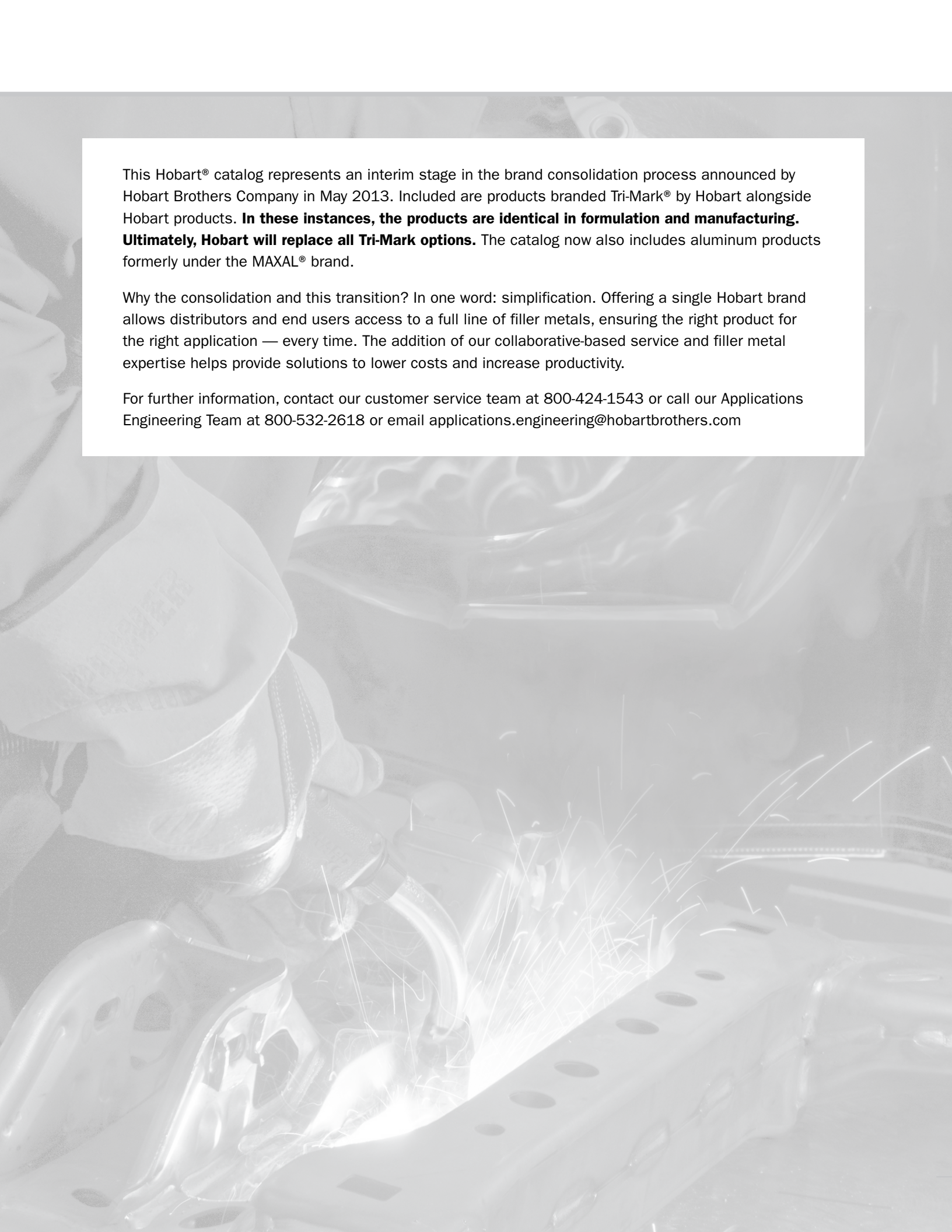
HOBART FILLER METALS

# Product Catalog

TRI-MARK® By HOBART FILLER METALS



This Hobart® catalog represents an interim stage in the brand consolidation process announced by Hobart Brothers Company in May 2013. Included are products branded Tri-Mark® by Hobart alongside Hobart products. **In these instances, the products are identical in formulation and manufacturing. Ultimately, Hobart will replace all Tri-Mark options.** The catalog now also includes aluminum products formerly under the MAXAL® brand.

Why the consolidation and this transition? In one word: simplification. Offering a single Hobart brand allows distributors and end users access to a full line of filler metals, ensuring the right product for the right application — every time. The addition of our collaborative-based service and filler metal expertise helps provide solutions to lower costs and increase productivity.

For further information, contact our customer service team at 800-424-1543 or call our Applications Engineering Team at 800-532-2618 or email applications.engineering@hobartbrothers.com

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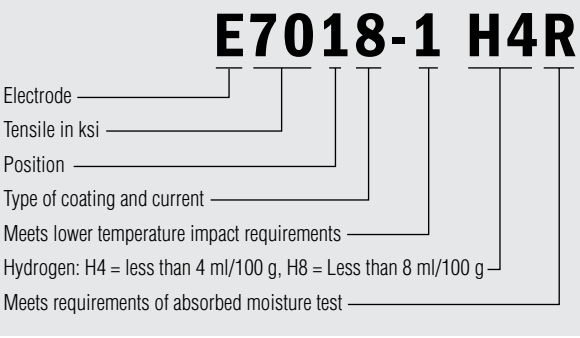
# Mild Steel Electrodes

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




### Position

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

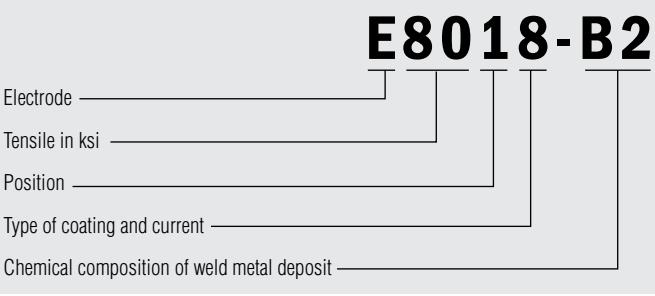
**2** Flat and Horizontal only

### 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 – 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, 9010 11018, 12018 | 250°F – 300°F | 500°F – 800°F, 1-2 hrs. |
| Stainless Steel Stick Electrodes<br>DC Lime (AWS-15)<br>Sterling AP & AC/DC (AWS-16)<br>Smootharc Plus (AWS-16)<br>Sterling (AWS-17) | 225°F – 260°F | 500°F – 600°F, 1 hr. |
| Hardalloy® Surfacing | 225°F – 260°F | 450°F – 600°F, 1 hr. |
| Special Maintenance GP | 225°F – 260°F | 500°F, 1 hr. |
| Cast Iron Electrodes | 215°F – 230°F | 250°F – 300°F, 1 hr. |

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

## Pipemaster® Pro-60

**AWS E6010**

Pipemaster Pro-60 is a quick-starting, cellulosic mild steel electrode that provides you with out-standing arc stability, penetration and wash-in. It's ideal for welding in all positions and produces an X-ray quality weld with light slag that's easy to remove. Pipemaster Pro-60 can be used to weld the following 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. It features enhanced weldabilty and increased physical properties. Earth-tone grey coating.

**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 |
| 3/16" (4.8 mm) | 140-225 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

## Pipemaster® 60

**AWS E6010**

Use Pipemaster 60 for quick starting, excellent arc stability, superior arc drive (penetration), light slag and excellent wash-in. An all-position cellulosic mild steel electrode, it outdoes itself in producing X-ray quality welds. Earthtone grey coating.

**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 | 0.11 |
| Manganese | 0.28 |
| Silicon | 0.14 |
| Chromium | 0.02 |
| Nickel | 0.02 |
| Molybdenum | < 0.01 |
| Vanadium | < 0.01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 73,000 (504 MPa) |
| Yield Strength (psi) | 63,000 (432 MPa) |
| Elongation % in 2" (50mm) | 26% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 52 ft.lb. (70J) |

**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 |
| 3/16" (4.8 mm) | 140-225 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**

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

## Hobart® 610

**AWS E6010**

Hobart 610 is a mild steel cellulose electrode that gives outstanding arc stability, consistent arc control, quick starts and restarts with low spatter. Its excellent bead wash, penetration and tie-in, plus the all-positional capability, make it a preferred electrode for pipe welding applications or fabrication jobs

**Typical Applications:**

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

**Typical Weld Metal Chemistry (ChemPad):**

| | |
|---|---|
| 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

# Mild Steel Electrodes

## Pipemaster® 70

**AWS E7010-P1**

The Pipemaster 70, an all-position cellulosic mild steel electrode, is excellent for producing X-ray quality welds. It's quick starting with excellent arc stability, superior penetration, light slag and excellent wash-in. Pipemaster 70 can also help you handle vertical-down welding on all passes on 5L, 5LX and X52 through X65 pipe.

**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) | 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) | 120-230 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**

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

## Pipemaster® 80

**AWS E8010-P1**

With features like quick starting, excellent arc stability, superior penetration, light slag and excellent wash-in, the Pipemaster 80 is great for a variety of jobs. This all-position cellulosic mild steel electrode gets a handle on vertical-down welding on all passes with X56 through X70 pipe. And with good low-temperature impact properties, it can be used on pipe steels with relatively high silicon (up to .30).

**Typical Applications:**

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

**Typical Weld Metal Chemistry (ChemPad):**

| | |
|---|---|
| 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**

Pipemaster 90 is designed for welding high-yield strength pipe out-of-position applications for use in harsh artic and/or desert environments. Pipemaster 90 meets the requirements of AWS 5.5 low alloy electrode specifications and pipeline API Code 1104. It is recommended for welding any 5L material from X65 to X80 steel pipe. Pipemaster 90 has a smooth, yet forceful arc that provides good penetration and fusion with excellent control. Its superior wetting characteristics offer freedom from internal undercutting with practically no slag, which minimizes slag entrapment. Although Pipemaster 90 can be used in any welding position, it is especially outstanding in the vertical-down position for welding pipe joints. As with all Pipemaster electrodes, Pipemaster 90 has excellent operator appeal with low spatter levels and easy slag removal for quick cleanup.

**Typical Applications:**

- high-yield X65, X70 and X80 pipe steels
- drill platforms
- storage tanks
- shipbuilding and construction industries

**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**

The Hobart 335A offers a fine spray transfer that enhances operator appeal in all positions. Designed for use with AC power sources, this all-position, cellulose-based electrode provides stable arc characteristics and good penetration.

**Typical Applications:**

- galvanized steel work
- general fabrication
- railroad cars
- 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, DCEP or DCEN

**Approvals and Conformances:**

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

## Hobart® 335C

**AWS E6011**

The versatile soft-arc electrode Hobart 335C is designed for AC power sources, but it can also be used on DCEP or DCEN. With the ability to weld through paint, mill scale or rust, it is an all-position cellulosic electrode with the ultimate in operator appeal.

**Typical Applications:**

- general construction
- light sheet metal fabrication
- maintenance and repair welding
- shipyards
- welding on galvanized steels
- welding through paint, mill scale or rust

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.10 |
| Manganese | 0.59 |
| Silicon | 0.22 |
| Nickel | 0.07 |
| Chromium | 0.07 |
| Molybdenum | 0.01 |
| Vanadium | 0.01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 83,000 (572 MPa) |
| Yield Strength (psi) | 72,000 (500 MPa) |
| Elongation % in 2" (50mm) | 27% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 41 ft.lb. (56J) |

**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, DCEP or DCEN

**Approvals and Conformances:**

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

## Hobart® 447A

**AWS E6013**

When poor fit-up conditions exist, you'll prefer the fast-freeze characteristics of Hobart 447A. Whether put to use with AC or DC power sources, the 447A has a very stable arc and good bead appearance.

**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

# Mild Steel Electrodes

## Hobart® 447C

**AWS E6013**

A soft arc AWS 6013 electrode, Hobart 447C is the best way to take control of poor fit-up conditions. It has fast-freeze characteristics, giving it preferred operator appeal. Hobart 447C versatility extends its usage with AC or DC power sources and low open-circuit voltage AC machines.

**Typical Applications:**
- general-purpose fabrication
- machine parts
- metal buildings and structures
- shaft buildup

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.08 |
| Manganese | 0.40 |
| Silicon | 0.25 |
| Nickel | 0.02 |
| Chromium | 0.03 |
| Molybdenum | 0.01 |
| Vanadium | 0.01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 75,000 (520 MPa) |
| Yield Strength (psi) | 67,000 (465 MPa) |
| Elongation % in 2" (50mm) | 27% |

**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 |

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

**Approvals and Conformances:**
- AWS A5.1, E6013
- ASME SFA 5.1
- CWB E4313
- ABS E6013

## Hobart® Deckmaster™ 1139

**AWS E6022**

When you want to get a handle on roof decking, you can rely on Hobart 1139. It is a very fluid electrode designed for welding roof decking to support beams with burn-through spot welds. You can also rely on the 1139 for rapid downhill welding when joining light-gauge materials.

**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**

When you are tackling jobs where higher deposition and speed of travel is needed, the Hobart 14A is the electrode to choose. An all-position electrode, Hobart 14A is equipped with a rutile base and iron powder addition to increase deposition rates and give operator appeal. This electrode offers outstanding slag removal and bead appearance and can be operated with AC, DCEP or DCEN power.

**Typical Applications:**
- frames
- heavy sheet metal
- machine bases

**Typical Weld Metal Chemistry:**

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

**Typical Mechanical Properties (AW):**

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

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

**Available diameter and recommended operating ranges:**

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

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

**Approvals and Conformances:**
- AWS A5.1, E7014
- ASME SFA 5.1, E7014
- CWB E4914
- ABS E7014

## Hobart® Rocket® 7024

**AWS E7024**

Hobart Rocket 7024 is a newly engineered E7024 electrode designed to provide the user with outstanding "best of class" features in several important areas. Rocket 7024 is engineered with a slag system to provide the easiest slag removal in its class and in most cases is self peeling. In addition the slag releases from the entire joint with no slag left in the toes of the joint. Spatter levels are extremely low, better than any other E7024. Rocket 7024 has a super smooth soft arc and is less harsh than other E7024 products. Rocket 7024 is more forgiving than other E7024 products when the material being welded is moderately rusty or isn't as clean as it should be. Rocket 7024 can be used with a drag welding technique and operates equally well on either AC or DC (electrode negative) power. It is exceptionally fast when used down hand in properly designed weld joints or in horizontal fillet welds and can be used in single or multipass applications.

**Typical Applications:**

- plate fabrication
- tank fabrication
- barge construction
- construction and earthmoving equipment

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 0.74 |
| Silicon | 0.45 |
| Phosphorus | 0.009 |
| Sulphur | 0.019 |
| Nickel | 0.07 |
| Chromium | 0.06 |
| Molybdenum | 0.01 |
| Vanadium | 0.02 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 82,000 (562 MPa) |
| Yield Strength (psi) | 70,000 (484 MPa) |
| Elongation % in 2" (50mm) | 26% |

**Typical Charpy V-notch Impact Values**

Not required

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 1/8 " (3.2 mm) | 130-170 amps |
| 5/32" (4.0 mm) | 180-245 amps |
| 3/16" (4.8 mm) | 200-300 amps |
| 7/32" (5.6 mm) | 250-340 amps |
| 1/4" (6.4 mm) | 300-380 amps |

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

**Approvals and Conformances:**

- AWS A5.1, E7024
- ASME SFA 5.1, E7024
- ABS E7024

## Hobart® 24

**AWS E7024, E7024-1**

If you want speed, the Hobart 24 high-speed electrode has it. Hobart 24 is exceptionally fast when used down hand in properly designed weld joints or in horizontal fillet welds where equal leg fillets are desired. It has excellent operation on either AC or DCEN power with a drag welding technique. It also meets AWS E7024-1 impact requirements.

