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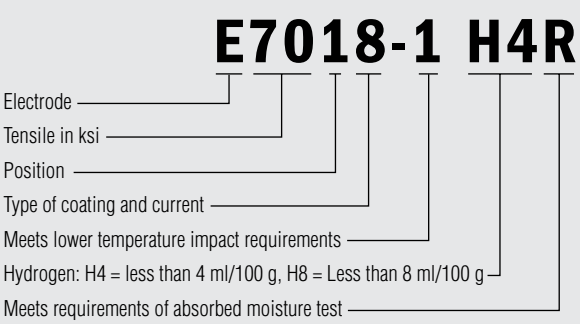
# Mild Steel Electrodes

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




### Position

**1** Flat, Horizontal, Vertical, Overhead

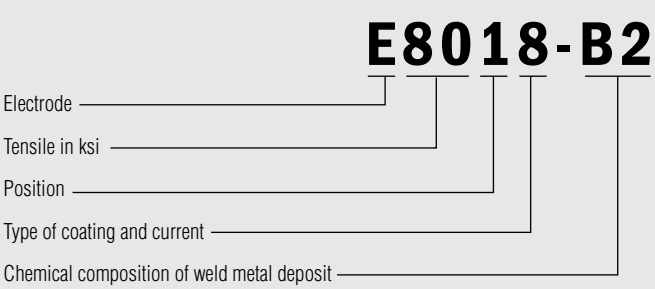
**2** Flat and Horizontal only

### 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.

# Mild Steel Electrodes

## 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

## 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

# Mild Steel Electrodes

## 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

## Pipemaster® 90

**AWS E9010-G**
With a smooth yet forceful arc, this electrode is designed for welding high-yield strength pipe out-of-position applications for use in harsh arctic and/or desert environments. Its recommended for welding any 5L material from X65, X70, and X80 and meets the requirements of AWS 5.5 low alloy electrode specifications and pipeline API Code 1104.

**Typical Applications:**
- high-yield X65, X70 and X80 pipe steels
- drill platforms
- storage tanks
- shipbuilding and construction

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.25 |
| Manganese | 1.10 |
| Silicon | 0.24 |
| Nickel | 0.78 |
| Phosphorus | 0.005 |
| Sulphur | 0.01 |
| Molybdenum | 0.18 |
| Vanadium | 0.005 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 103,000 (713 MPa) |
| Yield Strength (psi) | 86,000 (590 MPa) |
| Elongation % in 2" (50mm) | 23% |

**Typical Charpy V-notch Impact Values**
Not required

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 1/8" (3.2 mm) | 70-140 amps |
| 5/32" (4.0 mm) | 80-185 amps |
| 3/16" (4.8 mm) | 120-230 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**
- AWS A5.5, E9010-G
- ASME SFA 5.5, E9010-G

## 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 splatter 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

# Mild Steel Electrodes

## 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

# Mild Steel Electrodes

## 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

# Mild Steel Electrodes/Low Alloy Electrodes

## 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) |

**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) |

**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

## 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

# Low Alloy Electrodes

## 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

# Low Alloy Electrodes

## 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) |

**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-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) |

**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

# Mild Steel/Low Alloy Electrodes

## 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" |
|---|---|---|---|---|---|---|---|---|
| **Pipemaster® 70, 80, 90 Pipemaster® Pro-60, 610** | | — | 30 | 17 | 12 | 8 | — | — |
| **335A** | | — | 29 | 16 | 11 | 7 | — | — |
| **447A** | | — | 30 | 15 | 10 | 7 | — | — |
| **14A** | | — | 23 | 13 | 9 | 6 | — | — |
| **24 (-1)** | | — | — | 10 | 7 | — | 4 | 2 |
| **XX18 (Iron Powder)** | | — | 21 | 12 | 9 | 7 | — | 3 |
| **Stainless** | | 22 | — | 13 | 9 | 4 | — | 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 |
| E9010-G | Pipemaster® 90 | — | — | Shield-Arc 90 |

# Mild Steel/Low Alloy Electrodes

## Comparative Index of Low Alloy Electrodes

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

## Approvals, Specifications, Classifications

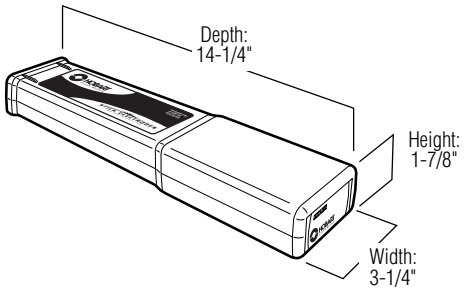
All filler metals listed conform to the specifications listed in each section. Because some agencies do not specifically approve particular types, please be careful to note whether or not the heading for each section indicates specific approval.

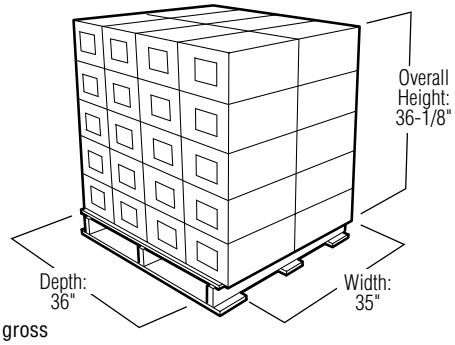
| Product | AWS/ASME | ABS | Lloyd's | CWB |
|---|---|---|---|---|
| **PIPEMASTER® PRO 60** | E6010 | E6010 | 3m | - |
| **610** | E6010 | - | - | E4310 |
| **HOBART® 335A** | E6011 | E6011 | 2m, 2Ym | E4311 |
| **HOBART® 447A** | E6013 | E6013 | - | E4313 |
| **HOBART® 1139** | E6022 | - | - | - |
| **HOBART® 14A** | E7014 | E7014 | - | E4914 |
| **HOBART® 418** | E7018 H4R/E7018-1 H4R | 3 H5, 3Y | 3m, 3Ym | E4918-1-H4 |
| **HOBART® 718MC** | E7018 H4R/E7018-1 H4R | 3 H5, 3Y | - | - |
| **7018XLM** | E7018 H4R/E7018-1 H4R | E7018-1 | - | - |
| **HOBART® 18AC** | E7018 H8 | - | - | - |
| **HOBART® 24** | E7024/E7024-1 | 3 | - | E4924-1 |
| **PIPEMASTER® 70** | E7010-P1 | E7010-P1 | 3m, 3Ym | - |
| **PIPEMASTER® 80** | E8010-P1 | E8010-P1 | 3m, 3Ym | - |
| **PIPEMASTER® 90** | E9010-G | - | - | - |
| **HOBALLOY® 7018A1** | E7018-A1 | E7018-A1 | - | - |
| **HOBALLOY® 8018B2** | E8018-B2 | E8018-B2 | - | - |
| **HOBALLOY® 8018C1** | E8018-C1 | E8018-C1 | - | - |
| **HOBALLOY® 8018C3** | E8018-C3 | E8018-C3 | - | - |
| **HOBALLOY® 9018B3** | E9018-B3 | E9018-B3 | - | - |
| **HOBALLOY® 9018M** | E9018-M | E9018-M | - | - |
| **HOBALLOY® 10018D2** | E10018-D2 | E10018-D2 | - | - |
| **HOBALLOY® 11018M** | E11018-M | E11018-M | - | - |

# Mild Steel/Low Alloy Electrodes

## 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

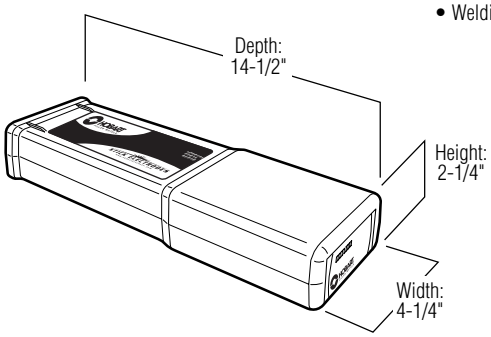


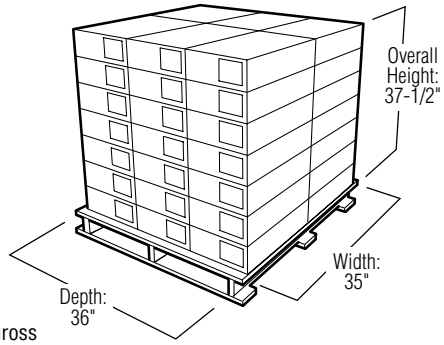




*Weight:* 2,000 lbs. net, 2,235 lbs. gross
*Stacking sequence:* 4 wide, 2 deep and 5 high
*Master pack per pallet:* 40
10 packs per 50 lb master pack

## 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

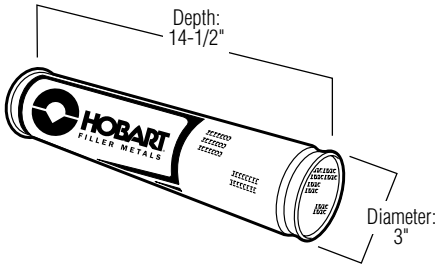


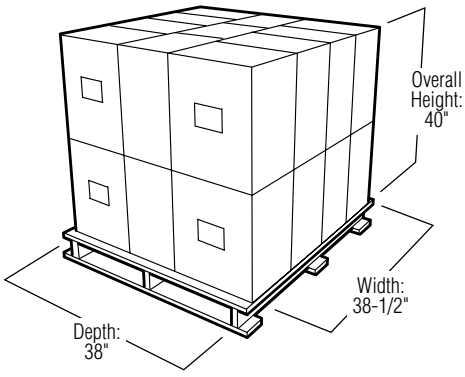

*Weight:* 2,100 lbs. net, 2,235 lbs. gross
*Stacking sequence:* 3 wide, 2 deep and 7 high
*Master pack per pallet:* 42
5 packs per 50 lb master pack

## 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



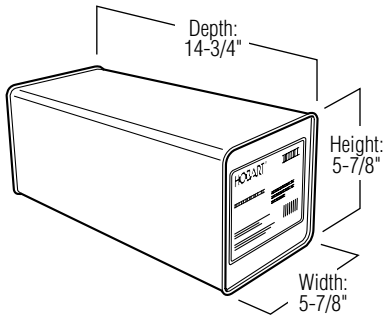

*Weight:* 1,260 lbs. net, 1,330 lbs. gross
7 layers, 6 per layer
*Master pack per pallet:* 42
3 cans per 30 lb master pack

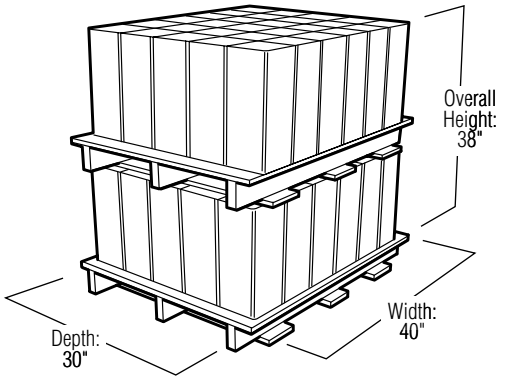


# Mild Steel/Low Alloy Electrodes

## 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

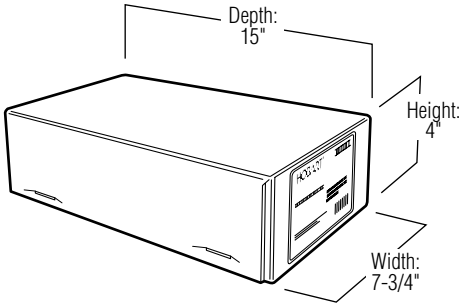


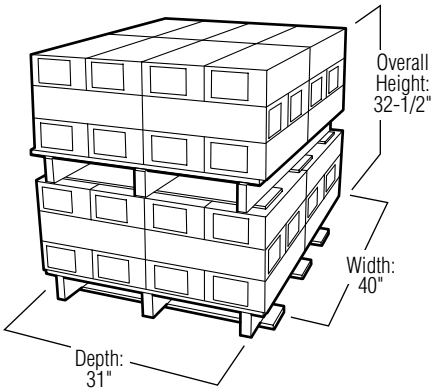




*Weight:* 3,000 pounds net, 3,150 gross
*Stacking sequence:* 5 wide, 6 deep & 2 high
*Cans per pallet:* 60 cans

## 50-lb. Carton

- Two separate pallets for convenient handling

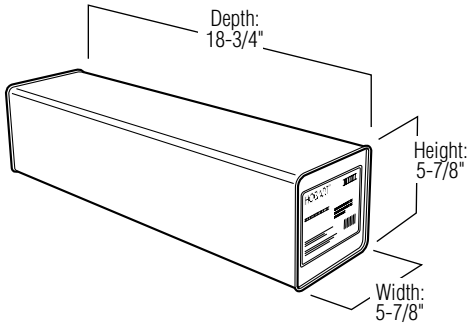


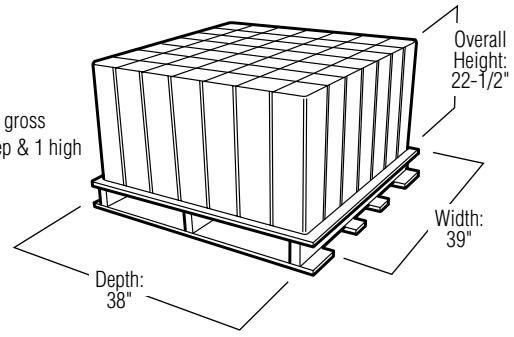

*Weight:* 3,000 pounds net, 3,090 gross
*Stacking sequence:* 4 wide, 4 deep & 2 high
*Cartons per pallet:* 48 cartons

## 50-lb. Can 18" length

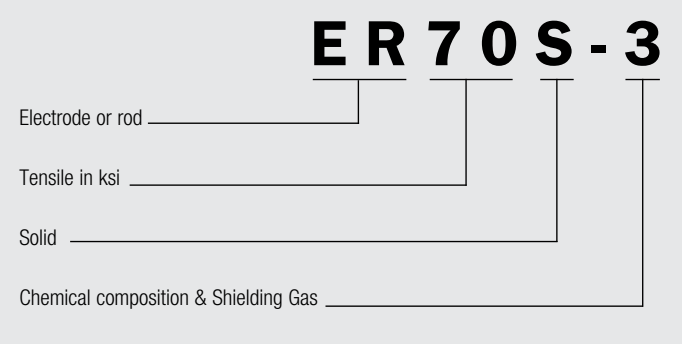
- Hermetically-sealed cans keep electrodes protected and ready for use when opened
- Pull-tab for safe, trouble-free opening
- Two separate pallets for convenient handling



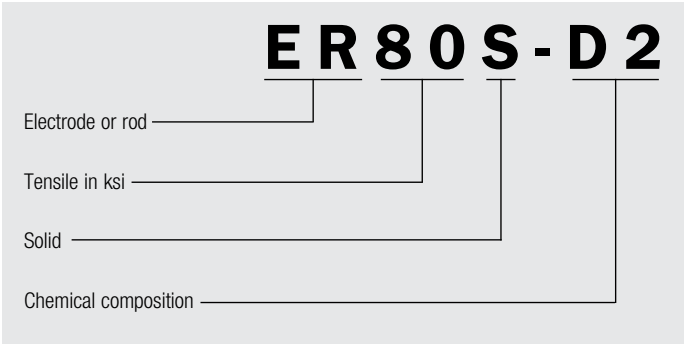

*Weight:* 2,450 pounds net, 2,540 gross
*Stacking sequence:* 7 wide, 7 deep & 1 high
*Cans per pallet:* 49 cans



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




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




## Chemical Composition of Solid Wires Using $CO_2$ 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 | $CO_2$ | 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 | $CO_2$ | 70 (480) | 58 (400) | 22 | 20 at 0 (27 at -18) | .06-.15 | .90-1.40 | .45-.70 | .025 | .035 | — | — | — | .50 | — |
| ER70S-4 | $CO_2$ | 70 (480) | 58 (400) | 22 | — | .07-.15 | 1.00-1.50 | .65-.85 | .025 | .035 | — | — | — | .50 | — |
| ER70S-5 | $CO_2$ | 70 (480) | 58 (400) | 22 | — | .07-.19 | .90-1.40 | .30-.60 | .025 | .035 | — | — | — | .50 | Al |
| ER70S-6 | $CO_2$ | 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 | $CO_2$ | 70 (480) | 58 (400) | 22 | 20 at -20 (27 at -29) | .07-.15 | 1.50-2.00 | .50-.80 | .025 | .035 | — | — | — | .50 | — |
| ER80S-D2 | $CO_2$ | 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 | **95-98% Ar/2-5% $O_2$** — Improves arc stability; produces a more fluid and controllable puddle; good coalescence and bead contour; minimizes undercutting; permits higher speeds than pure argon. |
| | | **90-92% Ar/8-10% $CO_2$** — High-speed mechanized welding; low-cost manual welding; pulsed welding. |
| | Low alloy steel | **98% Ar/2% $O_2$** — Minimizes undercutting; provides good toughness. |
| **Short Circuiting Transfer** | Carbon steel | **$CO_2$** — Broad penetration; reduces chances of porosity.<br>**75% Ar/25% $CO_2$** — High welding speeds without burn-through; minimum distortion and spatter. |
| | | **Ar/5-10% $CO_2$** — Deeper penetration; faster welding speeds. |
| | Low alloy steel | **60-70% He/25-35% Ar/4-5% $CO_2$** — Minimum reactivity; excellent toughness; excellent arc stability, wetting characteristics, and bead contour; little spatter. |
| | | **75% Ar/25% $CO_2$** — Fair toughness; excellent arc stability, wetting characteristics and bead contour; little spatter. |

# Mild Steel Solid Wires

## 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):**

| | $CO_2$ |
|---|---|
| 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), $CO_2$ | 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):**

| | $CO_2$ |
|---|---|
| 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), $CO_2$ | 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):**

| | $CO_2$ |
|---|---|
| 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), $CO_2$ | 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):**

| | $CO_2$ |
|---|---|
| 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), $CO_2$ 34 ft.lb. (46J)

**Approvals and Conformances:**
- AWS A5.28, ER80S-D2, ER90S-G
- ASME SFA 5.28, ER80S-D2, ER90S-G
- CWB

## 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 |

## 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" | QCL |
| 60 lb. fiber spool | 1,920 (871.7) | 14" | 8-1/4" | 4" | 2-1/16" | 7/16" | 1-3/4" | QA, QCL |
| 600 lb. ROBOPAK | 2,400 (1,089.6) | Height - 32-1/4", Diameter - 20-3/8", Core diameter - 11-1/2" | | | | | | QA, QCL |
| 300 lb. Recyclable ROBOPAK | 2,400 (1,089.6) | Height - 21", Diameter - 23" | | | | | | QA, QCL |
| 600 lb. Recyclable ROBOPAK | 2,400 (1089.6) | Height - 35-1/2", Diameter - 23" | | | | | | QA, QCL |
| 950 lb. Recyclable ROBOPAK | 1,900 (862.6) | Height - 35-1/2", Diameter - 23" | | | | | | QA, QCL |

*Carton weight.

## Short Circuit Transfer Welding Parameters

| Size | Material thickness[1] in. (decimal) | mm | Electrode diameter in. | mm | Welding current amps-DC | Arc voltage (electrode positive) | Wire feed speed ipm | Travel speed ipm | Shielding gas flow CFH[2] |
|---|---|---|---|---|---|---|---|---|---|
| 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 $CO_2$, or 75% Ar/25% $CO_2$.

## Spray Transfer Welding Parameters

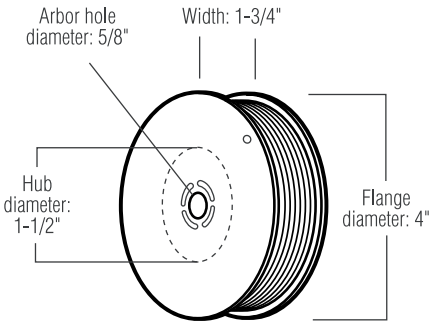
| Size | Material thickness in. (decimal) | mm | Type of weld[1] | Electrode diameter in. | mm | Welding current amps-DC | Arc voltage (electrode positive) | Wire feed speed ipm | Travel speed ipm | 92% Ar/8% $CO_2$ gas flow CFH |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 ga. | 0.050 | 1.3 | 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 |

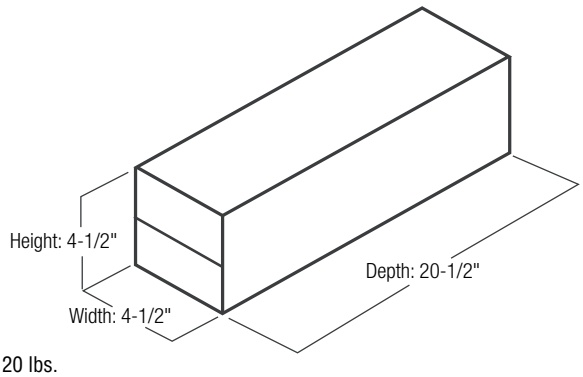
1 For mild carbon and low alloy steels – on square groove welds, backing is required.

# Steel Solid Wires

## 2-lb. Plastic Spool

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

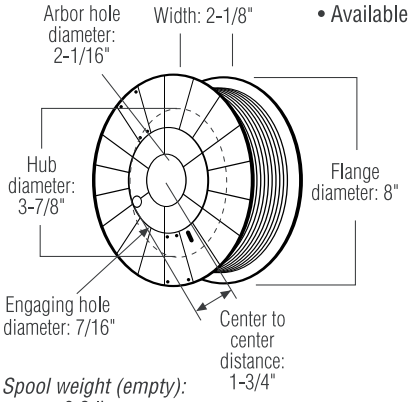


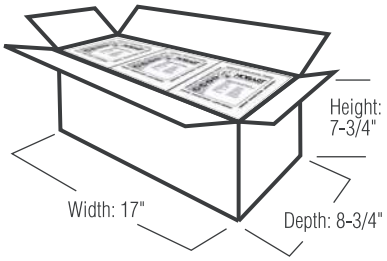

*Weight:* 20 lbs.
*Spools per master carton:* 10

## 10-lb. Plastic Spool

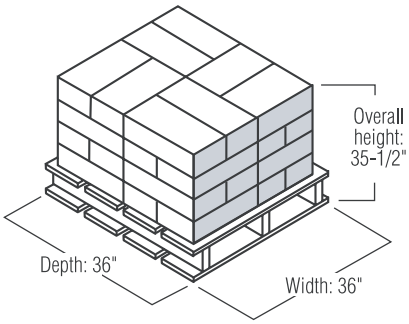
- Color-coded labels for easy wire identification
- Colorful packaging–great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection
- Available in: ☑ HB




*Spool weight (empty):* 0.8 lbs.



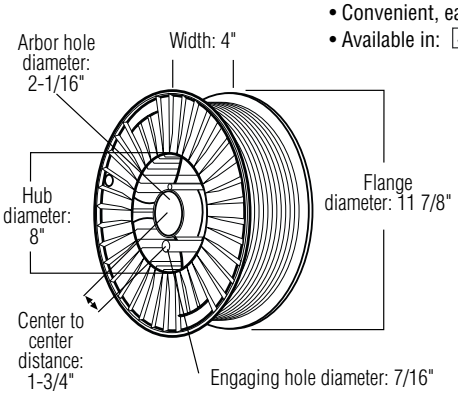

*Weight:* 60 lbs.
*Spools per master carton:* 10

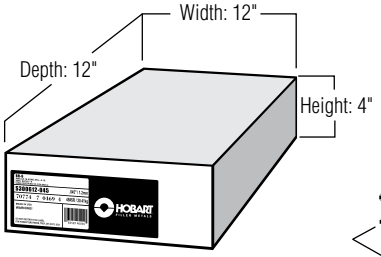


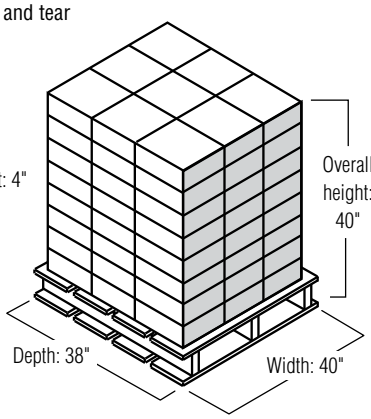

*Weight:* 1,920 lbs.
*Stacking sequence:* 4 wide, 4 deep and 4 high
*Master cartons per pallet:* 32
*Spools per pallet:* 192

## 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



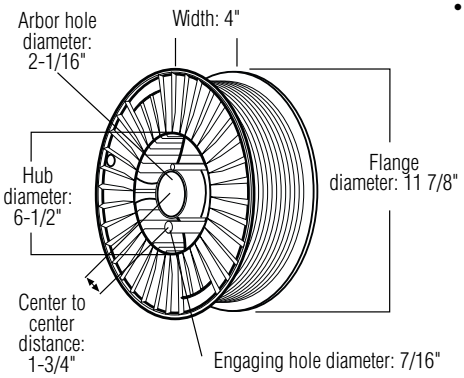



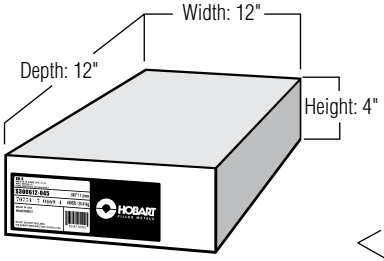



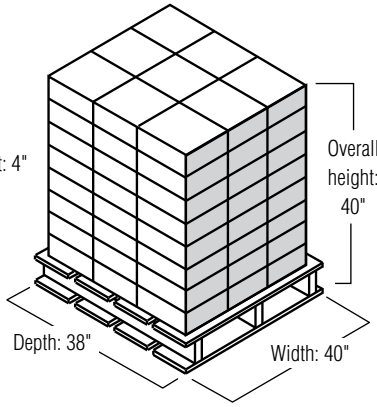

*Weight:* 2,376 lbs.
*Stacking sequence:* 3 wide, 3 deep and 8 high
*Spools per pallet:* 72

## 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



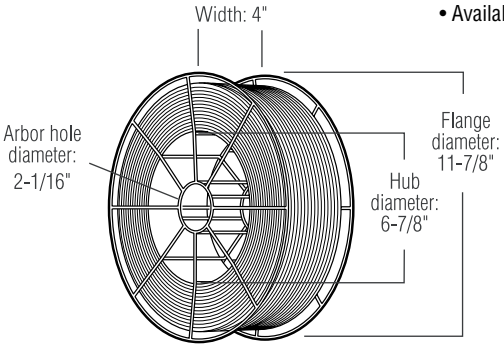



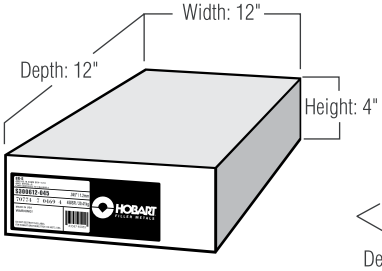

*Weight:* 3,240 lbs.
*Stacking sequence:* 3 wide, 3 deep and 8 high
*Spools per pallet:* 72

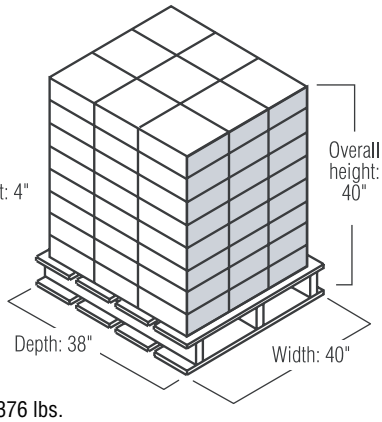
## 33-lb. & 45-lb. Steel Reels™

- 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.



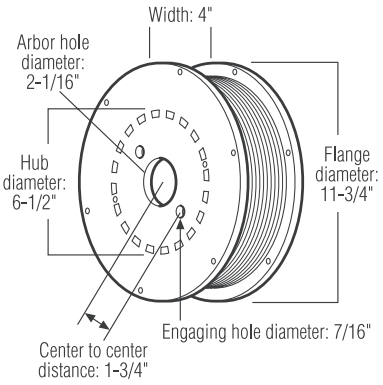




*Weight:* 33-lb Steel Reel 2,376 lbs.
45-lb Steel Reel 3,240 lbs.
*Stacking sequence:* 3 wide, 3 deep and 8 high
*Spools per pallet:* 72

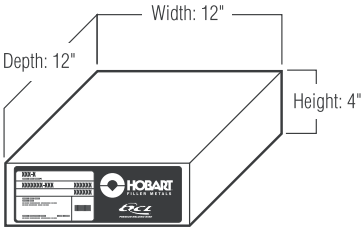
# Steel Solid Wires

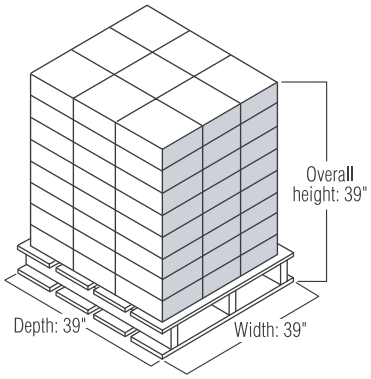
## 45-lb. Fiber Spool

- 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: ☑ QCL




*Spool weight (empty):* 2.6 lbs.

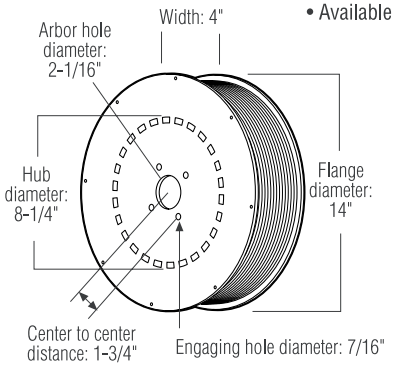


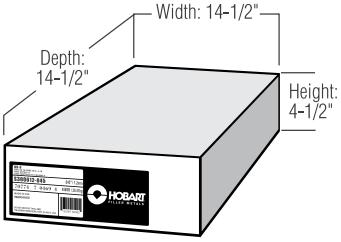

*Weight:* 3,240 lbs. net, 3,470 lbs. gross (est.)
*Stacking sequence:* 3 wide, 3 deep and 8 high
*Spools per pallet:* 72

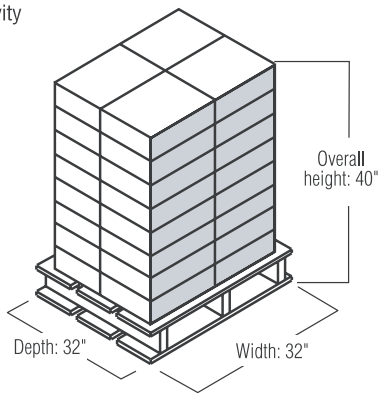
## 60-lb. Fiber Spool

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




*Spool weight (empty):* 3 lbs.

