) Coil	
S280219-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	
<b>FabCOR® 80D2</b>	<b>E90C-D2</b>			<b>57</b>
S281212-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S281212-027	0.045"	1.2	50 Lb (22.7 Kg) Spool	
S281212-050	0.045"	1.2	500 Lb (227 Kg) X-Pak™	
S281215-075	0.052"	1.4	750 Lb (340 Kg) Exacto-Pak	
S281219-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	
<b>FabCOR® Edge™ D2</b>	<b>E90C-D2</b>			<b>57</b>
S289612-027	0.045"	1.2	50 Lb (22.7 Kg) Spool	
S289612-050	0.045"	1.2	500 Lb (227 Kg) X-Pak™	
S289615-027	0.052"	1.4	50 Lb (22.7 Kg) Spool	
S289615-050	0.052"	1.4	500 Lb (227 Kg) X-Pak™	
S289619-027	1/16"	1.6	50 Lb (22.7 Kg) Spool	
S289619-075	1/16"	1.6	750 Lb (340 Kg) X-Pak™	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Seamless Metal-Cored</b>				
<b>MEGAFIL 710M</b>	<b>E70C-6M H4</b>			<b>66</b>
71015B	0.045"	1.2	35 Lb (15.9 Kg) Spool	
71016B	0.045"	1.2	660lb (300kg) Drum	
71033B	1/16"	1.6	35 Lb (15.9 Kg) Spool	
71034B	1/16"	1.6	550 lb (250Kg) Drum	
<b>MEGAFIL 240M</b>	<b>E80C-Ni1 H4</b>			<b>66</b>
24012B	0.045"	1.2	11lb (5Kg) Spool	
24015B	0.045"	1.2	35 Lb (15.9 Kg) Spool	
<b>MEGAFIL 1100M</b>	<b>E120C-K4 H4</b>			<b>66</b>
11015B	0.045"	1.2	35 Lb (15.9 Kg) Spool	
<b>FCAW (Gas-Shielded)</b>				
<b>MEGAFIL 713R</b>	<b>E71T-1MJ H4/-1C H4/-9MJ H4/-9C H4/-12MJ H4/-12C H4</b>			<b>67</b>
71315B	0.045"	1.2	35 Lb (15.9 Kg) Spool	
71316B	0.045"	1.2	660 Lb (299 Kg) Drum	
71333B	1/16"	1.6	35 Lb (15.9 Kg) Spool	
<b>MEGAFIL 819R</b>				<b>68</b>
81915B	0.045"	1.2	35 Lb (15.9 Kg) Spool	
81933B	1/16"	1.6	35 Lb (15.9 Kg) Spool	
<b>MEGAFIL 550R</b>	<b>E91T1-K2M J H4</b>			<b>67</b>
55015B	0.045"	1.2	35 Lb (15.9 Kg) Spool	

## Sub-Arc Fluxes part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>SWX 120</b>				<b>69</b>
S669210-055			50 Lb (22.5 Kg) EAE Bag	
<b>SWX 150</b>				<b>69</b>
S669510-055			50 Lb (22.5 Kg) EAE Bag	
<b>SWX 160</b>				<b>70</b>
S669010-055			50 Lb (22.5 Kg) EAE Bag	
<b>HA-495</b>				<b>70</b>
S669410-055			50 Lb (22.5 Kg) Bag	
<b>HN-590</b>				<b>70</b>
S669610-055			50 Lb (22.5 Kg) Bag	
<b>HF-N</b>				<b>113</b>
S669810-055			50 Lb (22.5 Kg) Bag	

## Sub-Arc Solid Wire part numbers

**Note: The following part numbers are exclusive to North American orders. For a complete list of international part numbers, e-mail [subarc@itw-welding.com](mailto:subarc@itw-welding.com).**