**Typical Applications:**

- earthmoving equipment
- mining machinery
- plate fabrication
- railroad cars
- structurals
- 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

## Hobart® 418

**AWS E7018 H4R/E7018-1 H4R**

Hobart 418 gives you all the flexibility you need in a general-purpose, low-hydrogen, mild steel electrode. It also has good out-of-position welding capabilities and provides an X-ray quality deposit. And this unique electrode is ideal for tacking prior to finish welding with Fabshield self-shielded, tubular wire. That's because the construction of the Hobart 418 allows removal of all the slag from the self-shielded 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 |
| 7/32" (5.6 mm) | 220-350 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

# Mild Steel Electrodes

## Hobart® 718MC

**AWS E7018 H4R/E7018(M)-1 H4R**
You can take control with the electrode that's formulated and manufactured to give you excellent moisture resistance, good out-of-position welding capabilities and an X-ray quality deposit. The 718MC meets the requirements of military spec. 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 |
| 7/32" (5.6 mm) | 260-340 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

## McKay by Hobart® 7018XLM

**AWS E7018 H4R / E7018-1 H4R**
The 7018XLM is a high deposition low hydrogen electrode with excellent operator appeal in all positions. It combines a quiet arc, minimal spatter level, easy slag removal, and an easily controlled puddle for a great operator appeal.

**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 |
| 7/32" (5.6mm) | 240-340 amps |
| ¼" (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

## McKay by Hobart® Soft-Arc™ 7018-1

**AWS E7018 H4R / E7018-1 H4R**
The Soft-Arc 7018-1 is a low hydrogen iron powder electrode designed for DECP and AC welding operations. It combines a quiet arc, minimal spatter level, easy slag removal, and an easily controlled puddle for a great operator appeal.

**Typical Applications:**
- Field Erections
- Shipbuilding
- Pipeline
- Construction

**Typical Weld Metal Chemistry**

| | |
|---|---|
| Carbon | 0.04 |
| Manganese | 1.02 |
| Silicon | 0.46 |
| Phosphorus | 0.009 |
| Sulphur | 0.009 |
| Nickel | 0.08 |
| Chromium | 0.06 |
| Molybdenum | 0.01 |
| Vanadium | 0.01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 81,000 (558MPa) |
| Yield Strength (psi) | 69,000 (476MPa) |
| Elongation % in 2" (50mm) | 29% |

**Typical Charpy V-Notch Impact Values (AW):**
Avg. @ -50°F (-46C) 108 ft. lb (147J)

**Available diameters and recommended operating ranges:**

| | |
|---|---|
| 3/32" (2.4mm) | 80-110 amps |
| 1/8" (3.2mm) | 90-150 amps |
| 5/32" (4.0mm) | 110-230 amps |
| 3/16" (4.8mm) | 150-300 amps |

**Type of Current:** DCEP or AC

**Approvals or Conformances:**
- AWS A5.1, E7018-1 H4R
- ASME SFA 5.1, E7018-1 H4R
- ABS

## Hobart® 18AC

**AWS E7018 H8**

Highly recommended for applications using small 208/230V, single phase AC welders, 18AC has good operator appeal, excellent re-striking characteristics and an extremely stable arc. 18AC is also an excellent choice for skip or tack welds. The slag is self-removing in most applications. 18AC will work well on all AC power sources and performs exceptionally well on utility-type welders.

**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

## Boilermaker™ 18

**E7018 H4R/E7018-1 H4R**

Boilermaker electrodes were specifically designed to be used in the repair of water wall tubes in power generation facilities. Their unique chemistry and formulation construction create water clear x-rays. The excellent starts and re-starts, low spatter levels, easy slag removal, and smooth wash and bead tie-ins make this the choice electrode to use for those critical welds in boilers.

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.06 |
| Manganese | 0.80 |
| Phosphorus | 0.013 |
| Sulphur | 0.012 |
| Silicon | 0.49 |
| Nickel | 0.04 |
| Chromium | 0.05 |
| Molybdenum | 0.01 |
| Vanadium | 0.01 |

**Typical Mechanical Properties (as welded):**

| | |
|---|---|
| Tensile Strength (psi) | 87,000 (601 MPa) |
| Yield Strength (psi) | 74,000 (510 MPa) |
| Elongation % in 2" (50mm) | 29% |

**Typical Charpy V-notch Impact Values**

| | |
|---|---|
| Avg. at -20°F (-30°C) | 115 ft.lb. (156J) |
| Avg. at -50°F (-46°C) | 87 ft.lb. (118J) |

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 3/32" (2.4 mm) | 60-110 amps |
| 1/8" (3.2 mm) | 90-165 amps |

**Type of Current:** DCEP, AC

**Approvals and Conformances:**
- AWS A5.1, ASME SFA 5.1

## Hoballoy® 7018A1

**AWS E7018-A1 H4R**

For pressure vessel applications, the Hoballoy 7018A1 is an outstanding choice. When welding .50% molybdenum steel and other low alloy steels, the Hoballoy 7018A1 offers resistance to moisture reabsorption. This important feature 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

## Boilermaker™ 18A1

**E7018-A1 H4R**

Boilermaker electrodes were specifically designed to be used in the repair of water wall tubes in power generation facilities. Their unique chemistry and formulation construction create water clear x-rays. The excellent starts and re-starts, low spatter levels, easy slag removal, and smooth wash and bead tie-ins make this the choice electrode to use for those critical welds in boilers.

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.04 |
| Manganese | 0.86 |
| Phosphorus | 0.01 |
| Sulphur | 0.01 |
| Silicon | 0.59 |
| Molybdenum | 0.50 |

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

| | |
|---|---|
| Tensile Strength (psi) | 97,000 (671 MPa) |
| Yield Strength (psi) | 86,000 (592 MPa) |
| Elongation % in 2" (50mm) | 25% |

**Typical Charpy V-notch Impact Values**

Not required

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 3/32" (2.4 mm) | 65-110 amps |
| 1/8" (3.2 mm) | 80-160 amps |

**Type of Current:** DCEP, AC

**Approvals and Conformances:**

- AWS A5.5, ASME SFA 5.5

## Boilermaker™ B2

**E8018-B2 H4R**

Boilermaker electrodes were specifically designed to be used in the repair of water wall tubes in power generation facilities. Their unique chemistry and formulation construction create water clear x-rays. The excellent starts and re-starts, low spatter levels, easy slag removal, and smooth wash and bead tie-ins make this the choice electrode to use for those critical welds in boilers.

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 0.68 |
| Phosphorus | 0.01 |
| Sulphur | 0.01 |
| Silicon | 0.36 |
| Chromium | 1.12 |
| Molybdenum | 0.40 |

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

| | |
|---|---|
| Tensile Strength (psi) | 98,000 (673 MPa) |
| Yield Strength (psi) | 86,000 (592 MPa) |
| Elongation % in 2" (50mm) | 23% |

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

Not required

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 3/32" (2.4 mm) | 60-105 amps |
| 1/8" (3.2 mm) | 90-160 amps |

**Type of Current:** DCEP, AC

**Approvals and Conformances:**

- AWS A5.5-81 E8018-B2
- AWS A5.5-06 E7018-B2, ASME SFA 5.5

## Boilermaker™ B3

**E9018-B3 H4R**

Boilermaker electrodes were specifically designed to be used in the repair of water wall tubes in power generation facilities. Their unique chemistry and formulation construction create water clear x-rays. The excellent starts and re-starts, low spatter levels, easy slag removal, and smooth wash and bead tie-ins make this the choice electrode to use for those critical welds in boilers.

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 0.65 |
| Phosphorus | 0.01 |
| Sulphur | 0.01 |
| Silicon | 0.33 |
| Chromium | 2.24 |
| Molybdenum | 1.09 |

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

| | |
|---|---|
| Tensile Strength (psi) | 111,000 (768 MPa) |
| Yield Strength (psi) | 96,000 (663 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) | 60-105 amps |
| 1/8" (3.2 mm) | 90-160 amps |

**Type of Current:** DCEP, AC

**Approvals and Conformances:**

- AWS A5.5-81 E9018-B3
- AWS A5.5-06 E8018-B3, ASME SFA 5.5

## Hoballoy® 8018B2

**AWS E8018-B2 H4R**

Hoballoy 8018B2 is an outstanding electrode for welding higher strength steels requiring tensile strengths of 80,000 lbs. or more. Ideal for welding in conditions of high heat or humidity, it features a specially formulated coating that's designed to reduce moisture pick-up and thus help keep hydrogen cracking and starting porosity to a minimum.

**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® 8018B2L

**AWS E8018-B2L H4R/E7018-B2L H4R**

Hoballoy 8018B2L is an outstanding electrode for welding higher strength steels requiring tensile strengths of 80,000 lbs. or more. Low carbon levels reduce the possibility of cracking in the weldment. It offers good arc characteristics and excellent notch toughness. Plus, Hoballoy 8018B2L features a specially formulated coating that reduces moisture pick-up, making it ideal for welding in conditions of high heat and humidity and helps to minimize hydrogen cracking and 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 | 0.03 |
| Manganese | 0.63 |
| Silicon | 0.56 |
| Phosphorus | 0.014 |
| Sulphur | 0.010 |
| Chromium | 1.48 |
| Molybdenum | 0.53 |

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

| | |
|---|---|
| Tensile Strength (psi) | 89,000 (612 MPa) |
| Yield Strength (psi) | 74,000 (510 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 |
| 3/16" (4.8 mm) | 200-300 amps |

**Type of Current:** DCEP or AC

**Approvals and Conformances:**

- AWS A5.5-81, E8018-B2L H4R
- AWS A5.5, E7018-B2L H4R
- ASME SFA 5.5, E8018-B2L
- ABS E8018-B2L

## Hoballoy® 8018B6

**AWS E8018-B6 H4R**

The Hoballoy 8018B6 is the right choice for 5% Cr, 1/2% Mo steels and other chromium-molybdenum steels in severe service conditions. Its special coating reduces moisture pick-up, minimizing hydrogen cracking and starting porosity. Plus, it offers excellent arc characteristics for a stable, easy-to-control arc and its quick slag removal means faster cleanup time.

**Typical Applications:**

- petrochemical and petroleum industries
- tubes and tube sheets
- plate steels
- high pressure hydrogen service

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 0.80 |
| Phosphorus | 0.01 |
| Sulphur | 0.01 |
| Silicon | 0.30 |
| Chromium | 4.80 |
| Nickel | 0.07 |
| Molybdenum | 0.48 |

**Typical Mechanical Properties (stress relieve 1 hour @ 1375°F):**

| | |
|---|---|
| Tensile Strength (psi) | 87,000 (603 MPa) |
| Yield Strength (psi) | 72,000 (499 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) | 70-110 amps |
| 1/8" (3.2 mm) | 90-160 amps |
| 5/32" (4.0 mm) | 130-210 amps |
| 3/16" (4.8 mm) | 200-290 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.5, E8018-B6 H4R
- ABS E8018-B6
- ASME SFA 5.5

# Low Alloy Electrodes

## Hoballoy® 8018B8

**AWS E8018-B8 H4R**

Whenever you face severe service conditions, the Hoballoy 8018-B8 is the perfect electrode choice. Designed for joining creep-resistant, high chromium (9% Cr) alloys of similar composition, its iron powder low-hydrogen coating reduces moisture pick-up and helps to minimize hydrogen cracking and starting porosity. It also offers a stable, easy-to-control arc and improved bead appearance.

**Typical Applications:**

- Petrochemical and petroleum industries
- Tubes, tube sheets and plate steels for high pressure hydrogen service
- 9% Cr and 1% Mo steels

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.07 |
| Manganese | 0.75 |
| Phosphorus | 0.013 |
| Sulphur | 0.007 |
| Silicon | 0.54 |
| Chromium | 9.07 |
| Nickel | 0.08 |
| Molybdenum | 0.88 |

**Typical Mechanical Properties (stress relieve 1 hour @ 1375°F):**

| | |
|---|---|
| Tensile Strength (psi) | 96,000 (663 MPa) |
| Yield Strength (psi) | 76,000 (525 MPa) |
| Elongation % in 2" (50mm) | 25% |

**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) | 130-210 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.5, E8018-B8 H4R
- ABS E8018-B8
- ASME SFA 5.5

## Hoballoy® 8018C1

**AWS E8018-C1 H4**

Hoballoy 8018C1 is a high-quality electrode that's designed for applications of 2% nickel deposits and the welding of nickel-bearing steels for low temperature applications where toughness of the weld metal is important. It provides good puddle control, excellent wetting action and tie-in and offers good arc characteristics as well as excellent notch toughness (65 ft. lbs. at -75°F) and easy slag removal. Hoballoy 8018C1 is also great for welding in conditions of high heat or humidity as it features a specially-formulated coating that's designed to minimize hydrogen cracking and starting porosity.

**Typical Applications:**

- shipbuilding
- piping
- tanks used in the storage of gases

**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® 8018C2

**AWS E8018-C2 H4**

Hoballoy 8018C2 is an outstanding electrode for low temperature applications requiring tensile strengths greater than 80,000 psi and for welding 2% to 4% nickel steels. It features a special formulated coating designed to minimize hydrogen cracking and starting porosity.

**Typical Applications:**

- shipbuilding
- piping and gas storage tanks
- AR and T-1 steel welding

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.04 |
| Manganese | 0.90 |
| Phosphorus | 0.01 |
| Sulphur | 0.01 |
| Silicon | 0.42 |
| Nickel | 3.62 |

**Typical Mechanical Properties (stress relieve 1 hour @ 1125°F):**

| | |
|---|---|
| Tensile Strength (psi) | 94,000 (647 MPa) |
| Yield Strength (psi) | 83,000 (572 MPa) |
| Elongation % in 2" (50mm) | 29% |

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

| | |
|---|---|
| Avg. at -100°F (-73°C) | 92 ft.lb. (125J) |

**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 |
| 1/4" (6.4 mm) | 300-400 amps |

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.5, E8018-C2 H4
- ASME SFA5.5, E8018-C2 H4
- ABS E8018-C2

## Hoballoy® 8018C3

**AWS E8018-C3 H4**
Hoballoy 8018-C3 electrodes are designed for high tensile steels requiring 1% nickel weld deposits.

**Typical Applications:**
- commercial using 80,000 tensile steels
- military using 80,000 tensile steels
- welding of AR and T-1 steels

**Typical Weld Metal Chemistry:**

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

**Typical Mechanical Properties (AW):**

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

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

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

**Available diameter and recommended operating ranges:**

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

**Type of Current:** DCEP or AC

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

## Hoballoy® 9015B9

**AWS E9015-B9 H4R**
The improved creep resistance of the Hoballoy 9015B9 make it an outstanding electrode for power generation and high temperature service applications. It features low moisture reabsorption that prevents starting porosity and offers resistance to hydrogen-induced cracking. Plus, its quick and easy slag removal makes cleanup faster than ever.

**Typical Applications:**
- petrochemical and petroleum industries
- high temperature service applications
- tubes, tube sheets
- pipe and plate steels
- 9% Cr - 1% Mo-V steels

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.10 |
| Manganese | 0.59 |
| Phosphorus | 0.01 |
| Sulphur | 0.007 |
| Silicon | 0.21 |
| Copper | 0.03 |
| Chromium | 8.90 |
| Vanadium | 0.23 |
| Nickel | 0.52 |
| Molybdenum | 0.92 |
| Aluminum | < 0.01 |
| Niobium | 0.04 |
| Nitrogen | 0.04 |

**Typical Mechanical Properties (stress relieve 1 hour @ 1400°F):**

| | |
|---|---|
| Tensile Strength (psi) | 113,000 (777 MPa) |
| Yield Strength (psi) | 98,000 (678 MPa) |
| Elongation % in 2" (50mm) | 17% |

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

**Available diameter and recommended operating ranges:**

| | |
|---|---|
| 3/32" (2.4 mm) | 70-100 amps |
| 1/8" (3.2 mm) | 90-140 amps |
| 5/32" (4.0 mm) | 120-210 amps |

**Approvals and Conformances:**
- AWS A5.5, E9015-B9 H4R
- ASME SFA5.5

## Hoballoy® 9018B3

**AWS E9018-B3 H4R**
Hobart's Hoballoy 9018B3 is an outstanding electrode that's designed for welding higher strength steel applications. It offers better corrosion resistance than carbon electrodes and features a special coating that's formulated to reduce moisture pick-up, helping to minimize hydrogen cracking and 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

# Low Alloy Electrodes

## Hoballoy® 9018B3L

**AWS E9018-B3L H4R/E8018-B3L H4R**
Hoballoy 9018B3L is an outstanding electrode for welding higher-strength piping where cracking is a problem. It features a coating that's specially formulated to reduce moisture pick-up, which makes it ideal for conditions of high heat and humidity and for minimizing hydrogen cracking and starting porosity.