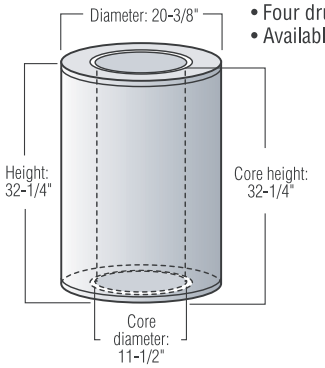


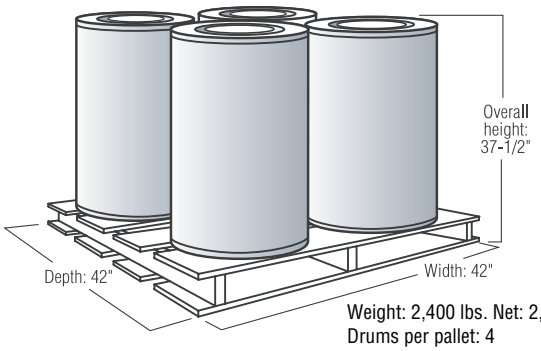

*Weight:* 1,920 lbs. net, 2,115 lbs. gross (est.)
*Stacking sequence:* 2 wide, 2 deep and 8 high
*Spools per pallet:* 32

## 600-lb. ROBOPAK®

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



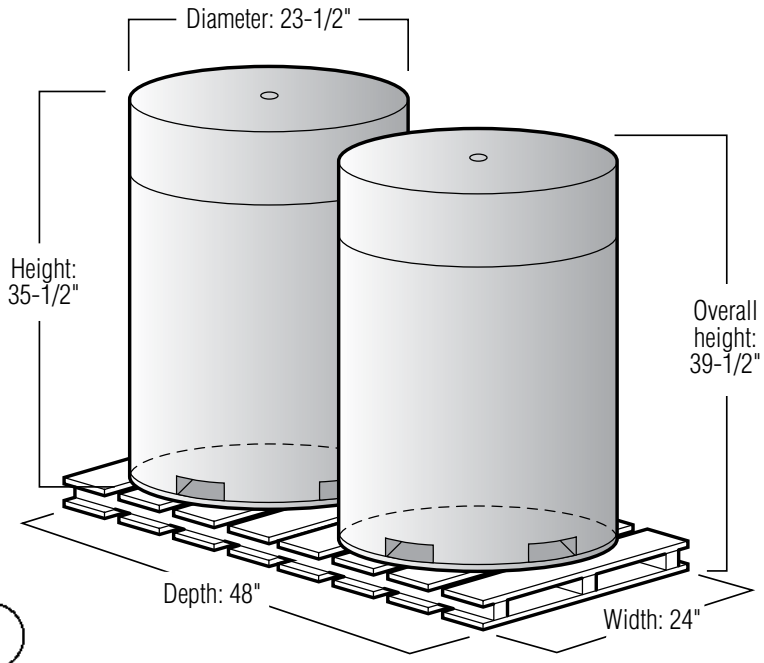

*Drum weight (empty):* 19 lbs.



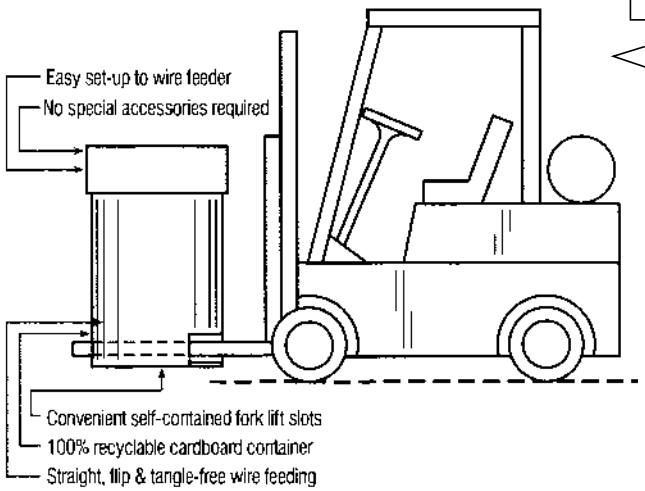

Weight: 2,400 lbs. Net: 2,519 lbs. gross (est.)
Drums per pallet: 4

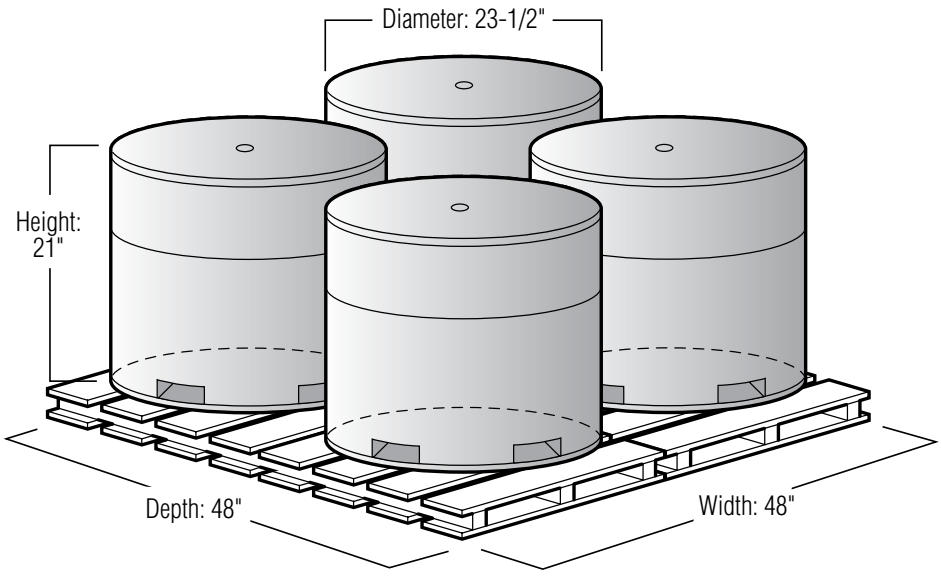
## Recyclable ROBOPAK® 300/600/700/950

- 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™ ☑ QCL



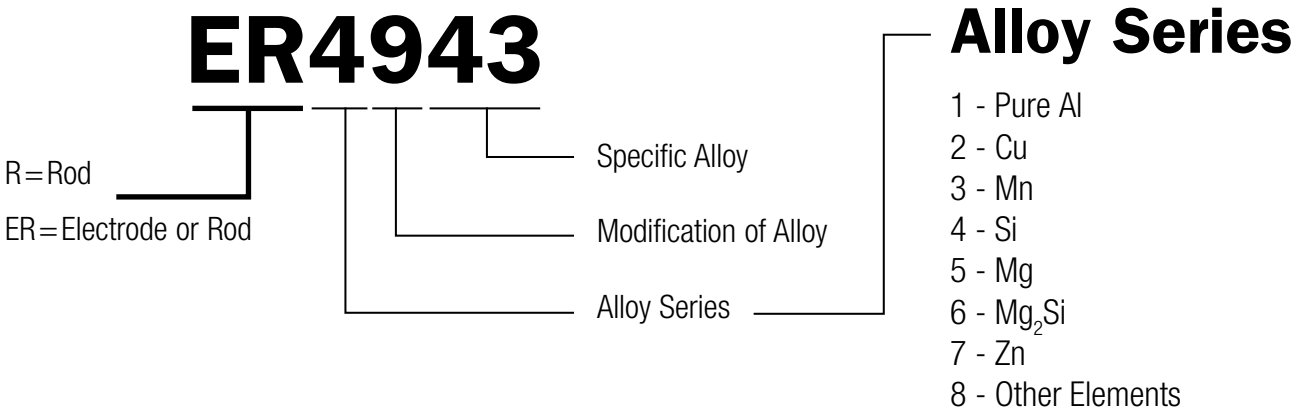

950 Weight: 1900 lb.
600 Weight: 2400 lb.
700 Weight: 1400 lb. (1/16 only)






300 Weight: 1200

# How AWS Classifies Aluminum



## MaxalMig® 1100

**AWS ER1100**

With excellent corrosion resistance and hot cracking sensitivity, this aluminum filler metal is designed for applications with higher electrical and thermal conductivity requirements and chemical storage facilities. It offers low welding smut and discoloration with a moderate shrinkage rate and the highest ductility/formability.

**Benefits:**

- highest ductility/formability
- higher electrical and thermal conductivity
- excellent corrosion resistance
- good hot cracking sensitivity in most applications

**Typical Applications:**

- electrical conductors
- chemical storage tanks
- piping and tubing for chemicals
- refrigeration

**Typical Weld Metal Chemistry:**

| | | | |
|---|---|---|---|
| Silicon+Iron (shall not exceed) | 0.95 | Zinc | 0.10 |
| Copper | 0.05-0.20 | Titanium | — |
| Manganese | 0.05 | Beryllium | < 0.0003 |
| Magnesium | — | Others Total | 0.15 |
| | | Aluminum | 99.0 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 13,500 (90 MPa) |
| Yield Strength (psi) | — |
| Elongation % in 2" (50mm) | 40% |

**Suggested GMAW welding procedures:**

| Diameter | Base Material Thickness | Amps | Volts | Wire Feed 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, ER1100
- ASME SFA 5.10, ER1100
- AWS A5.01, Class S1, Schedule F
- CWB

## 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 Thickness | Amps | Volts | Wire Feed 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 conditionning 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 Thickness | Amps | Volts | Wire Feed 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 Thickness | Amps | Volts | Wire Feed 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 Thickness | Amps | Volts | Wire Feed 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 |
| | 3/8" (9.5mm) | 230 | 25 | 450 |
| 0.062"/1.6mm | 1/4" (6.4mm) | 210 | 24 | 200 |
| | 3/8" (9.5mm) | 240 | 25 | 230 |
| | 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, 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 Thickness | Amps | Volts | Wire Feed 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 |
| | 3/8" (9.5mm) | 230 | 25 | 450 |
| 0.062"/1.6mm | 1/4" (6.4mm) | 210 | 24 | 200 |
| | 3/8" (9.5mm) | 240 | 25 | 230 |
| | 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 Thickness | Amps | Volts | Wire Feed 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 |
| | 3/8" (9.5mm) | 230 | 25 | 450 |
| 0.062"/1.6mm | 1/4" (6.4mm) | 210 | 24 | 200 |
| | 3/8" (9.5mm) | 240 | 25 | 230 |
| | 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 Thickness | Amps | Volts | Wire Feed 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 |
| | 3/8" (9.5mm) | 230 | 25 | 450 |
| 0.062"/1.6mm | 1/4" (6.4mm) | 210 | 24 | 200 |
| | 3/8" (9.5mm) | 240 | 25 | 230 |
| | 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

## MaxalTig® 1100

**AWS R1100**

Designed for applications with electrical conductivity requirements and chemical storage facilities, this aluminum filler metal offers the highest ductility, formability and electrical and thermal conductivity. Defining features include the low welding smut and discoloration, excellent corrosion resistance, moderate shrinkage rate, and good hot cracking sensitivity.

**Benefits:**

- highest ductility/formability
- higher electrical and thermal conductivity
- excellent corrosion resistance
- good hot cracking sensitivity in most applications

**Typical Applications:**

- electrical conductors
- chemical storage tanks
- piping and tubing for chemicals
- refrigeration

**Typical Weld Metal Chemistry:**

| | | | |
|---|---|---|---|
| Silicon+Iron shall not exceed | 0.95 | Zinc | 0.25 |
| Copper | 0.05-0.20 | Titanium | 0.05-0.20 |
| Manganese | 0.05 | Beryllium | < 0.0003 |
| Magnesium | — | Others Total | 0.15 |
| | | Aluminum | remainder |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 13,500 (90 MPa) |
| Yield Strength (psi) | — |
| Elongation % in 2" (50mm) | 40% |

**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, ER1100
- ASME SFA 5.10, ER1100
- AWS A5.01, Class S1, Schedule F
- CWB

# 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 smut 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 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, 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 conditionning 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 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, 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 MaxalMig® 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 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, 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

## 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 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 |

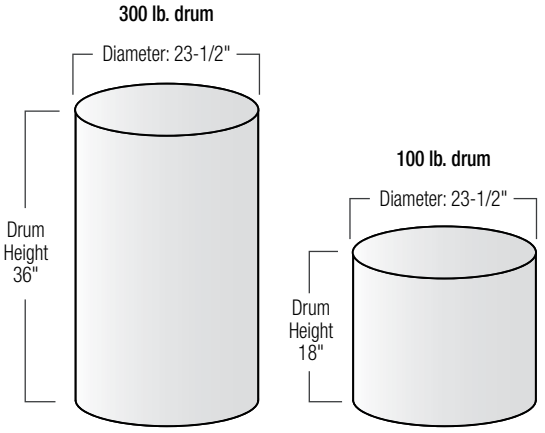
**Shielding Gas:** 100% Ar, 25% He/75% Ar

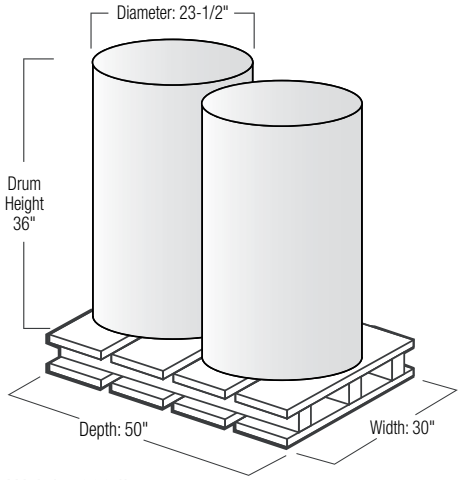
**Type of Current:** AC

**Approvals and Conformances:**

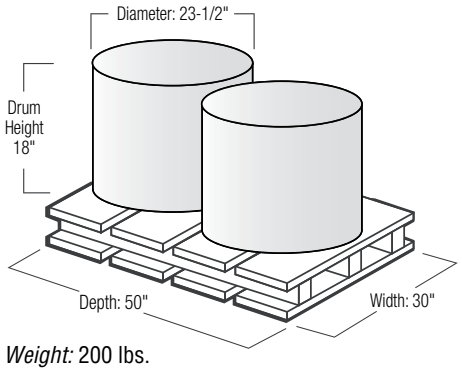
- AWS A5.10, R5556
- ASME SFA 5.10, R5556
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS

**Maxal PAC Drum**



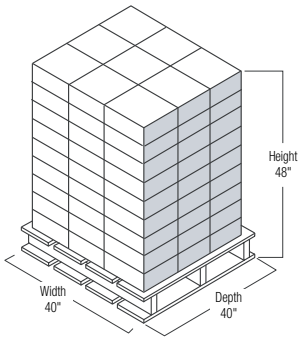




*Weight:* 600 lbs.
*Master pallet dimensions:* 30" x 50"

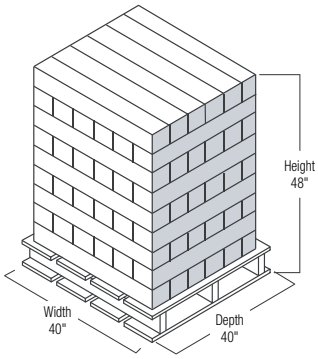



*Weight:* 200 lbs.
*Master pallet dimensions:* 30" x 50"

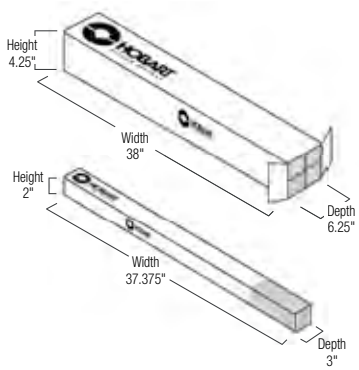
## Pallet Information




*1-lb. Carton Weight:* 1,658 lbs. gross; 1,458 lbs. net
*16-lbs. Carton Weight:* 1,496 lbs. gross; 1,296 lbs. net
*22-lbs. Carton Weight:* 1,982 lbs. gross; 1,782 lbs. net
*Stacking sequence:* 3 wide, 3 deep and 9 high

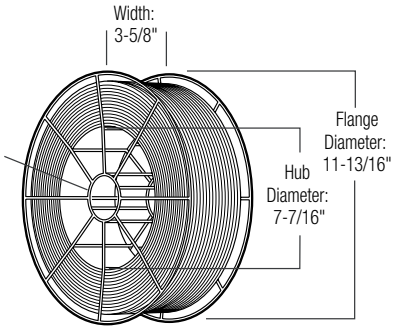



*Weight:* 2,360 lbs. gross; 2,160 lbs. net
*Stacking sequence:* 6 wide, 1 deep and 9 high

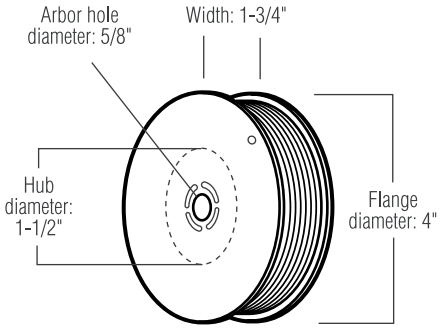



*Master Box (4-10 Lb. Boxes):* 38" x 4.25" x 6.25"
*10 Lb. Box:* 37.375" x 2" x 3"

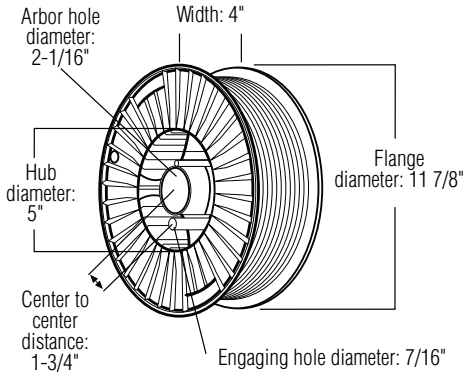
## 16-lb. Wire Basket & 1-lb., 5-lb., 16-lb., 22-lb. Plastic Spool



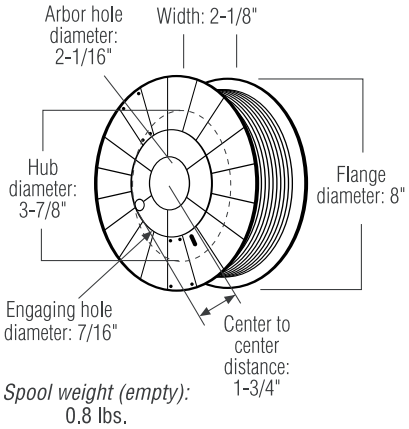

**16-lb.**




**1-lb.**

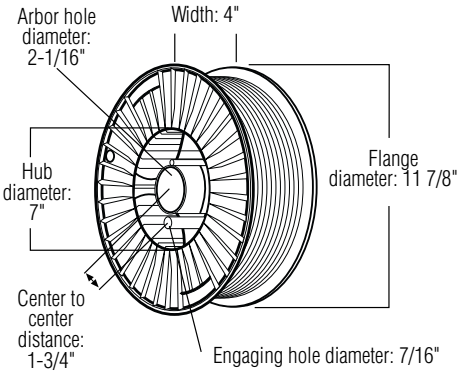



**22-lb.**



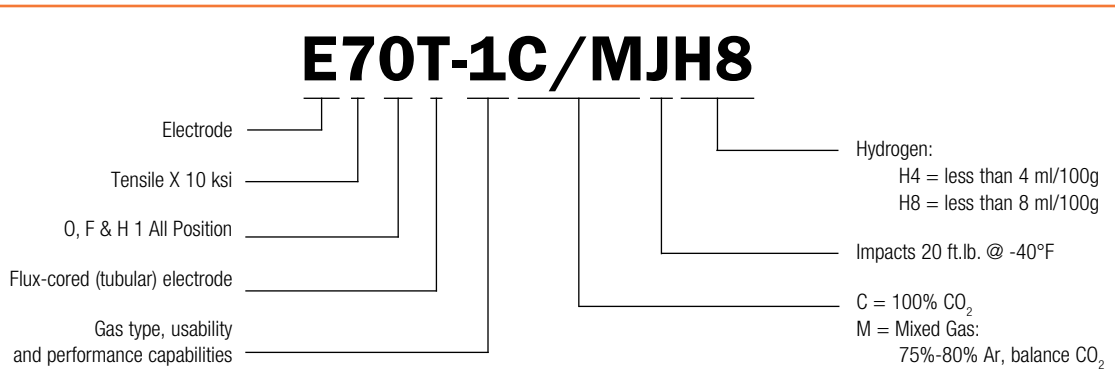

*Spool weight (empty):*
0.8 lbs.

**5-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[a] | Shielding[b] | Current[c] | Application[d] |
|---|---|---|---|---|
| E70T-1C | H and F | $CO_2$ | DCEP | M |
| E70T-1M | H and F | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E71T-1C | H, F, VU, OH | $CO_2$ | DCEP | M |
| E71T-1M | H, F, VU, OH | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E70T-2C | H and F | $CO_2$ | DCEP | S |
| E70T-2M | H and F | 75-80% Ar/bal $CO_2$ | DCEP | S |
| E71T-2C | H, F, VU, OH | $CO_2$ | DCEP | S |
| E71T-2M | H, F, VU, OH | 75-80% Ar/bal $CO_2$ | DCEP | S |
| E70T-3 | H and F | None | DCEP | S |
| E70T-4 | H and F | None | DCEP | M |
| E70T-5C | H and F | $CO_2$ | DCEP | M |
| E70T-5M | H and F | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E71T-5C | H, F, VU, OH | $CO_2$ | DCEP or DCEN[e] | M |
| E71T-5M | H, F, VU, OH | 75-80% Ar/bal $CO_2$ | DCEP or DCEN[e] | M |
| E70T-6 | H and F | None | DCEP | M |
| E70T-7 | H and F | None | DCEN | M |
| E71T-7 | H, F, VU, OH | None | DCEN | M |
| E70T-8 | H and F | None | DCEN | M |
| E71T-8 | H, F, VU, OH | None | DCEN | M |
| E70T-9C | H and F | $CO_2$ | DCEP | M |
| E70T-9M | H and F | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E71T-9C | H, F, VU, OH | $CO_2$ | DCEP | M |
| E71T-9M | H, F, VU, OH | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E70T-10 | H and F | None | DCEN | S |
| E70T-11 | H and F | None | DCEN | M |
| E71T-11 | H, F, VD, OH | None | DCEN | M |
| E70T-12C | H and F | $CO_2$ | DCEP | M |
| E70T-12M | H and F | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E71T-12C | H, F, VU, OH | $CO_2$ | DCEP | M |
| E71T-12M | H, F, VU, OH | 75-80% Ar/bal $CO_2$ | DCEP | M |
| E61T-13 | H, F, VD, OH | None | DCEN | S |
| E71T-13 | H, F, VD, OH | None | DCEN | S |
| E71T-14 | H, F, VD, OH | None | DCEN | S |
| EX0T-G | H and F | Not Specified | Not Specified | M |
| EX1T-G | H, F, VD or VU, OH | Not Specified | Not Specified | M |
| EX0T-GS | H and F | Not Specified | Not Specified | S |
| EX1T-GS | H, F, VD or VU, OH | Not Specified | Not Specified | S |

**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% $CO_2$

**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% $CO_2$, 2YSA H10
- CWB, 100% $CO_2$, E492T-9-H8 (1.2 mm - 2.4 mm diameter electrodes)
- AWS D1.8/D1.8M, 100% $CO_2$, 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% $CO_2$

**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% $CO_2$, E70T-1CJ
- CWB, 100% $CO_2$, E492T-9-H8
- AWS D1.8 Conformance, 100% $CO_2$, (1/16-3/32" diameter electrodes)

## FabCO® 70XHP

FLAT & HORIZONTAL

**AWS E70T-1C/MJ H8, E70T-9C/MJ H8, E70T-12CJ H8**

Designed for high deposition applications requiring high CVN values. The low fume generation rate, minimal spatter, and high deposition rates increase productivity and improves the welding environment. It also maintains CVN toughness after stress relief: exceeds 20-foot pound-force (27J) CVN impact strength at -40 degrees Fahrenheit after two hours of stress relief at 1150 degrees Fahrenheit.

**Benefits:**

- high deposition rates increase productivity
- low fume generation rate improves welding environment and operator appeal
- maintains CVN toughness after stress relief: Exceeds 20 ft.lb. (27J) CVN impact strength at -40F (-40C) after 2 hrs of stress relief at 1150F

**Typical Applications:**

- non-alloyed and fine grain steels
- earthmoving equipment
- shipbuilding
- storage vessels

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| Carbon | 0.04 | 0.03 |
| Manganese | 1.47 | 1.70 |
| Silicon | 0.52 | 0.52 |
| Phosphorus | 0.010 | 0.008 |
| Sulphur | 0.010 | 0.010 |

**Typical Diffusible Hydrogen:** 6.5 ml/100g

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 81,000 (558 MPa) | 85,000 (586 MPa) |
| Yield Strength (psi) | 68,000 (469 MPa) | 72,000 (496 MPa) |
| Elongation % in 2"(50mm) | 28% | 27% |

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

| | | |
|---|---|---|
| Avg. at -20°F (-30°C) | 42 ft.lb. (57J) | 40 ft.lb. (54J) |
| Avg. at -40°F (-40°C) | 35 ft.lb. (47J) | 30 ft.lb. (41J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 225-350 | 27-32 | 1" (25 mm) |
| 3/32" (2.4 mm) | 350-575 | 27-34 | 1" (25 mm) |

**Shielding Gas:** 100% $CO_2$, 75-80% Ar/Balance $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E70T-1CJ H8, E70T-1MJ H8, E70T-9CJ H8, E70T-9MJ H8, E70T-12CJ H8
- AWS A5.20M, E490T-1CJ H8, E490T-1MJ H8, E490T-9CJ H8, E490T-9MJ H8, E490T-12CJ H8
- ASME SFA 5.20, E70T-1CJ H8, E70T-1MJ H8, E70T-9CJ H8, E70T-9MJ H8, E70T-12CJ H8
- CWB, 100% $CO_2$, E492T-12CJ-H8
- CWB, 75% Ar/25% $CO_2$, E492T-9MJ-H8
- EN17632-B: T55 2 T1 0 C/M A H10

## FabCO® Premier 70

FLAT & HORIZONTAL

**AWS E70T-1CJ H8, E70T-9CJ H8**

Designed to weld through primers without porosity, this E70T-1 electrode offers increased deposition rates compared to standard E70T-1 type products increase productivity. Its fluid puddle and excellent mechanical properties prove an ideal choice for a shipyard or barge construction. Minimal spatter and easy slag removal reduce or eliminate post-weld cleanup.

**Benefits:**

- specially designed to weld over primer without porosity
- increased deposition rates compared to standard E70T-1 type products increase productivity
- minimal spatter and easy slag removal reduce or eliminate post-weld cleanup
- easy to set up and control

**Typical Applications:**

- structural steel
- shipbuilding
- heavy equipment
- general fabrication

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.03 |
| Manganese | 1.24 |
| Silicon | 0.32 |
| Phosphorus | 0.013 |
| Sulphur | 0.012 |
| Nickel | 0.42 |

**Typical Diffusible Hydrogen:** 3.7 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 84,000 (576 MPa) |
| Yield Strength (psi) | 77,000 (528 MPa) |
| Elongation % in 2" (50mm) | 27% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 111 ft.lb. (150J) |
| Avg. at -40°F (-40°C) | 72 ft.lb. (98J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 200-450 | 25-32 | 1" (25 mm) |

**Shielding Gas:** 100% $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E70T-1C H8, E70T-9CJ H8
- ASME SFA 5.20, E70T-1C, E70T-9CJ H8
- AWS A5.20M, E490T-1C H8, E490T-9CJ H8
- ABS, 100% $CO_2$, 3SA, 3YSA

## 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% $CO_2$

**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% CO2 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% $CO_2$ | 80% Ar/20% $CO_2$ |
|---|---|---|
| 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 (614 MPa) | 91,000 (627 MPa) |
| Yield Strength (psi) | 71,000 (490 MPa) | 71,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E70T-5CJ H4, 80% Ar/20% $CO_2$ E70T-5MJ H4
- CWB 75-80% Ar/Balance $CO_2$, E492T-5MJ H4, 100% $CO_2$ 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% $CO_2$

**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 and 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 and fine grain steels
- structural steel
- general fabrication
- heavy equipment

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (579 MPa) | 90,000 (619 MPa) |
| Yield Strength (psi) | 77,000 (531 MPa) | 83,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$ S3YM HH (0.045" - 1/16" diameter electrodes)
- Burea Veritas, 100% $CO_2$, S3YM HH (0.045" - 1/16" diameter electrodes)
- CWB, 100% $CO_2$ E491T-9-H8, 75-80% Ar/Balance $CO_2$, E491T-9M-H8 (1.2 mm - 1.6 mm diameter electrodes)
- DNV, 100% $CO_2$, Y40MS (H10)
- EN17632-A: T 46 3 P C/M 2 H10
- CE Marked per CPR 305/2011
- Lloyd's Reigster, 100% $CO_2$, 3YS H10
- AWS D1.8/D1.8M, 100% $CO_2$ & 75% Ar/25% $CO_2$, (0.045" [1.2 mm] & 1/16" [1.6 mm] diameter electrodes) (0.052" [1.4 mm] diameter 75% Ar/25% $CO_2$ only)

## FabCO® HORNET

ALL POSITION

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

Ideal for mild and low alloy steel applications, this all-position wire for both carbon dioxide and mixed gas maintains a superior penetration profile and promotes high-quality welds. The easy slag removal and low spatter levels reduces cleanup time and risk of inclusions while the low fume generation rate improves the overall working environment. Additionally, it's good impact strength at low temperatures promotes crack resistance in severe applications.