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>SDX S2Si-EM12K</b>		<b>EM12K</b>		<b>73</b>
722201025H	5/64"	2.0	55 Lb (25 Kg) Wire Basket	
72220414FH	5/64"	2.0	1000 Lb (454 Kg) Drum	
722241025H	3/32"	2.4	55 Lb (25 Kg) Wire Basket	
72224414FH	3/32"	2.4	1000 Lb (454 Kg) Drum	
722321025H	1/8"	3.2	55 Lb (25 Kg) Wire Basket	
72232414FH	1/8"	3.2	1000 Lb (454 Kg) Drum	
722401025H	5/32"	4.0	55 Lb (25 Kg) Wire Basket	
72240414FH	5/32"	4.0	1000 Lb (454 Kg) Drum	
<b>SDX EM13K</b>		<b>EM13K</b>		<b>73</b>
712241025H	3/32"	2.4	55 Lb (25 Kg) Wire Basket	
712321025H	1/8"	3.2	55 Lb (25 Kg) Wire Basket	
71232414HH	1/8"	3.2	1000 Lb (454 Kg) Drum	
712401025H	5/32"	4.0	55 Lb (25 Kg) Wire Basket	
71240414HH	5/32"	4.0	1000 Lb (454 Kg) Drum	
<b>SDX S3Si-EH12K</b>		<b>EH12K</b>		<b>74</b>
732201025H	5/64"	2.0	55 Lb (25 Kg) Wire Basket	
732241025H	3/32"	2.4	55 Lb (25 Kg) Wire Basket	
732321025H	1/8"	3.2	55 Lb (25 Kg) Wire Basket	
73232414FH	1/8"	3.2	1000 Lb (454 Kg) Drum	
732401025H	5/32"	4.0	55 Lb (25 Kg) Wire Basket	

## Sub-Arc Cored Wire part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>SDX S3Ni1Mo- EF3</b>	<b>EF3</b>			<b>79</b>
840241025H	3/32"	2.4	55 Lb (25 Kg) Wire Basket	
840321025H	1/8"	3.2	55 Lb (25 Kg) Wire Basket	
<b>SubCOR™ EM12K-S</b>	<b>EC1</b>			<b>54</b>
S282029-002	3/32"	2.4	60 Lb (27.2 Kg) Coil	
S282043-002	1/8"	3.2	60 Lb (27.2 Kg) Coil	
S282043-008	1/8"	3.2	600 Lb (272 Kg) Drum	
S282050-002	5/32"	4.0	60 Lb (27.2 Kg) Coil	
<b>SubCOR™ EM13K-S</b>	<b>EC1</b>			<b>75</b>
S280425-002	5/64"	2.0	60 Lb (27.2 Kg) Coil	
S280429-002	3/32"	2.4	60 Lb (27.2 Kg) Coil	
S280429-008	3/32"	2.4	600 Lb (272 Kg) Drum	
S280443-002	1/8"	3.2	60 Lb (27.2 Kg) Coil	
S280443-008	1/8"	3.2	600 Lb (272 Kg) Drum	
S280450-002	5/32"	4.0	60 Lb (27.2 Kg) Coil	
S280450-008	5/32"	4.0	600 Lb (272 Kg) Drum	
<b>SubCOR™ EM13K-S MOD</b>	<b>EC1</b>			<b>75</b>
S289329-002	3/32"	2.4	60 Lb (27.2 Kg) Coil	
S289329-008	3/32"	2.4	600 Lb (272 Kg) Drum	
S289343-002	1/8"	3.2	60 Lb (27.2 Kg) Coil	
S289343-008	1/8"	3.2	600 Lb (272 Kg) Drum	
S289350-002	5/32"	4.0	60 Lb (27.2 Kg) Coil	
<b>SubCOR™ N1-S</b>	<b>ECNi1</b>			<b>79</b>
S282243-002	1/8"	3.2	60 Lb (27.2 Kg) Coil	
S282250-002	5/32"	4.0	60 Lb (27.2 Kg) Coil	
<b>SubCOR™ 92-S</b>	<b>ECM1</b>			<b>80</b>
S651325-002	5/64"	2.0	60lb (27.2Kg) Coil	
S651329-002	3/32"	2.4	60 Lb (27.2 Kg) Coil	
S651329-008	3/32"	2.4	600 Lb (272 Kg) Drum	
S651343-002	1/8"	3.2	60 Lb (27.2 Kg) Coil	
S651350-002	5/32"	4.0	60 Lb (27.2 Kg) Coil	
S651350-008	5/32"	4.0	600 Lb (272 Kg) Drum	
<b>SubCOR™ 100F3-S</b>	<b>ECF3</b>			<b>80</b>
S659929-002	3/32"	2.4	60 Lb (27.2 Kg) Coil	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>SubCOR™ 120-S</b>	<b>ECM4</b>			<b>81</b>
S280343-002	1/8"	4.0	60 Lb (27.2 Kg) Coil	