**Typical Applications:**
- chrome-moly pipes
- boiler work

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.03 |
| Manganese | 0.59 |
| Silicon | 0.52 |
| Phosphorus | 0.02 |
| Sulphur | 0.01 |
| Chromium | 2.22 |
| Molybdenum | 1.03 |

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

| | |
|---|---|
| Tensile Strength (psi) | 97,000 (669 MPa) |
| Yield Strength (psi) | 82,000 (563 MPa) |
| Elongation % in 2" (50mm) | 23% |

**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 A5.5-81, E9018-B3L H4R
- AWS A5.5-96, E8018-B3L H4R
- ASME SFA 5.5, E9018-B3L
- ABS E9018-B3L

## Hoballoy® 9018M

**AWS E9018-M H4R**
Hoballoy 9018M is an outstanding electrode that's designed for applications requiring tensile strengths of at least 90,000 psi. An ideal choice for conditions of high heat and humidity, Hoballoy 9018M has a specially formulated coating that reduces moisture pick-up, which helps to 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**
A high-quality electrode, Hoballoy 10018D2 is designed for the welding of high tensile steels and manganese-molybdenum steels requiring tensile strengths of at least 100,000 psi. It has high operator appeal and offers a wide variety of welding advantages including good arc characteristics, ductility, crack-resistance, easy slag removal, and low spatter and smoke. Plus, Hoballoy 10018D2 is an ideal choice for conditions of high heat and humidity because it features a special coating that's designed to reduce moisture pick-up, which also helps to minimize hydrogen cracking and starting porosity.

**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® 10018M

**AWS E10018-M H4R**

Designed for welding low alloy, high-strength steels, the Hoballoy 10018M provides good ductility and excellent notch toughness. Its good arc characteristics, easy slag removal, and low spatter and smoke combine for operator appeal. And it's also ideal in high heat and humidity because of its moisture-resistant coating, which also helps to prevent hydrogen cracking and starting porosity.

**Typical Applications:**
- reinforcing steel
- HY-80, HY-90, T-1, AR and other high-tensile steels

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 1.18 |
| Phosphorus | 0.019 |
| Sulphur | 0.013 |
| Silicon | 0.10 |
| Chromium | 0.08 |
| Nickel | 1.77 |
| Molybdenum | 0.36 |
| Vanadium | 0 .01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 100,000 (687 MPa) |
| Yield Strength (psi) | 88,000 (606 MPa) |
| Elongation % in 2" (50mm) | 25% |

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

| | |
|---|---|
| Avg. at -60ºF (-51°C) | 60 ft.lb. (82J) |

**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

**Approvals and Conformances:**
- AWS A5.5, E10018-M H4R
- ASME SFA5.5

## Hoballoy® 11018M

**AWS E11018-M H4R**

Designed for military applications and other projects that require weld joints with tensile strengths of at least 110,000 psi, Hoballoy 11018M offers a wide range of welding advantages that will improve your welding productivity – good arc characteristics, excellent puddle control with good wetting action and tie-in, and easy slag removal. Ideal for conditions of high heat and humidity, it features a special coating that's designed to reduce moisture pick-up, helping to minimize hydrogen cracking and starting porosity. Hoballoy 11018M also offers good ductility, good crack resistance and high notch toughness even at temperatures as low as -60°F.

**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

## Hoballoy® 12018M

**AWS E12018-M H4R**

Hoballoy 12018M is designed for welding high tensile steels requiring weld joints with tensile strengths of at least 120,000 psi. It offers a wide variety of welding advantages that include: good arc characteristics, ductility, crack-resistance, easy slag removal, and low spatter and smoke. Hoballoy 12018M also works extremely well under conditions of high heat and humidity because its special coating is designed to reduce moisture pick-up, which also helps to keep hydrogen cracking and starting porosity to a minimum.

**Typical Applications:**
- low-alloy steels
- forgings
- castings
- plate and pressure vessels

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.05 |
| Manganese | 1.55 |
| Silicon | 0.42 |
| Phosphorus | 0.02 |
| Sulphur | 0.013 |
| Nickel | 1.76 |
| Molybdenum | 0.39 |
| Chromium | 0.63 |
| Vanadium | 0.01 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 130,000 (895 MPa) |
| Yield Strength (psi) | 118,000 (814 MPa) |
| Elongation % in 2" (50mm) | 19% |

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

| | |
|---|---|
| Avg. at -60°F (-51°C) | 24 ft.lb. (32J) |

**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, E12018-M H4R
- ASME SFA 5.5, E12018-M H4R
- ABS E12018M

# 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 60, 70, 80, 90 Pipemaster Pro-60, 610** | — | 30 | 17 | 12 | 8 | — | — |
| **335A, 335C** | — | 29 | 16 | 11 | 7 | — | — |
| **447A, 447C** | — | 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<br>Pipemaster Pro-60<br>Pipemaster 60 | — | SW-10P;<br>SW-10P Plus | Fleetweld 5P, 5P+;<br>Pipeliner 6P+ |
| E6011 | 335A; 335C | 6011C | SW-14 | Fleetweld 35; 35LS; 180 |
| E6013 | 447A; 447C | 6013D | SW-15; 6013LV | Fleetweld 37 |
| E6022 | 1139 | — | — | Fleetweld 22 |
| E7010-P1 | Pipemaster 70 | — | 710P | Shield-Arc HYP+<br>Pipeliner 7P+ |
| E7014 | 14A | 7014 | SW-15 IP | Fleetweld 47 |
| E7018 (AC) | 18AC | — | Atom Arc 7018-AC | Lincoln 7018AC |
| E7018 | 7018XLM<br>Boilermaker 18<br>418; 718MC<br>Soft-Arc 7018-1 | 7018MR | Atom Arc 7018 | Excalibur 7018MR;<br>Jetweld LH-70;<br>Jet-LH-78 MR |
| E7018-1 | 7018XLM<br>Boilermaker 18<br>418; 718MC<br>Soft-Arc 7018-1 | — | Atom Arc 7018-1 | Excalibur 7018-1 MR |
| E7024 | Rocket 7024 | 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+<br>Shield-Arc 80 |
| E9010-G | Pipemaster 90 | — | — | Shield-Arc 90 |

## Comparative Index of Low Alloy Electrodes

| AWS Class | HOBART | ESAB | LINCOLN |
|---|---|---|---|
| E7018-A1 | **Hoballoy 7018A1/Boilermaker A1** | Atom Arc 7018-Mo | Excalibur 7018-A1 MR |
| E8018-B2 | **Hoballoy 8018-B2/Boilermaker B2** | Atom Arc 8018-CM | Excalibur 8018-B2 MR |
| E7018-B2L/E8018-B2L | **Hoballoy 8018-B2L** | Atom Arc 7018-B2L | |
| E8018-B6 | **Hoballoy 8018B6** | Atom Arc 8018-B6 | |
| E8018-B8 | **Hoballoy 8018B8** | Atom Arc 8018-B8 | |
| E8018-C1 | **Hoballoy 8018C1** | Atom Arc 8018-C1 | Excalibur 8018-C1 MR |
| E8018-C2 | **Hoballoy 8018C2** | Atom Arc 8018-N | |
| E8018-C3 | **Hoballoy 8018C3** | Atom Arc 8018 | Excalibur 8018-C3 MR |
| E9015-B9 | **Hoballoy 9015B9** | Atom Arc 9015-B9 | |
| E9018-B3 | **Hoballoy 9018B3/Boilermaker B3** | Atom Arc 9018-CM | Excalibur 9018-B3 MR |
| E8018-B3L/E9018-B3L | **Hoballoy 9018B3L** | Atom Arc 8018-B3L | |
| E9018M | **Hoballoy 9018M** | Atom Arc 9018 | Excalibur 9018M MR |
| E10018-D2 | **Hoballoy 10018D2** | Atom Arc 10018-MM | Excalibur 10018-D2 MR |
| E10018M | **Hoballoy 10018M** | Atom Arc 10018 | |
| E11018M | **Hoballoy 11018M** | Atom Arc T | Excalibur 11018M MR |
| E12018M | **Hoballoy 12018M** | Atom Arc 12018 | |

## Approvals, Specifications, Classifications

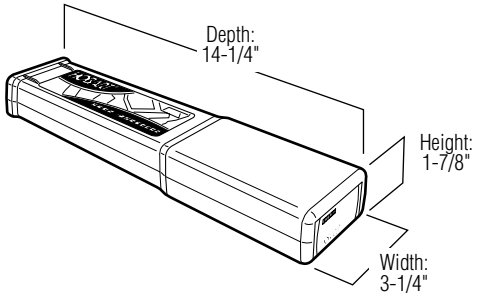
All filler metals listed conform to the specifications listed in each section. Because some agencies do not specifically approve particular types, please be careful to note whether or not the heading for each section indicates specific approval.

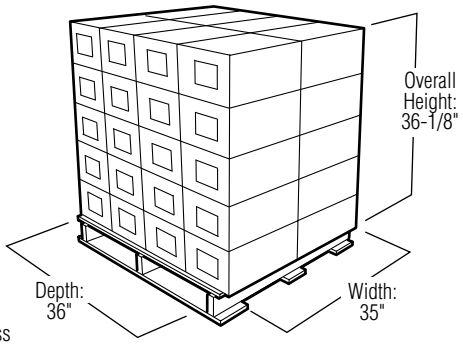
| Product | AWS/ASME | ABS | Lloyd's | CWB |
|---|---|---|---|---|
| **PIPEMASTER PRO 60** | E6010 | E6010 | 3m | - |
| **PIPEMASTER 60** | E6010 | E6010 | 3m | - |
| **610** | E6010 | - | - | E4310 |
| **HOBART 335A** | E6011 | E6011 | 2m, 2Ym | E4311 |
| **HOBART 335C** | E6011 | E6011 | 2m, 2Ym | - |
| **HOBART 447A** | E6013 | E6013 | - | - |
| **HOBART 447C** | E6013 | E6013 | - | E4313 |
| **HOBART 1139** | E6022 | - | - | - |
| **HOBART 14A** | E7014 | E7014 | - | E4914 |
| **BOILERMAKER 18** | E7018 H4R/E7018-1 H4R | | | |
| **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 | - | - |
| **HOBART 18AC** | E7018 H8 | - | - | - |
| **HOBART 24** | E7024/E7024-1 | 3 | - | E4924-1 |
| **HOBART ROCKET 7024** | E7024 | E7024 | - | - |
| **PIPEMASTER 70** | E7010-P1 | E7010-P1 | 3m, 3Ym | - |
| **PIPEMASTER 80** | E8010-P1 | E8010-P1 | 3m, 3Ym | - |
| **PIPEMASTER 90** | E9010-G | - | - | - |
| **HOBALLOY 7018A1/BOILERMAKER A1** | E7018-A1 | E7018-A1 | - | - |
| **HOBALLOY 8018B2/BOILERMAKER B2** | E8018-B2 | E8018-B2 | - | - |
| **HOBALLOY 8018B2L** | E8018-B2L | E8018-B2L | - | - |
| **HOBALLOY 8018B6** | E8018-B6 | E8018-B6 | - | - |
| **HOBALLOY 8018B8** | E8018-B8 | E8018-B8 | - | - |
| **HOBALLOY 8018C1** | E8018-C1 | E8018-C1 | - | - |
| **HOBALLOY 8018C2** | E8018-C2 | E8018-C2 | - | - |
| **HOBALLOY 8018C3** | E8018-C3 | E8018-C3 | - | - |
| **HOBALLOY 9015B9** | E9015-B9 | - | - | - |
| **HOBALLOY 9018B3/BOILERMAKER B3** | E9018-B3 | E9018-B3 | - | - |
| **HOBALLOY 9018B3L** | E9018-B3L | E9018-B3L | - | - |
| **HOBALLOY 9018M** | E9018-M | E9018-M | - | - |
| **HOBALLOY 10018D2** | E10018-D2 | E10018-D2 | - | - |
| **HOBALLOY 10018M** | E10018-M | - | - | - |
| **HOBALLOY 11018M** | E11018-M | E11018-M | - | - |
| **HOBALLOY 12018M** | E12018-M | E12018-M | - | - |
| **7018XLM** | E7018 H4R/E7018-1 H4R | E7018-1 | - | - |
| **SOFT-ARC 7018-1** | E7018 H4R/E7018-1 H4R | E7018-1 | - | - |

# 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

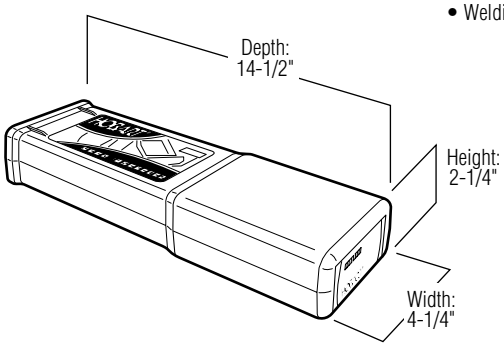


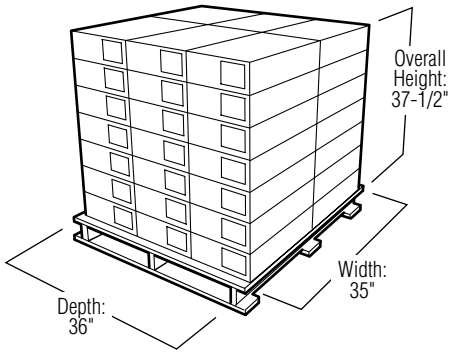




*Weight:* 2,000 pounds net, 2,235 gross
*Stacking sequence:* 4 wide, 2 deep & 5 high
*Cartons per pallet:* 40

## 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

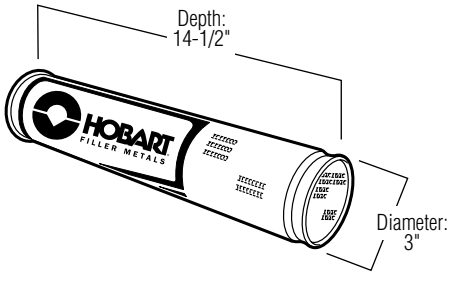


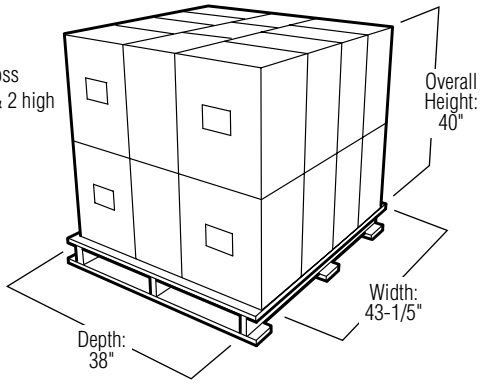

*Weight:* 2,100 pounds net, 2,235 gross
*Stacking sequence:* 3 wide, 2 deep & 7 high
*Cartons per pallet:* 42

## 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

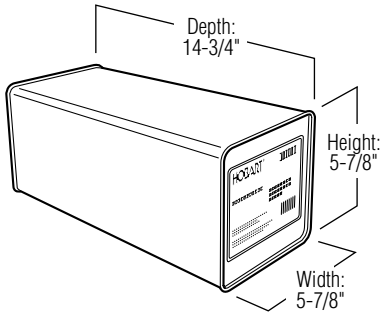


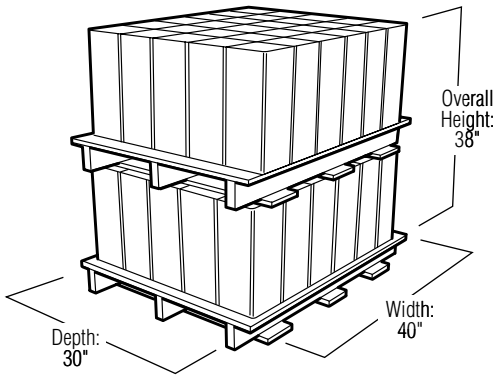

*Weight:* 1,320 pounds net, 1,465 gross
*Stacking sequence:* 3 wide, 4 deep & 2 high
*Cartons per pallet:* 22