**Benefits:**

- superior penetration profile promotes high-quality welds
- easy slag removal and low spatter levels reduces cleanup time and risk of inclusions
- good impact strength at low temperatures promotes crack resistance in severe applications
- low fume generation rate increases operator appeal and improves overall working environment

**Typical Applications:**

- structural steel
- general fabrication
- heavy equipment

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| Carbon | 0.03 | 0.02 |
| Manganese | 1.29 | 1.52 |
| Silicon | 0.30 | 0.40 |
| Sulphur | 0.005 | 0.004 |
| Phosphorus | 0.011 | 0.008 |

**Typical Diffusible Hydrogen:**

| 4.2 ml/100g | 4.4 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 86,000 (593 MPa) | 93,000 (642 MPa) |
| Yield Strength (psi) | 81,000 (558 MPa) | 87,000 (600 MPa) |
| Elongation % in 2" (50mm) | 29% | 26% |

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

| | | |
|---|---|---|
| Avg. at -0°F (-20°C) | 93 ft.lb.(126J) | 80 ft.lb.(108J) |
| Avg. at -20°F (-30°C) | 52 ft.lb.(71J) | 75 ft.lb.(102J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 170-300 | 23-29 | 3/4" (19 mm) |
| .052" (1.4 mm) | 170-350 | 24-30 | 3/4" (19 mm) |
| 1/16" (1.6 mm) | 215-400 | 24-30 | 1" (25 mm) |

**Shielding Gas:** 100% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, 3YSA H10, 80% Ar/20% $CO_2$, 3YSA H10
- CWB, 100% $CO_2$, E491T-9-H8, 80% Ar/20% $CO_2$, E491T-9M-H8
- AWS D1.8 Conformance: 0.045" (1.2 mm) & 1/16" (1.6 mm) diameter electrodes with 100% $CO_2$ or 75% Ar/25% $CO_2$ Shielding Gases
- DNV, 75% Ar/25% $CO_2$, IV Y40MS(H5)

## FabCO® Triple 7

ALL POSITION

**AWS E71T-1C/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 100% carbon dioxide or 75-80% argon/balance 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:**

- excellent weldability with 100% $CO_2$ or 75-80% Ar/Balance $CO_2$
- fast freezing slag permits the welder to use higher current to increase travel speeds while maintaining flat bead contour in all positions
- easy slag removal, even from deep groove weldments

**Typical Applications:**

- shipbuilding
- railcar
- general plate fabrication
- pressure vessels

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| Carbon | 0.03 | 0.03 |
| Manganese | 1.27 | 1.52 |
| Silicon | 0.56 | 0.74 |
| Phosphorus | 0.013 | 0.013 |
| Sulphur | 0.009 | 0.009 |

**Typical Diffusible Hydrogen:**

| 4.6 ml/100g | 5.4 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 90,000 (617 MPa) | 93,000 (643 MPa) |
| Yield Strength (psi) | 79,000 (547 MPa) | 79,000 (544 MPa) |
| Elongation % in 2" (50mm) | 27% | 26% |

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

| | | |
|---|---|---|
| Avg. at 0°F (-20°C) | 76 ft.lb. (103J) | 63 ft.lb. (85J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 100-325 | 23-34 | 3/4"(19 mm) |
| .052" (1.4 mm) | 125-350 | 22-33 | 3/4"(19 mm) |
| 1/16" (1.6 mm) | 150-450 | 23-35 | 3/4"(19 mm) |

**Shielding Gas:** 100% $CO_2$, 75-80% Ar/Balance $CO_2$

**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, 100% $CO_2$, 75% Ar/25% $CO_2$, 2YSA
- CWB, 100% $CO_2$, E491T-1-H8, 80% Ar/20% $CO_2$, E491T-1M-H8
- DNV II YMS

## 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% $CO_2$
- 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% $CO_2$

**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% $CO_2$, 4YSA H5
- CWB, 100% $CO_2$ E491T-9 H8
- DNV, 100% $CO_2$, IV YMS H5
- Lloyd's Register, 100% $CO_2$, 4YS H5

## FabCO® Element™ 71T1C

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% $CO_2$

**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% $CO_2$, 2YSA H10
- CWB, 100% $CO_2$, E491T-9-H8

## FabCO® Element™ 71T1M

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% $CO_2$ |
|---|---|
| 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 $CO_2$

**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% $CO_2$, 2YSA H10
- CWB, 75-85% Ar/Balance $CO_2$, 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% $CO_2$

**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% CO2, 3YSA H10
- CWB, 100% CO2, 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 futher reducing emmisions 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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E71T1-GM H8
- AWS A5.29M, E491T1-GM H8
- AWS A5.36, E71T1-M21A4-G H8, E71T1-M20A4-G H8
- AWS A5.36M, E491T1-M21A4-G H8, 491T1-M20A4-G H8
- ASME SFA 5.29, E71T1-GM H8
- ABS, 75% Ar/25% CO2, 3YSA H10
- CWB, 75% Ar/25% CO2, E491T1-GM-H8

## 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 $CO_2$ or 75-80% Ar/Balance $CO_2$

**Typical Applications:**

- shipbuilding
- ship repair
- general structural
- general fabrication

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (593 MPa) | 92,000 (635 MPa) |
| Yield Strength (psi) | 74,000 (514 MPa) | 80,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$

## 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% $CO_2$ |
|---|---|
| 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 $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E71T-1MJ H4, E71T-9MJ H4, E71T-12MJ H4
- AWS A5.20M, E491T-1MJ H4, E491T-9MJ H4, E491T-12MJ H4
- ASME SFA 5.20, E71T-1MJ H4, E71T-9MJ H4, E71T-12MJ H4
- ABS, 75% Ar/25% $CO_2$, 4YSA H5, (0.035" - 0.052" [0.9mm - 1.4mm] diameters only)
- CWB, 75-80% Ar/Balance $CO_2$, E491T-1M, E491T-12MJ-H4, (0.035" - 0.052" [0.9mm - 1.4mm] diameters only)
- EN 17632-A: T 42 6 P M 2 H5
- CE Marked per CPR 305/2011
- DNV, 75% Ar/25% $CO_2$, IV Y40M5 (H5)

## 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% $CO_2$

**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% $CO_2$, 4YSA H5 (1.2mm and 1.4mm diameter electrodes)
- ABS, 100% $CO_2$, 4YSA H10 (1.6mm diameter electrodes)
- CWB, 100% $CO_2$, E491T-9-H4
- DNV, 100% $CO_2$, IV YMS (H5) (1.2mm and 1.4mm diameter electrodes)
- Lloyd's Register, 100% CO2, 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
- general fabrication
- offshore structures
- pressure vessels

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| 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 $CO_2$

**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 $CO_2$, 3YSA H5
- CWB, 75-85% Ar/Balance $CO_2$, E491T-12MJ-H4
- DNV, 75-85% Ar/Balance $CO_2$, III Y40MS
- Lloyd's Register, 80% Ar/20% $CO_2$, 3YS H15
- MIL-E-24403/1, MIL-71T-1M, MIL-71T-1-HYM
- Bureau Veritas, 80% Ar/20% $CO_2$, 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% $CO_2$ | 95% Ar/5% $CO_2$ |
|---|---|---|
| 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 $CO_2$

**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 $CO_2$, 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 apperance 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 characterists 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) |

**Typical Charpy V-notch Impact Values:**
Not required

**Typical Operating Range:**

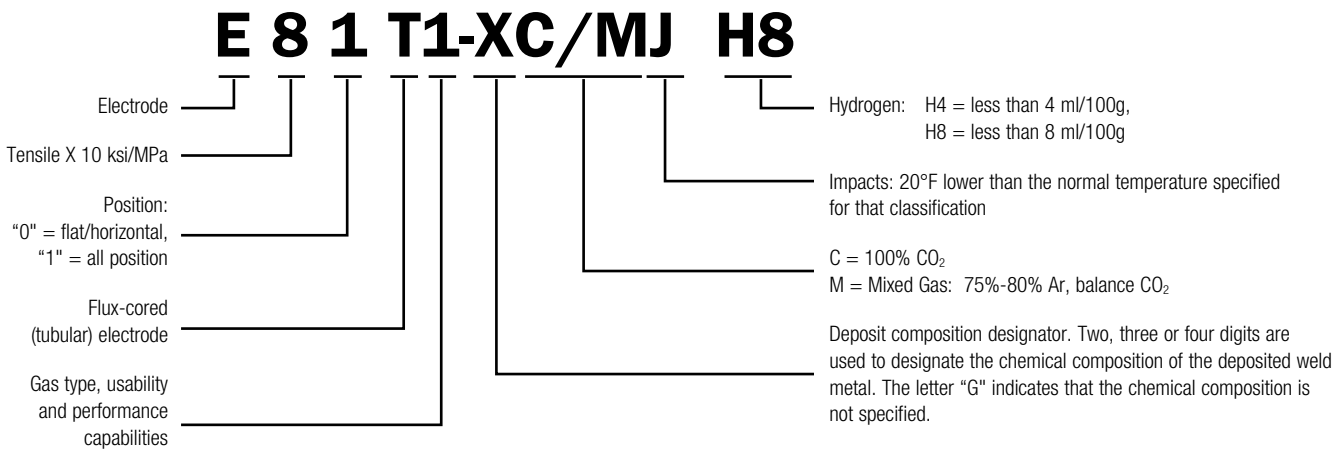
| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 125-150 | 15-17 | 1/2" (13 mm) |
| 1/16" (1.6 mm) | 150-250 | 18-20 | 3/4" (19 mm) |

**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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (628 MPa) | 96,000 (662 MPa) |
| Yield Strength (psi) | 80,000 (552 MPa) | 88,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E550T-Ni1C H8
- CWB, 75-90% Ar/Balance $CO_2$, E550T-Ni1M-H8
- ABS, 100% $CO_2$, 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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 83,000 (572 MPa) | 93,000 (641 MPa) |
| Yield Strength (psi) | 73,000 (503 MPa) | 85,000 (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) |

**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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E551T-Ni1C-JH8
- CWB, 75-80% Ar/Balance $CO_2$, E551T-Ni1M-JH8
- ABS, 100% $CO_2$, 3YSA
- AWS D1.8, 75% Ar/25% $CO_2$ (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) valuemeets 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 (640 MPa) | 82,000 (566 MPa) |
| Yield Strength | 80,000 (552 MPa) | 73,000 (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. (121 Joules) | 80 ft.lb. (108 Joules) |
| Avg. at -50°F (-45°C) | 82 ft.lb. (108 Joules) | 70 ft.lb. (95 Joules) |
| Avg. at -76°F (-60°C) | 60 ft.lb. (81 Joules) | 45 ft.lb. (60 Joules) |

**Typical Operating Range:**

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

**Shielding Gas:** 75-80% Ar/Balance $CO_2$

**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% CO2, 5Y400 H5
- CWB, 75-80% Ar/Balance CO2, E551T1-Ni1M H4 (PENDING)
- EN 17632-A T 50 6 1Ni P M H5 (PENDING)

## 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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E551T1-Ni2C-JH4
- CWB, 75-80% Ar/Balance $CO_2$, E551T1-Ni2M-JH4
- DNV, 100% $CO_2$, III Y40MS
- DNV, 75% Ar/25% $CO_2$, III Y40MS
- ABS, 100% $CO_2$, 3YSA
- Lloyd's Register, 100% $CO_2$, 3YS H15
- Lloyd's Register, 75% Ar/25% $CO_2$, 3YS H15
- AWS D1.8, 100% $CO_2$ (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% $CO_2$ | 80% Ar/20% $CO_2$ |
|---|---|---|
| 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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E81T1-K2M
- Lloyd's Register, 80% Ar/20% $CO_2$, 4Y42S H10
- Bureau Veritas, 75-80% Ar/Balance $CO_2$, S5Y42M
- DNV, 75-80% Ar/Balance $CO_2$, 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% $CO_2$

**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% $CO_2$, 3YSA H10 (0.045" diameter electrode)
- ABS, 100% $CO_2$, 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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (635 MPa) | 101,800 (702 MPa) |
| Yield Strength (psi) | 80,000 (552 MPa) | 93,400 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, E621T1-K2C-H8
- ABS, 100% $CO_2$, E91T1-K2C H8
- ABS, 75% Ar/25% $CO_2$, 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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (637 MPa) | 98,000 (673 MPa) |
| Yield Strength (psi) | 78,000 (540 MPa) | 88,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$

**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% $CO_2$

**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% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| 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 (772 MPa) | 126,800 (875 MPa) |
| Yield Strength (psi) | 98,000 (676 MPa) | 105,800 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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% $CO_2$, 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 hyrogen cracking

**Typical Applications:**

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

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| 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 $CO_2$

**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 $CO_2$, 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 depostition 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% $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**
- AWS A5.29, E110T5-K4C
- ASME SFA 5.29, E110T5-K4C
- ABS 100% $CO_2$ E110T5-K4C
- CWB 100% $CO_2$ 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 120,00 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 muliple pass applications with 100% $CO_2$ 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% $CO_2$

**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% $CO_2$ 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% $CO_2$

**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% $CO_2$ 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% $CO_2$

**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% $CO_2$ or mixed gas

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 80% Ar/20% $CO_2$ |
|---|---|---|
| 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 |
|---|---|

**Typical Mechanical Properties (PWHT 1 Hr. at 1275°F/691°C):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 100,000 (689 MPa) | 109,000 (752 MPa) |
| Yield Strength (psi) | 86,000 (593 MPa) | 86,000 (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% $CO_2$, 75-80% Ar/Balance $CO_2$

**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 NISOH and ACGIH ecommendations 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% $CO_2$

**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% $CO_2$ 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 NISOH and ACGIH ecommendations 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 $CO_2$

**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% $CO_2$ 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-positon 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% $CO_2$ |
|---|---|
| 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 $CO_2$

**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% $CO_2$, 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% $CO_2$

**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

ALL POSITION

**AWS E71T8-K6J H8**

This wire is designed for use on offshore drilling rigs as well as structural steel, general fabrication or any application requiring high impact toughness at low temperatures. It can be used outdoors without sheltering and the easy slag removal reduces cleanup time and minimizes the risk of inclusion.

**Benefits:**

- self-shielded; can be used outdoors without sheltering
- easy slag removal reduces cleanup time and minimizes risk of inclusion
- excellent impact toughness minimizes risk of cracking in severe application
- excellent welding characteristics improve operator appeal and promote consistent high-quality welds

**Typical Applications:**

- offshore drilling rigs
- shipbuilding
- piping
- structural fabrication

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.035 |
| Manganese | 0.82 |
| Silicon | 0.07 |
| Phosphorus | 0.011 |
| Sulphur | 0.004 |
| Nickel | 0.89 |
| Chromium | 0.06 |
| Molybdenum | 0.03 |
| Aluminum | 0.95 |

**Typical Diffusible Hydrogen:** 5.5 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 76,000 (524 MPa) |
| Yield Strength (psi) | 62,000 (427 MPa) |
| Elongation % in 2" (50mm) | 28% |

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

| | |
|---|---|
| Avg. at -40°F (-40°C) | 295 ft.lb. (400J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 5/64" (2.0 mm) | 175-275 | 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
- ASME SFA 5.29, E71T8-K6J H8
- ABS, E71T8-K6J (5/64" diameter, all position)
- EN17632-A T 38 4 1Ni Y 1 H10

## Fabshield® Offshore 71Ni

ALL POSITION

**AWS E71T8-K6J H8**

Designed for use on offshore drilling rigs, this wire is good for structural steel, general fabrication or any application requiring high impact toughness at low temperatures. It can be used outdoors without sheltering and the fast-freezing slag allows for welding in all positions. Easy slag removal reduces cleanup time and minimizes the risk of inclusion.

**Benefits:**

- self-shielded; can be used outdoors without sheltering
- fast-freezing slag allows for welding in all positions
- good impact toughness minimizes risk of cracking in critical applications
- easy slag removal reduces cleanup time and minimizes risk of inclusion

**Typical Applications:**

- certain structural applications
- shipbuilding
- offshore drilling rigs
- construction

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 1.21 |
| Silicon | 0.07 |
| Phosphorus | 0.011 |
| Sulphur | 0.004 |
| Nickel | 0.85 |
| Aluminum | 0.90 |

**Typical Diffusible Hydrogen:** 5.6 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 75,000 (517 MPa) |
| Yield Strength (psi) | 61,000 (421 MPa) |
| Elongation % in 2" (50mm) | 29% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 240 ft.lb. (325J) |
| Avg. at -40°F (-40°C) | 115 ft.lb. (156J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 5/64" (2.0 mm) | 175-225 | 18-20 | 1" (25 mm) |

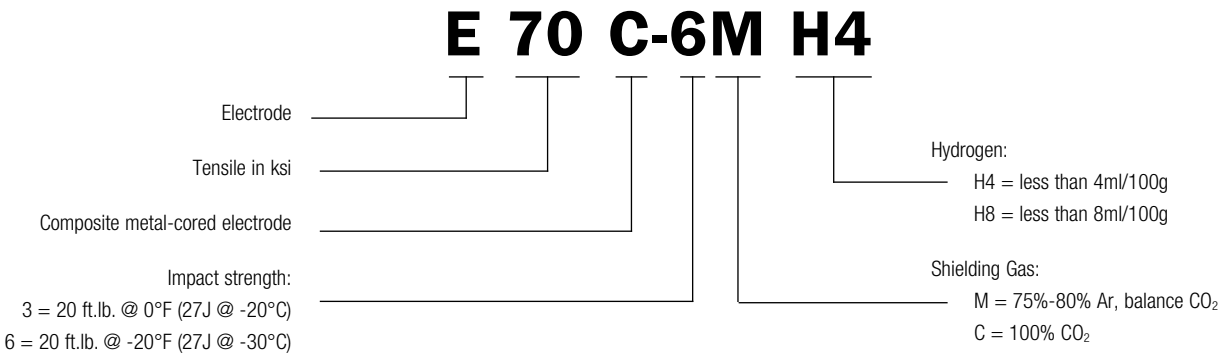
**Shielding Gas:** None required

**Type of Current:** DCEN

**Approvals and Conformances:**

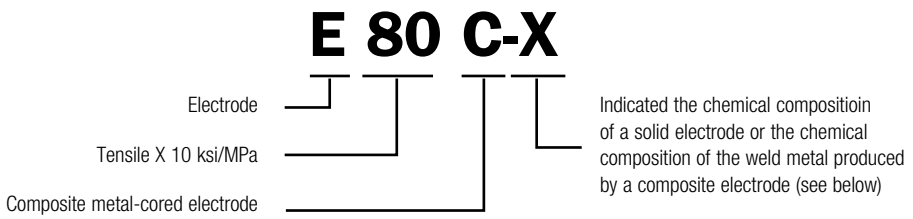
- AWS A5.29, E71T8-K6J H8
- AWS A5.29M, E491T8-K6J H8
- ASME SFA 5.29, E71T8-K6J H8
- ABS, E71T8-K6J (5/64" diameter, all position)
- EN17632-A T 38 4 1Ni Y 1 H10
- DNV, IV YMS (H10)
- Lloyd's Register, 4YS (H10)

## How AWS Classifies Metal-Cored Wires, GMAW Process (AWS A5.18)




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).

## 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 levels 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% $CO_2$ | 95% Ar/5% $CO_2$ |
|---|---|---|
| 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):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 81,000 (558 MPa) | 85,000 (586 MPa) |
| Yield Strength (psi) | 69,000 (476 MPa) | 75,000 (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 $CO_2$, 95% Ar/5% $O_2$

**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% $CO_2$, 3YSA H5 (0.035" - 1/16" diameters)
- Bureau Veritas, 80% Ar/20% $CO_2$, S3YMH5 (0.035" - 1/16" diameters)
- CWB, 75-95% Ar/Balance $CO_2$, E491C-6MJ-H4 (0.9 mm - 1.6 mm diameters)
- CWB, 95% Ar/5% O2, E491C-6MJ-H4 (1.2 mm - 1.6 mm diameters)
- DNV, 80% Ar/20% $CO_2$, III Y40MS(H5)
- Lloyd's Register, 80% Ar/20% $CO_2$, 3Y40S H5
- AWS D1.8/D1.8M, 75% Ar/25% $CO_2$, [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® 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% $CO_2$

**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% $CO_2$, 3YSA H10 (0.045" - 1/16" diameter electrodes, all positions)

## 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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 (630 MPa) | 97,000 (669 MPa) |
| Yield Strength (psi) | 81,000 (561 MPa) | 87,000 (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 $CO_2$

**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% $CO_2$, 3YSA H5 (0.045" - 1/16" diameters, flat position)
- ABS, 90% Ar/10% $CO_2$, 3YSA H5 (0.035" - 0.045" diameters, all position)
- AWS D1.8/D1.8M, 75% Ar/25% $CO_2$ [0.052" (1.4 mm) diameter]
- CWB, 75-95% Ar/Balance $CO_2$, E492C-6MJ-H4 (1.4 - 1.6 mm diameter)
- CWB, 75-95% Ar/Balance $CO_2$, 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)

## FabCOR® Element™ 70C6

**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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 ($CO_2$), 35-50 cfh (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% CO2, E492C-6M-H4

## FabCOR® F6

**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
- aluminized coated steels
- HVAC fabrication
- automotive and transportation
- thin-gauge steels

**Typical Weld Metal Chemistry:**

| | 80% Ar/20% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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) |

**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 $CO_2$

**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 0 M A
- CE Marked per CPR 305/2011

## 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

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 95% Ar/5% $O_2$ |
|---|---|---|
| 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 (634 MPa) | 85,000 (586 MPa) |
| Yield Strength (psi) | 81,000 (558 MPa) | 73,000 (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 $CO_2$, 95-99% Ar/Balance $O_2$

**Type of Current:** DCEP

**Approvals and Conformances:**
- AWS A5.28, E80C-Ni1 H4
- AWS A5.28M, E55C-Ni1 H4
- ASME SFA 5.28, E80C-Ni1 H4
- CWB, 75-95% Ar/Balance $CO_2$, 95% Ar/5% $O_2$, E55C-Ni1-H4

## 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% $CO_2$ | 98% Ar/2% $O_2$ |
|---|---|---|
| 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% $O_2$, 75% Ar/25% $CO_2$

**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% $CO_2$ , 98% Ar/2% $CO_2$, 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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 |

**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) |

**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 $CO_2$

**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 apllications
- 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) |

**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 $CO_2$

**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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 (814 MPa) | 128,000 (883 MPa) |
| Yield Strength (psi) | 105,000 (724 MPa) | 116,000 (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 $CO_2$

**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 $CO_2$, 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% $CO_2$ | 95% Ar/5% $O_2$ |
|---|---|---|
| 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 (731 MPa) | 105,000 (724 MPa) |
| Yield Strength (psi) | 98,000 (676 MPa) | 96,000 (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 $CO_2$, 95-99% Ar/Balance $O_2$

**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% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| 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 (676 MPa) | 107,000 (738 MPa) |
| Yield Strength (psi) | 90,000 (621 MPa) | 95,000 (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 $O_2$, 75-95% Ar/Bal $CO_2$

**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 |
| Carbon Steel | Flat & Horizontal | **E70T-1C** | FabCO® 11 | — | Dual Shield 111-RB | Select Super 70 |
| | | **E70T-1C/9C** | FabCO® RXR, FabCO® RX7, FabCO® 72, FabCO® TR-70 | Outershield® 70, Outershield® XLH-70, UltraCore® 70C | Dual Shield 700X | Select 71, Select 71A, Select 70TR |
| | | **E70T-1C/9C J** | FabCO® Premier 70 | — | — | — |
| | | **E70T-1C/9C/12C J** | FabCO® 70XHP | — | Dual Shield R-70 Ultra® | — |
| | | **E70T-1M/9M** | FabCO® 70XHP | — | — | Select 70TR, Select 97 |
| | | **E70T-2C** | FabCO® 73 | — | — | Select 72, Select Super 72 |
| | | **E70T-5CJ E70T-5MJ** | FabCO® 85, FabCO® 55 | UltraCore® 75C | Dual Shield T-75 | Select 75 |
| | All Position | **E71T-1M** | FabCO® Triple 7, FabCO® 711M | — | — | Select 710 |
| | | **E71T-1M/9M** | FabCO® Excel-Arc™ 71, FabCO® Hornet, 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 |
| | | **E71T-1M/9M/12M** | FabCO® XL-525, FabCO® 910 | UltraCore® 712A80, UltraCore® HD-12M | Dual Shield II 712X, Dual Shield II 70 Ultra® | Select 737 |
| | | **E71T-1M/9M/12M H4** | FabCO® 712M | UltraCore® 712A80-H, UltraCore® SR-12 | Dual Shield II 70T-12H4 | — |
| | | **E71T-1C** | FabCO® Triple 7, FabCO® 711M | — | Dual Shield 7100 Ultra® | Select 710 |
| | | **E71T-1C/9C** | FabCO® Excel-Arc™ 71, FabCO® Hornet, FabCO® Element™ E71T1C, FabCO® Triple 8 | UltraCore® 71A75 Dual | Dual Shield 7100 LC, Dual Shield 710X, Dual Shield 710X-M | Select 720A, Select 727 |
| | | **E71T-1C/9C/12C J** | FabCO® XL-550, FabCO® 771 | UltraCore® 712C, UltraCore® HD-12C | Dual Shield II 71 Ultra®, Dual Shield II 711X | — |
| Low-Alloy | Ni | **E80T1-Ni1C E80T1-Ni1M** | FabCO® 81N1 | — | — | Select 81-Ni1 |
| | | **E81T1-Ni1C** | FabCO® 811N1 | — | Dual Shield 810X-Ni1 | Select 810-Ni1, Select 820-Ni1 |
| | | **E81T1-Ni1C H4** | FabCO® 811N1 | UltraCore® 81Ni1C-H | — | — |
| | | **E81T1-Ni1M** | FabCO® 811N1 | — | Dual Shield 810X-Ni1 | Select 810-Ni1, Select 820-Ni1 |
| | | **E81T1-Ni1M H4** | FabCO® 811N1 | UltraCore® 81Ni1A75-H | Dual Shield 80-NiH4 | — |
| | | **E81T1-Ni2C** | FabCO® 811N2 | UltraCore® 81Ni2C-H | Dual Shield 8000-Ni2 | Select 810-Ni2, Select 820-Ni2 |
| | | **E81T1-Ni2M** | FabCO® 811N2 | UltraCore® 81Ni2A75-H | — | Select 810-Ni2, Select 820-Ni2 |
| | K | **E90T5-K2C** | FabCO® 95K2 | — | — | Select 95-K2 |
| | | **E90T5-K2M** | FabCO® 95K2 | — | — | — |
| | | **E91T1-K2C** | FabCO® 991K2 | Outershield® 91K2-H | Dual Shield II 90-K2 | Select 910-K2, Select 920-K2 |
| | | **E91T1-K2M** | FabCO® 991K2 | — | — | Select 910-K2, Select 920-K2 |
| | | **E100T1-K3C** | FabCO® 101K3 | — | — | Select 100-K3 |
| | | **E110T5-K3C** | FabCO® 115-K3 | — | — | Select 115 |
| | | **E110T5-K3M** | FabCO® 115-K3 | — | — | — |
| | | **E111T1-K3M** | FabCO® 110 | Pipeliner® G90M | Dual Shield II 110 | Select 111-K3M |
| | | **E110T5-K4C** | FabCO® 115 | — | Dual Shield T-115 | Select 115-K4 |
| | | **E120T5-K4C** | FabCO® 125K4 | — | — | Select 125-K4 |
| | B | **E81T1-B2C** | FabCO® 811B2 | Cormet® 1 | Dual Shield 8000-B2 | Select 810-B2 |
| | | **E81T5-B2M** | FabCO® XTREME™ B2 | — | — | — |
| | | **E91T1-B3C E91T1-B3M** | FabCO® 911B3 | Cormet® 2 | Dual Shield 9000-B3 | Select 910 B3 |
| | | **E91T5-B3M** | FabCO® XTREME™ B3 | — | — | — |
| | A | **E81T1-A1C** | 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 | **E70T-4** | Fabshield® 4 | Innershield® NS-3M | Coreshield® 40 | Select 74 |
| | **E70T-6** | Fabshield® XLNT-6 | Innershield® NR®-305 | Coreshield® 6 | — |
| | **E70T-7** | Fabshield® 7027 | Innershield® NR®-311<br>Innershield® NR®-FAB 70 | Coreshield® 7 | — |
| | **E71T1-8** | Fabshield® XLR-8 | Innershield® NR®-203 MP<br>Innershield® NR®-232<br>Innershield® NR®-233 | Coreshield® 8 | — |
| | **E71T-11** | Fabshield® 21B | Innershield® NR®-211MP<br>Innershield® NR®-212 | Coreshield® 11 | Select 701 |
| | **E71T-14** | Fabshield® 23 | Innershield® NR®-52 | Coreshield® 14 | Select 700GS |
| Low-Alloy | **E71T8-Ni1** | Fabshield® 71T8<br>Fabshield® 81N1 | Innershield® NR®-203<br>Nickel (1%) | Coreshield® 8-Ni1 H5 | — |
| | **E81T8-Ni2** | Fabshield® X80 | Pipeliner® 81M | — | — |
| | **E71T8-K6** | Fabshield® 71K6<br>Fabshield® Offshore 71Ni | Innershield® NR®-207<br>Pipeliner® NR®-207+ | — | — |

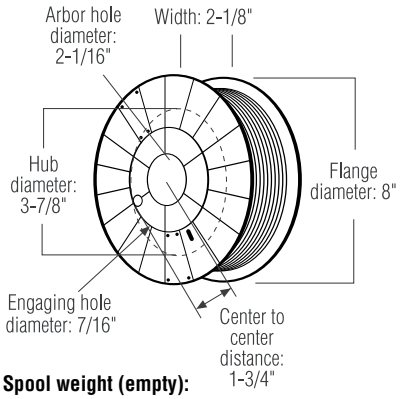
## Carbon-Steel & Low-Alloy Metal-Cored Electrodes

| AWS Classification | | Manufacturer | | | |
|---|---|---|---|---|---|
| | | Hobart Filler Metals | Lincoln Electric | ESAB | Select Arc |
| Carbon Steel | **E70C-6M** | FabCOR® 86R | Metalshield® MC®-6<br>Metalshield® MC®-706<br>Metalshield® MC®-710XL® | Coreweld® 70<br>Coreweld® C6 | Endurance<br>Select 70C-6<br>Select 70C-8<br>Select 70C-10<br>Select 70C-T |
| | **E70C-6M** | FabCOR® Edge | — | Coreweld® 77-HS | Select 70C-6LS |
| | **E70C-3C** | FabCOR® 702 | — | — | — |
| | **E70C-GS** | FabCOR® F6 | Metalshield® Z | — | — |
| Low-Alloy | **E80C-Ni1** | FabCOR® Edge Ni1 | Metalshield® MC®-80Ni1 | Coreweld® 80C-Ni1<br>Coreweld® 88HS Ni1 | Select 80C-Ni1<br>Select 80C-Ni1LS |
| | **E80C-Ni2** | FabCOR® 80N2 | — | — | Select 80C-Ni2 |
| | **E90C-K3** | FabCOR® 90 | Metalshield® MC®-90 | — | Select 90C-M2 |
| | **E110C-K3** | FabCOR® 100 | — | Coreweld® 110 | — |
| | **E110C-K4** | FabCOR® 1100 | Metalshield® MC®-110 | — | Select 110C-M2 |
| | **E90C-D2** | FabCOR® 80D2<br>FabCOR® Edge™ D2 | — | — | Select 80C-D2 |

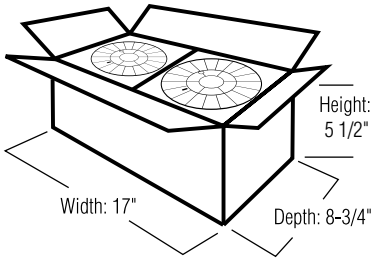
# Tubular Wires

## 10-lb. Spool

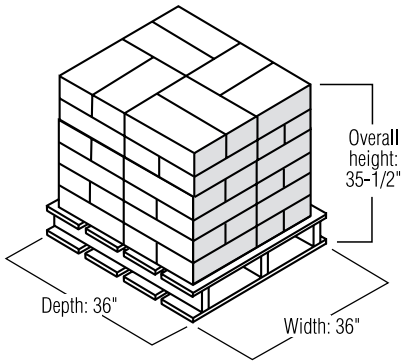
- Color-coded labels for easy wire identification
- Colorful packaging–great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection




**Spool weight (empty): 0.8 lbs.**



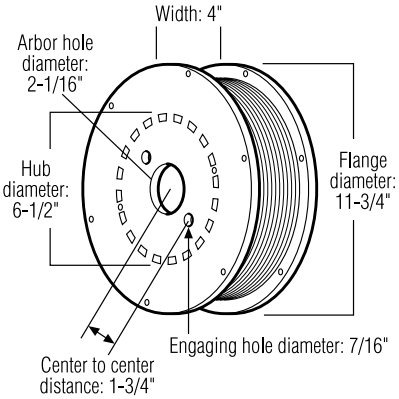

*Weight:* 40 lbs.
*Spools per master carton:* 4



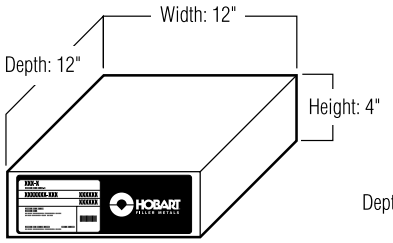

*Weight:* 1,920 lbs. net, 2,115 lbs. gross
*Stacking sequence:* 4 wide, 4 deep and 6 high
*Master cartons per pallet:* 48
*Spools per pallet:* 192

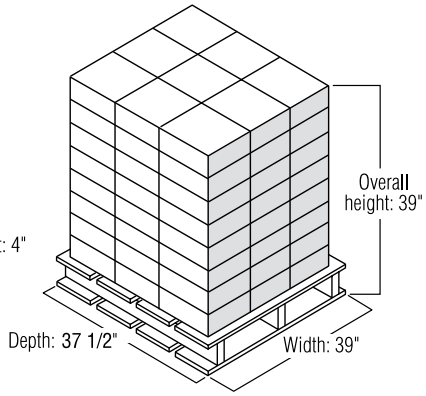
## 33-lb. Spool

- 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.**

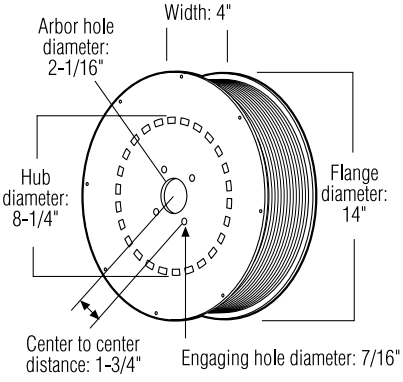


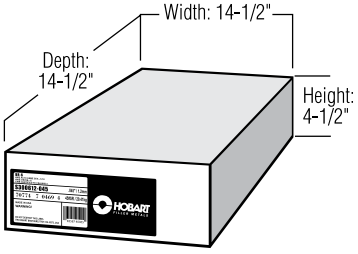

*Weight:* 2,376 lbs. net, 2,645 lbs. gross (est.)
*Stacking sequence:* 3 wide, 3 deep and 8 high
*Spools per pallet:* 72

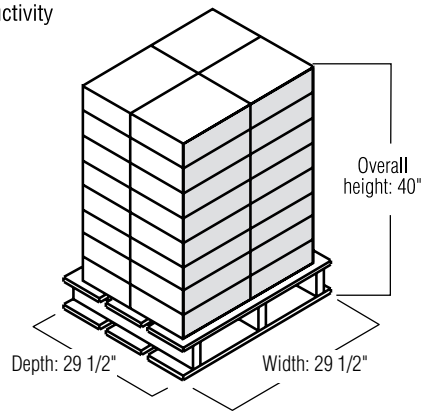
## 50-lb. Spool

- 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.**

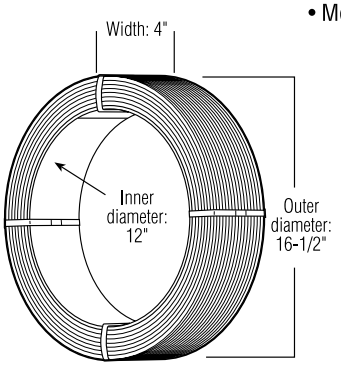


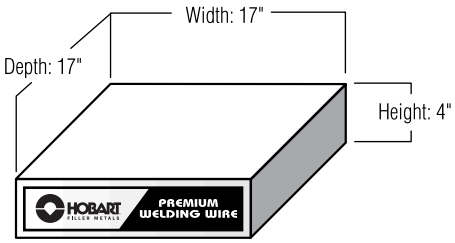

*Weight:* 1,600 lbs. net, 1770 lbs. gross (est.)
*Stacking sequence:* 2 wide, 2 deep and 8 high
*Spools per pallet:* 32

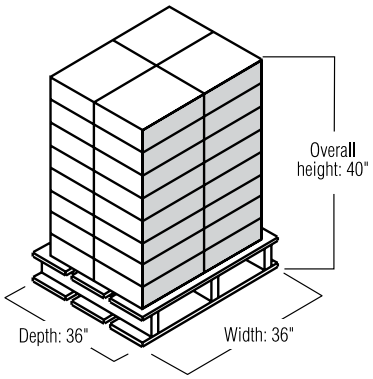
## 60-lb. Coil

- 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.

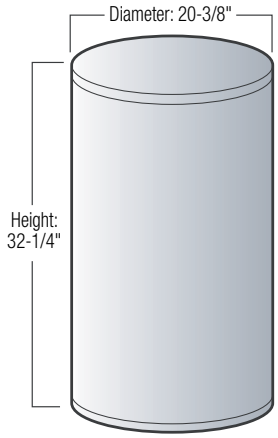


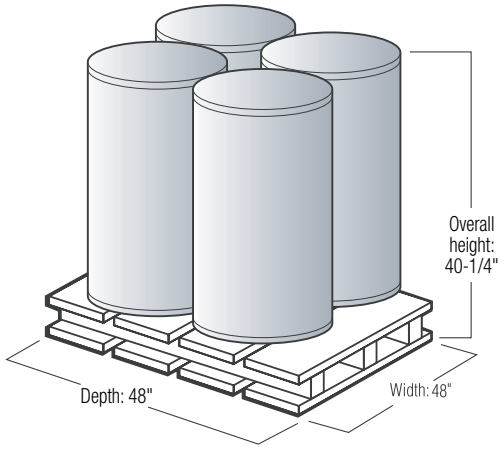

*Weight:* 1,920 lbs. net, 1,987 lbs. gross (est.)
*Stacking sequence:* 2 wide, 2 deep and 8 high
*Spools per pallet:* 32

## 500-lb. 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



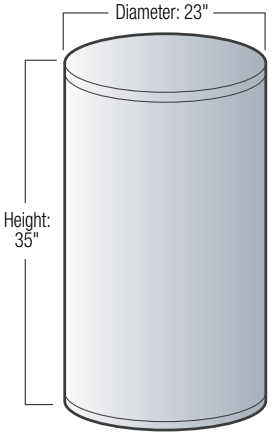

*Drum weight (empty):* 19 lbs.



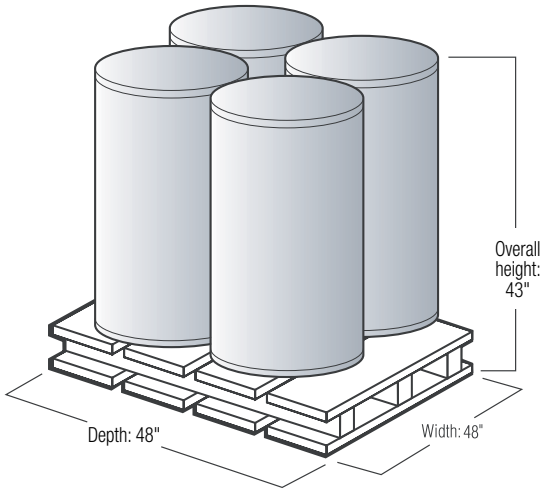

*Weight:* 2,000 lbs. net, 2,050 lbs. gross (est.)
*Drums per pallet:* 4

## 750-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




*Drum weight (empty):* 20 lbs.




*Weight:* 3,000 lbs. net, 3,050 lbs. gross (est.)

# 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:

$$W = \frac{D}{(1-L)}$$

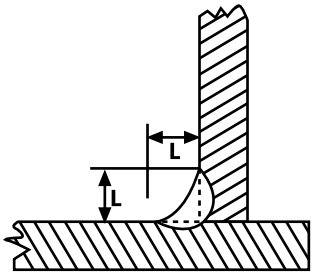
Where:

***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 x Length of groove x 0.283) + Reinforcement (if applicable)]

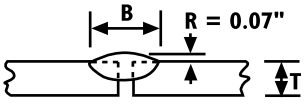
***Table data for square and V-groove joints are based on the efficiency of stick electrodes. To calculate for flux-cored wires, divide D by .80; for solid wire, divide D by .90.***

**HORIZONTAL FILLET WELD**



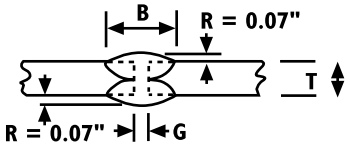

| Size of fillet L (in inches) | Steel deposited per linear foot of weld (lb.) | Pounds of wires required per linear foot of weld (approx.) | | |
|---|---|---|---|---|
| | | *Stick* (SMAW)* | *Flux-Cored (FCAW)* | *Solid (GMAW)* |
| 1/8 | 0.027 | .049 | .034 | .03 |
| 3/16 | 0.063 | .114 | .079 | .07 |
| 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 |

**SQUARE GROOVE BUTT JOINT**
**...welded one side**



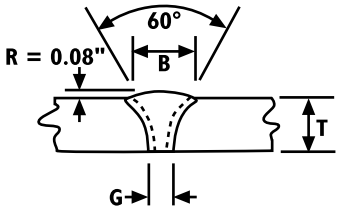

**...welded two sides**

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).




| 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 |

**"V" GROOVE BUTT JOINT**




| 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.

| 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 |
| $in^2$ | $mm^2$ | 645.2 |
| $mm^2$ | $in^2$ | .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 710M

FLAT & HORIZONTAL

**AWS E70C-6M H4**

**EN 17632-A: T 46 6 M M 1 H5**

This metal-cored wire for carbon steel application offers excellent impact toughness properties down to -40 Fahrenheit. It minimizes the risk of hydrogen cracking, even after considerable atmospheric exposure.

**Benefits:**

- provides consistent chemical and mechanical properties
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- provides excellent low temp (-50F) CVN values

**Typical Applications:**

- automatic and mechanized welding
- heavy equipment
- process piping
- root pass welding on pipe

**Typical Weld Metal Chemistry:**

| | 80% Ar/20% $CO_2$ |
|---|---|
| Carbon | 0.04 |
| Manganese | 1.48 |
| Silicon | 0.65 |
| Phosphorus | 0.008 |
| Sulphur | 0.008 |

**Typical Diffusible Hydrogen:**

3.1 mL/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 85,000 (586 MPa) |
| Yield Strength (psi) | 75,000 (517 MPa) |
| Elongation % 2" (50mm) | 27% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 85 ft.lb. (115J) |
| Avg. at -40°F (-40°C) | 65 ft.lb. (88J) |
| Avg. at -50°F (-46°C) | 65 ft.lb. (88J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 0.045" (1.2 mm) | 200-375 | 25-30 | 5/8" (16 mm) |
| 1/16" (1.6 mm) | 250-500 | 27-34 | 1" (25 mm) |

**Shielding Gas:** 75-95% Argon/Balance $CO_2$

**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, 75-80% Ar/Balance $CO_2$, E491C-6M H4
- DNV, 75-80% Ar/Balance $CO_2$, V Y46MS(H5), 100% $CO_2$, III Y40MS(H5)
- EN 17632-A: T 46 6 M M 1 H5
- Lloyd's Register, 82% Ar/18% $CO_2$, 5Y48S H5, 100% $CO_2$, 3Y40S H5

## MEGAFIL 240M

FLAT & HORIZONTAL

**AWS E80C-Ni1 H4**

Great for root pass welding on higher strength pipe (x70), this wire is designed for welding low alloy steels with around a 1% nickel deposit and applications where low-temperature toughness is required. It can also be used in some weathering steel applications where color match is not critical. It minimizes the risk of hydrogen cracking, even after considerable atmospheric exposure.

**Benefits:**

- provides consistent chemical and mechanical properties
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- great for root pass welding on higher strength pipe (x70)

**Typical Applications:**

- automatic and mechanized welding
- heavy equipment
- storage vessels

**Typical Weld Metal Chemistry:**

| | 80% Ar/20% $CO_2$ | 95% Ar/5% $O_2$ |
|---|---|---|
| Carbon | 0.04 | 0.05 |
| Manganese | 1.23 | 0.97 |
| Silicon | 0.50 | 0.44 |
| Phosphorus | 0.005 | 0.005 |
| Sulphur | 0.014 | 0.017 |

**Typical Diffusible Hydrogen:**

1.5 mL/100g 1.6 mL/100g

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 90,700 (625 MPa) | 86,000 (593 MPa) |
| Yield Strength (psi) | 78,700 (543 MPa) | 79,000 (544 MPa) |
| Elongation % 2" (50mm) | 27% | 25% |

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

| | | |
|---|---|---|
| Avg. at -50°F (-45°C) | 62 ft.lb (84J) | 60 ft.lb. (81J) |
| Avg. at -76°F (-60°C) | 51 ft.lb (69J) | 45 ft.lb. (61J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 0.045" (1.2 mm) | 175-350 | 25-29 | 5/8" (16 mm) |

**Shielding Gas:** 75-95% Argon (Ar)/Balance ($CO_2$), 95-99% Argon (Ar)/Balance Oxygen ($O_2$)

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.28, E80C-Ni1 H4
- AWS A5.28M, E55C-Ni1 H4
- ASME SFA 5.28, E80C-Ni1 H4

## MEGAFIL 1100M

FLAT & HORIZONTAL

**AWS E120C-K4 H4**

Suitable for 120 ksi Quench & Temper (Q&T), this 120,000-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. Diffusible hydrogen levels will be less than 4 millimeters/100 grams of deposited weld metal giving it more resistance to cracking.

**Benefits:**

- provides consistent chemical and mechanical properties
- minimizes risk of hydrogen cracking, even after considerable atmospheric exposure
- suitable for 120 KSI Quench & Temper (Q & T) and High-Strength Low-Alloy (HSLA) steels

**Typical Applications:**

- automatic and mechanized welding
- heavy equipment
- offshore fabrication
- Q & T and HSLA steels

**Typical Weld Metal Chemistry:**

| | 80% Ar/20% $CO_2$ |
|---|---|
| Carbon | 0.07 |
| Manganese | 1.31 |
| Silicon | 0.29 |
| Phosphorus | 0.008 |
| Sulphur | 0.007 |

**Typical Diffusible Hydrogen:**

2.52 mL/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 139,000 (958 MPa) |
| Yield Strength (psi) | 128,000 (883 MPa) |
| Elongation % 2" (50mm) | 18% |

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

Avg. at -60°F (-50°C) 32 ft.lb. (43J)

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 0.045" (1.2 mm) | 200-350 | 25-30 | 3/4" (19 mm) |

**Shielding Gas:** 75-80% Argon (Ar)/Balance ($CO_2$)

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.28, E120C-K4 H4
- AWS A5.28M, E83C-K4 H4
- ASME SFA 5.28, E120C-K4 H4
- ISO 18276: T 89 4 Mn2NiCrMo M M 1 H5

## 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 propogation
- 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% $CO_2$ | | |
|---|---|---|---|
| Carbon | 0.05 | Phosphorus | 0.010 |
| Manganese | 1.47 | Sulphur | 0.010 |
| Silicon | 0.36 | | |

**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) |
| 0.052" (1.4 mm) | 150-300 | 23-27 | 3/4" (19 mm) |

**Shielding Gas:** 75-85% Argon (Ar) / Balance Carbon Dioxide ($CO_2$)

**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% $CO_2$, 5YQ550SA H5
- DNV, 82% Ar/18% $CO_2$, V Y55MS
- Lloyd's Register, 82% Ar/18% $CO_2$, 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% $CO_2$ | | 100% $CO_2$ |
|---|---|---|---|
| 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 (607 MPa) | 86,000 (593 MPa) |
| Yield Strength (psi) | 81,000 (558 MPa) | 79,000 (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 ($CO_2$), 75-80% Argon (Ar)/Balance Carbon Dioxide ($CO_2$)

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20: E71T-1M J H4, E71T-1C H4, E71T-9M J H4, E71T-9C H4, E71T-12M J H4, E71T-12C H4E80C-Ni2 H4
- AWS A5.20M, E491T-1MJ H4, E491T-1C H4, E491T-9MJ H4 E491T-9C H4, E491T-12MJ H4, E491T-12C H4,
- ASME SFA 5.20, E71T-1M J H4, E71T-1C H4, E71T-9M J H4, E71T-9C H4, E71T-12M J H4, E71T-12C H4E80C-Ni2 H4
- CWB, 100% $CO_2$, E491T-9C-H4, 75-80% Ar/ Balance $CO_2$, E491T-9M-H4
- DNV, 100% $CO_2$, IV Y40MS(H5), 75-80% Ar/ Balance $CO_2$, IV Y40MS(H5)
- Lloyd's Register, 100% $CO_2$, 3Y40S H5, 82%Ar/18%$CO_2$, 3Y40S H5

# 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% $CO_2$ | 100% $CO_2$ |
|---|---|---|
| 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 (607 MPa) | 82,000 (565 MPa) |
| Yield Strength (psi) | 81,000 (558 MPa) | 74,000 (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 ($CO_2$), 100% ($CO_2$)

**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 110

**EN ISO 14174: S A AB 1 67 AC H5**
This multipurpose flux can be applied in a variety of industries and its wide parameter window allows the use of high productivity procedures with optimal performance. Excellent slag removal minimizes clean-up time and risk of inclusion. Moisture-proof packaging eliminates the need to re-dry unopened product. The carefully chosen formula provides excellent weldability and good bead appearance.

**Benefits:**
- carefully chosen formula provides excellent weldability and good bead appearance
- wide parameter window allows the use of high productivity procedures with optimal performance
- suitable for use in a wide range of industries and applications
- provides excellent slag removal, minimizing clean-up time and risk of inclusion
- moisture-proof packaging eliminates the need to re-dry unopened product

**Typical Applications:**
- general fabrication
- structural fabrication
- shipbuilding
- storage vessels

**Flux Type:**
Agglomerated aluminate-basic flux

**Basicity Index (Boniszewski):** 1.4

**Alloy Transfer:** Slightly Si & Mn Alloying

**AWS Wall Neutrality Number:** 21 (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:**
$Al_2O_3$ + MnO ..... ~35%
CaO + MgO..... ~25%
$SiO_2$ + $TiO_2$..... ~20%
$CaF_2$..... ~15%

**Packaging Available:**
- 55 lb. (25 kg) EAE Bag

## 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:**
$Al_2O_3$ + MnO ..... ~35%
CaO + MgO..... ~25%
$SiO_2$ + $TiO_2$..... ~20%
$CaF_2$..... ~20%

**Packaging Available:**
- 55 lb. (25 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:**
$Al_2O_3$ + MnO ..... ~20%
CaO + MgO..... ~35%
$SiO_2$ + $TiO_2$..... ~15%
$CaF_2$..... ~25%

**Packaging Available:**
- 50 lb. (22 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:**
$Al_2O_3$+ MnO ..... ~20%
CaO + MgO..... ~35%
$SiO_2$ + $TiO_2$..... ~15%
$CaF_2$..... ~25%

**Packaging Available:**
- 55 lb. (25 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:**
$Al_2O_3$ + $TiO_2$ ..... ~60%
CaO + MgO + CaF ..... ~20%
$SiO_2$ ..... ~5%
MnO + FeO ..... ~15%

**Packaging Available**
- 55 lb. (25 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:**
$Al_2O_3$ + $TiO_2$ ..... ~35%
CaO + MgO + CaF ..... ~38%
$SiO_2$ ..... ~10%
MnO + FeO ..... ~15%

**Packaging Available**
- 55 lb. (25 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 psi | (MPa) | Min. yield strength psi | (MPa) | Elongation, Min. % |
|---|---|---|---|---|---|
| 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 °F | (°C) | Min. Absorbed Energy, Charpy V-Notch 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 desposit 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 110 | SWX 120 | SWX 150 | SWX 160 |
| SDX S2Si-EM12K | F7A2-EM12K | F7A4-EM12K | F7A4-EM12K | F7A6-EM12K | F7A6-EM12K | - |
| SDX S2Si-EM12K | - | F7P5-EM12K | F7P6-EM12K | F7P8-EM12K | F7P8-EM12K | - |
| SDX EM13K | - | F7A4-EM13K | F7A4-EM13K | F7A4-EM13K | F7A4-EM13K | - |
| SDX EM13K | - | F7P4-EM13K | F7P4-EM13K | F7P8-EM13K | F7P8-EM13K | - |
| SDX S3Si-EH12K | - | - | F7A6-EH12K | F7A6-EH12K | F7A8-EH12K | F7A8-EH12K |
| SDX S3Si-EH12K | - | - | F7P6-EH12K | - | F7P8-EH12K | F7P8-EH12K |
| SubCOR™ EM12K-S | F7A2-EC1 | F7A6-EC1 | F7A4-EC1 | F7A6-EC1 | F7A4-EC1 | - |
| SubCOR™ EM12K-S | - | - | F6A4-EC1 | F6P8-EC1 | - | - |
| SubCOR™ EM13K-S | F7A4-EC1 H8 | F7A8-EC1 H8 | F7A6-EC1 | F7A8-EC1 H8 | F7A8-EC1 | - |
| SubCOR™ EM13K-S | - | F7P8-EC1 H8 | F7P6-EC1 | F7P8-EC1 H8 | F6P8-EC1 | - |
| SubCOR™ EM13K-S MOD | - | F7A8-EC1 H8 | F7A6-EC1 H8 | F7A8-EC1 | F7A8-EC1 | - |
| SubCOR™ EM13K-S MOD | - | F7P4-EC1 H8 | F7P6-EC1 H8 | F7P8-EC1 | F7P8-EC1 | - |
| SubCOR™ SL 731 | - | - | F7A6-ECG | F7A8-ECG | - | - |
| | | | F7A8-ECG | F7P10-ECG | | |

| Wire/Flux Combination Classifications (EN ISO 14171-A) | | | |
|---|---|---|---|
| Wire Trade Name | Flux Trade Name | | |
| | SWX 110 | SWX 120 | SWX 150 |
| SDX S2 | S 38 4 AB S2 | S 38 5 AB S2 | S 38 5 FB S2Si |
| SDX S2Si-EM12K | S 38 4 AB S3Si | S 38 5 AB S2Si | - |
| SDX S3Si-EH12K | S 42 4 AB S3Si | - | S 46 6 FB S3Si |
| SDX S3Si-EH12K | S 3T 2 AB S3Si | - | - |
| SubCOR™ SL 731 | S 46 4 AB T3 | 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 S1-EL12 | SWX 110 | | | | | | | X | X |
| SDX S2Si-EM12K | SWX 110 | 4YM | | 4YM | | F49A4-EM12K-H8 | X | X | X |
| 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 110 | | | | | F49A6-EH12K-H8 | | | 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 110 | | | | F49A6-EC1-H8 | | | X | |
| 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 110 | | | | | | | | X |
| 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 110, 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 110 | F7A4-EM12K | F7P6-EM12K |
| SWX 120 | F7A6-EM12K | F7P8-EM12K |
| SWX 150 | F7A6-EM12K | F7P8-EM12K |

**Typical Weld Metal Chemistry:**

| | HA-495 | SWX 110 | SWX 150 |
|---|---|---|---|
| Carbon | 0.09 | 0.06 | 0.07 |
| Manganese | 1.50 | 1.36 | 0.93 |
| Silicon | 0.59 | 0.34 | 0.20 |
| Phosphorus | 0.023 | 0.015 | 0.013 |
| Sulphur | 0.018 | 0.012 | 0.009 |
| Copper | 0.22 | 0.18 | 0.17 |

**Typical Mechanical Properties (AW/PWHT):**

| | HA-495 | SWX 110 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 94/-- ksi | 82/78 ksi | 77/74 ksi |
| Yield Strength | 84/-- ksi | 71/64 ksi | 68/61 ksi |
| Elongation in 2" | 22%/-- | 29/29% | 31/ 32% |
| Tensile Strength | 648/-- MPa | 565/538 MPa | 531/510 MPa |
| Yield Strength | 579/-- MPa | 490/441 MPa | 469/421 MPa |
| Elongation in 50 mm | 22/-- % | 29/29% | 31/32% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | HA-495 | SWX 110 | SWX 150 |
|---|---|---|---|
| Avg. at -20°F | 30/-- ft-lbs | | |
| Avg. at -40°F | | 45/-- ft-lbs | |
| Avg. at -60°F | | --/50 ft-lbs | 90/-- ft-lbs |
| Avg. at -80°F | | | --/55 ft-lbs |
| Avg. at -30°C | 41/-- J | | |
| Avg. at -40°C | | 61/-- J | |
| Avg. at -50°C | | --/68 J | 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 110, SWX 120, SWX 150

**AWS A5.17 Wire/Flux Classifications:**

| | As-Welded (AW) | Stress-Relieved (PWHT) |
|---|---|---|
| HN-590 | F7A4-EM13K | F7P4-EM13K |
| SWX 110 | F7A4-EM13K | F7P4-EM13K |
| SWX 120 | F7A4-EM13K | F7P8-EM13K |
| SWX 150 | F7A4-EM13K | F7P8-EM13K |

**Typical Weld Metal Chemistry:**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Carbon | 0.06 | 0.06 | 0.07 |
| Manganese | 1.36 | 1.31 | 0.93 |
| Silicon | 0.34 | 0.17 | 0.18 |
| Phosphorus | 0.015 | 0.014 | 0.013 |
| Sulphur | 0.012 | 0.010 | 0.007 |
| Copper | 0.17 | 0.18 | 0.17 |

**Typical Mechanical Properties (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 82/78 ksi | 78/78 ksi | 77/74 ksi |
| Yield Strength | 71/64 ksi | 66/64 ksi | 68/61 ksi |
| Elongation in 2" | 29/29% | 27/28% | 31/32% |
| Tensile Strength | 565/538 MPa | 538/538 MPa | 531/510 MPa |
| Yield Strength | 490/441 MPa | 455/441 MPa | 469/421 MPa |
| Elongation in 50 mm | 29/29% | 27/28% | 31/32% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Avg. at -40°F | 45/-- ft-lbs | | |
| Avg. at -60°F | 20/50 ft-lbs | 75/55 ft-lbs | 90/65 ft-lbs |
| Avg. at -80°F | | 40/45 ft-lbs | 25/55 ft-lbs |
| Avg. at -40°C | 61/-- J | | |
| Avg. at -50°C | 27/68 J | 102/5 J | 122/88 J |
| Avg. at -60°C | | 54/61 J | 34/75 J |

**Standard Diameters:**
5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

## SDX 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 110, SWX 120, SWX 150, SWX 160

**AWS A5.17 Wire/Flux Classifications:**

| | As-Welded (AW) | Stress-Relieved (PWHT) |
|---|---|---|
| SWX 110 | F7A6-EH12K | F7P6-EH12K |
| SWX 120 | F7A6-EH12K | |
| SWX 150 | F7A8-EH12K | F7P8-EH12K |
| SWX 160 | F7A8-EH12K | F7P8-EH12K |

**Typical Weld Metal Chemistry:**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Carbon | 0.07 | 0.07 | 0.08 |
| Manganese | 1.73 | 1.72 | 1.45 |
| Silicon | 0.46 | 0.27 | 0.35 |
| Phosphorus | 0.014 | 0.014 | 0.011 |
| Sulphur | 0.004 | 0.004 | 0.004 |
| Copper | 0.07 | 0.07 | 0.07 |

**Typical Mechanical Properties (AW / PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 88/83 ksi | 84/-- ksi | 83/80 ksi |
| Yield Strength | 76/67 ksi | 73/-- ksi | 74/65 ksi |
| Elongation in 2" | 27/28% | 30/--% | 31/31% |
| Tensile Strength | 607/572 MPa | 579/-- MPa | 572/552 MPa |
| Yield Strength | 524/462 MPa | 503/--MPa | 510/448 MPa |
| Elongation in 50 mm | 27/28% | 30/--% | 31/31% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Avg. at -60°F | 50/-- ft-lbs | 50/-- ft-lbs | 190/-- ft-lbs |
| Avg. at -80°F | --/55 ft-lbs | 35/40 ft-lbs | 120/215 ft-lbs |
| Avg. at -50°C | 68/-- J | 68/-- J | 258/-- J |
| Avg. at -60°C | --/75 J | 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 110 | F7A4-EC1 | F6A4-EC1 |
| SWX 120 | F7A6-EC1 | F6P8-EC1 |
| SWX 150 | F7A4-EC1 | |

**Typical Weld Metal Chemistry:**

| | HA-495 | HN-590 | SWX 110 |
|---|---|---|---|
| Carbon | 0.05 | 0.07 | 0.04 |
| Manganese | 1.20 | 1.39 | 1.18 |
| Silicon | 0.56 | 0.33 | 0.31 |
| Phosphorus | 0.020 | 0.020 | 0.015 |
| Sulphur | 0.010 | 0.010 | 0.008 |
| Copper | 0.06 | 0.07 | 0.06 |

**Typical Mechanical Properties (AW/PWHT):**

| | HA-495 | HN-590 | SWX 110 |
|---|---|---|---|
| Tensile Strength | 85/-- ksi | 79/-- ksi | 71/69 ksi |
| Yield Strength | 76/-- ksi | 68/-- ksi | 59/54 ksi |
| Elongation in 2" | 26/--% | 28/--% | 29/34% |
| Tensile Strength | 586/-- MPa | 545/-- MPa | 490/476 MPa |
| Yield Strength | 524/-- MPa | 524/-- MPa | 407/372 MPa |
| Elongation in 50 mm | 26/--% | 28/--% | 29/34% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | HA-495 | SWX 110 | SWX 150 |
|---|---|---|---|
| Avg. at -20°F | 20/-- ft-lbs | | |
| Avg. at -40°F | | | 45/85 ft-lbs |
| Avg. at -60°F | | 50/-- ft-lbs | 25/35 ft-lbs |
| Avg. at -30°C | 27/-- J | | |
| Avg. at -40°C | | | 61/115 J |
| Avg. at -50°C | | 68/-- J | 34/47 J |
| Avg. at -60°C | | | |