**Note: The following part numbers are exclusive to North American orders. For a complete list of international part numbers, e-mail [subarc@itw-welding.com](mailto:subarc@itw-welding.com).**

Seamless Products (see note above)				
<b>SubCOR™ SL 731</b>				<b>76</b>
503401025H	5/32"	4.0	55 Lb (25 Kg) Wire Basket	
<b>SubCOR™ SL 742</b>				<b>81</b>
5222410250	3/32"	2.4	55 Lb (25 Kg) Wire Basket	
5224010250	5/32"	4.0	55 Lb (25 Kg) Wire Basket	
<b>SubCOR™ SL 745</b>				<b>82</b>
5252410250	3/32"	2.4	55 Lb (25 Kg) Wire Basket	

**Note: The following part numbers are exclusive to North American orders. For a complete list of international part numbers, e-mail [subarc@itw-welding.com](mailto:subarc@itw-welding.com).**

## Stainless Stick part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>308/308L Sterling® AP</b>	<b>E308-16 / E308L-16</b>			<b>85</b>
S481930-036	3/32"	2.4	5 Lb (2.3 Kg) Hermetically Sealed Can	
S481944-032	1/8"	3.2	6 Lb (2.7 Kg) Hermetically Sealed Can	
S481951-032	5/32"	4.0	6 Lb (2.7 Kg) Hermetically Sealed Can	
S481958-039	3/16"	4.8	6 Lb (2.7 Kg) Hermetically Sealed Can	
<b>312 Sterling® AP</b>	<b>E312-16</b>			<b>85</b>
S480631-036	3/32"	2.4	5 Lb (2.3 Kg) Hermetically Sealed Can	
S480644-032	1/8"	3.2	6 Lb (2.7 Kg) Hermetically Sealed Can	
S480651-032	5/32"	4.0	6 Lb (2.7 Kg) Hermetically Sealed Can	
<b>309/309L Sterling® AP</b>	<b>E309-16 / E309L-16</b>			<b>85</b>
S483931-036	3/32"	2.4	5 Lb (2.3 Kg) Hermetically Sealed Can	
S483944-032	1/8"	3.2	6 Lb (2.7 Kg) Hermetically Sealed Can	
S483951-032	5/32"	4.0	6 Lb (2.7 Kg) Hermetically Sealed Can	
S483958-039	3/16"	4.8	7 Lb (3.2 Kg) Hermetically Sealed Can	
<b>310 Sterling® AP</b>	<b>E310-16</b>			<b>85</b>
S480431-036	3/32"	2.4	5 Lb (2.3 Kg) Hermetically Sealed Can	
S480444-032	1/8"	3.2	6 Lb (2.7 Kg) Hermetically Sealed Can	
S480451-032	5/32"	4.0	6 Lb (2.7 Kg) Hermetically Sealed Can	
S480458-039	3/16"	4.8	7 Lb (3.2 Kg) Hermetically Sealed Can	
<b>316/316L Sterling® AP</b>	<b>E316-16 / E316L-16</b>			<b>85</b>
S482931-036	3/32"	2.4	5 Lb (2.3 Kg) Hermetically Sealed Can	
S482944-032	1/8"	3.2	6 Lb (3 Kg) Hermetically Sealed Can	
S482951-032	5/32"	4.0	6 Lb (2.7 Kg) Hermetically Sealed Can	
S482958-039	3/16"	4.8	7 Lb (3.2 Kg) Hermetically Sealed Can	
<b>Fabshield® 309L-0</b>	<b>E309LT0-3</b>			<b>90</b>