## 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

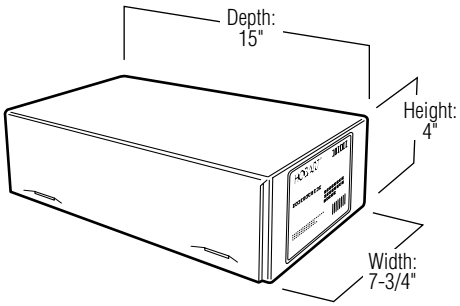


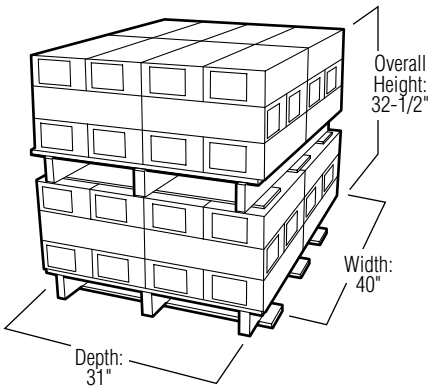




*Weight:* 3,000 pounds net, 3,150 gross
*Stacking sequence:* 5 wide, 6 deep & 2 high
*Cans per pallet:* 60 cans

## 50-lb. Carton

- Two separate pallets for convenient handling

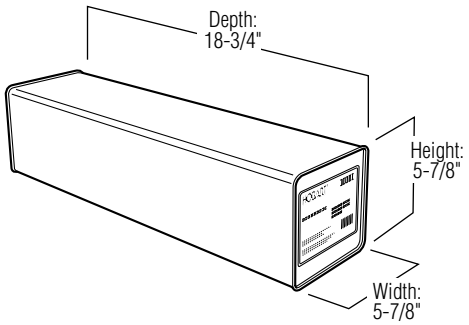


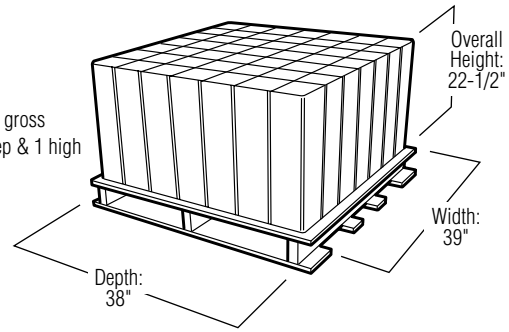

*Weight:* 3,000 pounds net, 3,090 gross
*Stacking sequence:* 4 wide, 4 deep & 2 high
*Cartons per pallet:* 48 cartons

## 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

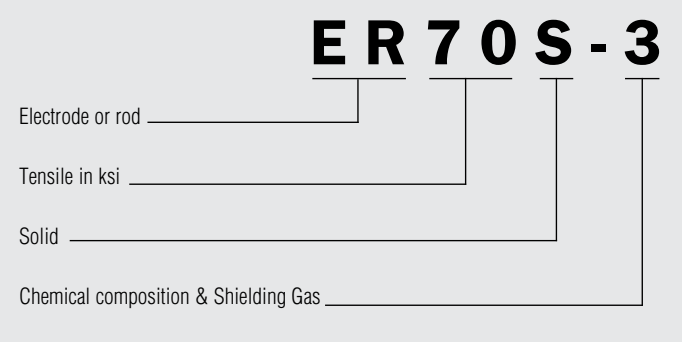



*Weight:* 2,450 pounds net, 2,540 gross
*Stacking sequence:* 7 wide, 7 deep & 1 high
*Cans per pallet:* 49 cans

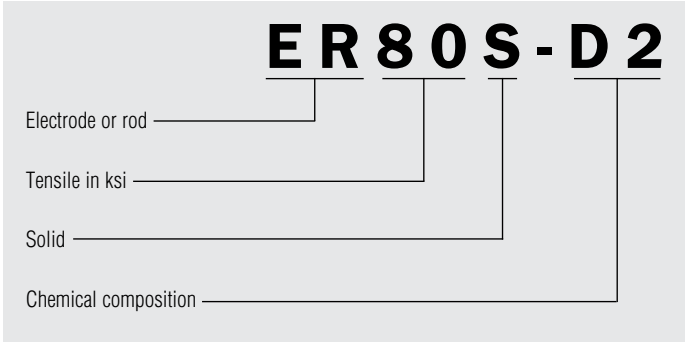


# Mild Steel Solid Wires

## How AWS Classifies Mild Steel Solid Electrodes, GMAW, GTAW and PAW




## How AWS Classifies Low Alloy Solid Electrodes, GMAW, GTAW and PAW




## 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-lbs 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. |

## Quantum Arc™ 3

**AWS ER70S-3**

When you need a wire versatile enough for general fabrication or a wire that can handle argon-rich mixtures like 75% Ar/25% $CO_2$ with ease, choose Hobart Quantum Arc 3. It's a precision mix of silicon and manganese in a deoxidized wire that makes short-circuiting and spray-transfer applications go smoothly.

**Typical Applications:**

- auto frames
- 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
- ABS ER70S-3
- CWB ER49S-3

## QCL-3

**AWS ER70S-3**

A premium copperless, mild steel wire, with silicon and manganese levels suitable for light levels of rust and mill scale, QCL-3 is designed for use with $CO_2$, argon-rich, and argon/oxygen mixtures, exhibiting a smooth, stable arc in high-speed spray, pulse and short arc applications.

**Typical Applications:**

- general fabrication
- farm implement fabrication
- auto and truck assemblies
- storage bins
- railcar assemblies

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

| | |
|---|---|
| Carbon | 0.09 |
| Manganese | 1.19 |
| Silicon | 0.46 |
| Phosphorus | 0.015 |
| Sulphur | 0.010 |

**Typical Mechanical Properties (AW):**

| | $CO_2$ |
|---|---|
| Tensile Strength (psi) | 81,000 (556 MPa) |
| Yield Strength (psi) | 66,000 (452 MPa) |
| Elongation % in 2" (50mm) | 27% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 79 ft.lb. (107J) |

**Approvals and Conformances:**

- AWS A5.18, ER70S-3
- ASME SFA 5.18, ER70S-3
- CWB ER49S-3

## HB-25

**AWS ER70S-3**

Hobart HB-25 is specially formatted to work with $CO_2$. It's a silicon and manganese deoxidized wire, so it's also excellent for general fabrication, for short-circuiting and for spray-transfer applications.

**Typical Applications:**

- auto frames
- farm equipment
- general fabrication
- metal furniture
- ornamental iron fabrication
- sheet metal
- storage bins

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

| | |
|---|---|
| Carbon | 0.09 |
| Manganese | 1.18 |
| Silicon | 0.57 |
| Phosphorus | 0.007 |
| Sulphur | 0.012 |

**Typical Mechanical Properties (AW):**

| | $CO_2$ |
|---|---|
| Tensile Strength (psi) | 80,000 (552 MPa) |
| Yield Strength (psi) | 64,000 (442 MPa) |
| Elongation % in 2" (50mm) | 27% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C), $CO_2$ | 94 ft.lb. (120J) |

**Approvals and Conformances:**

- AWS A5. 18, ER70S-3
- ASME SFA 5.18, ER70S-3

# Mild Steel Solid Wires

## Quantum Arc™ 6

**AWS ER70S-6**

When the task demands excellent weldability for $CO_2$ or Ar/$CO_2$ mixtures and you have rusty, scaly or oily plates, choose the mild steel electrode with deoxidizers powerful enough to handle the job. Hobart Quantum Arc 6 is formulated to ensure sound, porosity-free welds over a wide range of general shop fabrications.

**Typical Applications:**

- construction work
- farm implement fabrication
- general shop work
- steel castings or forging salvage
- shaft buildup
- tanks
- auto and truck assemblies

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

| | |
|---|---|
| Carbon | 0.08 |
| Manganese | 1.45 |
| Silicon | 0.81 |
| Phosphorus | 0.009 |
| Sulphur | 0.015 |

**Typical Mechanical Properties (AW):**

| | $CO_2$ |
|---|---|
| Tensile Strength (psi) | 85,000 (587 MPa) |
| Yield Strength (psi) | 70,000 (485 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
- ABS ER70S-6
- CWB ER49S-6

## QCL-6

**AWS ER70S-6**

A premium copperless, mild steel wire with higher deoxidizer levels for use on light to moderately scaled or lightly rusted plate without pre-cleaning. QCL-6 produces a smooth, stable arc, with low spatter levels, producing a weld bead that ties evenly to the sides. QCL-6 can be used with all common gas mixtures and arc transfer applications (short arc, spray, pulse).

**Typical Applications:**

- general fabrication
- pressure vessels
- pipe fabrication
- auto, truck, farm assemblies
- railcar assemblies

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

| | |
|---|---|
| Carbon | 0.08 |
| Manganese | 1.40 |
| Silicon | 0.82 |
| Phosphorus | 0.007 |
| Sulphur | 0.008 |

**Typical Mechanical Properties (AW):**

| | $CO_2$ |
|---|---|
| Tensile Strength (psi) | 79,000 (546 MPa) |
| Yield Strength (psi) | 63,000 (436 MPa) |
| Elongation % in 2" (50mm) | 28% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 77 ft.lb. (104J) |

**Approvals and Conformances:**

- AWS A5.18, ER70S-6
- ASME SFA 5.18, ER70S-6
- CWB ER49S-6

## HB-28

**AWS ER70S-6**

When your $CO_2$ welding task won't allow for strict cleaning practices, choose HB-28. It's a mild steel electrode that provides sound, porosity-free welds. You'll get excellent weldability with powerful deoxidizers for your work with $CO_2$ and other commercially available shielding gas mixtures.

**Typical Applications:**

- construction work
- farm implement fabrication
- 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) | 86,000 (596 MPa) |
| Yield Strength (psi) | 71,000 (487 MPa) |
| Elongation % in 2" (50mm) | 27% |

**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 exceptional quality, high-strength welding wire gives you an X-ray quality weld deposit. You can use it with $CO_2$, Ar/$CO_2$ and Ar/$O_2$ mixtures in situations where porosity is a problem or when you must counter high-sulfur or carbon content in your base metal.

**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

## QCL-D2

**AWS ER80S-D2, ER90S-G**

QCL-D2 is a premium copperless solid wire with a chemistry that includes the addition of 1/2% molybdenum to provide increased strength in those applications requiring tensile strengths of 80,000 - 90,000. QCL-D2 provides x-ray quality welds, and can be used with $CO_2$, 75/25, and 90/10 Shielding Gases.

**Typical Applications:**

- high temperature service piping
- construction equipment
- trailers
- Cranes high tensile applications

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

| | |
|---|---|
| Carbon | 0.08 |
| Manganese | 1.67 |
| Silicon | 0.65 |
| Phosphorus | 0.009 |
| Sulphur | 0.012 |
| Molybdenum | 0.47 |

**Typical Mechanical Properties (AW):**

| | $CO_2$ |
|---|---|
| Tensile Strength (psi) | 94,000 (652 MPa) |
| Yield Strength (psi) | 79,000 (547 MPa) |
| Elongation % in 2" (50mm) | 23% |

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

Avg. at -20°F (-30°C), $CO_2$ 41 ft.lb. (56J)

**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-3 | HB-25; QCL-3; QUANTUM ARC 3 | SuperArc L-50; SuperGlide S3 | Spoolarc 29S; Spoolarc 82; ESAB MIG-3 | NS-101 |
| ER70S-6 | HB-28; QCL-6; QUANTUM ARC 6 | SuperArc L-56; SuperGlide S6 | Spoolarc 86; ESAB MIG-6 | NS-115 |
| ER80S-D2 | QCL-D2; QUANTUM ARC D2 | SuperArc LA-90 | Spoolarc 83 | NS-102 |

# Steel Solid Wires

## Packaging of Hobart Solid Welding Wires

| Package | Pallet Net Weight lbs. (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 |
| 30 lb. fiber spool | 2,160 (980.6) | 11-3/4" | 8-1/4" | 4" | 2-1/16" | 7/16" | 1-3/4" | QCL |
| 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% $CO_2$.

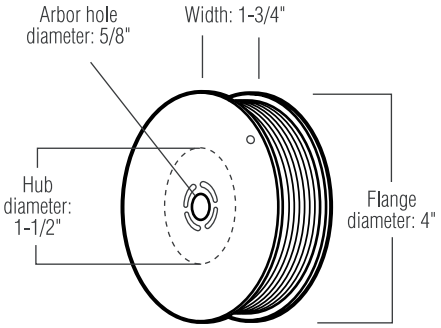
## Spray Transfer Welding Parameters

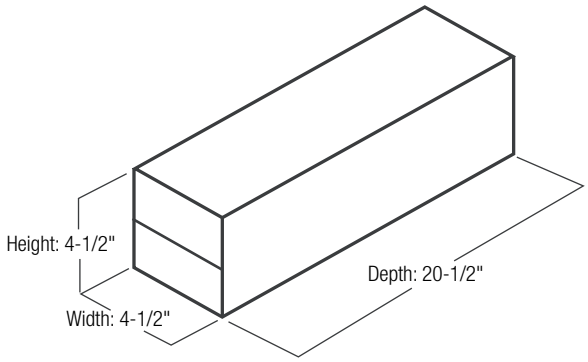
| size | Material thickness in. (decimal) | mm | Type of weld[1] | Electrode diameter in. | mm | Welding current amps-DC | Arc voltage (electrode positive) | Wire feed speed ipm | Travel speed ipm | 92% Ar/8% $CO_2$ gas flow CFH |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 ga. | 0.050 | 1.3 |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

## 2-lb. Plastic Spool

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

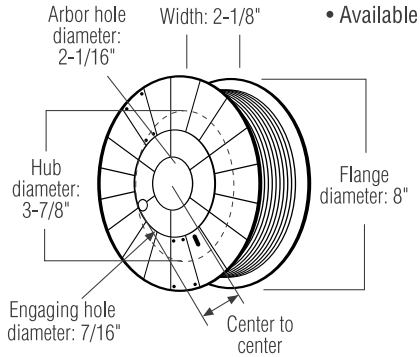


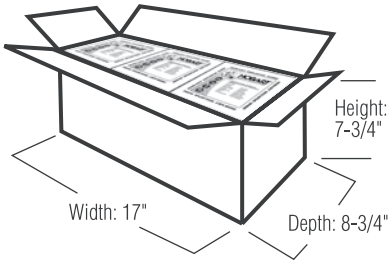

*Weight:* 20 pounds
*Spools per carton:* 10

## 10-lb. Plastic Spool

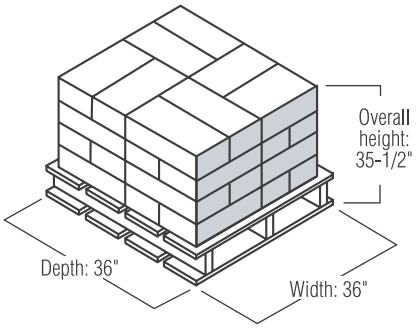
- Color-coded labels for easy wire identification
- Colorful packaging–great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection
- Available in: ☑ HB




*Spool weight (empty):* 0.8 lbs.