**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 110, 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 110 | F7A6-EC1 | F7P6-EC1 |
| SWX 120 | F7A8-EC1 H8 | F7P8-EC1 H8 |
| SWX 150 | F7A8-EC1 | F6P8-EC1 |

**Typical Weld Metal Chemistry:**

| | HA-495 | SWX 110 | SWX 120 |
|---|---|---|---|
| Carbon | 0.06 | 0.06 | 0.08 |
| Manganese | 1.44 | 1.20 | 1.36 |
| Silicon | 0.57 | 0.28 | 0.32 |
| Phosphorus | 0.020 | 0.014 | 0.014 |
| Sulphur | 0.013 | 0.010 | 0.012 |
| Copper | 0.07 | 0.06 | 0.06 |

**Typical Mechanical Properties (AW/PWHT):**

| | HA-495 | SWX 110 | SWX 120 |
|---|---|---|---|
| Tensile Strength | 84/-- ksi | 77/73 ksi | 76/73 ksi |
| Yield Strength | 72/-- ksi | 64/64 ksi | 65/60 ksi |
| Elongation in 2" | 28% | 28/32% | 30/32% |
| Tensile Strength | 579/-- MPa | 531/503 MPa | 524/503 MPa |
| Yield Strength | 496/-- MPa | 441/441 MPa | 448/414 MPa |
| Elongation in 50 mm | 28/--% | 28/32% | 30/32% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | HA-495 | SWX 110 | SWX 120 |
|---|---|---|---|
| Avg. at -40°F | 60/-- ft-lbs | | |
| Avg. at -80°F | | 95/260 ft-lbs | 80/140 ft-lbs |
| Avg. at -40°C | 81/-- J | | |
| Avg. at -60°C | | 129/353 J | 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 110, SWX 120, SWX 150

**AWS A5.17 Wire/Flux Classifications:**

| | As-Welded (AW) | Stress-Relieved (PWHT) |
|---|---|---|
| HN-590 | F7A8-EC1 H8 | |
| SWX 110 | F7A6-EC1-H8 | F7P6-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 |

## SubCOR™ SL 731

**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:**

**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 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Carbon | 0.04 | 0.04 | 0.05 |
| Manganese | 1.78 | 1.85 | 1.55 |
| Silicon | 0.51 | 0.40 | 0.48 |
| Phosphorus | 0.012 | 0.011 | 0.009 |
| Sulphur | 0.006 | 0.005 | 0.003 |
| Copper | 0.07 | 0.07 | 0.08 |

**Typical Mechanical Properties (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 86/80 ksi | 88/79 ksi | 86/80 ksi |
| Yield Strength | 73/65 ksi | 77/65 ksi | 75/66 ksi |
| Elongation in 2" | 28/32% | 29/33% | 29/31% |
| Tensile Strength | 592/551 MPa | 606/544 MPa | 592/551 MPa |
| Yield Strength | 503/448 MPa | 530/448 MPa | 517/455 MPa |
| Elongation in 50 mm | 28/32 % | 29/33% | 29/31% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Avg. at -60°F | 57/-- ft-lbs | | 118/-- ft-lbs |
| Avg. at -80°F | 15/90 ft-lbs | 87/98 ft-lbs | 46/103 ft-lbs |
| Avg. at -100°F | --/76 ft-lbs | 76/97 ft-lbs | --/84 ft-lbs |
| Avg. at -50°C | 77/-- J | | |
| Avg. at -60°C | 20/122 J | 118/132 J | 160/ - J |
| Avg. at -70°C | --/103 | 103/131 J | 62/39 J |

**Standard Diameters:**
3/32" (2.4 mm), 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: **F 8 A 10 - EC M2 - 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 |

**Impact toughness properties**

| | Temperature °F | (°C) | Min. Absorbed Energy, Charpy V-Notch 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)** |
| 15 | -150 | (-101) | 20 | (27) |
| Z | No requirements | | | |

**Heat treatment**

| | |
|---|---|
| A | As welded |
| P | Post weld heat treated (PWHT) — time and temperature varies by alloy |

**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 |

## Wire/Flux Combination Classifications (AWS A5.23)

| Wire Trade Name | Flux Trade Name | | | | | |
|---|---|---|---|---|---|---|
| | HA-495 | HN-590 | SWX 110 | SWX 120 | SWX 150 | SWX 160 |
| SDX S3Ni1Mo0.2-ENi5 | | F8A4-ENi5-Ni5 | F8A6-ENi5-Ni5 | F8A8-ENi5-Ni5 | F8A8-ENi5-Ni5 | |
| SDX S3Ni1Mo0.2-ENi5 | | | F8P6-ENi5-Ni5 | F8P8-ENi5-Ni5 | F8P6-ENi5-Ni5 | |
| 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™ F2-S | | F9A8-ECF2-F2 | | F9A8-ECF2-F2 | F10A10-ECF2-F2 | |
| SubCOR™ F2-S | | F9P6-ECF2-F2 | | F9P6-ECF2-F2 | F10P10-ECF2-F2 | |
| SubCOR™ SL 741 | | | | | | |
| SubCOR™ SL 741 | | | | | | |
| 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 | | | | | F11AB-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 110 | SWX 120 | SWX 150 | SWX 160 |
| SDX S3Ni1Mo0.2-ENi5 | 14171-A | S 50 4 AB S3Ni1Mo0.2 | - | S 46 6 FB S2Ni1Mo0.2 | - |
| SDX S3NiMo-EF3 | 14171-A | - | - | S 62 6 FB S3Ni1Mo | - |
| SubCOR™ SL 741 | 26304-A | - | - | S 55 6 FB T3 Ni1Mo | - |
| 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 |
| SDX S3NiMo0.2-ENi5 | SWX 150 | | | | | | | X |
| SubCOR™ 120-S | SWX 150 | F11A10-ECM4-M4 | | | | | | |
| SubCOR™ 92-S | SWX 150 | | | 4Y400M H10 (SW+TM)<br>4YT H10 (SW+TM) | 3YM, 3YT<br>3YM, 3YT | | | |
| 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 741 | SWX 150 | | | | | | | X |
| SubCOR™ SL 742 | SWX 150 | 5YQ690M H5 | A 5Y69M H5 | 6Y65 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 S3Ni1Mo0.2-ENi5

**AWS A5.23: ENi5**
**EN ISO 14174: S3Ni1Mo0.2**

Ideal for submerged arc welding, this copper-coated, low-alloy, solid wire with nominal nickel-molybdenum composition provides good low-temperature toughness and is suitable for welding many high-strength low-alloy (HSLA).

**Benefits:**

- nominal 1% Ni / 0.25% Mo composition is suitable for welding a wide range of high-strength low-alloy steels, and provides good impact toughness for demanding service conditions
- copper coated for optimal consistency of electrode feeding and electrical transfer

**Typical Applications:**

- offshore structures
- heavy equipment
- pressure vessels
- welding HSLA steels with impact toughness requirements down to -60°C (-76°F)

**Recommended Fluxes:**
HN-590, SWX 110, SWX 120, SWX 150

**AWS A5.23 Wire / Flux Classifications:**

| | As-Welded (AW) | Stress-Relieved (PWHT) |
|---|---|---|
| HN-590 | F8A4-ENi5-Ni5 | |
| SWX 110 | F8A6-ENi5-Ni5 | F8P6-ENi5-Ni5 |
| SWX 120 | F8A8-ENi5-Ni5 | F8P8-ENi5-Ni5 |
| SWX 150 | F8A6-ENi5-Ni5 | F8P6-ENi5-Ni5 |

**Typical Weld Metal Chemistry:**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Carbon | 0.06 | 0.05 | 0.06 |
| Manganese | 1.66 | 1.69 | 1.35 |
| Silicon | 0.46 | 0.27 | 0.31 |
| Phosphorus | 0.013 | 0.012 | 0.011 |
| Sulphur | 0.004 | 0.003 | 0.002 |
| Copper | 0.06 | 0.06 | 0.06 |
| Nickel | 0.80 | 0.83 | 0.82 |
| Molybdenum | 0.18 | 0.19 | 0.19 |

**Typical Mechanical Properties (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 97/92 ksi | 92/88 ksi | 90/88 ksi |
| Yield Strength | 88/80 ksi | 83/76 ksi | 82/77 ksi |
| Elongation in 2" | 25/27% | 26/26% | 26/28% |
| Tensile Strength | 669/634 MPa | 634/607 MPa | 565/531 MPa |
| Yield Strength | 607/552 MPa | 572/524 MPa | 565/531 MPa |
| Elongation in 50 mm | 25/27% | 26/26% | 26/28% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | SWX 110 | SWX 120 | SWX 150 |
|---|---|---|---|
| Avg. at -40°F | 60/-- ft-lbs | 85/85 ft-lbs | |
| Avg. at -60°F | 35/35 ft-lbs | 65/60 ft-lbs | |
| Avg. at -80°F | | 85/50 ft-lbs | 145/130 ft-lbs |
| Avg. at -40°C | 81/-- J | 115/115 J | |
| Avg. at -50°C | 47/47 J | 88/81 J | |
| Avg. at -60°C | | 115/68 J | 197/176 J |

**Standard Diameters:**
3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

## 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 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), 5/32" (4.0 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-temperate 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 110, 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 110 | F7A8-ECNi1-Ni1 | |
| SWX 120 | F7A10-ECNi1-Ni1 | |
| SWX 150 | F7A8-ECNi1-Ni1 | F7P10-ECNi1-Ni1 |

## SubCOR™ 92-S

### Typical Weld Metal Chemistry:

| | HN-590 | SWX 110 | SWX 150 |
|---|---|---|---|
| Carbon | 0.06 | 0.04 | 0.07 |
| Manganese | 1.45 | 1.06 | 0.82 |
| Silicon | 0.34 | 0.29 | 0.20 |
| Phosphorus | 0.019 | 0.015 | 0.010 |
| Sulphur | 0.014 | 0.011 | 0.006 |
| Copper | 0.06 | 0.05 | 0.05 |
| Chromium | 0.03 | 0.05 | 0.04 |
| Nickel | 0.95 | 0.86 | 0.88 |
| Molybdenum | 0.01 | 0.01 | 0.01 |

### Typical Mechanical Properties (AW/PWHT):

| | HN-590 | SWX 110 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 79/77 ksi | 76/-- ksi | 72/70 ksi |
| Yield Strength | 63/63 ksi | 64/-- ksi | 62/58 ksi |
| Elongation in 2" | 31/31% | 27% | 30/31% |
| Tensile Strength | 45/531 MPa | 524/-- MPa | 545/531 MPa |
| Yield Strength | 448/434 MPa | 441/-- MPa | 427/393 MPa |
| Elongation in 50 mm | 31/31% | 27% | 30/31% |

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

| | HN-590 | SWX 110 | SWX 150 |
|---|---|---|---|
| Avg. at -80°F | 45/-- ft-lbs | 65/105 ft-lbs | 95/155 ft-lbs |
| Avg. at -100°F | --/40 ft-lbs | 60/90 ft-lbs | 15/115 ft-lbs |
| Avg. at -60°C. | 61/-- J | 88/142 J | 129/210 J |
| Avg. at -70°C | --/54 J | 81/122 J | 20/169 J |

### Standard Diameters:

5/32" (4.0 mm)

### 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™ F2-S

**AWS A5.23: ECF2**

With a weld deposit chemistry of less than 1% nickel, this composite metal-cored wire is suitable for use in applications where stress-corrosion cracking caused by H2S is a concern. It also 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 EF2 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 H2S is a concern

**Typical Applications:**

- high-strength low-alloy (HSLA steels)
- ~ 90 KSI 620 MPa Q&T steels
- oil and gas pipe double jointing
- sour gas applications
- heavy equipment

**Recommended Fluxes:**

HN-590, SWX 120, SWX 150

**AWS A5.23 Wire / Flux Classifications:**

| | As-Welded (AW) | Stress-Relieved (PWHT) |
|---|---|---|
| HN-590 | F9A8-ECF2-F2 | F9P6-ECF2-F2 |
| SWX 120 | F9A8-ECF2-F2 | F9P6-ECF2-F2 |
| SWX 150 | F10A10-ECF2-F2 | F10P10-ECF2-F2 |

**Typical Weld Metal Chemistry:**

| | HN-590 | SWX 120 | SWX 150 |
|---|---|---|---|
| Carbon | 0.05 | 0.07 | 0.07 |
| Manganese | 1.72 | 1.78 | 1.43 |
| Silicon | 0.36 | 0.32 | 0.32 |
| Phosphorus | 0.022 | 0.012 | 0.010 |
| Sulphur | 0.010 | 0.009 | 0.007 |
| Copper | 0.03 | 0.05 | 0.06 |
| Nickel | 0.69 | 0.59 | 0.69 |
| Molybdenum | 0.48 | 0.40 | 0.40 |

**Typical Mechanical Properties (AW/PWHT):**

| | HN-590 | SWX 120 | SWX 150 |
|---|---|---|---|
| Tensile Strength | 9 /95 ksi | 97/95 ksi | 104/101 ksi |
| Yield Strength | 88/85 ksi | 85/83 ksi | 95/91 ksi |
| Elongation in 2" | 26/25% | 25/25% | 23/25% |
| Tensile Strength | 669/655 MPa | 669/655 MPa | 717/696 MPa |
| Yield Strength | 607/586 MPa | 586/572 MPa | 627/607 MPa |
| Elongation in 50 mm | 26/25% | 25/25% | 23/25% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | HN-590 | SWX 120 | SWX 150 |
|---|---|---|---|
| Avg. at -60°F | --/45 ft-lbs | 55/30 ft-lbs | |
| Avg. at -80°F | 45/-- ft-lbs | 30/30 ft-lbs | 85/35 ft-lbs |
| Avg at -100°F | | | 55/25 ft-lbs |
| Avg. at -50°C | --/61 J | 75/41 J | |
| Avg. at -60°C | 61/-- J | 41/41 J | 115/47 J |
| Avg. at -70°C | | | 75/34 J |

**Standard Diameters:**

3/32" (2.4 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 $H_2S$ 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% |

**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 $H_2S$ 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

## SubCOR™ 120-S

**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" 63mm)]
- 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)

## SubCOR™ SL 741

This seamless low-alloy cored wire is designed for welding base materials with a yield strength of up to 80 ksi (550 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 both the as-welded and stress-relieved conditions, making it a suitable candidate for welding fine-grain structural steels with a yield strength up to 550 MPa 80 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:**
- boilers and pressure vessels
- casting repair
- pipeline double jointing
- heavy equipment
- cranes
- industrial machinery

**Recommended Fluxes:**
SWX 120, SWX 150

**Typical Weld Metal Chemistry:**

| | SWX 120 | SWX 150 |
|---|---|---|
| Carbon | 0.06 | 0.06 |
| Manganese | 1.30 | 1.20 |
| Silicon | 0.30 | 0.30 |
| Phosphorus | 0.015 | 0.015 |
| Sulphur | 0.015 | 0.015 |
| Nickel | 0.90 | 0.90 |
| Molybdenum | 0.50 | 0.50 |

**Typical Mechanical Properties (AW/PWHT):**

| | SWX 120 | SWX 150 |
|---|---|---|
| Tensile Strength | 94/81 ksi | 93/-- ksi |
| Yield Strength | 81/74 ksi | 80/-- ksi |
| Elongation in 2" | 18/20% | 19/--% |
| Tensile Strength | 650/560 MPa | 640/-- MPa |
| Yield Strength | 560/510 MPa | 550/-- MPa |
| Elongation in 50 mm | 18/20% | 19/--% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

| | SWX 120 | SWX 150 |
|---|---|---|
| Avg. at -40°F | 59/59 ft-lbs | 74/-- ft-lbs |
| Avg. at -60°F | 52/52 ft-lbs | |
| Avg. at -80°F | 44/44 ft-lbs | 59/-- ft-lbs |
| Avg. at -20°C | 100/100 J | |
| Avg. at -40°C | 80/80 J | 100/-- J |
| Avg. at -50°C | 70/70 J | |
| Avg. at -60°C | 60/60 J | 80/-- J |

**Standard Diameters:**
3/32" (2.4 mm), 5/32" (4.0 mm)

## SubCOR™ SL 742

**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):**

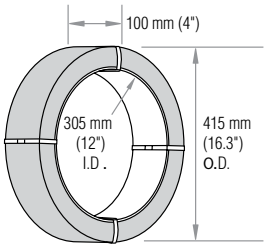
| | SWX 150 |
|---|---|
| Tensile Strength | 155/154 ksi |
| Yield Strength | 130/129 ksi |
| Elongation in 2" | 18/17% |
| Tensile Strength | 1068/1061 MPa |
| Yield Strength | 896/889 MPa |
| Elongation in 50 mm | 18/17% |

**Typical Charpy V-Notch Impact Values (AW/PWHT):**

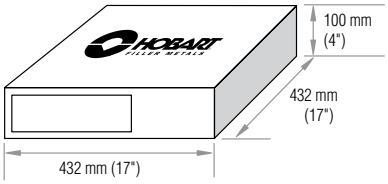
| | SWX 150 |
|---|---|
| Avg. at -4°F | 40/-- ft-lbs |
| Avg. at -20°F | --/21 ft-lbs |
| Avg. at -40°F | 27/20 ft-lbs |
| Avg. at -20°C | 54/-- J |
| Avg. at -30°C | --/28 J |
| Avg. at -40°C | 36/27 J |

**Standard Diameters:**
3/32" (2.4 mm), 5/32" (4.0 mm)

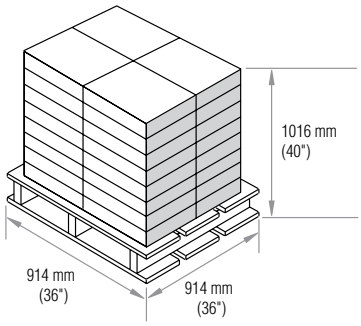
## 27 kg (60-lb.) Coil



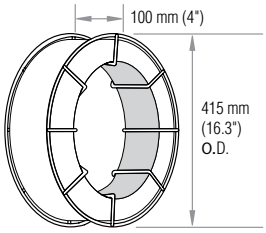

Weight: 27 kg (60 lbs)



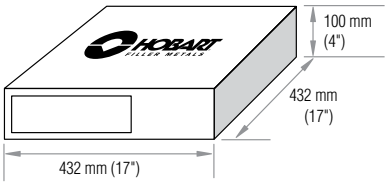

Items per pallet: 32
Pallet net weight: 871 kg (1920 lbs)

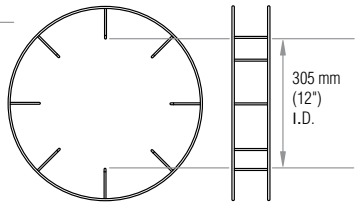


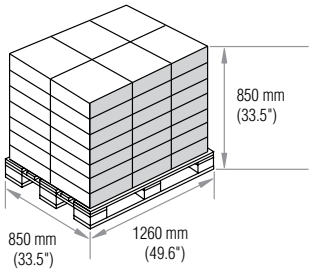

## 25 kg (55-lb.) Spool — Wire Basket K-415



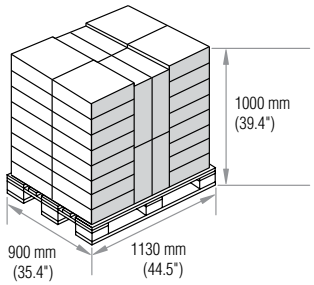

Weight: 25 kg (55 lbs)



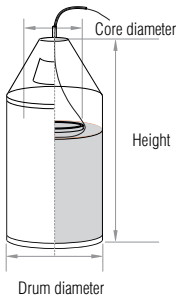




Items per pallet: 42
Pallet net weight:
1050 kg
(2310 lbs)




Items per pallet: 40
Pallet net weight:
1000 kg
(2200 lbs)

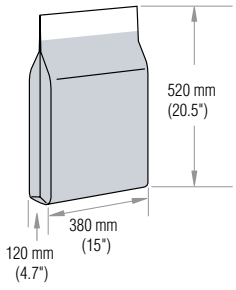
## Pay-off Drums



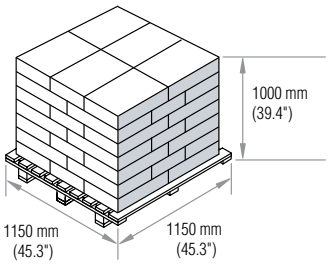

| Drum weight | Drum diameter | Core diameter | Drum height | Items per pallet | Pallet net weight | Pallet width | Pallet depth | Overall height |
|---|---|---|---|---|---|---|---|---|
| 272 kg (600 lbs) | 585 mm (23") | 410 mm (16") | 890 mm (35") | 2 | 545 kg (1200 lbs) | 660 mm (26") | 1220 mm (48") | 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/25 kg
(50 lbs/55 lbs)




Items per pallet: 42
Pallet net weight:
953 kg/1050 kg
(2100 lbs/2310 lbs)

# Stainless Steel Stick Electrodes

## Stick Electrodes
## AWS Classification of Stainless Steel Coated Electrodes

**E 3 0 8 L - 1 6**

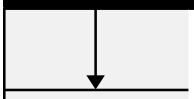
- **16** — Indicates how the metal is transferred and the coating type. *(See Coating Characteristics Chart)*
- **L** — Indicates any changes to the original alloy. *(See Additional Requirements Chart)*
- **308** — Indicates what a weld made by this electrode will have in it. *(See Applications Chart)*
- **E** — Indicates that this is an electrode.

## Additional Requirements

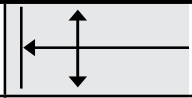
| Suffix | Additional Requirements |
|---|---|
| L | Has a lower carbon content |
| H | Limited to the upper range on the carbon content |
| Mo | Molybdenum added–pitting resistance, creep strength, ferrite increased |
| Ni | Nickel added–high temperature strength, corrosion resistance, added toughness |

## Positions

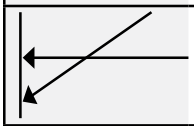
**1 Flat, Horizontal, Vertical, Overhead**



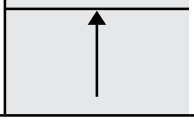
FLAT - Usually groove welds, fillet welds only if welding like a "V."



VERTICAL - Welds on walls (travel is either up or down).



HORIZONTAL - Fillet welds, on walls (travel is from side to side).



OVERHEAD - Weld that needs to be done upside down.

## 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 | Globu-lar | AC/DCEP | Flat |
| Sterling® | -17 | 3 | 1 | 1 | 1 | 3 | Spray | AC/DCEP | Con-cave |

Ratings:
1 = the best
3 = the least

*AC-DC -16 Flat*

*Sterling® -17 Concave*

## AWS Class and Applications

| | Class | Brief Description |
|---|---|---|
| A | E308 | Used for welding many dissimi-lar 300 series stainless steels |
| A | E309 | Used for welding many dissimi-lar 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 stain-less steels and used for surfac-ing 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. |

## Stainless Steel Stick Electrodes

**Sterling® AP(-16)** Ideal multipurpose stainless electrodes provide smooth, uniform and finely rippled weld beads that require minimal finishing. AC-DC/Sterling AP electrodes perform well on AC or DCEP and possess outstanding out-of-position capabilities and good strike and restrike characteristics.

**Sterling® (-17)** A superb family of spray transfer electrodes that produces attractive, finely rippled concave weld beads. Sterling electrodes operate well in all positions, on AC or DCEP, with self-peeling slag and excellent restrike characteristics. The direct spray arc transfer is extremely stable and exhibits higher deposition rates with little spatter.

| Hobart® Product | AWS Class | Sterling® AP -16 | Sterling® -17 |
|---|---|---|---|
| 308/308H | E308 & E308H | • | • |
| 308L | E308L | • | • |
| 309 | E309 | • | • |
| 309L | E309L | • | • |
| 310 | E310 | • | o |
| 312 | E312 | • | o |
| 316L | E316L | • | • |
| 317L | E317L | • | • |
| 347 | E347 | • | • |
| 410 | E410 | • | o |
| 410NiMo | E410NiMo | • | o |
| 2209 | E2209 | • | o |

• Offered o Not Offered

*NOTE: Actual certs are included in every master carton of stainless stick electrodes at no charge.*

## 308/308H Sterling® AP

**AWS E308-16, E308H-16**

Excellent for use on Type 301, 302, 304, 305 and 308 base metals, these stainless-steel electrodes are specially formulated with more than .04 carbon to provide maximum elevated temperature strength. It has a smooth-running arc that results in a uniform weld bead that is flat to slightly convex and yields a concave weld bead that is smooth and refined. It is also ideal for use as an intermediate layer prior to the deposit of hard facing materials.

**Typical Deposit Analysis %**

Carbon.....0.06
Manganese .....1.14
Silicon.....0.44
Chromium .....19.88
Nickel.....9.78
Iron.....Balance

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 86,000 (593 MPa) |
| Yield Strength (psi) | 65,000 (448 MPa) |
| Elongation in 2" | 45% |
| DeLong Ferrite Number | 7 |

## 308/308L Sterling® AP 308L Sterling®

**AWS E308-16, E308L-16, E308L-17**

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 (H) Sterling® AP

**AWS E309-16, E309H-16**

This moisture resistant, all-position electrode is primarily designed for welding Type 309 metal but can also be used for 18-8 clad steels or dissimilar materials if the alloy content is sufficiently high for a sound, ductile deposit. It yields a uniform weld bead that is flat to slightly convex.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.08 |
| Chromium | 23.50 |
| Nickel | 13.00 |
| Molybdenum | 0.10 |
| Manganese | 1.05 |
| Phosphorus | 0.020 |
| Sulfur | 0.016 |
| Copper | 0.10 |

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 88,000 (607 MPa) |
| Yield Strength (psi) | 67,000 (462 MPa) |
| Elongation in 2" | 37% |
| DeLong Ferrite Number | 6-15 |

## 309Mo Sterling® AP 309MoL Sterling® AP

**AWS E309Mo-16, E309MoL-16**

The addition of molybdenum in this stainless-steel electrode improves tensile strength and resistance. It is used for 316 clad steels and joining molybdenum-containing steels to carbon steels.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.03 |
| Manganese | 1.23 |
| Silicon | 0.44 |
| Chromium | 22.70 |
| Nickel | 13.60 |
| Molybdenum | 2.40 |
| Iron | Balance |

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 90,000 (621 MPa) |
| Yield Strength (psi) | 70,000 (483 MPa) |
| Elongation in 2" | 35% |
| DeLong Ferrite Number | 13 |

## 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 |

## 309/309L Sterling® AP 309L Sterling®

**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 |

## 316/316L Sterling® AP 316L Sterling®

**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 Stick Electrodes

## 317L Sterling® AP

**AWS E317L-16, E317L-17**

The increased molybdenum content in this stainless-steel electrode results in higher tensile strength, better corrosion resistance, and improved high temperature creep strength. It is highly resistant to moisture pick-up with a smooth-running arc that results in a uniform bead that is flat to slightly convex.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.03 |
| Manganese | 1.21 |
| Silicon | 0.51 |
| Chromium | 18.80 |
| Nickel | 13.70 |
| Molybdenum | 3.40 |
| Iron | Balance |

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 92,000 (634 MPa) |
| Yield Strength (psi) | 69,000 (476 MPa) |
| Elongation in 2" | 35% |
| DeLong Ferrite Number | 4 |

## 2209 Sterling® AP

**AWS E2209-16**

Specially formulated for welding the 22 chromium-5 nickel-3 molybdenum (type 2205) duplex stainless steels, this stainless-steel electrode offers high strength with improved pitting and SSC resistance.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.03 |
| Manganese | 1.01 |
| Silicon | 0.38 |
| Chromium | 22.90 |
| Nickel | 10.10 |
| Molybdenum | 3.00 |
| Nitrogen | 0.093 |
| Iron | Balance |

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 115,000 (793 MPa) |
| Yield Strength (psi) | 90,000 (621 MPa) |
| Elongation in 2" | 27% |
| DeLong Ferrite Number (Extended) | 34 |
| Impact Strength, -50°F (Charpy v Notch) | 23 ft.lbf |

## 347 Sterling® AP

**AWS E347-16**

Excellent for welding 347 and 321 steels, this stainless-steel electrode provides good corrosion resistance in steam or utility applications up to 1400 degrees Fahrenheit. It is specifically formulated with columbium to prevent carbide precipitation.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.06 |
| Manganese | 1.19 |
| Silicon | 0.46 |
| Chromium | 20.24 |
| Nickel | 10.00 |
| Columbium | 0.60 |
| Iron | Balance |

**Typical Properties and Ferrite Number of Weld Deposit as Welded**

| | |
|---|---|
| Tensile Strength (psi) | 80,000 (552 MPa) |
| Yield Strength (psi) | 64,000 (441 MPa) |
| Elongation in 2" | 36% |
| DeLong Ferrite Number | 10 |

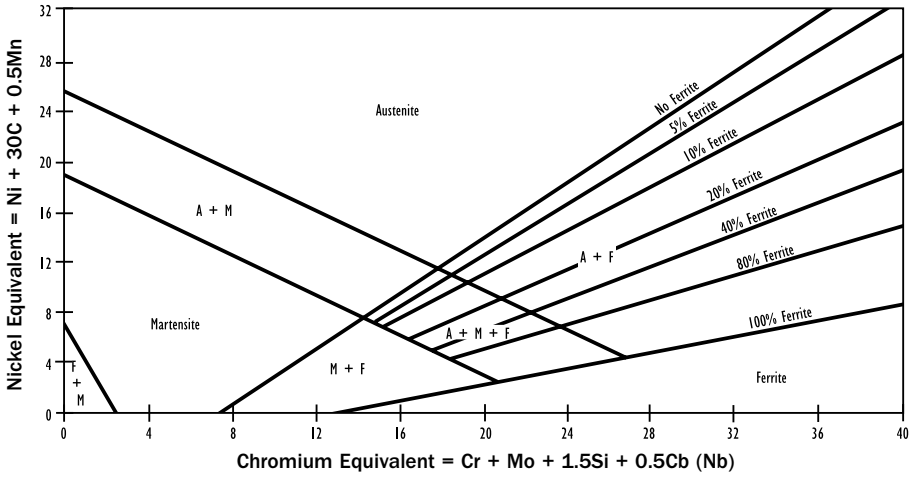
# TECHNICAL SECTION

## 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 |
| E308L-17 | 308L-17 Sterling® | Tech Rod 308L-17 | 19.9. LR | Blue Max 308/308L AC/DC |
| E308H-16 | 308/308H Sterling® AP | Tech Rod 308-16 | – | Red Baron 308/308H MR |
| E308H-17 | 308/308H Sterling® | Tech Rod 308-17 | – | – |
| E309L-16 | 309/309L Sterling® AP | Tech Rod 309L-16 | – | Red Baron 309/309L MR |
| E3096L-17 | 309L Sterling® | Tech Rod 309L-17 | 24.3. LR | Blue Max 309/309L AC/DC |
| E309-17 | 309-17 Sterling® | Tech Rod 309-17 | – | – |
| E309Mo-17 | 309 Mo/309MoL | – | 23.12.2. LR | – |
| 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 |
| E316L-17 | 316L-17 Sterling® | Tech Rod 316L-17 | 19.12.3. LR | Blue Max 316/316L AC/DC |
| E316H-17 | 316/316H-17 Sterling® | Tech Rod 316-17 | – | – |
| E317L-16 | 317L Sterling® AP | Tech Rod 317-16 | 19.13.4. LR | – |
| E347-16 | 347 Sterling® AP | Tech Rod 347-16 | – | – |
| E410-16 | 410 Sterling® AP | Tech Rod 410-16 | – | – |
| E410NiMo-16 | 410NiMo Sterling® AP | Tech Rod 410NiMo-16 | – | – |
| E2209-16 | 2209 Sterling® AP | Tech Rod 2209 | 22.9.3. LR (B) | – |

# TECHNICAL SECTION

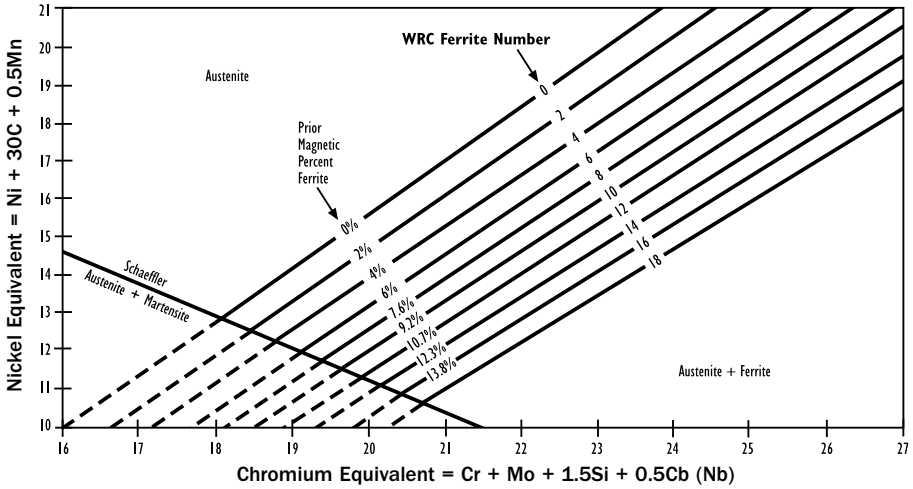
## Schaeffler Constitution Diagram




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 ± 3 in approximately 90% of the tests for the 308, 309, 316, and 317 families.