S670929-062	3/32"	2.4	60 Lb (27 Kg) Coil	
<b>FabCO® 410NiMoT1</b>	<b>E410NiMoT1-4/-1 H4</b>			<b>90</b>
S681719-002	1/16"	1.6	60 Lb (27 Kg) Coil	
S681719-H28	1/16"	1.6	30 Lb (14 Kg) Vacuum Pkgd Wire Spool (VPWB)	
S681729-002	3/32"	2.4	60 Lb (27 Kg) Coil	
<b>FabCO® 308LT1</b>	<b>E308LT1-1/-4</b>			<b>91</b>
S688412-078	0.045"	1.2	27.5 Lb (13 Kg) Spool	
S688419-078	1/16"	1.6	27.5 Lb (13 Kg) Spool	
<b>FabCO® 309LT1</b>	<b>E309LT1-1/-4</b>			<b>91</b>
S688512-078	0.045"	1.2	27.5 Lb (13 Kg) Spool	
S688519-078	1/16"	1.6	27.5 Lb (13 Kg) Spool	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>FabCO® 316LT1</b>	<b>E316LT1-1/-4</b>			<b>91</b>
S689312-078	0.045"	1.2	27.5 Lb (13 Kg) Spool	
S689319-078	1/16"	1.6	27.5 Lb (13 Kg) Spool	
<b>308/308L</b>	<b>ER308, ER308L</b>			<b>96</b>
S512511-I12	1/16"	1.6	10 Lb (4.5 Kg) Tube	
S512537-I12	3/32"	2.4	10 Lb (4.5 Kg) Tube	
S512546-I12	1/8"	3.2	10 Lb (4.5 Kg) Tube	
S522508-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S522512-I26	0.045"	1.2	30 Lb (14 Kg) Spool	
<b>308L HiSiI</b>	<b>ER308LSi</b>			<b>96</b>
S526806-I26	0.030"	0.8	30 Lb (14 Kg) Spool	
S526808-550	0.035"	0.9	550 Lb (250 Kg) Drum	
S526808-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S526812-I26	0.045"	1.2	30 Lb (14 Kg) Spool	
S526812-550	0.045"	1.2	550 Lb (250 Kg) Drum	
S526818-I26	1/16"	1.6	30 Lb (14 Kg) Spool	
<b>309/309L</b>	<b>ER309, ER309L</b>			<b>96</b>
S510811-I12	1/16"	1.6	10 Lb (4.5 Kg) Tube	
S510837-I12	3/32"	2.4	10 Lb (4.5 Kg) Tube	
S510846-I12	1/8"	3.2	10 Lb (4.5 Kg) Tube	
S520808-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S520812-I26	0.045"	1.2	30 Lb (14 Kg) Spool	
S520818-I26	1/16"	1.6	30 Lb (14 Kg) Spool	
<b>309L HiSiI</b>	<b>ER309LSi</b>			<b>96</b>
S527508-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S527508-550	0.035"	0.9	550 Lb (250 Kg) Drum	
S527512-550	0.045"	1.2	550 Lb (250 Kg) Drum	
S527512-I26	0.045"	1.2	30 Lb (14 Kg) Spool	
<b>316/316L</b>	<b>ER316, ER316L</b>			<b>96</b>
S512311-I12	1/16"	1.6	10 Lb (4.5 Kg) Tube	
S512337-I12	3/32"	2.4	10 Lb (4.5 Kg) Tube	
S512346-I12	1/8"	3.2	10 Lb (4.5 Kg) Tube	
S522308-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S522312-I26	0.045"	1.2	30 Lb (14 Kg) Spool	
<b>316L HiSiI</b>	<b>ER316LSiI</b>			<b>96</b>
S527408-I26	0.035"	0.9	30 Lb (14 Kg) Spool	
S527412-I26	0.045"	1.2	30 Lb (14 Kg) Spool	