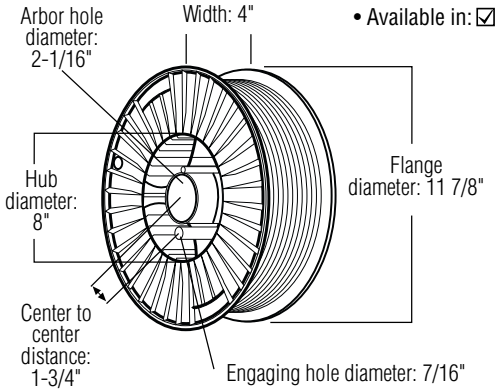

*Weight:* 60 lbs.
*Spools per master carton:* 6

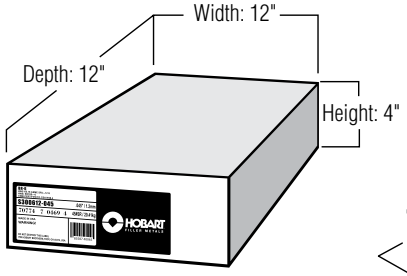



*Weight:* 1,920 lbs.
*Stacking sequence:* 4 wide, 4 deep, 4 high
*Master cartons per pallet:* 32
*Spools per pallet:* 192

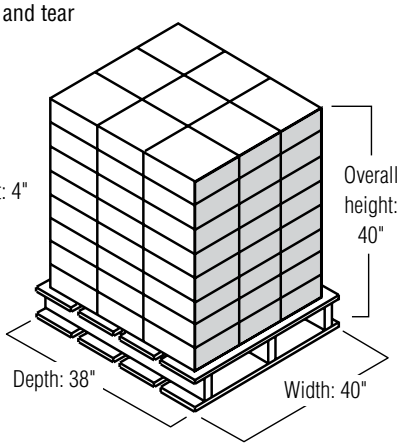
## 33-lb. Plastic Spool

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



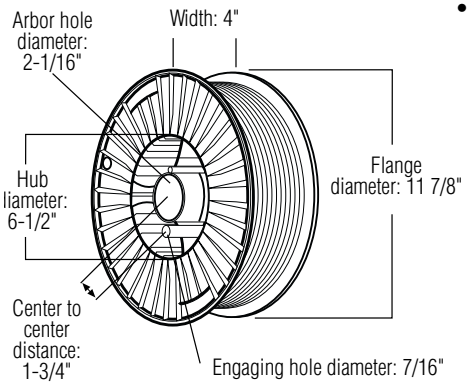

*Weight:* 33-lb. Plastic Spool – 2,376 lbs.
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

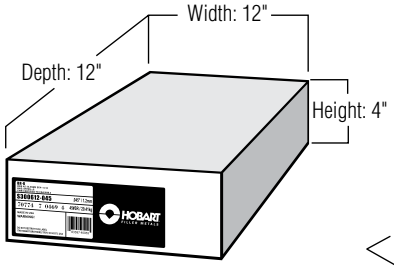


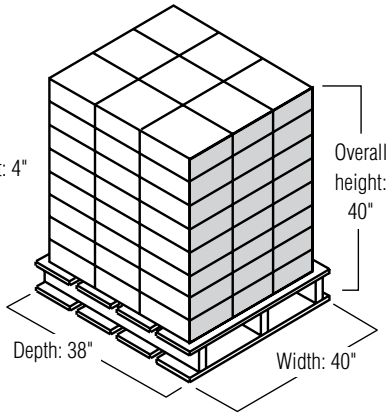
# Steel Solid Wires

## 45-lb. Plastic Spool

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



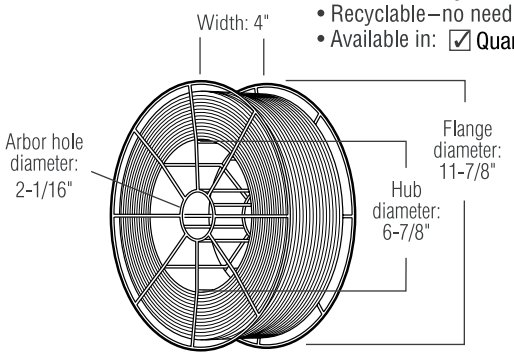



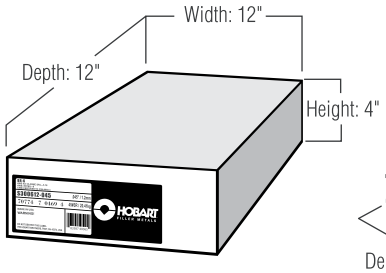

*Weight: 45-lb. Plastic Spool – 3,240 lbs.*
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

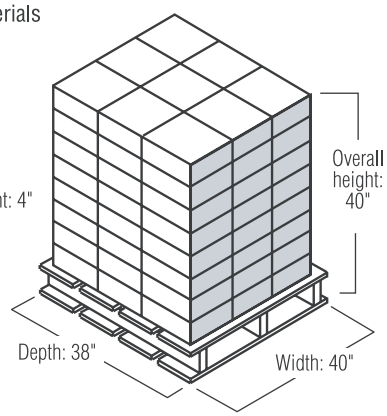
## 33-lb. & 45-lb. Steel Reels™

- 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.

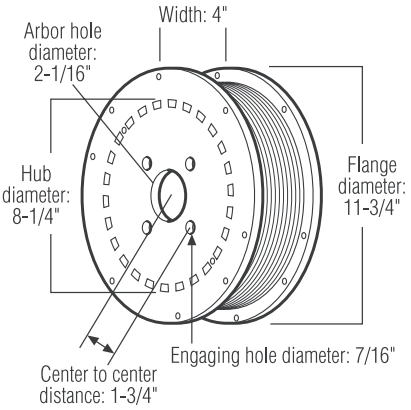


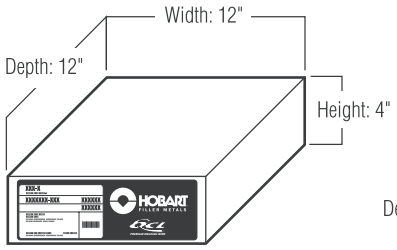

*Weight:* 33-lb. Steel Reel–2,376 lbs.
45-lb. Steel Reel–3,240 lbs.
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

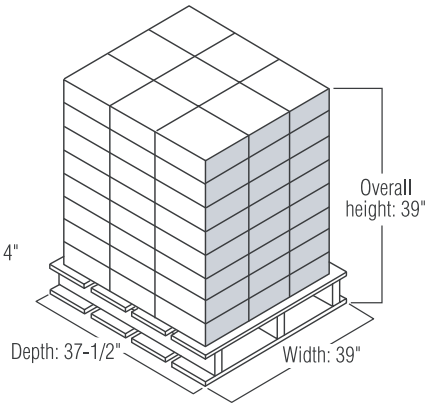
## 30-lb. Fiber Spool

- 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):* 2.4 lbs.

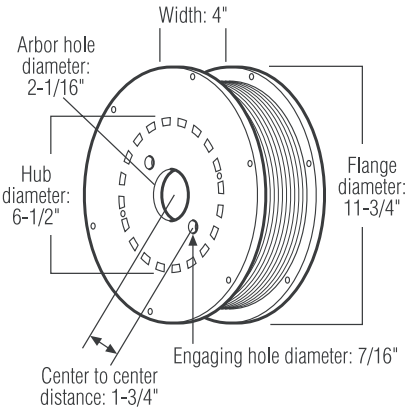


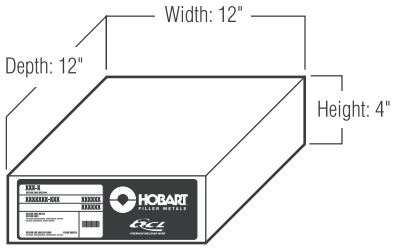

*Weight:* 2,160 lbs. net; 2,390 lbs., gross (est.)
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

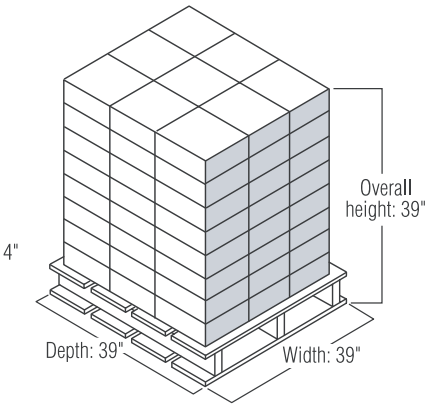
## 45-lb. Fiber Spool

- 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.

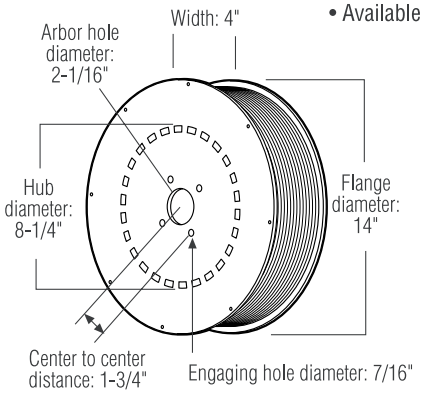


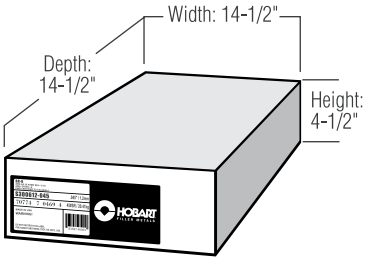

*Weight:* 45-lb. Fiber Spool – 3,240 lbs. net; 3,470 lbs. gross (est.)
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

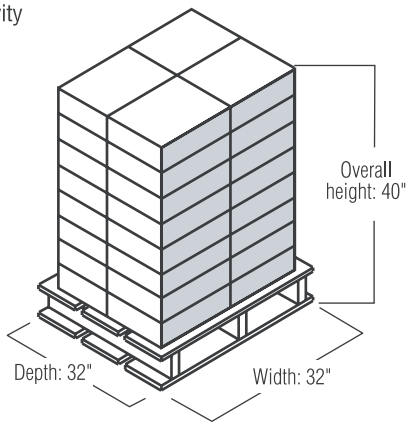
## 60-lb. Fiber Spool

- 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.



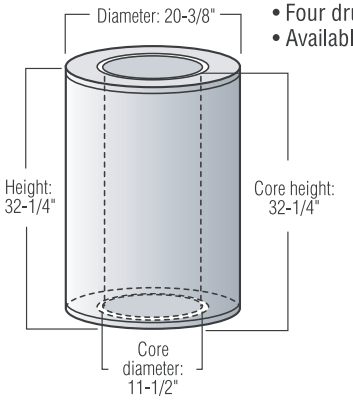




*Weight:* 1,920 lbs. net; 2,115 lbs., gross (est.)
*Stacking sequence:* 2 wide, 2 deep, 8 high
*Spools per pallet:* 32

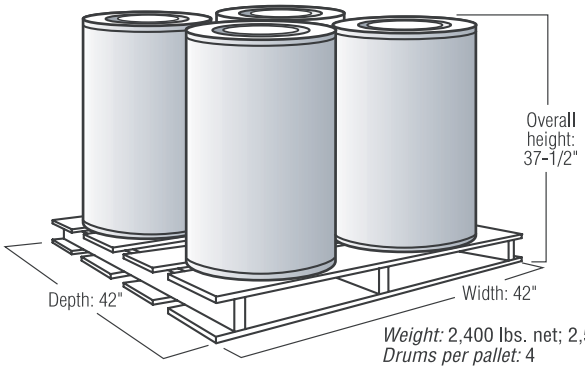
# Steel Solid Wires

## 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



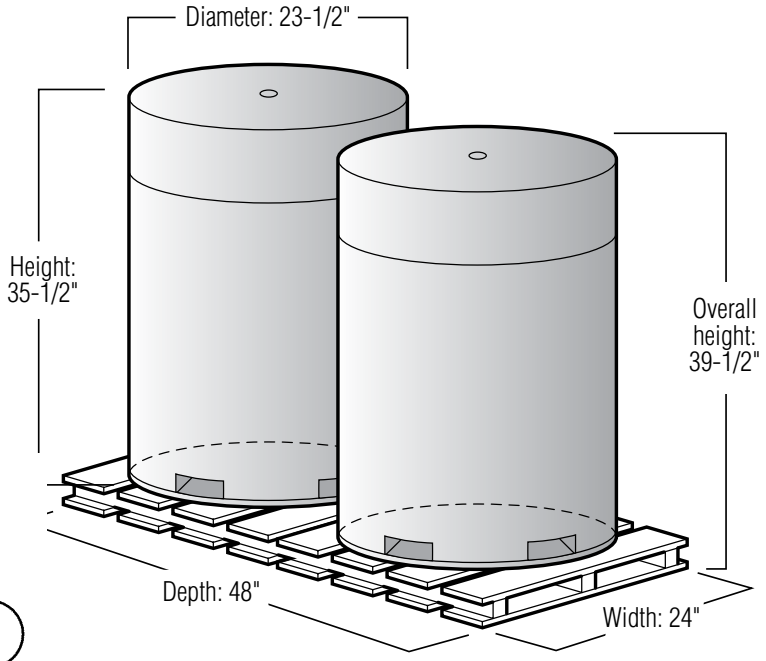

*Drum weight (empty):* 19 lbs.



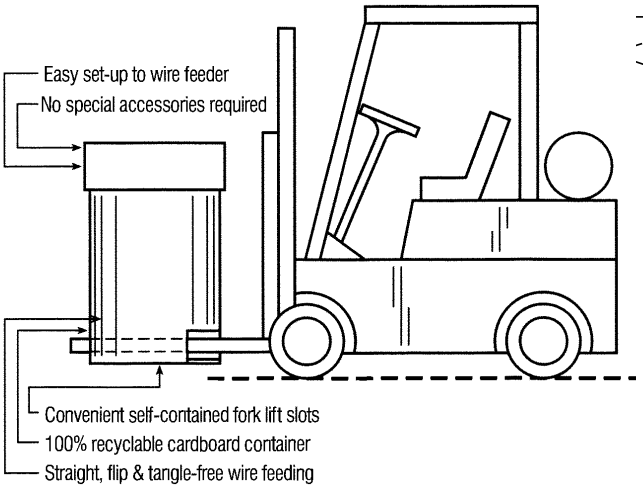

*Weight:* 2,400 lbs. net; 2,519 lbs., gross (est.)
*Drums per pallet:* 4

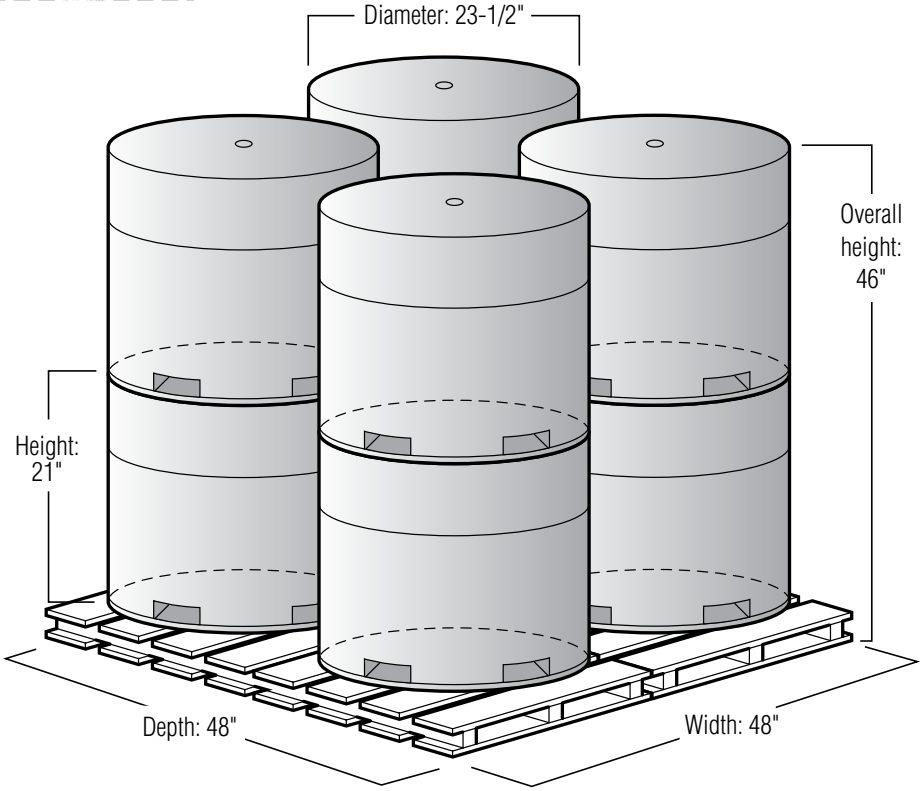
## Recyclable Robopak 300/600/700/950

- 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 lbs.
600 Weight: 2400 lbs.
700 Weight: 1400 lbs. (1/16 only)




300 Weight: 2400

# Aluminum Wires

## MaxalMig ER1100

**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 |
| Copper | 0.05-0.20 |
| Manganese | 0.05 |
| Magnesium | — |
| Zinc | 0.10 |
| Titanium | — |
| Beryllium | < 0.0003 |
| 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
- CE

## MaxalMig ER4043

**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 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
- CE

## MaxalMig ER4047

**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 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
- CE

## MaxalMig ER4943

**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 |
| 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 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
- CE

## MaxalMig ER5183

**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 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
- CE
- VdTUV
- DB

## MaxalMig ER5356

**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
- rail cars/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 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
- CE
- DB