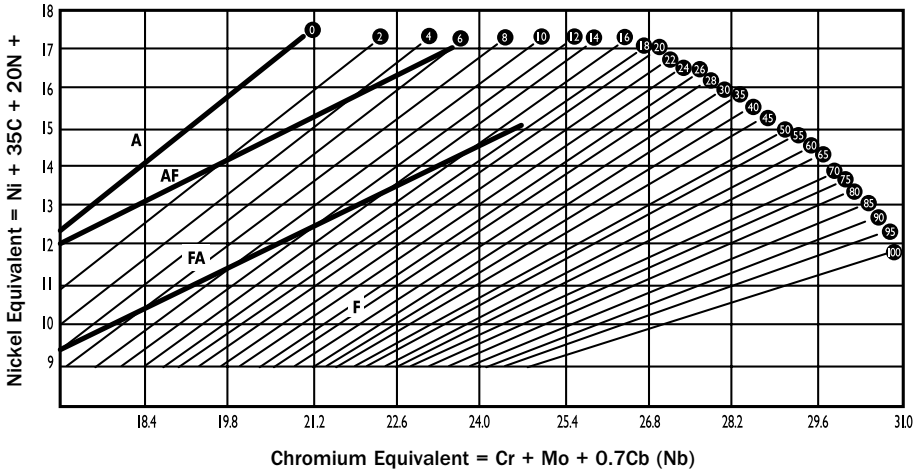
## DeLong Constitution Diagram




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

## 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" | 3/16" (4.8mm) 14" | 5/32" (4.0mm) 14" | 1/4" (6.4mm) 14" |
|---|---|---|---|---|---|---|
| Sterling® AP (-16) | | 32 | 13 | 9 | 6 | 3 |
| Sterling® (-17) | | 32 | 13 | 9 | 6 | — |

## Stainless Steel Stick Electrode Pallet Information

| | | PALLET WEIGHT (LB) | | PALLET DIMENSIONS | | | |
|---|---|---|---|---|---|---|---|
| Length | Hobart® Type | Net | Gross (est.) | Depth | Width | Height | Number of Units Per Pallet |
| 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) |
| 3/32"–12" | Sterling® | 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) |

## Packaging Options

All Hobart® stainless steel electrodes are stamped with product name and lot number for complete traceability.

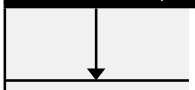
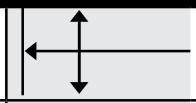
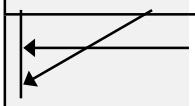
# Stainless Steel Tubular Wires

## Stainless Steel Tubular Wires
## AWS Classification of Stainless Steel Tubular Wires

**E 3 0 8 L T 1 - 1**

- E — Indicates that this is an electrode.
- 308 — Indicates what the weld made by this electrode will have in it. *(See Applications Chart)*
- L — Indicates any changes to the original alloy. *(See Additional Requirements Chart)*
- T — Indicates that this is a flux-cored wire. Tubular
- 1 — Indicates the welding position.
- -1 — Indicates the shielding gas, if any. *(See Shielding Chart)*

### 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, + 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 | $CO_2$ | DCEP |
| -3 | None (Self-Shielded) | DCEP |
| -4 | 75-80% Ar/ Balance $CO_2$ | 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 |
|---|---|---|---|---|---|---|
| **Open-Arc** | | | | | | |
| E309LT0-3 | 0.03 Max. | 23.0–25.5 | 12.0–14.0 | 0.5 Max. | 0.5–2.5 | 1.0 |
| **Gas-Shielded** | | | | | | |
| 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-O** | 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 Gas-Shielded Metal-Cored Tubular Wires

Hobart® FabCOR® wires are designed to meet the needs of chemical/food service/automotive exhaust fabricators that have poor to fair fit up and desire a metal-cored wire that can produce a soft arc at superior welding speeds.

| Hobart® Product | AWS Class | Positions |
|---|---|---|
| **FabCOR® 308LSi** | EC308LSi | Flat, Horizontal |
| **FabCOR® 309LSi** | EC309LSi | Flat, Horizontal |

# Stainless Steel Wires

## STAINLESS STEEL OPEN-ARC FLUX-CORED WIRES

### Fabshield® 309L-O

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** 1/16", 3/32"

**Approvals and conformances:**

- 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 ($Ar/CO_2$) or 100% $CO_2$

**Diameters** .045", 1/16", 3/32"

**Approvals and conformances:**

- 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 MR0175-95, 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% $CO_2$ or 100% $CO_2$ | |

**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% $CO_2$ or 100% $CO_2$ | |

**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% $CO_2$ or 100% $CO_2$ | |

**Diameters** .045", 1/16"

# TECHNICAL SECTION

## Comparative Index of Stainless Steel Open-Arc Tubular Wires

| AWS Class | Hobart® | ESAB | Stoody |
|---|---|---|---|
| E309LTO-3 | **Fabshield® 309L-O** | Core-Bright 309L | SOS 309L |

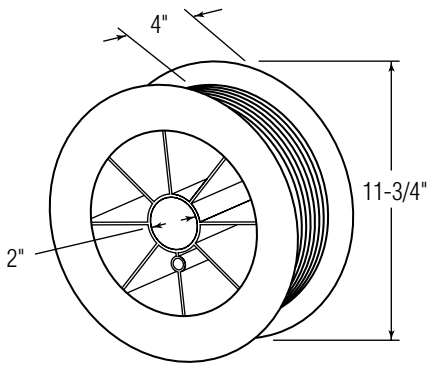
## Comparative Index of Stainless Steel Gas-Shielded Tubular Wires

| 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** | — | — | — | — |

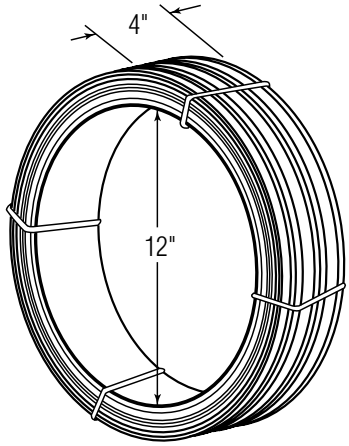
## Stainless Steel Tubular Wire Pallet Information

| 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) |

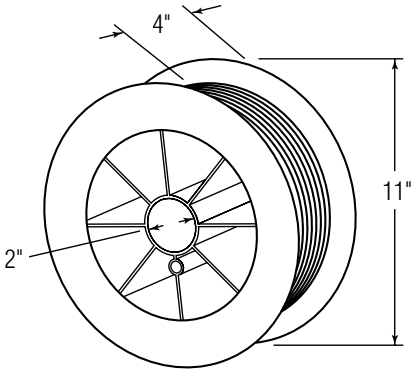
## Packaging Options




**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 201 |
| 202 | | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 202 |
| 301 | | | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 301 |
| 302 | | | | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 302 |
| 302B | | | | | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 302B |
| 303 | | | | | | 308 312 | 308 312 | 308 312 | 308 312 | 308 312 | 308 312 | 308 312 | 312 | 312 | 312 | 308 312 | 308 312 | 308 312 | 308 312 | 308 312 | 312 309 | 308 312 | 308 312 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 312 | 303 |
| 304 | | | | | | | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 304 |
| 304L | | | | | | | | 308L | 308 | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308L | 308 | 308L | 308L | 312 309 | 308L | 308L | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 304L |
| 305 | | | | | | | | | 308 310 | 308 | 308 | 308 | 310 308 | 310 308 | 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 305 |
| 308 | | | | | | | | | | 308 | 308 | 308 | 308 | 308 | 308 312 | 308 | 308 | 308 | 308 | 308 | 312 309 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 308 |
| 309 | | | | | | | | | | | 309 | 309 | 309 | 309 | 309 312 | 309 | 309 316 | 309 | 309 | 308 347 | 312 309 | 308 347 | 308 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 309 |
| 309S | | | | | | | | | | | | 309 | 309 | 309 | 309 312 | 309 316L | 316 | 316 | 316 | 308 347 | 312 309 | 308 347 | 308 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 309S |
| 310 | | | | | | | | | | | | | 310 | 310 | 310 312 | 316 | 316 | 317 | 317L | 308 | 312 310 | 308 347 | 308 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 310 | 310 |
| 310S | | | | | | | | | | | | | | 310 | 310 312 | 316 | 316 | 317 | 317L | 308 | 312 310 | 308 347 | 308 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 310 | 310S |
| 314 | | | | | | | | | | | | | | | 310 312 | 316 | 316 | 317 | 317 | 308 | 312 310 | 308 | 308 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 310 | 314 |
| 316 | | | | | | | | | | | | | | | | 316 16-8-2 | 316 | 316 | 316 | 308 | 312 309 | 308 16-8-2 | 308 316 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 316 |
| 316L | | | | | | | | | | | | | | | | | 316L | 316 | 316L | 308L | 312 309 | 316L | 316L | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 316L |
| 317 | | | | | | | | | | | | | | | | | | 317 | 317 | 308 | 312 309 | 308L 16-8-2 | 308L 16-8-2 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 317 |
| 317L | | | | | | | | | | | | | | | | | | | 317L | 308L 347 | 312 309 | 308L | 308L | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 317L |
| 321 | | | | | | | | | | | | | | | | | | | | 347 | 312 309 | 347 | 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 310 | 321 |
| 330 | | | | | | | | | | | | | | | | | | | | | 330 | 312 309 | 312 309 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 312 | 330 |
| 347 | | | | | | | | | | | | | | | | | | | | | | 347 | 347 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 327 |
| 348 | | | | | | | | | | | | | | | | | | | | | | | 348 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 309 | 348 |
| 403 | | | | | | | | | | | | | | | | | | | | | | | | 410 | 410 | 410 | 410 | 312 309 | 410 | 430 | 309 | 410 | 410 | 410 | 410 | 410 | 410 | 403 |
| 405 | | | | | | | | | | | | | | | | | | | | | | | | | 410 | 410 | 410 | 312 309 | 410 | 430 | 309 | 410 | 410 | 410 | 410 | 410 | 410 | 405 |
| 410 | | | | | | | | | | | | | | | | | | | | | | | | | | 410 | 410 | 312 309 | 410 | 430 | 309 | 410 | 410 | 410 | 410 | 410 | 410 | 410 |
| 414 | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 312 309 | 410 | 430 | 309 | 410 | 410 | 410 | 410 | 410 | 410 | 414 |
| 416 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 410 309 | 309 | 410 309 | 309 | 410 309 | 309 | 309 | 309 | 309 | 309 | 416 |
| 420 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 420 410 | 410 | 309 | 410 | 420 | 420 | 420 | 430 | 420 |
| 430 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 430 | 309 | 430 | 430 | 430 | 430 | 430 | 430 | 430 |
| 430F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 309 | 309 | 309 | 309 | 309 310 | 430F |
| 431 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 309 | 309 | 309 | 309 310 | 431 |
| 440A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 309 | 309 | 309 310 | 440A |
| 440B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 309 | 309 310 | 440B |
| 440C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 309 | 309 310 | 440C |
| 446 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 312 310 | 446 |

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-O and 410 NiMo-O, 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 a the low end. Same way for high-side settings.

## Operating Ranges and Deposition Rates for FabCO® Wires

| Diameter<br>Electric Stick-Out Position | Arc Voltage (volts) | Current DCEP (+) (amps) | Approximate Wire Feed Speed (in/min) | Deposition Rates (lb./hr) |
|---|---|---|---|---|
| .045" (1.2 mm)<br>5/8" – 3/4"<br>(16 mm – 19 mm)<br>Flat, Horizontal & Vertical Up | 24<br>**25 – 29**<br>33 | 140<br>**160 – 200**<br>300 | 210<br>**275 – 380**<br>680 | 5.0<br>**6.0 – 8.0**<br>15.0 |
| 1/16" (1.6 mm)<br>3/4" – 1"<br>(19 – 25.4 mm)<br>Flat, Horizontal & Vertical Up | 28<br>**29 – 33**<br>35 | 200<br>**240 – 280**<br>350 | 155<br>**230 – 290**<br>420 | 6.5<br>**8.5 – 11.0**<br>16.0 |

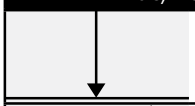
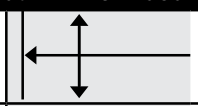
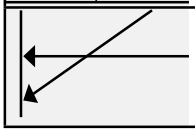
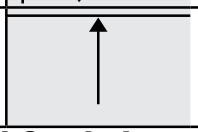
*When using $CO_2$ shielding gas, add 1–2 volts. **BOLD** – Optimum parameters for welder appeal.

## Metal-Cored/Solid Wire
## AWS Classification of Stainless Steel Solid Wires

**E R 3 0 8 L**

- Indicates any changes to the original alloy *(See Additional Requirements Chart)*
- Indicates what the weld made by this electrode will have in it. *(See Applications Chart)*
- Electrode (wire) or Rod (cut length) Composite (metal-cored)

## 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 Wires

## STAINLESS STEEL SOLID WIRES — SPOOLED/COILED/CUT LENGTHS

### 308/308L

**AWS ER308, ER308L**
With a lower range carbon to help prevent inter-granular 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 conformances:**
AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

Cut lengths available.

### 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 (Charpy V Notch) | 100 ft.lb. |
| DeLong Ferrite Number | 12 |

**Approvals and conformances:**
AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

Cut lengths available

### 308L HiSil

**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 conformances:**
AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

### 309L HiSil

**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 (Charpy V Notch) | 92 ft.lb. |
| DeLong Ferrite Number | 10 |

**Approvals and conformances:**
AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

## STAINLESS STEEL SOLID WIRES — SPOOLED/COILED/CUT LENGTHS

### 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 conformances:**
AWS Spec A5.9, ASME
SFA5.9 (F-6, A-8)

Cut lengths available

### 316L HiSil

**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 conformances:**
AWS Spec A5.9, ASME SFA5.9 (F-6, A-8)

## FabCOR® STAINLESS STEEL GAS-SHIELDED METAL-CORED WIRES

### FabCOR® 308LSi

FLAT & HORIZONTAL
**AWS EC308LSi**
With good resistance to intergranular corrosion, this austenitic stainless-steel wire used to join 301, 302, 304, 304L and 308 stainless steels.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.025 |
| Manganese | 1.50 |
| Silicon | 0.85 |
| Phosphorus | 0.026 |
| Sulfur | 0.018 |
| Copper | 0.35 |
| Chromium | 21.40 |
| Nickel | 10.11 |
| Molybdenum | 0.30 |

**Typical Weld Metal Properties***

| | |
|---|---|
| DeLong Ferrite | 10-18 |
| Schaeffler Number Range | 7-15 |
| WRC Number Range (1992) | 8-19 |
| 98%Ar/2%O2 or 95%Ar/5%CO2 | |

**Diameters** .045"

**Approvals and conformances:**
AWS Spec A5.9,
ASME SFA5.9 (F-6, A-8)

### FabCOR® 309LSi

FLAT & HORIZONTAL
**AWS EC309LSi**
This austenitic stainless-steel wire is used to join similar 309L alloys or join 300 series stainless steel to carbon or low alloy steels.

**Typical Deposit Analysis %**

| | |
|---|---|
| Carbon | 0.025 |
| Manganese | 1.50 |
| Phosphorus | 0.028 |
| Sulfur | 0.020 |
| Silicon | 0.93 |
| Copper | 0.30 |
| Chromium | 24.50 |
| Nickel | 13.11 |
| Molybdenum | 0.30 |

**Typical Weld Metal Properties***

| | |
|---|---|
| DeLong Ferrite | 13-20 |
| Schaeffler Number Range | 11-17 |
| WRC Number Range (1992) | 11-19 |
| 98%Ar/2%O2 or 95%Ar/5%CO2 | |

**Diameters** .045", 1/16"

**Approvals and conformances:**
AWS Spec A5.9, ASME
SFA5.9 (F-6, A-8)

# Stainless Steel Wires

## 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 |

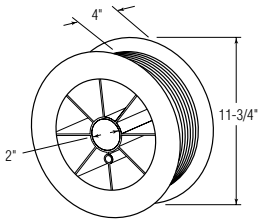
## Typical Parameters for Spray Transfer Welding with Bare Stainless Wires

| 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 |

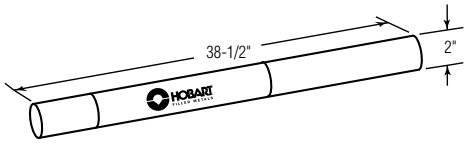
## Recommended Operating Parameters

| Diameter<br>Electric Stick-Out Pos. | Arc Voltage (volts) | Current DCEP (+) (amps) | Approximate Wire Feed Speed (in/min) | Deposition Rates (lb./hr) |
|---|---|---|---|---|
| .045" (1.2 mm)<br>3/4" – 1"<br>(19 mm)<br>Flat and Horizontal | 23<br>**26**<br>33 | 140<br>**190**<br>300 | 260<br>**390**<br>490 | 5.5<br>**9.0**<br>11.6 |
| 1/16" (1.6 mm)<br>3/4" – 1"<br>(19 – 25.4 mm)<br>Flat and Horizontal | 26<br>**29**<br>32 | 180<br>**250**<br>390 | 152<br>**250**<br>442 | 6.0<br>**11.0**<br>18.0 |

## Packaging Options

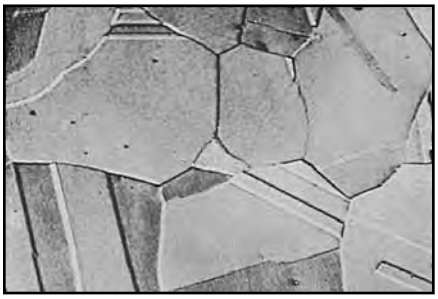



**30-lb. Plastic Spool**




**10-lb. Tube** (Cut Lengths)

## Hardfacing Stick Electrode Alloy Classification

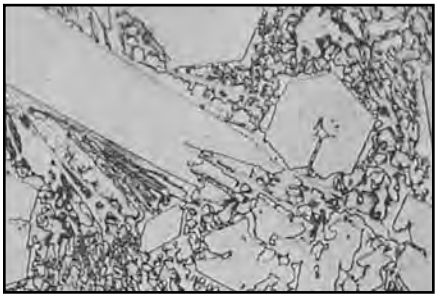


*Photomicrograph of austenite.*

### 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 |
| Hardalloy® 155 |

### 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 |
| **Impact** | Hardalloy® 118 | For build-up & joining of manganese steels only. | • | o |
| | | | Abrasion Resistance (Carbon Content %) | |
| **Abrasion** | Hardalloy® 148 | For abrasion and impact resistance. | | |
| | Hardalloy® 140 | For heavy abrasion and moderate impact. | | |
| | Hardalloy® 155 | For extreme abrasion with minimal impact. | | |
| | | | 0 2 4 6 | |
| **Metal to Metal** | Hardalloy® 32 | Excellent build-up and overall alloy for carbon steels | | |
| | | | 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

# Hardfacing Stick Electrodes

## 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

## Hardalloy® 155

This stick electrode deposits an extra high chromium carbide alloy steel intended for overlay on surfaces subjected to extremely severe abrasion. It maintains its hot hardness to 1250 degrees Fahrenheit and has an excellent edge building capability. It is designed for overlay on carbon, low alloy, or manganese steel base metals or over a welded build-up base of Hardalloy® 32, Hardalloy® 118, or Chrome-Mang™.

### Typical Applications

- ammonia knives
- augers
- bucket lips and teeth
- bulldozer blades
- cement chutes
- coal feeder screws
- coke chutes
- coke pusher shoes
- coal pulverizer hammers
- conveyor screws
- crusher jaws and cones
- crusher rolls
- cultivator chisels and sweeps
- dredge cutter heads and teeth
- dredge pump inlet nozzle and side plates
- fan blades
- gizzzly bars and fingers
- manganese pump shells
- muller tires
- ore/coal chutes
- paving agitator screws
- pipeline ball joints
- pug mill paddles
- ripper shanks
- road rippers
- sheepsfoot tampers, similar to those for Hardalloy® 140 where additional abrasion resistance is required
- sizing screens
- subsoiler teeth

### Typical Deposit Analysis %

| | |
|---|---|
| Carbon | 5.50 |
| Manganese | 0.40 |
| Silicon | 1.00 |
| Chromium | 32.00 |
| Molybdenum | 4.50 |
| Iron | Balance |

### Typical Properties

Machinability: Grinding Only
Thickness: 3 layers max
Typical Hardness, 59-63 HRC
Cannot be flame cut
Deposit will relief-check crack readily
Deposit maintains hot hardness to 1250°F

### Optimum Current

| Diameter | Amps |
|---|---|
| 1/8" | 140 |
| 5/32" | 150 |
| 3/16" | 190 |

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 |
| Hardalloy® 155 | 246 FC, 247 FC, 284 FC | — | Superchrome, 2134 |

## Hardfacing Electrodes Per Pound

| Hobart® Type / Diameter: / Length: | 1/8" (3.2mm) 14" | 5/32" (4.0mm) 14" | 3/16" (4.8mm) 14" | 1/4" (6.4mm) 18" |
|---|---|---|---|---|
| Hardalloy® 148 | 9 | 6 | 5 | — |
| Hardalloy® 118 | 12 | 8 | 5 | 2 |
| Hardalloy® 140 | 9 | 6 | 4 | — |
| Hardalloy® 155 | 8 | 5 | 4 | — |

**For other product comparisons, please go to our Hardfacing Product Cross-Reference Guide at www.hobartbrothers.com**

# TECHNICAL SECTION

## Suggested Hobart Stick Electrode per Industry Application

### Agriculture

| Application Overlay | Hobart® Electrode |
|---|---|
| Ammonia Knives | 140, 155 |
| Cultivator Chisels & Sweeps | 140, 155 |
| Plow Shares | 140 |
| Ripper Shanks | 155 |
| Subsoiler Teeth | 155 |

### Dredging Industry

| Application Build Up | Overlay | Hobart® Electrode |
|---|---|---|
| Dredge Bucket Lips | — | 140, 155 |
| Dredge Cutter Heads & Teeth | 118 | 140, 155 |
| Dredge Ladder Rolls | 32 | — |
| Dredge Pump Casings | 118 | — |
| Dredge Pump Impellers | 118 | 140 |
| Dredge Pump Inlet Nozzle | — | 155 |
| Dredge Pump Side Plates | 118 | 140, 155 |
| Pipeline Ball Joints | — | 140, 155 |
| Pump Shells (Manganese) | — | 140, 155 |

### Heavy Equipment/Mining Industries

| Application Build-Up | Overlay | Hobart® Electrode |
|---|---|---|
| Augers | — | 140, 155 |
| Bucket Teeth/Lips | 32 | 140 |
| Bulldozer Blades | — | 140, 155 |
| Crane Wheels | 32 | — |
| Dragline Buckets | 32 | — |
| Dragline Car Wheels | 32 | — |
| Dragline Chain | 32 | — |
| Ore/Coal Chutes | — | 155 |
| Paving Agitator Screws | — | 155 |
| Power Shovel Bucket Teeth/Lips | 32 | 140, 155 |
| Road Rippers | — | 155 |
| Scraper Blades | — | 140 |
| Sheepsfoot Tampers | — | 140, 155 |
| Steel Shafts | 32 | — |
| Tractor Idlers/Rollers | 32 | — |
| Tractor Idlers/Roller | 32 | — |

### Power Generation Industry

| Application Overlay | Hobart® Electrode |
|---|---|
| Coal Feeder Screws | 155 |
| Coal Pulverizer Hammers | 155 |
| Fan Blades | 155 |
| Hydroelectric Turbines | 118 |

### Crushing/Quarry Industries

| Application Build-Up | Overlay | Hobart® Electrode |
|---|---|---|
| Bucket Lips | 32 | 140, 155 |
| Bucket Teeth (Manganese Steel) | 118 | 140, 155 |
| Bulldozer End Bits | — | 155 |
| Cement Chutes | — | 140, 155 |
| Conveyor Screws | — | 155 |
| Crusher Jaws/Cones | 118 | 140, 155 |
| Crusher Rolls | 118 | 140, 155 |
| Gear Teeth | 32 | |
| Gyratory Crusher Mantles/ Cones | 118 | — |
| Hammer Mill Hammers | 118 | 140 |
| Impactor Crusher Bars | 118 | 140 |
| Kiln Trunnions | 32 | — |
| Muller Tires | — | 140, 155 |
| Pug Mill Paddles | — | 155 |
| Sizing Screens | 118 | 140, 155 |
| Steel Shafts | 32 | — |

### Iron & Steel Industry

| Application Build-Up | Overlay | Hobart® Electrode |
|---|---|---|
| Coke Chutes | — | 155 |
| Coke Pusher Shoes | — | 155 |
| Coupling Boxes | 32 | — |
| Gear Teeth | 32 | — |
| Grizzly Bars & Fingers | — | 140, 155 |
| Ingot Tongs | — | 148 |
| Mill Guides | — | 140 |
| Pug Mill Paddles | — | 155 |
| Pulleys | — | 148 |
| Screw Conveyors | — | 140,155 |
| 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-O | Vertiwear® AP | — |
| Hardalloy® 32 | Tube-Alloy® Build Up-O | — | Tube-Alloy® Build Up-G |
| — | ArmorWear™ | — | — |
| Hardalloy® 140 | Tube-Alloy® 240-O | — | — |
| Hardalloy® 155 | Tube-Alloy® 255-O | — | Tube-Alloy® 255-G |
| Hardalloy® 148 | — | — | — |
| — | Tube-Alloy® A43-O | — | — |

## 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

## Build-Up

**Restoring worn parts to their original dimensions**

| | Open-Arc Tubular Wires | Gas-Shielded Tubular Wires | |
|---|---|---|---|
| | Tube-Alloy® Build Up-O*<br>Tube-Alloy® AP-O*<br>Tube-Alloy® 218-O*<br>Tube-Alloy® 242-O | Tube-Alloy® Build Up-G*<br>VertiWear® AP* | |

## Overlay

**Providing additional resistance to wear**

| Application | Open-Arc Tubular Wires | Gas-Shielded Tubular Wires | Metal-Cored Submerged-Arc Tubular Wires |
|---|---|---|---|
| **Metal to Metal** | Tube-Alloy® Build Up-O*<br>Tube-Alloy® 258-O*<br>ArmorWear™*<br>Tube-Alloy® 242-O | Tube-Alloy® Build Up-G*<br>Tube-Alloy® 258-G*<br>VertiWear® 600<br>FabTuf® 960 | Tube-Alloy® 242-S Mod<br>Tube-Alloy® 8620-S<br>Tube-Alloy® 861-S<br>Tube-Alloy® 868-S<br>Tube-Alloy® 877-S<br>Tube-Alloy® 952-S<br>Tube-Alloy® 954-S<br>Tube-Alloy® 252-S<br>Tube-Alloy® A2JL-S<br>Tube-Alloy® 887-S<br>Tube-Alloy® A250-S<br>Tube-Alloy® A420M-S<br>Tube-Alloy® 865-S Mod |
| **Impact** | Tube-Alloy® AP-O*<br>Tube-Alloy® 218-O* | VertiWear® AP* | |
| **Abrasion** | Tube-Alloy® 255-O*<br>Tube-Alloy® 240-O*<br>Tube-Alloy® 258TiC-O<br>Tube-Alloy® 244-O<br>Tube-Alloy® A43-O | Tube-Alloy® 255-G* | |

## Special Alloys & Flux

| | Open-Arc Tubular Wires | Flux | |
|---|---|---|---|
| | Tool-Alloy® GP-O | 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

.045"
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

# Hardfacing Wires

## 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

1/16"
7/64"
DCEP

## Tube-Alloy® 242-O

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-O. With proper preheating, crack-free deposits can be obtained. Tube-Alloy® 242-O 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

.045"
1/16"
7/64"
DCEP

## ArmorWear™

This self-shielded, flux-cored wire deposits a premium martensitic alloy steel of H-12 tool steel composition and has excellent resistance to adhesive (metal-to-metal) wear. It also has good resistance to abrasion and impact, and maintains its hardness up to 1000 degrees Fahrenheit. It is designed for use as an overlay on carbon and low alloy steels. Because of its high hardenability, proper preheat may be required for crack-free deposits, particularly on low alloy steels. It is formulated to optimize performance with the small 110/220V type wire welding machines.