## Hardfacing Stick part numbers

## Hardfacing Wire part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Hardalloy® 118</b>				<b>100</b>
S540444-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S540451-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S540458-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	
S540481-031	1/4"	6.4	50 Lb (22.7 Kg) Carton	
<b>Hardalloy® 140</b>				<b>100</b>
S544044-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S544051-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S544058-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	
<b>Hardalloy® 148</b>				<b>101</b>
S541044-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S541051-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S541058-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	
<b>Hardalloy® 32</b>				<b>100</b>
S540144-033	1/8"	3.2	10 Lb (4.5 Kg) Hermetically Sealed Can	
S540151-033	5/32"	4.0	10 Lb (4.5 Kg) Hermetically Sealed Can	
S540158-033	3/16"	4.8	10 Lb (4.5 Kg) Hermetically Sealed Can	

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Tube-Alloy® Build Up-O</b>				<b>106</b>
S600419-029	1/16"	1.6	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® 218-O</b>				<b>106</b>
S601812-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S601819-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S601839-002	7/64"	2.8	60 Lb (27 Kg) Coil	
<b>Tube-Alloy® AP-O</b>				<b>106</b>
S600119-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S601839-002	7/64"	2.8	60 Lb (27 Kg) Coil	
<b>Tube-Alloy® 258-O</b>				<b>107</b>
S605812-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S605819-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S605839-002	7/64"	2.8	60 Lb (27 Kg) Coil	
<b>Tube-Alloy® 240-O</b>				<b>107</b>
S604012-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S604019-029	1/16"	1.6	33 Lb (15 Kg) Spool	
S604039-002	7/64"	2.8	60 Lb (27 Kg) Coil	
<b>Tube-Alloy® 255-O</b>				<b>107</b>
S605539-002	7/64"	2.8	60 Lb (27 Kg) Coil	
<b>Tube-Alloy® 242-O</b>				<b>108</b>
S604219-029	1/16"	1.6	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® 258TiC-O</b>				<b>108</b>
S605919-029	1/16"	1.6	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® 244-O</b>				<b>108</b>
S604439-065	7/64"	2.8	250 Lb (113 Kg) Auto-Pak	
<b>VertiWear® 600</b>				<b>109</b>
S607112-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S607119-029	1/16"	1.6	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® 255-G</b>				<b>109</b>
S608412-029	0.045"	1.2	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® Build Up-G</b>				<b>109</b>
S235012-029	0.045"	1.2	33 Lb (15 Kg) Spool	
<b>Tube-Alloy® 258-G</b>				<b>110</b>
S595412-029	0.045"	1.2	33 Lb (15 Kg) Spool	
<b>FabTuf® 960</b>				<b>110</b>
S234212-029	0.045"	1.2	33 Lb (15 Kg) Spool	
S234219-029	1/16"	1.6	33 Lb (15 Kg) Spool	



## Hardfacing-Sub-Arc Wire part numbers

Part Number	Dia. (IN)	Dia. (MM)	Package	Page
<b>Tube-Alloy® 877-S</b>				<b>110</b>
S611943-084	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
S611929-084	3/32"	2.4	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® 242-S MOD</b>				<b>111</b>
S614343-084	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® A2JL-S</b>				<b>111</b>
S614543-008	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® 887-S</b>				<b>111</b>
S618029-084	3/32"	2.4	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® A250-S</b>				<b>112</b>
S611643-084	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® 865-S MOD</b>				<b>112</b>
S614943-084	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
<b>Tube-Alloy® 952-S</b>				<b>112</b>
S614043-084	1/8"	3.2	600 Lb (272 Kg) Auto-Pak	
S614029-084	3/32"	2.4	600 Lb (272 Kg) Auto-Pak	
<b>HF-N</b>				<b>113</b>
S669810-055	–	–	50 Lb (22.5 Kg) Bag	

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