# Aluminum Wires

## MaxalMig ER5554

**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 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
- CE

## MaxalMig ER5556

**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 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
- CE

## MaxalTig R1100

**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 |
| Copper | 0.05-0.20 |
| Manganese | 0.05 |
| Magnesium | — |
| Zinc | 0.10 |
| Titanium | — |
| Beryllium | < 0.0003 |
| 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 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
- CE

## MaxalTig R4043

**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
- CE

## MaxalTig R4047

**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
- CE

## MaxalTig R4943

**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 |
| 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
- CE

# Aluminum Wires

## MaxalTig R5183

**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
- CE

## MaxalTig R5356

**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
- rail cars/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
- CE

## MaxalTig R5554

**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
- CE

## MaxalTig R5556

**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:**

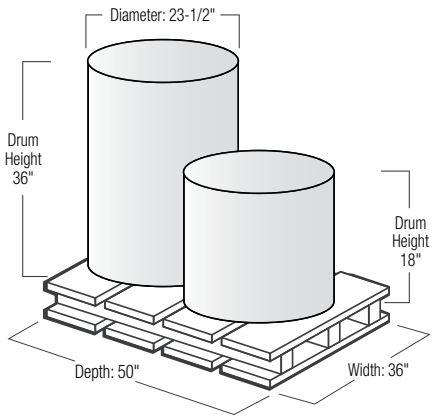
| Rod/Tungsten Diameter | Base Mat. Thickness | Amps | Gas Cup Diameter | Arc Travel Speed |
|---|---|---|---|---|
| 1/16"(1.6mm) | .062"(1.6mm) | 60-100 | 3/8"(9.5mm) | 8-10 ipm |
| 3/32"(2.4mm) | .094" (2.4mm) | 85-115 | 3/8"(9.5mm) | 10-12 ipm |
| .125"(3.2mm) | .1875"(4.8mm) | 155-190 | 7/16"(0.4mm) | 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

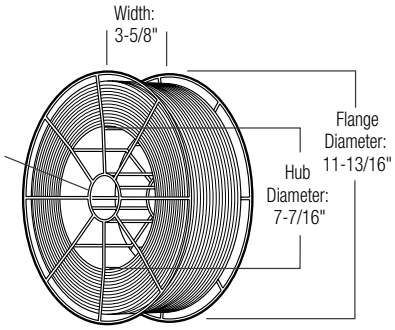
**Approvals and Conformances:**
- AWS A5.10, R5556
- ASME SFA 5.10, R5556
- AWS A5.01, Class S1, Schedule F
- CWB
- ABS
- CE

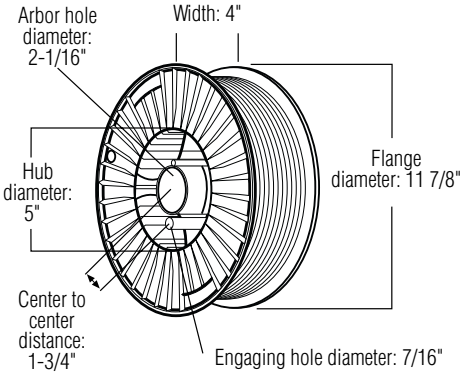
### Maxal PAC Drum



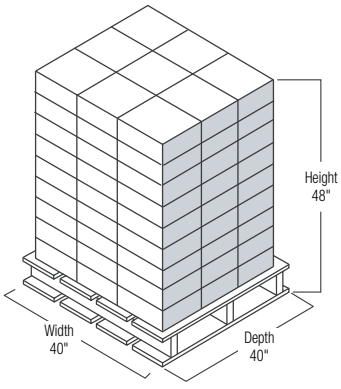

*Weight:* 300 pounds
*Master Pallet Dimensions:* 36" x 50"
*Individual Drum Pallet:* 24" x 24"

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

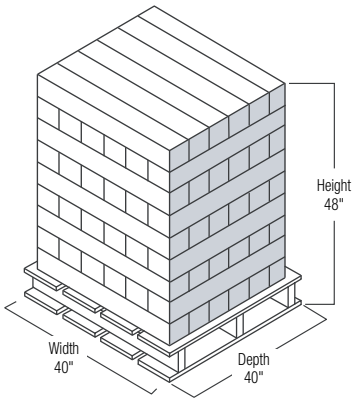



### Pallet Information

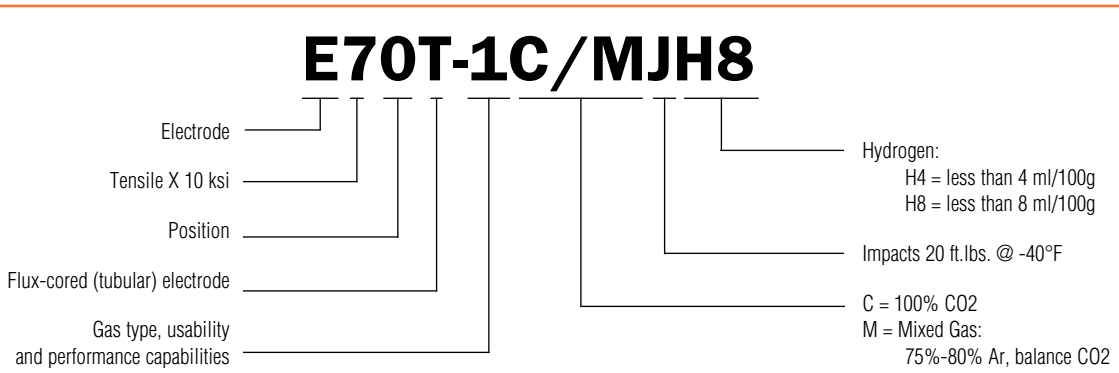



*1-lb. Carton Gross Weight:* 1,658 lbs. *Net Weight:* 1,458 lbs.
*16-lbs. Carton Gross Weight:* 1,496 lbs. *Net Weight:* 1,296 lbs.
*22-lbs. Carton Gross Weight:* 1,982 lbs. *Net Weight:* 1,782 lbs.
*Stacking Sequence:* 3 wide x 3 deep, 9 high




*Gross Weight:* 2,360 lbs. *Net Weight:* 2,160 lbs.
*Stacking Sequence:* 3 wide x 3 deep, 9 high

# 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

### TM-RX7

FLAT & HORIZONTAL

**AWS E70T-1C, E70T-9C**

**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
- rail cars

**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) | 28 ft.lb. (38J) |
| Avg. at -20°F (-30°C) | 29 ft.lb. (40J) |

**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:**

**Hobart and Tri-Mark**

- 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

**Hobart**

- 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**

**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
- rail cars

**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) |
| .052" (1.4 mm) | 150-350 | 24-32 | 3/4" (19 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**

**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 lbs (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) |
| 5/64" (2.0 mm) | 250-500 | 28-34 | 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

## Premier 70

FLAT & HORIZONTAL

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

**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 |
|---|---|---|---|
| .045" (1.2 mm) | 175-300 | 25-32 | 3/4" (19 mm) |
| .052" (1.4 mm) | 250-350 | 27-32 | 3/4" (19 mm) |
| 1/16" (1.6 mm) | 200-450 | 25-32 | 1" (25 mm) |
| 5/64" (2.0 mm) | 250-550 | 26-34 | 1" (25 mm) |
| 3/32" (2.4 mm) | 300-550 | 26-34 | 1-1/4" (32 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

## TM-72

FLAT & HORIZONTAL

**AWS E70T-1C, E70T-9C**

**Benefits:**

- excellent arc stability over entire current range increases operator appeal
- faster freezing slag and lower spatter when compared to TM-11, especially at lower amperage settings of current range
- fast freezing nature of slag facilitates welding on modestly inclined surfaces and girth welds
- surfaces are smooth and uniformly rippled, providing excellent bead appearance

**Typical Applications:**

- structural steel
- shipbuilding
- heavy equipment
- general fabrication

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.07 |
| Manganese | 1.26 |
| Silicon | 0.62 |
| Phosphorus | 0.009 |
| Sulphur | 0.005 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 89,000 (612 MPa) |
| Yield Strength (psi) | 78,000 (543 MPa) |
| Elongation % in 2" (50mm) | 24% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 36 ft.lb. (49J) |
| Avg. at -20°F (-30°C) | 26 ft.lb. (35J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 300-425 | 28-35 | 3/4" (19 mm) |
| 5/64" (2.0 mm) | 350-450 | 29-32 | 3/4" (19 mm) |
| 3/32" (2.4 mm) | 350-500 | 27-31 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E70T-1C, E70T-9C
- ASME SFA 5.20, E70T-1C, E70T-9C
- AWS A5.20M, E490T-1C, E490T-9C
- ABS, 100% $CO_2$, E70T-1C
- Military Spec. MIL-E-24403/1, Class MIL-70T-1C

## TM-11

FLAT & HORIZONTAL

**AWS E70T-1C**

**Benefits:**

- better at higher amperage levels
- good weld bead geometry
- excellent at higher current levels
- slag freezes at a moderate rate, contributing to smooth, flat and uniformly rippled beads

**Typical Applications:**

- heavy equipment
- machinery
- structural components
- general fabrication

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.08 |
| Manganese | 1.36 |
| Silicon | 0.78 |
| Phosphorus | 0.009 |
| Sulphur | 0.005 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 92,000 (635 MPa) |
| Yield Strength (psi) | 77,000 (532 MPa) |
| Elongation % in 2" (50mm) | 24% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 29 ft.lb. (39J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 150-400 | 26-32 | 3/4" (19 mm) |
| 5/64" (2.0 mm) | 250-450 | 26-33 | 3/4" (19 mm) |
| 3/32" (2.4 mm) | 375-600 | 25-35 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E70T-1C
- ASME SFA 5.20, E70T-1C
- AWS A5.20M, E490T-1C

## FabCO® 85

### TM-55

FLAT & HORIZONTAL

**AWS E70T-5C/MJ H4**

**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 fabrications
- 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% $CO_2$, 80%Ar/20%$CO_2$

**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

## TM-73

FLAT & HORIZONTAL

**AWS E70T-2**

**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 fabrications
- 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 |
|---|---|---|---|
| 5/64" (2.0 mm) | 250-500 | 25-35 | 1" (25 mm) |
| 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

## Excel Arc™ 71

ALL POSITION

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

**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)
- $CO_2$, (0.045" [1.2mm] & 1/16" [1.6mm] diameter electrodes)

## FabCO® Hornet

ALL POSITION

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

**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:**

| 3.3 ml/100g | 3.9 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

## Triple 7

ALL POSITION

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

**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 fabrication
- 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) | 65 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 E491T-1 H8, E491T-1M H8
- CWB, 100% $CO_2$, E491T-9-H8, 80% Ar/20% $CO_2$, E491T-9M-H8
- DNV II YMS

## Triple 8

ALL POSITION

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

**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
- rail car
- 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

## Element™ 71T1C

ALL POSITION

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

**Benefits:**

- enhanced out of positional 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

## Element™ 71T1M

ALL POSITION

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

**Benefits:**

- enhanced out of positional 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

## TM-711M

ALL POSITION

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

**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 |
|---|---|---|---|
| .035" (0.9 mm) | 175-225 | 25-28 | 3/4"(19 mm) |
| .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**

**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 |
|---|---|---|---|
| .035" (0.9 mm) | 125-175 | 24 | 1/2" (13 mm) |
| .045" (1.2 mm) | 125-250 | 24 | 3/4" (19 mm) |
| .052" (1.4 mm) | 140-275 | 24-25 | 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

## Formula XL®-550

ALL POSITION

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

**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 |
|---|---|---|---|
| 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-1C H4, E71T-12CJ H4
- AWS A5.20M, E491T-1C H4, E491T-12CJ H4
- ASME SFA 5.20, E71T-1C H4, E71T-12CJ H4
- ABS, 100% $CO_2$, 4YSA H10
- CWB, 100% $CO_2$, E491T-9-H8
- Lloyd's Register, 100% $CO_2$, 3Y40S H10

## Formula XL®-550 H4

ALL POSITION

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

**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 |
|---|---|---|---|
| .045" (1.2 mm) | 200-225 | 24-26 | 3/4" (19 mm) |
| .052" (1.4 mm) | 225-250 | 24-27 | 3/4" (19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E71T-1C H4, E71T-12CJ H4
- AWS A5.20M, E491T-1C H4, E491T-12CJ H4
- ASME SFA 5.20, E71T-1C H4, E71T-12CJ H4
- ABS, 100% $CO_2$, 4YSA H5
- CWB, 100% $CO_2$, E491T-9-H4
- DNV, 100% $CO_2$, IV YMS H5 (1.2mm diameter electrode only)
- Lloyd's Register, 100% $CO_2$, 3Y40S H10

## Formula XL®-525

### TM-770

ALL POSITION

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

**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 |
|---|---|---|---|
| .035" (0.9 mm) | 130-250 | 23-29 | 1/2" (13 mm) |
| .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, E491T-12MJ H8
- ASME SFA 5.20, E71T-1M H8, E71T-9M H8, E71T-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

## TM-771

ALL POSITION

**AWS E71T-1CJ H8, E71T-9CJ H8, E71T-12CJ H8**

**Benefits:**

- excellent CVN toughness for critical applications
- low-hydrogen electrode minimizes risk of hydrogen embrittlement
- excellent arc characteristics provide consistent appearance and weld quality
- minimal spatter reduces post weld cleanup

**Typical Applications:**

- structural fabrication
- shipbuilding
- pressure vessel
- heavy equipment

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.02 |
| Manganese | 0.88 |
| Silicon | 0.23 |
| Phosphorus | 0.013 |
| Sulphur | 0.005 |
| Nickel | 0.47 |

**Typical diffusible hydrogen:** 5.1 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 81,000 (558 MPa) |
| Yield Strength (psi) | 72,000 (496 MPa) |
| Elongation % in 2" (50mm) | 26% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 108 ft.lb. (146J) |
| Avg. at -40°F (-40°C) | 82 ft.lb. (111J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 150-300 | 24-31 | 3/4" (19 mm) |
| .052" (1.4 mm) | 200-350 | 26-31 | 1" (25 mm) |
| 1/16" (1.6 mm) | 200-450 | 24-29 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.20, E71T-1C H8, E71T-9C H8, E71T-12CJ H8
- AWS A5.20M, E491T-1C H8, E491T-9C H8, E491T-12CJ H8
- ASME SFA 5.20, E71T-1C H8, E71T-9C H8, E71T-12CJ H8
- ABS, 100% $CO_2$, 3YSA
- Bureau Veritas, 100% $CO_2$, S3YM
- CWB, 100% $CO_2$, E491T-9-H8
- Lloyd's Register, 100% $CO_2$, 3YS H15
- MIL-E-24403/1, MIL-71T-1C, MIL-71T-1-HYC

## TM-910

ALL POSITION

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

**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 vessel
- 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) |
| .052" (1.4 mm) | 150-300 | 23-27 | 1" (25 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 A5.20M, E491T-1M, E491T-9M, E491T-12MJ H8
- AWS A5.20M, E491T-1M, E491T-9M, E491T-12MJ H8
- ASME SFA 5.20, E71T-1M, E71T-9M, E71T-12MJ H8
- CWB, 75-92% Ar/Balance $CO_2$, E491T-12MJ
- MIL-E-24403/1, MIL-71T-1-HYR

## Fabshield® 4

### TM-44

FLAT & HORIZONTAL

**AWS E70T-4**

**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**

**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.lbs. (61J) |
| Avg. at -20°F (-30°C) | 35 ft.lbs. (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
- AWS D1.8/D1.8M Conformance, [3/32" (2.4 mm) diameter]
- ASME SFA A5.20, E70T-6

## Fabshield® 7027

FLAT & HORIZONTAL

**AWS E70T-7**

**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 |
|---|---|---|---|
| 5/64" (2.0 mm) | 250-450 | 23-30 | 1 3/4" (44 mm) |
| 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**

**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

TM-121

ALL POSITION

**AWS E71T-11**

**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:**

**Hobart & Tri-Mark**

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

**Hobart**

- CWB, E491T-11 H8 (1.2 - 1.6 mm diameters)