### Typical Applications

- bucket lips and teeth
- cultivator chisels and sweeps
- plow shares, scraper blades
- shanks, knives, teeth
- kiln trunnions
- spindles
- pump components

### Typical Deposit Analysis %

Carbon.....0.40
Manganese .....1.00
Silicon.....0.40
Chromium .....5.80
Molybdenum .....1.50
Tungsten .....1.40
Iron.....Balance

### Typical Properties

Abrasion Resistance Good
Impact Resistance Good
Machinability Grind only
Hardness, as deposited, Rc

| No. of Layers | 1020 Steel |
|---|---|
| 1 | 47 |
| 2 | 49 |
| 3 | 53 |

Flame cutting is difficult
Magnetic
Heat Treatable and Forgeable
Maintains Hot Hardness to 1000°F

### Diameter and Polarity

.035"
DCEN

## Tube-Alloy® 258TiC-O

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"
7/64"
DCEP

# Hardfacing Wires

## Tube-Alloy® 244-O

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

## Tube-Alloy® A43-O

With a premium high chromium-columbium carbide surfacing alloy deposit, this wire can be used on components subject to extremely severe high and low-stress abrasive wear and moderate impact. It can also be used where high temperature (up to 1250 degrees Fahrenheit) wear resistance is required. It can be run as submerged arc by using MK-N neutral flux and the deposit will stress relief-check crack readily.

### Typical Applications

- augers
- bucket lips and teeth
- coal feeder screws
- coal pulverizer rolls and table
- coke chutes
- coke pusher shoes
- conveyor screws
- dredge cutter heads and teeth
- dredge pump inlet nozzle & side plates
- fan blades
- grizzly bars and fingers
- muller tires
- paving agitator screws
- pipeline ball joints
- pug mill paddles
- scraper blades
- sheepsfoot tampers
- sizing screws

### Typical Deposit Analysis %

| | |
|---|---|
| Carbon | 5.50 |
| Manganese | 0.20 |
| Silicon | 1.00 |
| Chromium | 22.00 |
| Columbium | 6.50 |
| 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 | 58 | 48 |
| 2-3 | 62 | 56 |

Cannot be flame cut

### Diameter and Polarity

1/16"
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 ($Ar/CO_2$)
or 100% $CO_2$

## 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 ($Ar/CO_2$)
75/25 ($Ar/CO_2$)

## VertiWear® AP

A premium, work-hardening austenitic manganese steel alloy, this flux-cored, all-position wire can be used for buildup or overlay on austenitic manganese steel. It can also be used for joining austenitic manganese steel to manganese steel, carbon steel and low alloy steel. The deposit has excellent impact resistance.

### Typical Applications

- bucket teeth and lips
- crusher jaws and cones
- dragline buckets
- dredge cutter heads and teeth
- grizzly bars and fingers
- gyratory crusher mantles and cones
- hammer mill hammers
- hydroelectric turbines
- impactor crusher bars
- muller tires
- pulverizer hammers
- sizing screens

### Typical Deposit Analysis %

| | |
|---|---|
| Carbon | 0.45 |
| Manganese | 14.00 |
| Silicon | 0.50 |
| Chromium | 13.50 |
| Nickel | 0.50 |
| Iron | Balance |

### Typical Properties

| | |
|---|---|
| Abrasion Resistance | Good |
| Impact Resistance | Excellent |
| Machinability | Fair |
| Hardness: | |
| Work Hardened | 50-55 Rc |

| No. of Layers | 1020 Steel |
|---|---|
| 1 | 24 Rc |
| 2 | 20 Rc |
| 3-8 | 18 RC |

Cannot be flame cut

### Diameter and Polarity

.045"
DCEP
Gas-Shielded
75/25 ($Ar/CO_2$)
or 100% $CO_2$

## 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"
1/16"
DCEP
Gas-Shielded
75/25 ($Ar/CO_2$)
or 100% $CO_2$

# Hardfacing Wires

## 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"
1/16"
DCEP
Gas-Shielded
75/25 ($Ar/CO_2$)
or 100% $CO_2$

## 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
- wobbler 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 ($Ar/CO_2$)
or 100% $CO_2$

## Tool-Alloy® GP-O

This multipurpose wire is recommended for joining dissimilar metals and hard to weld steels. It can be used for any high-strength application where wear, impact, heat and corrosion resistant properties are required.

### Typical Applications
- welding attachments to manganese castings
- welding grouser bars to grousers
- welding T-1 steel lips to manganese buckets

### Typical Deposit Analysis %
Carbon.....0.06
Manganese .....1.00
Silicon.....0.50
Chromium .....26.50
Nickel.....9.00
Iron.....Balance

### Typical Properties
Tensile Strength (psi) 120,000 (827 MPa)
Yield Strength (psi) 90,000 (620 MPa)
Elongation in 2" 27%
Machinability Good
Thickness As required
Cannot be flame cut
Nonmagnetic

### Diameter and Polarity
1/16"
DCEP

## 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"
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"
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 w/controlled ferrite | Martensitic |
| 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"
DCEP

# Hardfacing Wires

## 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"
1/8"
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"
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"
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**
3/32"
1/8"
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:**

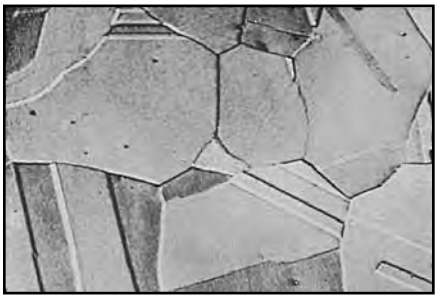
| | |
|---|---|
| $Al_2O_3$ + MnO | ~19% |
| CaO + MgO | ~34% |
| $SiO_2$ + $TiO_2$ | ~18% |
| $CaF_2$ | ~29% |

**Commonly Used With:**
- Tube-Alloy® 242-S MOD
- Tube-Alloy® 810-S
- Tube-Alloy® 8620-S
- Tube-Alloy® 865-S MOD
- Tube-Alloy® 875-S
- Tube-Alloy® 952-S
- Tube-Alloy® A250-S
- Tube-Alloy® A2JL-S
- Tube-Alloy® BU-S

**Packaging Available:**
- SWX HF-N
- 55 lb. (25 kg) Bag
- SWX HF-N
- 55 lb. (25 kg) EAE Bag
- 2200 lb. (1000 kg) DoubleBag™

# TECHNICAL SECTION

## Hardfacing Wire Alloy Classification

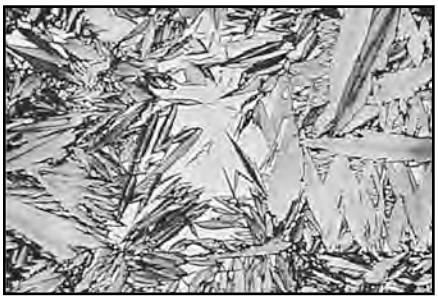


*Photomicrograph of austenite.*

### 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.

| Hobart® Austenitic Products |
|---|
| Tube-Alloy® 218-O |
| Tube-Alloy® AP-O |
| VertiWear® AP |

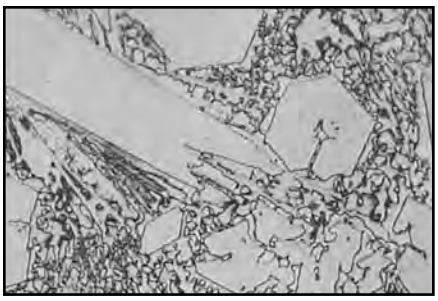


*Photomicrograph of martensite.*

### 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.

| 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 |



*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 |
|---|
| Tube-Alloy® 244-O |
| Tube-Alloy® 258 TiC-O |
| Tube-Alloy® 240-O |
| Tube-Alloy® 255-O |
| Tube-Alloy® 255-G |

## Hardfacing Wire/Stick Electrode Equivalent

| | Gas-Shielded Wire | | |
|---|---|---|---|
| Open- Arc Wire | Flux-Cored | Metal-Cored | Stick Electrode |
| Tube-Alloy® 218-O | — | — | Hardalloy®118 |
| Tube-Alloy® AP-O | VertiWear® AP | — | — |
| Tube-Alloy® Build Up-O | — | Tube-Alloy® Build Up-G | — |
| Tube-Alloy® 258-O/ArmorWear™ | — | Tube-Alloy® 258-G | — |
| | VertiWear® 600 | — | — |
| | FabTuf® 960 | — | — |
| Tube-Alloy® 240-O | — | — | Hardalloy® 140 |
| Tube-Alloy® 255-O | — | Tube-Alloy® 255-G | Hardalloy® 155 |
| Tube-Alloy® 242-O | — | — | — |

## General Operating Parameters of Tube-Alloy® G Flux-Cored Gas-Shielded Surfacing Wires

| .045" Diameter | | 1/16" Diameter | |
|---|---|---|---|
| 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

| .045" Diameter | | 1/16" Diameter | |
|---|---|---|---|
| **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

| .045" Diameter | | 1/16" Diameter | | 7/64" Diameter | |
|---|---|---|---|---|---|
| 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

| .045" Diameter | | 1/16" Diameter | | 7/64" Diameter | |
|---|---|---|---|---|---|
| **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

| 3/32" (2.4 mm) | | | 1/8" (3.2 mm) | | | 5/32" (4.0 mm) | | |
|---|---|---|---|---|---|---|---|---|
| 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/ ArmorWear™ | 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 |
| Tube-Alloy® A43-O | — | — | — | SA/Super-20 | CN-O, CN2-O |
| Tool-Alloy® GP-O | 706 FC | 690 | — | Versalloy, GP-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 |
| VertiWear® AP | — | 15CrMn | 110 |

## 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<br>Stoody R-20 | — | ??? | UTP UP FX 603<br>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<br>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<br>ThermaClad Roll Build 3 | SelectWear BU-S | HARDFACE B | UP DUR 250<br>SK BU-S<br>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**

# 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, AP | 255-O, 255-G, A43-O |
| Dredge Pump Casings | 218-O | — |
| Dredge Pump Inlet Nozzle | — | 255-O, 255-G, A43-O |
| 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, A43-O |
| 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, A43-O |
| Bucket Lips/Teeth | BU-O, BU-G | 240-O, 255-O, 255-G, A43-O |
| 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, AP | 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, A43-O |
| Power Shovel Bucket Lips/ Teeth | BU-O, BU-G, AP-O, AP | 240-O, 255-O, 255-G |
| Pug Mill Paddles | — | 255-O, 255-G |
| Road Rippers | — | 255-O, 255-G, A43-O |
| Scraper Blades | — | 240-O, 255-O, 255-G, A43-O |
| Sheepsfoot Tampers | — | 240-O, 255-O, 255-G, A43-O |
| 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, A43-O |
| Bucket Teeth (Manganese Steel) | 218-O, AP-O, AP | 240-O, 255-O, 255-G, A43-O |
| Bulldozer End Bits | — | 240-O, 255-O, 255-G |
| Cement Chutes | — | 255-O, 255-G |
| Conveyor Screws | — | 240-O, 255-O, 255-G, A43-O |
| Crusher Jaws/Cones | 218-O, AP-O, AP | 240-O, 255-O, 255-G |
| Crusher Rolls | — | 240-O |
| Gear Teeth | BU-O, BU-G | — |
| Gyratory Crusher Mantles/ Cones | 218-O, AP-O, AP | 255-O, 255-G |
| Hammer Mill Hammers | 218-O, AP-O, AP | 240-O |
| Impactor Crusher Bars | 218-O, AP-O, AP | 240-O |
| Kiln Trunnions | BU-O, BU-G | 258-O, 258-G |
| Muller Tires | AP-O, AP | 240-O, 255-O, 255-G, A43-O |
| Pug Mill Paddles | — | 255-O, 255-G, A43-O |
| Pulverizer Hammers | AP-O, AP | 240-O |
| Sizing Screens | AP-O, AP | 240-O, 255-O,255-G, A43-O |
| Steel Shafts | BU-O, BU-G | 242-O |

## Iron & Steel Industry

| Application Build-Up | Overlay | Hobart® Wire |
|---|---|---|
| Coke Chutes | — | 255-O, 255-G, A43-O |
| Coke Pusher Shoes | — | 255-O, 255-G, A43-O |
| 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, AP | 255-O, 255-G, A43-O |
| Mill Guides | — | 258-O, 258-G, 240-O |
| Pug Mill Paddles | — | 255-O, 255-G, A43-O |
| 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, AP |
| Frogs (Carbon Steel) | 242-O |
| Frogs (Manganese Steel) | 218-O, AP-O, AP |
| Rail Ends (Low Alloy Steel) | 242-O |
| Switch Points (Low Alloy Steel) | 242-O |

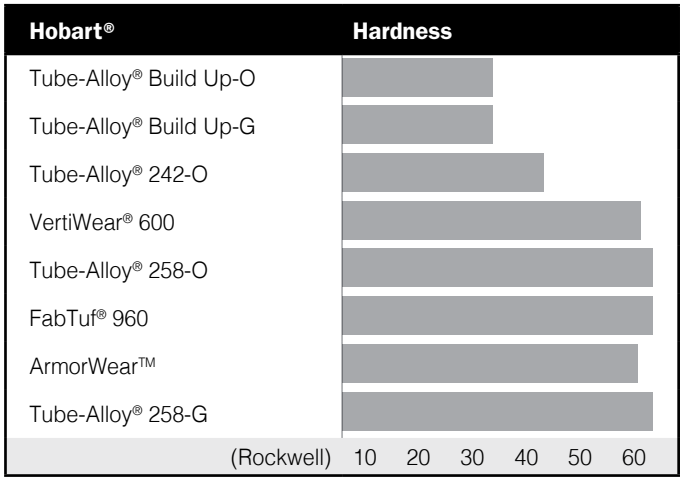
## Power Generation Industry

| Application Overlay | Hobart® Wire |
|---|---|
| Coal Feeder Screws | 255-O, 255-G, A43-O |
| Coal Pulverizer Hammers | 255-O, 255-G |
| Coal Pulverizer Rolls | 255-O, 255-G, A43-O |
| Coal Pulverizer Table | 255-O, 255-G, A43-O |
| Fan Blades | 255-O, 255-G, A43-O |
| Hydroelectric Turbines | AP-O, AP |

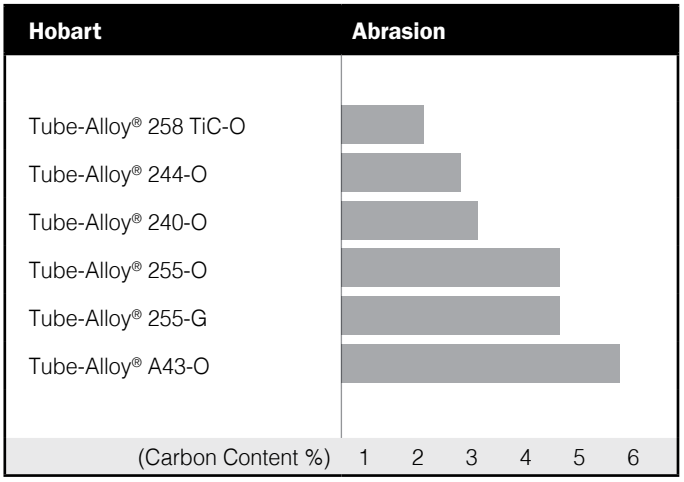
**BU = Build-Up, O = Open Arc, -G = Gas Shielded, -S = Sub-Arc**

# TECHNICAL SECTION

## Metal-to-Metal Wear Resistance



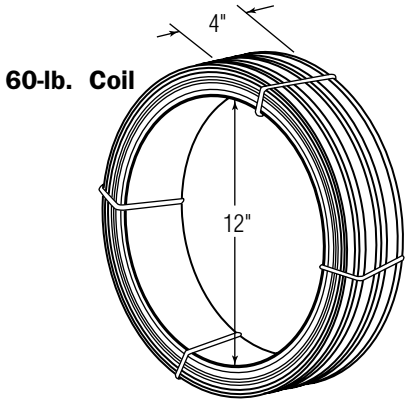

## Abrasion Resistance

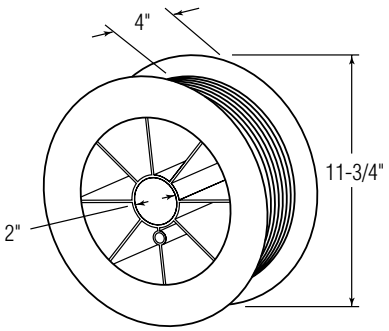



## Pallet Packaging

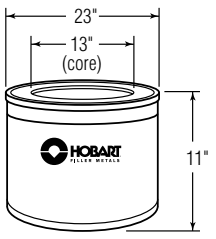
| Hobart® Type | Pallet Weight (lb) | | Pallet Dimensions | | | Number of Items Per Pallet |
|---|---|---|---|---|---|---|
| | Net | Gross (est) | Depth | Width | Height | |
| 25-lb. Spool | 500 | 605 | 24" | 24" | 27" | 20 (25-lb. Spools) |
| 60-lb. Coil | 1680 | 1743 | 36" | 36" | 35" | 28 (60-lb. Coils) |
| Note: Please contact factory for Auto-Pak pallet requirements | | | | | | |

## Packaging Options

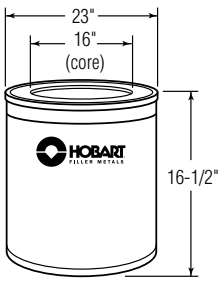


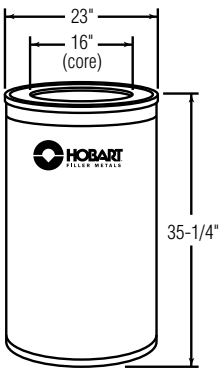

25-lb. Plastic Spool




100-lb. Auto-Pak




250-lb. Auto-Pak




600-lb. Auto-Pak

# TECHNICAL SECTION

## 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 |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Pipemaster® Pro-60** | **E6010** | | | **3** |
| 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 | |
| **Hobart® 610** | **E6010** | | | **3** |
| 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 | |
| S129458-035 | 3/16" | 4.8 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| **Pipemaster® 70** | **E7010-P1** | | | **3** |
| 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 | |
| **Pipemaster® 80** | **E8010-P1** | | | **4** |
| 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 | |
| **Pipemaster® 90** | **E9010-G** | | | **4** |
| S116844-035 | 1/8" | 3.2 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| S116851-035 | 5/32" | 4.0 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| S116858-035 | 3/16" | 4.8 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| **Hobart® 335A** | **E6011** | | | **4** |
| 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 | |
| S112251-089 | 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 | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Hobart® 447A** | **E6013** | | | **5** |
| S113832-089 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Plastic Pak | |
| 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 | |
| S113851-045 | 5/32" | 4.0 | 5 Lb (2 Kg) Plastic Pak | |
| 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 | |
| **Hobart® Deckmaster™ 1139** | **E6022** | | | **5** |
| S113244-031 | 1/8" | 3.2 | 50 Lb (22.7 Kg) Carton | |
| S113251-031 | 5/32" | 4.0 | 50 Lb (22.7 Kg) Carton | |
| **Hobart® 14A** | **E7014** | | | **5** |
| S114232-045 | 3/32" | 2.4 | 5 Lb (2 Kg) Plastic Pak | |
| 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 | |
| S112981-031 | 1/4" | 6.4 | 50 Lb (22.7 Kg) Carton | |
| **Hobart® 24** | **E7024 / E7024-1** | | | **6** |
| 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 | |
| **Hobart® 418** | **E7018 H4R / E7018-1 H4R** | | | **6** |
| 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 | |
| S119951-033 | 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 | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Hobart® 718MC** | **E7018 H4R / E7018-1 H4R** | | | **6** |
| 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 | |
| **Hobart® 7018 XLM** | **E7018 H4R / E7018-1 H4R** | | | **7** |
| 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 | |
| S422070-035 | 7/32" | 5.6 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| S422081-035 | 1/4" | 6.4 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| **Hobart® 18AC** | **E7018 H8** | | | **7** |
| 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 | |
| S119844-089 | 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 | |
| S119851-035 | 5/32" | 4.0 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| **Hoballoy® 7018A1** | **E7018-A1 H4R** | | | **7** |
| 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 | |
| S125044-033 | 1/8" | 3.2 | 10 Lb (4.5 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 | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Hoballoy® 8018B2** | **E8018-B2 H4R** | | | **8** |
| 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 | |
| S125444-033 | 1/8" | 3.2 | 10 Lb (4.5 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 | |
| **Hoballoy® 8018C1** | **E8018-C1 H4** | | | **8** |
| 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 | |
| **Hoballoy® 8018C3** | **E8018-C3 H4** | | | **8** |
| 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 | |
| **Hoballoy® 9018B3** | **E9018-B3 H4R** | | | **9** |
| S125532-033 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Hermetically Sealed Can | |
| 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 | |
| **Hoballoy® 9018M** | **E9018-M H4R** | | | **9** |
| S125632-033 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Hermetically Sealed Can | |
| 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 | |
| S125658-035 | 3/16" | 4.8 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |
| S125681-035 | 1/4" | 6.4 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Hoballoy® 10018D2** | **E10018-D2 H4R** | | | **9** |
| 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 | |
| **Hoballoy® 11018M** | **E11018-M H4R** | | | **10** |
| 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 | |
| S126081-035 | 1/4" | 6.4 | 50 Lb (22.7 Kg) Hermetically Sealed Can | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Quantum Arc™ 3** | **ER70S-3** | | | **16** |
| 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 | |
| S307308-028 | 0.035" | 0.9 | 60 Lb (27 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 | |
| S307312-033 | 0.045" | 1.2 | 33 Lb (15 Kg) Steel Reel | |
| 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 | |
| S307315-011 | 0.052" | 1.4 | 600 Lb (272 Kg) Robo-Pak | |
| | | | | |
| **Quantum Arc™ 6** | **ER70S-6** | | | **16** |
| 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 | |
| S307608-028 | 0.035" | 0.9 | 60 Lb (27 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 | |
| S307612-070 | 0.045" | 1.2 | 950 Lb (431 Kg) Recyclable Robo-Pak | |
| S307615-028 | 0.052" | 1.4 | 60 Lb (27 Kg) Fiber Spool | |
| S307615-070 | 0.052" | 1.4 | 950 Lb (431 Kg) Recyclable Robo-Pak | |
| S307618-045 | 1/16" | 1.6 | 45 Lb (20.4 Kg) Steel Reel | |
| S307618-028 | 1/16" | 1.6 | 60 Lb (27 Kg) Fiber Spool | |
| S307618-013 | 1/16" | 1.6 | 500 Lb (227 Kg) Robo-Pak | |
| S307618-007 | 1/16" | 1.6 | 700 Lb (318 Kg) Recyclable Robo-Pak | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **HB-28** | **ER70S-6** | | | **17** |
| S305401-019 | 0.024" | 0.6 | 2 Lb (0.9 Kg) Spool | |
| S305401-022 | 0.024" | 0.6 | 10 Lb (4.5 Kg) Spool | |
| S305401-033 | 0.024" | 0.6 | 33 Lb (15 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 | |
| S305412-033 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S305412-045 | 0.045" | 1.2 | 45 Lb (20.4 Kg) Spool | |
| **Quantum Arc™ D2** | **ER80S-D2 / ER90S-G** | | | **17** |
| 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 |
|---|---|---|---|---|
| **Wire** | | | | |
| **MaxalMig ER1100** | **ER1100** | | | **25** |
| 110003512 | 0.035" | 0.9 | 16 Lb (7.3 Kg) Wire Basket | |
| 110004712 | 3/64" | 1.2 | 16 Lb (7.3 Kg) Wire Basket | |
| 110004723L | 3/64" | 1.2 | 100 Lb (45 Kg) Drum | |
| 110006212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| 110006212P22 | 1/16" | 1.6 | 22 Lb (10 Kg) Plastic Spool | |
| 110006223L | 1/16" | 1.6 | 100 Lb (45 Kg) Drum | |
| 110006223 | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |
| 110006223M | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |
| **MaxalMig ER4043** | **ER4043** | | | **25** |
| 404303004 | 0.030" | 0.8 | 1 Lb (0.45 Kg) Plastic Spool | |
| 404303012 | 0.030" | 0.8 | 12 Lb (5.4 Kg) Wire Basket | |
| 404303012B | 0.030" | 0.8 | 14 Lb (6.4 Kg) Wire Basket Bulk | |
| 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 | |
| 404303523L | 0.035" | 0.9 | 100 Lb (45 Kg) Drum | |
| 404303523 | 0.035" | 0.9 | 300 Lb (136 Kg) Drum | |
| 404304012 | 0.040" | 1.0 | 16 Lb (7.3 Kg) Wire Basket | |
| 404304023 | 0.040" | 1.0 | 300 Lb. (136 Kg) Drum | |
| 404304704 | 3/64" | 1.2 | 1 Lb (0.45 Kg) Plastic Spool | |
| 404304712B | 3/64" | 1.2 | 14 Lb (6.4 Kg) Wire Basket Bulk | |
| 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 | |
| 404306223L | 1/16" | 1.6 | 100 Lb (45 Kg) Drum | |
| 404306223 | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |
| **MaxalMig ER4047** | **ER4047** | | | **25** |
| 4047035 | 0.035" | 0.9 | 16 Lb (7.3 Kg) Plastic Spool | |
| 404703512 | 0.035" | 0.9 | 16 Lb (7.3 Kg) Wire Basket | |
| 404703523 | 0.035" | 0.9 | 300 Lb (136 Kg) Drum | |
| 404704704 | 3/64" | 1.2 | 1 Lb (0.45 Kg) Plastic Spool | |
| 404704712 | 3/64" | 1.2 | 16 Lb (7.3 Kg) Wire Basket | |
| 404704712P22 | 3/64" | 1.2 | 22 Lb (10 Kg) Plastic Spool | |
| 404704723L | 3/64" | 1.2 | 100 Lb (45 Kg) Drum | |
| 404704723 | 3/64" | 1.2 | 300 Lb (136 Kg) Drum | |
| 404706212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| 404706212P | 1/16" | 1.6 | 16 Lb (7.3 Kg) Plastic Spool | |
| 404706223L | 1/16" | 1.6 | 100 Lb (45 Kg) Drum | |
| 404706223 | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **MaxalMig ER4943** | **ER4943** | | | **26** |
| 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 | |
| 494303523L | 0.035" | 0.9 | 100 Lb (45 Kg) Drum | |
| 494303523 | 0.035" | 0.9 | 300 Lb (136 Kg) Drum | |
| 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 | |
| 494306212P22 | 1/16" | 1.6 | 22 Lb (10 Kg) Plastic Spool | |
| 494306223L | 1/16" | 1.6 | 100 Lb (45 Kg) Drum | |
| 494306223 | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |
| **MaxalMig ER5183** | **ER5183** | | | **26** |
| 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 | |
| 518304708 | 3/64" | 1.2 | 5 Lb (2 Kg) Plastic Spool | |
| 518304712 | 3/64" | 1.2 | 16 Lb (7.3 Kg) Wire Basket | |
| 518304712P | 3/64" | 1.2 | 16 Lb (7.3 Kg) Plastic Spool | |
| 518304712P22 | 3/64" | 1.2 | 22 Lb (10 Kg) Plastic Spool | |
| 518304723 | 3/64" | 1.2 | 300 Lb (136 Kg) Drum | |
| 518306212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| 518306212P | 1/16" | 1.6 | 16 Lb (7.3 Kg) Plastic Spool | |
| **MaxalMig ER5356** | **ER5356** | | | **26** |
| 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 | |
| 535603508 | 0.035" | 0.9 | 5 Lb (2 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 | |
| 535604704 | 3/64" | 1.2 | 1 Lb (0.45 Kg) Plastic Spool | |
| 535604708 | 3/64" | 1.2 | 5 Lb (2 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 | |
| 535604730 | 3/64" | 1.2 | 350 Lb (159 Kg) Drum | |
| 535606212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| 535606212B | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket Bulk | |
| 535606212P | 1/16" | 1.6 | 16 Lb (7.3 Kg) Plastic Spool | |
| 535606223L | 1/16" | 1.6 | 100 Lb (45 Kg) Drum | |
| 535606223 | 1/16" | 1.6 | 300 Lb (136 Kg) Drum | |
| 535606230 | 1/16" | 1.6 | 350 Lb (159 Kg) Drum | |
| 535609412 | 3/32" | 2.4 | 16 Lb (7.3 Kg) Wire Basket | |
| 535609412P | 3/32" | 2.4 | 16 Lb (7.3 Kg) Plastic Spool | |
| **MaxalMig ER5554** | **ER5554** | | | **27** |
| 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 | |
| 555403512 | 0.035" | 0.9 | 16 Lb (7.3 Kg) Wire Basket | |
| 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 | |
| 555404723L | 3/64" | 1.2 | 100 Lb (45 Kg) Drum | |
| 555404723 | 3/64" | 1.2 | 300 Lb (136 Kg) Drum | |
| 555406212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| **MaxalMig ER5556** | **ER5556** | | | **27** |
| 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 | |
| 555604712 | 3/64" | 1.2 | 16 Lb (7.3 Kg) Wire Basket | |
| 555604712P | 3/64" | 1.2 | 16 Lb (7.3 Kg) Plastic Spool | |
| 555604723 | 3/64" | 1.2 | 300 Lb (45 Kg) Drum | |
| 555606212 | 1/16" | 1.6 | 16 Lb (7.3 Kg) Wire Basket | |
| 555606212P | 1/16" | 1.6 | 16 Lb (7.3 Kg) Plastic Spool | |
| 555609412P | 3/32" | 2.4 | 16 Lb (7.3 Kg) Plastic Spool | |
| **Cut Lengths** | | | | |
| **MaxalTig 1100** | **R1100** | | | **27** |
| 110006270 | 1/16" | 1.6 | 10 Lb (4.5 Kg) Carton | |
| 110009470 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Carton | |
| 110012570 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 4043** | **R4043** | | | **28** |
| 404306271 | 1/16" | 1.6 | 1 Lb (0.45 Kg) Tube | |
| 404306270 | 1/16" | 1.6 | 10 Lb (4.5 Kg) Carton | |