## Fabshield® 23

ALL POSITION

**AWS E71T-14**

**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) | 250-550 | 26-34 | 1" (25 mm) |
| 3/32" (2.4 mm) | 350-650 | 27-40 | 1" (25 mm) |

**Shielding Gas:** None required

**Type of Current:** DCEN

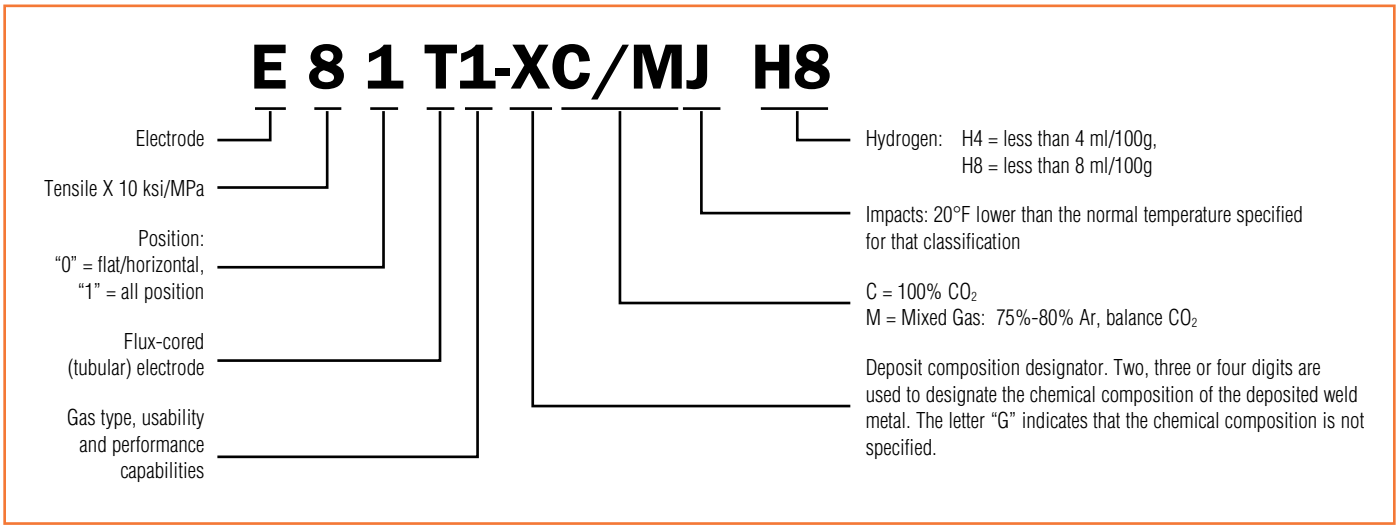
**Approvals and Conformances:**

- AWS A5.20, E71T-14
- AWS A5.20M, E491T-14
- ASME SFA 5.20, E71T-14

**Hobart**

- 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 |

## TM-81N1

FLAT & HORIZONTAL

**AWS E80T1-Ni1C/MJ H8**

**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 |
|---|---|---|---|
| 1/16" (1.6 mm) | 170-350 | 24-31 | 1"(25 mm) |
| 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

## TM-811N1

ALL POSITION

**AWS E81T1-Ni1C/MJ H4**

**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) |
| .052" (1.4 mm) | 125-300 | 24-27 | 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)

## Formula XL®-8Ni1

ALL POSITION

**AWS E81T1-Ni1MJ H8**

**Benefits:**

- excellent wetting characteristics for uniform bead appearance
- excellent slag release for reduced post weld cleanup time
- low hydrogen to minimize risk of hydrogen embrittlement
- excellent deposition rates for increased productivity

**Typical Applications:**

- ship and barge construction
- pressure vessels
- structural applications
- heavy equipment

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| Carbon | 0.08 |
| Manganese | 1.35 |
| Silicon | 0.40 |
| Phosphorus | 0.014 |
| Sulphur | 0.011 |
| Nickel | 1.06 |

**Typical diffusible hydrogen:** 4.4 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 96,000 (662 MPa) |
| Yield Strength (psi) | 86,000 (593 MPa) |
| Elongation % in 2" (50mm) | 24% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 93 ft.lb. (126J) |
| Avg. at -40°F (-40°C) | 85 ft.lb. (115J) |
| Avg. at -60°F (-50°C) | 63 ft.lb. (85J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 100-300 | 23-28 | 7/8"(22 mm) |
| 1/16" (1.6 mm) | 250-450 | 25-31 | 1"(25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E81T1-Ni1MJ H8
- AWS A5.29M, E551T1-Ni1MJ H8
- ASME SFA 5.29, E81T1-Ni1MJ H8
- ABS, 75% Ar/25% $CO_2$, 3YSA H10
- DNV, 75% Ar/25% $CO_2$, IV YMS

## FabCO® 803

### TM-811N2

ALL POSITION

**AWS E81T1-Ni2C/MJ H4, E81T1-Ni2MJ H4**

**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:**

**Hobart and Tri-Mark:**

- 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
- 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)

**Tri-Mark:**

- ABS, 100% $CO_2$, 3YSA

## TM-911N2

ALL POSITION

**AWS E91T1-Ni2C**

**Benefits:**

- excellent wetting characteristics for uniform bead appearance
- excellent slag release for reduced post weld cleanup time
- fast freezing slag for excellent out-of-position capability
- excellent low temperature impact properties for critical applications

**Typical Applications:**

- 2% Nickel steels
- ASTM A203 Grade A & B steels
- offshore construction
- shipbuilding

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.07 |
| Manganese | 1.18 |
| Silicon | 0.60 |
| Phosphorus | 0.012 |
| Sulphur | 0.021 |
| Nickel | 2.41 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 99,000 (683 MPa) |
| Yield Strength (psi) | 86,000 (593 MPa) |
| Elongation % in 2" (50mm) | 23% |

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

| | |
|---|---|
| Avg. at -40°F (-40°C) | 36 ft.lb. (49J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 150-425 | 21-31 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E91T1-Ni2C
- AWS A5.29M, E621T1-Ni2C
- ASME SFA 5.29, E91T1-Ni2C

## TM-881K2

ALL POSITION

**AWS E81T1-K2C/MJ H8**

**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**

**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) |
| .052" (1.4 mm) | 150-300 | 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% $CO_2$, 3Y400S H5

## TM-991K2

ALL POSITION

**AWS E91T1-K2C/M H8**

**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

## TM-95K2

FLAT & HORIZONTAL

**AWS E90T5-K2C/M H4**

**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) |

**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

## TM-101K3

FLAT & HORIZONTAL

**AWS E100T1-K3C**

**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) |
| 5/64" (2.0 mm) | 250-500 | 25-35 | 1-1/4"(32 mm) |
| 3/32" (2.4 mm) | 300-600 | 26-37 | 1-1/4"(32 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

## TM-115

FLAT & HORIZONTAL

**AWS E110T5-K3C/M H4**

**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% $CO_2$

**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

### TM-1101K3-M

ALL POSITION

**AWS E111T1-K3MJ H8**

**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) |
| .052" (1.4 mm) | 200-350 | 25-30 | 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

## TM-1101K3-C

ALL POSITION

**AWS E111T1-K3CJ H8**

**Benefits:**

- excellent arc stability for exceptional operator appeal
- low spatter helps reduce post weld cleanup
- low hydrogen to reduce risk of hyrogen cracking

**Typical Applications:**

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

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.07 |
| Manganese | 1.55 |
| Silicon | 0.34 |
| Phosphorus | 0.009 |
| Sulphur | 0.017 |
| Chromium | 0.03 |
| Nickel | 1.97 |
| Molybdenum | 0.37 |
| Vanadium | 0.02 |

**Typical diffusible hydrogen:** 2.9 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 117,000 (807 MPa) |
| Yield Strength (psi) | 105,000 (724 MPa) |
| Elongation % in 2" (50mm) | 22% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 34 ft.lb. (46J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 125-325 | 24-31 | 3/4" (19 mm) |
| .052" (1.4 mm) | 150-375 | 24-32 | 3/4" (19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E111T1-K3CJ H8
- AWS A5.29M, E761T1-K3CJ H8
- ASME SFA 5.29, E111T1-K3CJ H8
- ABS, 100% $CO_2$, E111T1-K3CJ H8

## FabCO® 110K3-M

ALL POSITION

**AWS E111T1-K3MJ H4**

**Benefits:**

- optimized for use with mixed gas
- low temperature impact properties for critical applications
- 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 | 0.05 |
| Manganese | 2.04 |
| Silicon | 0.26 |
| Phosphorus | 0.007 |
| Sulphur | 0.014 |
| Chromium | 0.12 |
| Nickel | 1.84 |
| Molybdenum | 0.37 |

**Typical diffusible hydrogen:** 2.2 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 128,000 (883 MPa) |
| Yield Strength (psi) | 124,000 (854 MPa) |
| Elongation % in 2" (50mm) | 15% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 32 ft.lb. (43J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 170-200 | 23-28 | 3/4"(19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E111T1-K3MJ H4
- AWS A5.29M, E761T1-K3MJ H4
- ASME SFA 5.29, E111T1-K3MJ H4
- ABS, 75% Ar/25% $CO_2$, E111T1-K3MJ H4

## FabCO® 115

FLAT & HORIZONTAL

**AWS E110T5-K4C**

**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-the-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

## TM-125K4

FLAT & HORIZONTAL

**AWS E120T5-K4C H4**

**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 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

## TM-105D2

FLAT & HORIZONTAL

**AWS E100T5-D2C**

**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. @ 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. @ 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

## TM-811A1

ALL POSITION

**AWS E81T1-A1C**

**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. @ 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) |
| 1/16" (1.6 mm) | 150-425 | 21-31 | 3/4" (19 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

## TM-811W

ALL POSITION

**AWS E81T1-W2C H8**

**Benefits:**

- meets D1.1 structural code to weld A242 and A588
- good properties in the 80,000-100,000 psi strength range and good impact values
- alloyed to provide a weld metal color match in the weathring conditions
- capable of welding in all positions

**Typical Applications:**

- weathering steels where the steel may be exposed to the environment
- single and multiple pass applications with 100% $CO_2$ Shielding Gas

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.06 |
| Manganese | 1.30 |
| Silicon | 0.70 |
| Phosphorus | 0.008 |
| Sulphur | 0.014 |
| Chromium | 0.59 |
| Nickel | 0.74 |
| Copper | 0.38 |

**Typical diffusible hydrogen:** 2.7 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 99,000 (683 MPa) |
| Yield Strength (psi) | 85,000 (586 MPa) |
| Elongation % in 2" (50mm) | 25% |

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

Avg. at -20°F (-30°C) 25 ft.lb. (34J)

**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% $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E81T1 W2C H8
- AWS A5.29M, E551T1-W2 H8
- ASME SFA 5.29, E81T1 W2C H8

## TM-811B2

ALL POSITION

**AWS E81T1-B2C H8**

**Benefits:**

- maintains tensile strength at high service temperature, provides good creep resistance
- suitable replacement for E8018-B2
- fast-freezing slag, suitable for all-position welding
- increases productivity

**Typical Applications:**

- PII Pipe
- high temperature applications
- welding of 1.25% Cr and 0.5% Mo steels
- single or multiple pass applications with 100% $CO_2$

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.06 |
| Manganese | 0.53 |
| Silicon | 0.38 |
| Phosphorus | 0.009 |
| Sulphur | 0.010 |
| Chromium | 1.28 |
| Molybdenum | 0.44 |

**Typical diffusible hydrogen:** 5.0 ml/100g

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

| | |
|---|---|
| Tensile Strength (psi) | 95,000 (655 MPa) |
| Yield Strength (psi) | 82,000 (565 MPa) |
| Elongation % in 2" (50mm) | 22% |

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

Not required

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 175-300 | 24-30 | 5/8" (16 mm) |
| 1/16" (1.6 mm) | 200-400 | 24-33 | 3/4" (19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E81T1-B2C H8
- ASME SFA 5.29, E81T1-B2C H8
- AWS A5.29M, E551T1-B2C H8
- CWB 100% $CO_2$ E551T1-B2C

## FabCO® XTREME™ B2

ALL POSITION

**AWS E81T5-B2M H8**

**Benefits:**

- basic slag system with the slag removal and spatter of a T1 electrode
- excellent toughness properties
- reduced chance of temper embrittlement
- minimizes crack susceptibility

**Typical Applications:**

- welding of 1.25 Cr and 0.5 Mo steels
- single and multiple pass applications with mixed gas
- high temperature service application where high tensile strength and creep resistance is required
- boiler and pressure vessel piping

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| Carbon | 0.10 |
| Manganese | 1.08 |
| Silicon | 0.10 |
| Phosphorus | 0.008 |
| Sulphur | 0.003 |
| Nickel | 0.04 |
| Chromium | 1.22 |
| Molybdenum | 0.50 |

**Typical diffusible hydrogen:** 5.2 ml/100g

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

| | |
|---|---|
| Tensile Strength (psi) | 86,100 (594 MPa) |
| Yield Strength (psi) | 68,800 (474 MPa) |
| Elongation % in 2" (50mm) | 24% |

**Typical Charpy V-notch Impact Values (PWHT 1 Hr. @ 1275°F/691°C):**

Avg. at -40°F (-40°C) 91 ft.lb. (124J)

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 160-290 | 21-27 | 1/2" (13 mm) |

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

**Type of Current:** DCEN

**Approvals and Conformances:**

- AWS A5.29, E81T5-B2M H8
- AWS A5.29M, E581T5-B2M H8
- ASME SFA 5.29, E81T5-B2M H8

## TM-91B3

FLAT & HORIZONTAL

**AWS E90T1-B3C**

**Benefits:**
- high temperature creep resistance and some oxidation resistance
- replaces E9018-B3 covered electrode in suitable applications
- excellent welder appeal with good bead geometry

**Typical Applications:**
- welding of 2.25 Cr and 1 Mo Steels
- single or multiple pass applications with 100% $CO_2$ shielding gas
- steam or chemical piping systems

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.06 |
| Manganese | 0.64 |
| Silicon | 0.25 |
| Phosphorus | 0.010 |
| Sulphur | 0.013 |
| Chromium | 2.47 |
| Molybdenum | 1.06 |

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

| | |
|---|---|
| Tensile Strength (psi) | 106,000 (731 MPa) |
| Yield Strength (psi) | 93,000 (641 MPa) |
| Elongation % in 2" (50mm) | 19% |

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

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 5/64" (2.0 mm) | 140-390 | 25-36 | 1-1/4"(32 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**
- AWS A5.29, E90T1-B3C
- AWS A5.29M, E620T1-B3C
- ASME SFA 5.29, E90T1-B3C

## TM-911B3

ALL POSITION

**AWS E91T1-B3C/M H8**

**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. @ 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® XTREME™ B3

ALL POSITION

**AWS E91T5-B3M H8**

**Benefits:**
- excellent toughness properties
- minimizes crack susceptibility
- reduced chance of temper embrittlement
- slag removal and spatter similar to a T1 electrode

**Typical Applications:**
- welding 2.25 Cr and 1 Mo steels
- single and multiple pass applications with mixed gas
- high temperature piping systems

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| Carbon | 0.10 |
| Manganese | 1.05 |
| Silicon | 0.08 |
| Phosphorus | 0.007 |
| Sulphur | 0.003 |
| Nickel | 0.02 |
| Chromium | 2.30 |
| Molybdenum | 1.03 |

**Typical diffusible hydrogen:** 5.0 ml/100g

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

| | |
|---|---|
| Tensile Strength (psi) | 105,600 (728 MPa) |
| Yield Strength (psi) | 88,100 (607 MPa) |
| Elongation % in 2" (50mm) | 21% |

**Typical Charpy V-notch Impact Values (PWHT 1 Hr. @ 1275°F/691°C):**

| | |
|---|---|
| Avg. at -40°F (-40°C) | 110 ft.lb. (149J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 160-290 | 21-26.5 | 3/4" (19 mm) |

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

**Type of Current:** DCEN

**Approvals and Conformances:**
- AWS A5.29, E91T5-B3M H8
- AWS A5.29M, E621T5-B3M H8
- ASME SFA 5.29, E91T5-B3M H8

## TM-B6

ALL POSITION

**AWS E81T1-B6C/M**

**Benefits:**

- fast freezing slag for out-of-position welding
- excellent arc stability with flat bead appearance
- low spatter level
- produces x-ray quality weld