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|---|---|---|---|---|
| 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 | |
| 404312570B | 1/8" | 3.2 | 10 Lb (4.5 Kg) Bulk Tig | |
| 404315670 | 5/32" | 4.0 | 10 Lb (4.5 Kg) Carton | |
| 404318770 | 3/16" | 4.8 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 4047** | **R4047** | | | **28** |
| 404706270 | 1/16" | 1.6 | 10 Lb (4.5 Kg) Carton | |
| 404709470 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Carton | |
| 404712570 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Carton | |
| 404715670 | 5/32" | 4.0 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 4943** | **R4943** | | | **28** |
| 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 | |
| **MaxalTig 5183** | **R5183** | | | **29** |
| 518306270 | 1/16" | 1.6 | 10 Lb (4.5 Kg) Carton | |
| 518309470 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Carton | |
| 518312570 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 5356** | **R5356** | | | **29** |
| 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 | |
| 535618770 | 3/16" | 4.8 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 5554** | **R5554** | | | **29** |
| 555409470 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Carton | |
| 555406271 | 1/8" | 3.2 | 1 Lb (0.45 Kg) Tube | |
| 555412571 | 1/8" | 3.2 | 1 Lb (0.45 Kg) Tube | |
| 555412570 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Carton | |
| **MaxalTig 5556** | **R5556** | | | **30** |
| 555609470 | 3/32" | 2.4 | 10 Lb (4.5 Kg) Carton | |
| 555612570 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Carton | |
| 555615670 | 5/32" | 4.0 | 10 Lb (4.5 Kg) Carton | |
| 555618770 | 3/16" | 4.8 | 10 Lb (4.5 Kg) Carton | |



| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
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| **Mild Steel FCAW(gas)** | | | | |
| **FabCO® RXR** | **E70T-1C/-9C** | | | **33** |
| S246512-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S246512-044 | 0.045" | 1.2 | 44 Lb. (20 Kg) Spool | |
| S246519-029 | 1/16" | 1.6 | 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 | |
| S246519-056 | 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 | |
| S246529-005 | 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 | |
| **FabCO® TR-70** | **E70T-1C H8/-9C H8** | | | **33** |
| 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 | |
| **FabCO® 70XHP** | **E70T-1CJ H8/-9CJ H8/-12CJ H8/-1MJ H8/-9MJ H8** | | | **33** |
| S240919-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S240929-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| **FabCO® Premier 70** | **E70T-1C/-9CJ H8** | | | **34** |
| S247419-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® SUPER-COR** | **E70T-1C H4/E70T-9C H4** | | | **34** |
| S647129-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| S647129-008 | 3/32" | 2.4 | 600 Lb. (272 Kg) Drum | |
| **FabCO® 85** | **E70T-5CJ H4/-5MJ H4** | | | **34** |
| S647519-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S647529-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| S647529-008 | 3/32" | 2.4 | 600 Lb. (272 Kg) Drum | |
| **FabCO® 73** | **E70T-2C** | | | **35** |
| S248229-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| S248239-002 | 7/64" | 2.8 | 60 Lb. (27 Kg) Coil | |

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| **FabCO® Excel-Arc™ 71** | **E71T-1C/M H8, E71T-9C/M H8** | | | **35** |
| S247108-022 | 0.035" | 0.9 | 10 Lb. (4.5 Kg) Spool | |
| 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 | |
| S247112-002 | 0.045" | 1.2 | 60 Lb. (27 Kg) Coil | |
| S247112-064 | 0.045" | 1.2 | 400 Lb. (181 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 | |
| S247115-044 | 0.052" | 1.4 | 44 Lb. (20 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 | |
| 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 | |
| **FabCO® Hornet** | **E71T-1C/-1M/-9C/-9M H8** | | | **35** |
| S246212-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S246212-044 | 0.045" | 1.2 | 44 Lb. (20 Kg) Spool | |
| S246219-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| S246219-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S246219-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |
| **FabCO® Triple 7** | **E71T-1C/-1M H8** | | | **36** |
| S285812-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S285812-027 | 0.045" | 1.2 | 50 Lb. (22.7 Kg) Spool | |
| S285812-064 | 0.045 | 1.2 | 400 Lb. (181 Kg) X-Pak™ | |
| S285815-029 | 0.052" | 1.4 | 33 Lb. (15 Kg) Spool | |
| S285819-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| S285819-027 | 1/16" | 1.6 | 50 Lb. (22.7 Kg) Spool | |
| S285819-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S285819-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |
| **FabCO® Triple 8** | **E71T-1CJ/-9CJ H8** | | | **36** |
| S288812-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S288815-029 | 0.052" | 1.4 | 33 Lb. (15 Kg) Spool | |
| S288819-027 | 1/16" | 1.6 | 50 Lb. (22.7 Kg) Spool | |

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| **FabCO® Element™ 71T1C** | **E71T-1C/-9C H8** | | | **36** |
| 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 | |
| **FabCO® Element™ 71T1M** | **E71T-1M/-9M H8** | | | **37** |
| 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 | |
| **FabCO® Element™ 71C** | **E71T-1C H8/E71T-9C H8** | | | **37** |
| S297912-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S297915-029 | 0.052" | 1.5 | 33 Lb. (15 Kg) Spool | |
| S297919-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® Element™ 71M** | **E71T-1M H8/E71T-9M H8** | | | **37** |
| S294712-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S294715-029 | 0.52" | 1.4 | 33 Lb. (15 Kg) Spool | |
| S294719-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 711M** | **E71T-1C H8/-1M H8** | | | **38** |
| S248812-029 | 0.045" | 1.2 | 33 Lb. (15 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 | |
| S248819-056 | 1/18" | 1.8 | 600 Lb. (272 Kg) X-PakTM | |
| **FabCO® 712M** | **E71T-12MJ H4** | | | **38** |
| S237512-053 | 0.045" | 1.2 | 33 Lb. (15 Kg) Vacuum Pkgd Spool | |
| S237519-053 | 1/16" | 1.6 | 33 Lb. (15 Kg) Vacuum Pkgd Spool | |
| **FabCO® XL®-550** | **E71T-1CJ/-9CJ/-12CJ H4** | | | **38** |
| 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 | |
| S245019-027 | 1/16" | 1.6 | 50 Lb. (22.7 Kg) Spool | |
| S245019-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S245019-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |

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| **FabCO® XL®-525** | **E71T-1M/-12MJ H8** | | | **39** |
| 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 | |
| **FabCO® 910** | **E71T-1M/-12MJ** | | | **39** |
| S288412-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S288415-029 | 0.052" | 1.4 | 33 Lb. (15 Kg) Spool | |
| S288419-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **Mild Steel FCAW(self)** | | | | |
| **Fabshield® 4** | **E70T-4** | | | **40** |
| 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 | |
| S224541-014 | 0.120" | 3.0 | 50 Lb. (22.7 Kg) Coil | |
| S224541-008 | 0.120" | 3.0 | 600 Lb. (272 Kg) Drum | |
| **Fabshield® XLNT-6** | **E70T-6** | | | **40** |
| 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 | |
| **Fabshield® 7027** | **E70T-7** | | | **40** |
| S222729-V14 | 3/32" | 2.4 | 50 Lb. (22.7 Kg) Coil | |
| S222739-014 | 7/64" | 2.8 | 50 Lb. (22.7 Kg) Coil | |
| S222739-008 | 7/64" | 2.8 | 600 Lb. (272 Kg) Drum | |
| **Fabshield® XLR-8** | **E71T-8JD H8** | | | **41** |
| 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 | |
| S225725-014 | 5/64" | 2.0 | 50 Lb. (22.7 Kg) Coil | |

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| **Fabshield® 21B** | **E71T-11** | | | **41** |
| 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 | |
| S222123-029 | 0.068" | 1.7 | 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 | |
| **Fabshield® 23** | **E71T-14** | | | **41** |
| S222312-056 | 0.045" | 1.2 | 600 Lb. (272 Kg) X-Pak™ | |
| S222319-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |
| **Low-Alloy FCAW(gas)** | | | | |
| **FabCO® 81N1** | **E80T1-NI1CJ H8/-NI1MJ H8** | | | **43** |
| S284229-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| S284229-018 | 3/32" | 2.4 | 600 Lb. (272 Kg) Drum | |
| **FabCO® 811N1** | **E81T1-Ni1CJ H4/-Ni1 MJ H4** | | | **43** |
| S283612-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S283619-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| S283619-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| **FabCO® 812-Ni1M** | **E81T1-Ni1 MJ H4** | | | **43** |
| S298012-053 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 803** | **E81T1-Ni2CJ H4/-Ni2MJ H4** | | | **44** |
| 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 | |
| S283719-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |
| **FabCO® 881K2** | **EE81T1-K2CJ H8/-K2MJ H8** | | | **44** |
| S284812-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 81K2-C** | **E81T1-K2CJ H8** | | | **44** |
| S288112-053 | 0.045" | 1.2 | 33 Lb. (15 Kg) Vacuum Pkgd Spool | |
| S288119-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 991K2** | **E91T1-K2C H8/-K2M H8** | | | **45** |
| S285612-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S285619-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |

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| **FabCO® 95K2-C** | **E90T5-K2C H4/-K2M H4** | | | **45** |
| S659519-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 101K3** | **E100T1-K3C** | | | **45** |
| S282419-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| **FabCO® 115K3** | **E110T5-K3C/-K3M H4** | | | **46** |
| S651519-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S651519-056 | 1/16" | 1.6 | 600 Lb. (272 Kg) X-Pak™ | |
| S651529-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| S651529-008 | 3/32" | 2.4 | 600 Lb. (272 Kg) Drum | |
| **FabCO® 110** | **E111T1-K3 MJ H8** | | | **46** |
| S282812-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S282819-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 115** | **E110T5-K4C** | | | **46** |
| 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 | |
| **FabCO® 125K4** | **E120T5-K4C H4** | | | **47** |
| S655519-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| **FabCO® 105D2** | **E100T5-D2C** | | | **47** |
| S650419-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| S650429-002 | 3/32" | 2.4 | 60 Lb. (27 Kg) Coil | |
| **FabCO® 811A1** | **E81T1-A1C** | | | **47** |
| S653212-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 911B3** | **E91T1-B3C H4/-B3M H4** | | | **48** |
| S285012-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S285012-064 | 0.045" | 1.2 | 400 Lb. (181 Kg) X-Pak™ | |
| S285019-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® Element™ 81K2C** | **E81T1-GC H8** | | | **48** |
| S292412-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S292419-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® Element™ 81K2M** | **E81T1-GM H8** | | | **48** |
| S294412-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S294419-029 | 1/16" | 1.6 | 33 Lb. (15 Kg) Spool | |
| **FabCO® 101** | **E101T1-GM** | | | **49** |
| S241012-029 | 0.045" | 1.2 | 33 Lb. (15 Kg) Spool | |
| S241019-002 | 1/16" | 1.6 | 60 Lb. (27 Kg) Coil | |
| **FabCO® XTREME® 120** | **E121T5-GC H4** | | | **49** |
| S290019-053 | 1/16" | 1.6 | 33 Lb. (15 Kg) Vacuum Pkgd Spool | |

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| **Low-Alloy FCAW(self)** | | | | |
| **Fabshield® 71T8** | **E71T8-Ni1 J H8** | | | **50** |
| S228519-P01 | 1/16" | 1.6 | 14 Lb. (6 Kg) Coil | |
| S228525-P01 | 5/64" | 2.0 | 14 Lb. (6 Kg) Coil | |
| **Fabshield® 81N1** | **E71T8-Ni1 J H8** | | | **50** |
| S228125-P01 | 5/64" | 2.0 | 14 Lb. (6 Kg) Coil | |
| **Fabshield® X80** | **E81T8-Ni2 J H8** | | | **50** |
| S228825-P01 | 5/64" | 2.0 | 14 Lb. (6 Kg) Coil | |
| **Fabshield® 71K6** | **E71T8-K6 J H8** | | | **51** |
| S228625-P01 | 5/64" | 2.0 | 14 Lb. (6 Kg) Coil | |
| **Fabshield® Offshore 71Ni** | **E71T8-K6 J H8** | | | **51** |
| S292025-032 | 5/64" | 2.0 | 10 Lb. (4.5 Kg) Vacuum Pkgd Spool | |

# Metal-Cored part numbers

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| **Mild Steel Metal-Cored** | | | | |
| **FabCOR® 86R** | **E70C-6M H4** | | | **53** |
| S249408-029 | 0.035" | 0.9 | 33 Lb (15 Kg) Spool | |
| S249408-064 | 0.035" | 0.9 | 400 Lb (181 Kg) X-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 | |
| S249412-002 | 0.045" | 1.2 | 60 Lb (27 Kg) Coil | |
| S249412-050 | 0.045" | 1.2 | 500 Lb (227 Kg) X-Pak™ | |
| S249412-075 | 0.045" | 1.2 | 750 Lb (340 Kg) X-Pak™ | |
| S249412-090 | 0.045" | 1.2 | 900 Lb (408 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™ | |
| S249415-090 | 0.052" | 1.4 | 900 Lb (408 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™ | |
| 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 | |
| **FabCOR® Edge™** | **E70C-6M H4** | | | **53** |
| 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™ | |
| 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™ | |

| 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™ | |
| **FabCOR® 702** | **E70C-3C** | | | **53** |
| S248419-B33 | 1/16" | 1.6 | 33 Lb (15 Kg) Bulk Spool | |
| S248419-002 | 1/16" | 1.6 | 60 Lb (27 Kg) Coil | |
| S248439-010 | 7/64" | 2.8 | 60 Lb (27 Kg) Bulk Coil | |
| **FabCOR® Element™ 70C6** | **E70C-6M H4** | | | **54** |
| S294612-029 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S294615-029 | 0.052" | 1.4 | 33 Lb (15 Kg) Spool | |
| S294619-029 | 1/16" | 1.6 | 33 Lb (15 Kg) Spool | |
| **FabCOR® F6** | **E70C-GS** | | | **54** |
| S278308-029 | 0.035" | 0.9 | 33 Lb (15 Kg) Spool | |
| S278308-050 | 0.035" | 0.9 | 500 Lb (227 Kg) X-Pak™ | |
| 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 | |
| S278312-091 | 0.045" | 1.2 | 900 Lb (408 Kg) X-Pak™ | |
| **Low-Alloy Metal-Cored** | | | | |
| **FabCOR® Edge™ Ni1** | **E80C-Ni1 H4** | | | **55** |
| S279512-029 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S279512-027 | 0.045" | 1.2 | 50 Lb (22.7 Kg) Spool | |
| S279512-050 | 0.045" | 1.2 | 500 Lb (227 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™ | |
| S279519-029 | 1/16" | 1.6 | 33 Lb (15 Kg) Spool | |
| S279519-002 | 1/16" | 1.6 | 60 Lb (27 Kg) Coil | |
| S279519-075 | 1/16" | 1.6 | 750 Lb (340 Kg) X-Pak™ | |
| **FabCOR® 80N2** | **E80C-Ni2 H4** | | | **56** |
| S281412-029 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S281412-050 | 0.045" | 1.2 | 500 Lb (227 Kg) X-Pak™ | |
| S281419-002 | 1/16" | 1.6 | 60 Lb (27 Kg) Coil | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **FabCOR® 90** | **E90C-K3 H4** | | | **56** |
| S281612-029 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S281612-075 | 0.045" | 1.2 | 750 Lb (340 Kg) X-Pak™ | |
| S281619-056 | 1/16" | 1.6 | 600 Lb (272 Kg) X-Pak™ | |
| **FabCOR® 100** | **E100C-K3** | | | **56** |
| 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) X-Pak™ | |
| **FabCOR® 1100** | **E110C-K4** | | | **57** |
| S280212-029 | 0.045" | 1.2 | 33 Lb (15 Kg) Spool | |
| S280212-075 | 0.045" | 1.2 | 750 Lb (340 Kg) X-Pak™ | |
| S280215-029 | 0.052" | 1.4 | 33 Lb (15 Kg) Spool | |
| S280215-075 | 0.052" | 1.4 | 750 Lb (340 Kg) X-Pak™ | |
| 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™ | |
| **FabCOR® 80D2** | **E90C-D2** | | | **57** |
| 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™ | |
| S281219-K75 | 1/16" | 1.6 | 750 Lb (340 Kg) X-Pak™ | |
| **FabCOR® Edge™ D2** | **E90C-D2** | | | **57** |
| 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™ | |

**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 |
|---|---|---|---|---|
| **Seamless Metal-Cored** | | | | |
| **MEGAFIL 710M** | **E70C-6M H4** | | | **64** |
| 71015B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |
| 71033B | 1/16 | 1.6 | 35 Lb (15.9 Kg) Spool | |
| **MEGAFIL 240M** | **E80C-Ni1 H4** | | | **64** |
| 24015B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |
| **MEGAFIL 1100M** | **E120C-K4 H4** | | | **64** |
| 11015B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |
| **Seamless FCAW(gas)** | | | | |
| **MEGAFIL 713R** | **E71T-1MJ H4/-1C H4/-9MJ H4/-9C H4/-12MJ H4/-12C H4** | | | **65** |
| 71315B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |
| 71333B | 1/16 | 1.6 | 35 Lb (15.9 Kg) Spool | |
| **MEGAFIL 819R** | | | | **65** |
| 81915B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |
| 81933B | 1/16 | 1.6 | 35 Lb (15.9 Kg) Spool | |
| **MEGAFIL 550R** | **E91T1-K2M J H4** | | | **66** |
| 55015B | 0.045 | 1.2 | 35 Lb (15.9 Kg) Spool | |

## Sub-Arc Fluxes part numbers

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **SWX 110** | | | | **67** |
| 110022500H | | | 55 Lb (25 Kg) EAE Bag | |
| **SWX 120** | | | | **67** |
| 120022500H | | | 55 Lb (25 Kg) EAE Bag | |
| **SWX 150** | | | | **68** |
| 150022300H | | | 50 Lb (22.5 Kg) EAE Bag | |
| **SWX 160** | | | | **68** |
| 160022300H | | | 55 Lb (25 Kg) EAE Bag | |
| **HA-495** | | | | **69** |
| S669410-055 | | | 50 Lb (22.5 Kg) Bag | |
| **HN-590** | | | | **69** |
| S669610-055 | | | 50 Lb (22.5 Kg) Bag | |
| **SWX 220** | | | | **84** |
| 220022500H | | | 55 Lb (25 Kg) EAE Bag | |
| **HF-N** | | | | **121** |
| 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.**

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **SDX S2Si-EM12K** | **EM12K** | | | **73** |
| 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 | |
| 72232501TH | 1/8" | 3.2 | 2200 Lb (1000 Kg) Wire Stand | |
| 722401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| 72240414FH | 5/32" | 4.0 | 1000 Lb (454 Kg) Drum | |
| **SDX EM13K** | **EM13K** | | | **73** |
| 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 | 100 Lb (454 Kg) Drum | |
| 712401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| 71240414HH | 5/32" | 4.0 | 100 Lb (454 Kg) Drum | |
| **SDX S3Si-EH12K** | **EH12K** | | | **74** |
| 732201025H | 5/64" | 2.0 | 55 Lb (25 Kg) Wire Basket | |
| 732241025H | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 73224414FH | 3/32" | 2.4 | 1000 Lb (454 Kg) Drum | |
| 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 | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **SDX S3Ni1Mo-EF3** | **EF3** | | | **79** |
| 840241025H | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 840321025H | 1/8" | 3.2 | 55 Lb (25 Kg) Wire Basket | |
| 840401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| **SDX S3Ni1Mo0.2-ENi5** | **ENi5** | | | **79** |
| 824241025H | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 824321025H | 1/8" | 3.2 | 55 Lb (25 Kg) Wire Basket | |
| 824401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| **SubCOR™ EM12K-S** | **EC1** | | | **74** |
| S282029-002 | 3/32" | 2.4 | 60 Lb (27.2 Kg) Coil | |
| S282029-008 | 3/32" | 2.4 | 600 Lb (272 Kg) Drum | |
| 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 | |
| **SubCOR™ EM13K-S** | **EC1** | | | **75** |
| 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 | |
| **SubCOR™ EM13K-S MOD** | **EC1** | | | **75** |
| 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 | |
| S289350-008 | 5/32" | 4.0 | 600 Lb (272 Kg) Drum | |
| **SubCOR™ N1-S** | **ECNi1** | | | **79** |
| S282250-002 | 5/32" | 4.0 | 60 Lb (27.2 Kg) Coil | |
| **SubCOR™ 92-S** | **ECM1** | | | **80** |
| 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 | |
| S651329-008 | 1/8" | 3.2 | 600 Lb (272 Kg) Drum | |
| S651350-002 | 5/32" | 4.0 | 60 Lb (27.2 Kg) Coil | |
| S651350-008 | 5/32" | 4.0 | 600 Lb (272 Kg) Drum | |
| **SubCOR™ 100F3-S** | **ECF3** | | | **81** |
| S659929-002 | 3/32" | 2.4 | 60 Lb (27.2 Kg) Coil | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **SubCOR™ F2-S** | **ECF2** | | | **81** |
| S282129-002 | 3/32" | 2.4 | 60 Lb (27.2 Kg) Coil | |
| S282143-002 | 1/8" | 3.2 | 60 Lb (27.2 Kg) Coil | |
| **SubCOR™ 120-S** | **ECM4** | | | **82** |
| 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.**

| Seamless Products (see note above) | | | | |
|---|---|---|---|---|
| **SubCOR™ SL 731** | | | | **76** |
| 503241025H | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 50324442FH | 3/32" | 2.4 | 550 Lb (250 Kg) Drum | |
| 503401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| 50340442FH | 5/32" | 4.0 | 550 Lb (250 Kg) Drum | |
| **SubCOR™ SL 741** | | | | **82** |
| 521241025H | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 521401025H | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| **SubCOR™ SL 742** | | | | **83** |
| 5222410250 | 3/32" | 2.4 | 55 Lb (25 Kg) Wire Basket | |
| 5224010250 | 5/32" | 4.0 | 55 Lb (25 Kg) Wire Basket | |
| **SubCOR™ SL 745** | | | | **83** |
| 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.**

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **308/308H Sterling® AP** | **E308-16 / E308H-16** | | | **86** |
| S481831-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S481844-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S481851-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S481858-039 | 3/16" | 4.8 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **308/308L Sterling® AP** | **E308-16 / E308L-16** | | | **86** |
| 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 | |
| **308L Sterling®** | **E308L-17** | | | **86** |
| S493931-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S493944-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S493951-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S493958-039 | 3/16" | 4.8 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **309 (H) Sterling® AP** | **E309-16 / E309H-16** | | | **87** |
| S483831-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S483844-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| **309Mo/ 309MoL** | **E309Mo-16 / E309MoL-16** | | | **87** |
| S484944-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S484951-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| **312 Sterling® AP** | **E312-16** | | | **87** |
| 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 | |
| **309/309L Sterling® AP** | **E309-16 / E309L-16** | | | **87** |
| 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 | |
| **309L Sterling®** | **E309L-17** | | | **87** |
| S493431-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S493444-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| **310 Sterling® AP** | **E310-16** | | | **87** |
| 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 | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **316/316L Sterling® AP** | **E316-16 / E316L-16** | | | **87** |
| S482931-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S482944-032 | 1/8" | 3.2 | dc2.7 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 | |
| **316/316L Sterling®** | **E316L-17** | | | **87** |
| S494531-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S494544-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S494551-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S494558-039 | 3/16" | 4.8 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **317L Sterling® AP** | **E317L-16** | | | **88** |
| S482431-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S482444-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S482451-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S482458-0339 | 3/16" | 4.8 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **347 Sterling® AP** | **E347-16** | | | **88** |
| S483131-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S483144-032 | 1/8" | 3.2 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **2209 Sterling® AP** | **E2209-16** | | | **88** |
| S486431-036 | 3/32" | 2.4 | 5 Lb (2.3 Kg) Hermetically Sealed Can | |
| S486444-032 | 1/8" | 3.2 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S486451-032 | 5/32" | 4.0 | 6 Lb (2.7 Kg) Hermetically Sealed Can | |
| S486458-039 | 3/16" | 4.8 | 7 Lb (3.2 Kg) Hermetically Sealed Can | |
| **Fabshield® 309L-O** | **E309LT0-3** | | | **94** |
| S670919-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S670919-062 | 1/16" | 1.6 | 60 Lb (27 Kg) Coil | |
| S670929-062 | 3/32" | 2.4 | 60 Lb (27 Kg) Coil | |
| **FabCO® 410NiMoT1** | **E410NiMoT1-4/-1 H4** | | | **94** |
| S681712-073 | 0.045" | 1.2 | 30 Lb (14 Kg) Vacuum Pkgd Wire Spool (VPWB) | |
| S681719-062 | 1/16" | 1.6 | 60 Lb (27 Kg) Coil | |
| S681719-043 | 1/16" | 1.6 | 30 Lb (14 Kg) Vacuum Pkgd Wire Spool (VPWB) | |
| S681719-073 | 1/16" | 1.6 | 30 Lb (14 Kg) Vacuum Pkgd Wire Spool (VPWB) | |
| S681729-062 | 3/32" | 2.4 | 60 Lb (27 Kg) Coil | |
| **FabCO® 308LT1** | **E308LT1-1/-4** | | | **95** |
| S688412-Z78 | 0.045" | 1.2 | 27.5 Lb (13 Kg) Spool | |
| S688419-Z78 | 1/16" | 1.6 | 27.5 Lb (13 Kg) Spool | |
| **FabCO® 309LT1** | **E309LT1-1/-4** | | | **95** |
| S688512-Z78 | 0.045" | 1.2 | 27.5 Lb (13 Kg) Spool | |
| S688519-Z78 | 1/16" | 1.6 | 27.5 Lb (13 Kg) Spool | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **FabCO® 316LT1** | **E316LT1-1/-4** | | | **95** |
| S688612-Z78 | 0.045" | 1.2 | 27.5 Lb (13 Kg) Spool | |
| **308/308L** | **ER308, ER308L** | | | **100** |
| 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 | |
| **308L HiSil** | **ER308LSi** | | | **100** |
| 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 | | | 550 Lb (250 Kg) Drum | |
| S526818-I26 | 1/16" | 1.6 | 30 Lb (14 Kg) Spool | |
| **309/309L** | **ER309, ER309L** | | | **100** |
| 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 | |
| **309L HiSil** | **ER309LSi** | | | **100** |
| 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 | |
| S527408-550 | | | | |
| S527412-550 | | | | |
| S527512-I26 | 0.045" | 1.2 | 30 Lb (14 Kg) Spool | |
| **316/316L** | **ER316, ER316L** | | | **101** |
| 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 | |
| **316L HiSil** | **ER316LSil** | | | **101** |
| S527408-I26 | 0.035" | 0.9 | 30 Lb (14 Kg) Spool | |
| S527412-I26 | 0.045" | 1.2 | 30 Lb (14 Kg) Spool | |
| **FabCOR® 308LSi** | **EC308LSi** | | | **101** |
| S690812-026 | 0.045" | 1.2 | 30 Lb (14 Kg) Spool | |
| **FabCOR® 309LSi** | **EC309LSi** | | | **101** |
| S690912-026 | 0.045" | 1.2 | 30 Lb (14 Kg) Spool | |

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Hardalloy® 118** | | | | **105** |
| 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 | |
| **Hardalloy® 140** | | | | **105** |
| 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 | |
| **Hardalloy® 155** | | | | **106** |
| S542244-033 | 1/8" | 3.2 | 10 Lb (4.5 Kg) Hermetically Sealed Can | |
| S542251-033 | 5/32" | 4.0 | 10 Lb (4.5 Kg) Hermetically Sealed Can | |
| S542258-033 | 3/16" | 4.8 | 10 Lb (4.5 Kg) Hermetically Sealed Can | |
| **Hardalloy® 148** | | | | **106** |
| 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 | |
| **Hardalloy® 32** | | | | **105** |
| 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 | |

## Hardfacing Wire part numbers

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Tube-Alloy® Build Up-O** | | | | **111** |
| S600419-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| **Tube-Alloy® 218-O** | | | | **111** |
| S601812-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| S601819-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S601839-062 | 7/64" | 2.8 | 60 Lb (27 Kg) Coil | |
| **Tube-Alloy® AP-O** | | | | **111** |
| S600119-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S600139-062 | 7/64" | 2.8 | 60 Lb (27 Kg) Coil | |
| **Tube-Alloy® 258-O** | | | | **112** |
| S605812-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| S605819-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S605839-062 | 7/64" | 2.8 | 60 Lb (27 Kg) Coil | |
| **Tube-Alloy® 240-O** | | | | **112** |
| S604012-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| S604019-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S604039-062 | 7/64" | 2.8 | 60 Lb (27 Kg) Coil | |
| **Tube-Alloy® 255-O** | | | | **112** |
| S605519-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| S605539-062 | 7/64" | 2.8 | 60 Lb (27 Kg) Coil | |
| **Tube-Alloy® 242-O** | | | | **113** |
| S604219-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| **Armorwear™** | | | | **113** |
| S605708-Z22 | 0.035" | 0.9 | 10 Lb (4.5 Kg) Spool | |
| **Tube-Alloy® 258TiC-O** | | | | **113** |
| S605919-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| **Tube-Alloy® 244-O** | | | | **114** |
| S604439-065 | 7/64" | 2.8 | 250 Lb (113 Kg) Auto-Pak | |
| S604439-066 | 7/64" | 2.8 | 500 Lb (227 Kg) Auto-Pak | |
| **Tube-Alloy® A43-O** | | | | **114** |
| S607719-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| **VertiWear® 600** | | | | **114** |
| S607112-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| S607119-029 | 1/16" | 1.6 | 25 Lb (11 Kg) Spool | |
| **Tube-Alloy® 255-G** | | | | **115** |
| S608412-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| **VertiWear® AP** | | | | **115** |
| S606812-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| **Tube-Alloy® Build Up-G** | | | | **115** |
| S235012-Z29 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| **Tube-Alloy® 258-G** | | | | **116** |
| S595412-029 | 0.045" | 1.2 | 25 Lb (11 Kg) Spool | |
| S595419-027 | 1/16" | 1.6 | 50 Lb (22.7 Kg) Spool | |

## Hardfacing-Sub-Arc Wire part numbers

| Part Number | Dia. (IN) | Dia. (MM) | Package | Page |
|---|---|---|---|---|
| **Tube-Alloy® 877-S** | | | | **117** |
| S611943-084 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® 242-S MOD** | | | | **117** |
| S614343-084 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® A2JL-S** | | | | **117** |
| S614543-008 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® 887-S** | | | | **118** |
| S618029-084 | 3/32" | 2.4 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® A250-S** | | | | **118** |
| S611643-084 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® 865-S MOD** | | | | **118** |
| S614943-084 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| **Tube-Alloy® 952-S** | | | | **119** |
| S614043-084 | 1/8" | 3.2 | 600 Lb (272 Kg) Auto-Pak | |
| S614029-084 | 3/32" | 2.4 | 600 Lb (272 Kg) Auto-Pak | |
| **HF-N** | | | | **119** |
| S669810-055 | – | – | 50 Lb (22.5 Kg) Bag | |

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## EXPERTISE + PARTNERSHIP


| | |
|---|---|
| 2 | Mild Steel Stick Electrodes |
| 7 | Low Alloy Electrodes |
| 15 | Steel Solid Wires |
| 24 | Aluminum Wires |
| 33 | Flux-Cored, Gas-Shielded Carbon Steel |
| 45 | Flux-Cored, Gas-Shielded Low Alloy |
| 52 | Flux-Cored, Self-Shielded Low Alloy |
| 55 | Metal-Cored, Gas-Shielded Wires Carbon Steel |
| 69 | Submerged Arc |
| 85 | Stainless Steel Stick Electrodes |
| 92 | Stainless Steel Wires |
| 103 | Hardfacing Stick Electrodes |
| 110 | Hardfacing Wires |
| 127 | Part Numbers |


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**That passion … It's the tie that binds.**

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