**Typical Applications:**

- welding 5 Cr and 0.5 Mo steels
- single and multiple pass applications with 100% $CO_2$ or mixed gas
- high temperature and high pressure applications

**Typical Weld Metal Chemistry:**

| | 100% $CO_2$ | 75% Ar/25% $CO_2$ |
|---|---|---|
| Carbon | 0.05 | 0.06 |
| Manganese | 0.40 | 0.40 |
| Silicon | 0.54 | 0.51 |
| Phosphorus | 0.008 | 0.007 |
| Sulphur | 0.010 | 0.010 |
| Nickel | 0.02 | 0.02 |
| Chromium | 4.80 | 4.90 |
| Molybdenum | 0.49 | 0.50 |

**Typical Mechanical Properties (PWHT 2 Hrs. @ 1375°F/746°C):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 99,000 (683 MPa) | 102,500 (707 MPa) |
| Yield Strength (psi) | 85,000 (586 MPa) | 92,000 (634 MPa) |
| Elongation % in 2" (50mm) | 18% | 18% |

**Typical Charpy V-notch Impact Values (PWHT 2 Hrs. @ 1375°F/746°C):**

| | | |
|---|---|---|
| Avg. at 32°F (0°C) | 25 ft.lb. (34J) | 28 ft.lb. (38J) |

**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, E81T1-B6C/M
- AWS A5.29M, E551T1-B6C/M
- ASME SFA 5.29, E81T1-B6C/M

## TM-B9

ALL POSITION

**AWS E91T1-B9M**

**Benefits:**

- fast freezing slag for out-of-position welding
- excellent arc stability with flat bead appearance
- low spatter level
- x-ray quality weld

**Typical Applications:**

- welding of Grade 91 steels
- high temperature and high pressure applications
- single and multiple pass applications with mixed gas

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| Carbon | 0.12 |
| Manganese | 0.60 |
| Silicon | 0.15 |
| Phosphorus | 0.008 |
| Sulphur | 0.008 |
| Nickel | 0.70 |
| Chromium | 9.00 |
| Molybdenum | 1.00 |

**Typical Mechanical Properties (PWHT 1 Hr. @ 1400°F/760°C):**

| | |
|---|---|
| Tensile Strength (psi) | 116,000 (728 MPa) |
| Yield Strength (psi) | 96,000 (607 MPa) |
| Elongation % in 2" (50mm) | 16% |

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

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 170-260 | 24-26 | 3/4" (19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E91T1-B9M
- AWS A5.29M, E621T1-B9M
- ASME SFA 5.29, E91T1-B9M

## Element™ 71Ni1C

ALL POSITION

**AWS E71T1-GC H8**

**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 recommendations for Manganese could be a concern
- heavy equipment
- rail and general fabrication
- shipbuilding

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.04 |
| Manganese | 0.25 |
| Silicon | 0.44 |
| Phosphorus | 0.010 |
| Sulphur | 0.009 |
| Nickel | 1.05 |

**Typical diffusible hydrogen:** 3.3 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 74,000 (510 MPa) |
| Yield Strength (psi) | 66,000 (455 MPa) |
| Elongation % in 2" (50mm) | 28% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 98 ft.lb. (133J) |
| Avg. at -40°F (-40°C) | 78 ft.lb. (106J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 150-280 | 24-30 | 3/4" (19 mm) |
| .052" (1.4 mm) | 170-350 | 25-34 | 3/4" (19 mm) |
| 1/16" (1.6 mm) | 250-550 | 26-34 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E71T1-GC H8
- AWS A5.29M, E491T1-GC H8
- ASME SFA 5.29, E71T1-GC H8
- ABS, 100% $CO_2$ 3YSA-H10

## Element™ 71Ni1M

ALL POSITION

**AWS E71T1-GM H8**

**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
- rail and general fabrication
- shipbuilding

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ |
|---|---|
| Carbon | 0.07 |
| Manganese | 0.24 |
| Silicon | 0.47 |
| Phosphorus | 0.012 |
| Sulphur | 0.012 |
| Nickel | 1.00 |

**Typical diffusible hydrogen:** 5.7 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 74,000 (510 MPa) |
| Yield Strength (psi) | 63,000 (434 MPa) |
| Elongation % in 2" (50mm) | 26% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 86 ft.lb. (117J) |
| Avg. at -40°F (-40°C) | 61 ft.lb. (83J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 180-295 | 22-27 | 3/4" (19 mm) |
| .052" (1.4 mm) | 170-350 | 23-29 | 3/4" (19 mm) |
| 1/16" (1.6 mm) | 220-400 | 21-28 | 1" (25 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E71T1-GM H8
- AWS A5.29M, E491T1-GM H8
- ASME SFA 5.29, E71T1-GM H8
- ABS, 75% Ar/25% $CO_2$ 3YSA-H10

## Element™ 81K2C

ALL POSITION

**AWS E81T1-GC H8**

**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
- rail and general fabrication
- shipbuilding

**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

## Element™ 81K2M

ALL POSITION

**AWS E81T1-GM H8**

**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
- rail and general fabrication
- shipbuilding

**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® 107G

ALL POSITION

**AWS E101T1-GC**

**Benefits:**

- ideal for welding 4130 and 8630 steels with good impact toughness before and after PWHT
- ideal for welding A519, A514, A710, A517, EQ56 and other Q&T grades
- excellent weldability in all positions with low spatter levels
- low diffusible hydrogen levels

**Typical Applications:**

- offshore platforms
- structural applications
- single and multiple pass applications with 100% $CO_2$

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.07 |
| Manganese | 1.40 |
| Silicon | 0.25 |
| Phosphorus | 0.009 |
| Sulphur | 0.010 |
| Nickel | 0.76 |
| Chromium | 0.05 |
| Molybdenum | 0.26 |

**Typical diffusible hydrogen:** 3.7 ml/100g

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 102,000 (703 MPa) |
| Yield Strength (psi) | 94,000 (648 MPa) |
| Elongation % in 2" (50mm) | 22% |

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

| | |
|---|---|
| Avg. at -20°F (-30°C) | 64 ft.lb. (87J) |
| Avg. at -40°F (-40°C) | 52 ft.lb. (71J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 100-230 | 24-27 | 3/4" (19 mm) |

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

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.29, E101T1-GC
- AWS A5.29M, E691T1-GC
- ASME SFA 5.29, E101T1-GC
- ABS, 100% $CO_2$ E101T1-GC

## TM-101

ALL POSITION

**AWS E101T1-GM**

**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**

**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**

**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 & gas transmission pipelines
- oil & 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 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**

**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 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**

**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 & gas transmission pipeline
- oil & 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 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.lbs. (142J) |
| Avg. at -40°F (-40°C) | 95 ft.lbs. (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**

**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 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.lbs. (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:** DCEP & 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**

**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 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.lbs. (325J) |
| Avg. at -40°F (-40°C) | 115 ft.lbs. (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
- EN17632-A T 38 4 1Ni Y 1 H10

## Fabshield® X90

ALL POSITION

**AWS E91T8-G H8**

**Benefits:**

- high strength deposit suitable for welding a wide range of materials
- self-shielded; can be used outdoors without sheltering
- optimized performance for pipe welding applications
- excellent impact toughness minimizes risk of cracking in severe applications

**Typical Applications:**

- overmatch of API 5L Grade X80
- oil & gas transmission pipelines
- oil & gas distribution pipelines

**Typical Weld Metal Chemistry:**

| | |
|---|---|
| Carbon | 0.04 |
| Manganese | 1.56 |
| Silicon | 0.09 |
| Phosphorus | 0.008 |
| Sulphur | 0.004 |
| Nickel | 2.92 |
| Aluminum | 1.05 |

**Typical Mechanical Properties (AW):**

| | |
|---|---|
| Tensile Strength (psi) | 101,000 (696 MPa) |
| Yield Strength (psi) | 90,000 (621 MPa) |
| Elongation % in 2" (50mm) | 24% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 120 ft.lbs. (163J) |
| Avg. at -20°F (-30°C) | 105 ft.lbs. (142J) |
| Avg. at -40°F (-40°C) | 85 ft.lbs. (115J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 5/64" (2.0 mm) | 175-250 | 18-20 | 1" (25 mm) |

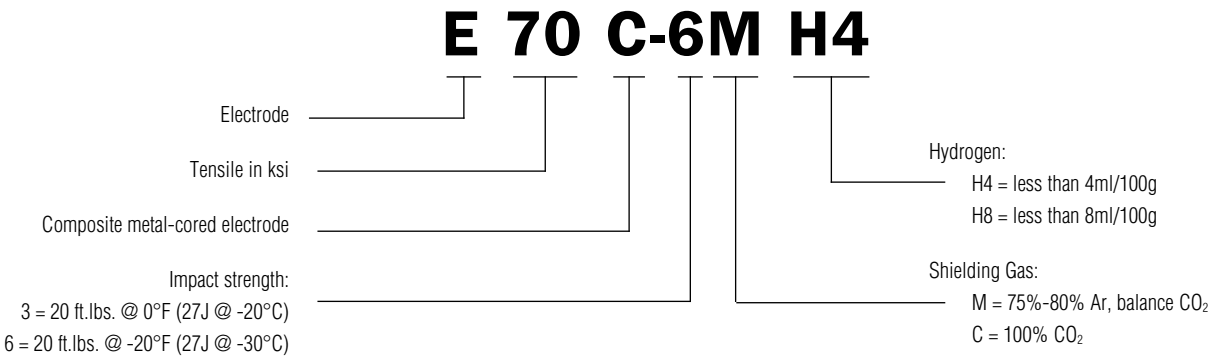
**Shielding Gas:** None required

**Type of Current:** DCEN

**Approvals and Conformances:**

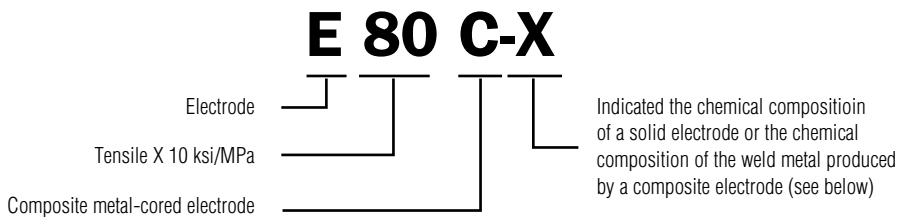
- AWS A5.29, E91T8-G H8
- AWS A5.29M, E621T8-G H8
- ASME SFA 5.29, E91T8-G H8

## 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, .40 - .65% Molybdenum |
| **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** | |
| **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 |

## FabCOR® 86R

### Metalloy® 76

**AWS E70C-6M H4**
**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:**
- rail cars
- 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 |

**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:**
**Hobart and Tri-Mark**
- 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% $CO_2$, [1/16" (1.6 mm) diameter]
- EN17632-A: T 46 2 M M 3 H5
- CE Marked per CPR 305/2011 (1.2 mm - 1.6 mm diameters)

## FabCOR® Edge™

### Metalloy® Vantage™

FLAT & HORIZONTAL
**AWS E70C-6M H4**
**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 |

**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 |
|---|---|---|---|
| .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:**
**Hobart & Tri-Mark**
- 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® Edge™ MC

FLAT & HORIZONTAL
**AWS E70C-6M H4**
**Benefits:**
- higher deposition rate increases productivity compared to solid wire
- virtually no slag coverage helps reduce cleanup time
- smooth arc characteristics help to ensure consistent high-quality welds
- outstanding high-production performance for automation and mechanization

**Typical Applications:**
- robotic and mechanized welding
- general fabrication
- heavy equipment fabrication
- railcar fabrication

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 95% Ar/5% $CO_2$ |
|---|---|---|
| Carbon | 0.04 | 0.04 |
| Manganese | 1.43 | 1.62 |
| Silicon | 0.62 | 0.77 |
| Phosphorus | 0.006 | 0.008 |
| Sulphur | 0.009 | 0.011 |

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 85,000 (586 MPa) | 90,000 (621 MPa) |
| Yield Strength (psi) | 73,000 (503 MPa) | 81,000 (558 MPa) |
| Elongation % in 2" (50mm) | 28% | 25% |

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

| | | |
|---|---|---|
| Avg. at -20°F (-30°C) | 45 ft.lb. (61J) | 30 ft.lb. (41J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 200-400 | 25-36 | 3/4" (19 mm) |
| .052" (1.4 mm) | 200-400 | 23-36 | 1" (25 mm) |
| 1/16" (1.6 mm) | 250-500 | 27-36 | 1" (25 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
- CWB E492C-6M H4

## Matrix™

FLAT & HORIZONTAL

**AWS E70C-6M H4**

**Benefits:**

- advanced feedability is suitable for high wire feed speeds, increases consumable life
- superior arc starting improves welding performance and consistency
- excellent wetting characterics produces smooth weld beads with uniform fusion
- minimal silicon deposits reduces cleanup time, increases productivity
- superb manufacturing consistency provides repeatable welding performance and properties, suitable for automation

**Typical Applications:**

- heavy equipment
- high-production applications
- non-alloyed and fine grain steels
- robotic and mechanized welding

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| Carbon | 0.04 | 0.04 |
| Manganese | 1.30 | 1.38 |
| Silicon | 0.62 | 0.63 |
| Phosphorus | 0.008 | 0.010 |
| Sulphur | 0.022 | 0.023 |

**Typical diffusible hydrogen:**

| 2.2 ml/100g | 1.4 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 71,000 (490 MPa) | 85,000 (586 MPa) |
| Yield Strength (psi) | 67,000 (462 MPa) | 73,000 (503 MPa) |
| Elongation % in 2" (50mm) | 24% | 27% |

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

| | | |
|---|---|---|
| Avg. at -20°F (-30°C) | 46 ft.lb. (62J) | 40 ft.lb. (54J) |
| Avg. at -40°F (-40°C) | 42 ft.lb. (57J) | 38 ft.lb. (52J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 200-350 | 25-30 | 5/8" (16 mm) |
| .052" (1.4 mm) | 250-400 | 26-34 | 3/4" (19 mm) |
| 1/16" (1.6 mm) | 250-450 | 28-34 | 1" (25 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
- CWB, E492C-6M-H4
- EN 17632-A: T46 4 M M 3 H5
- CE Marked per CPR 305/2011 (1.2 mm & 1.4 mm diameter electrodes)

## Metalloy® 70X

FLAT & HORIZONTAL

**AWS E70C-6M H4**

**Benefits:**

- low fume generation rate increases welder appeal and improves the working environment
- excellent wetting characteristics assists in producing smooth weld beads with uniform fusion
- virtually no slag coverage reduces cleanup time and minimizes risk of inclusions
- low spatter reduces cleanup time, and increases productivity

**Typical Applications:**

- automotive
- railcars
- structural applications
- storage vessels

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| Carbon | 0.03 | 0.03 |
| Manganese | 1.48 | 1.67 |
| Silicon | 0.61 | 0.80 |
| Phosphorus | 0.013 | 0.013 |
| Sulphur | 0.009 | 0.012 |

**Typical diffusible hydrogen:**

| 2.5 ml/100g | 3.0 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 81,000 (558 MPa) | 89,000 (614 MPa) |
| Yield Strength (psi) | 70,000 (483 MPa) | 70,000 (483 MPa) |
| Elongation % in 2" (50mm) | 27% | 25% |

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

| | | |
|---|---|---|
| Avg. at 0°F (-20°C) | 75 ft.lb. (102J) | 70 ft.lb. (95J) |
| Avg. at -20°F (-30°C) | 60 ft.lb. (81J) | 56 ft.lb. (76J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .035" (0.9 mm) | 150-250 | 25-29 | 5/8" (16 mm) |
| .045" (1.2 mm) | 200-350 | 25-28 | 5/8" (16 mm) |
| .052" (1.4 mm) | 250-400 | 26-31 | 1" (25 mm) |
| 1/16" (1.6 mm) | 250-450 | 28-31 | 1" (25 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
- CWB, 75-95% Ar/Balance $CO_2$, E491C-6M-H4 (1.2 - 1.6 mm diameter electrodes only)

## Metalloy® X-Cel™

FLAT & HORIZONTAL

**AWS E70C-6M H4**

**Benefits:**

- maximizes the benefits of using DCEN (straight) polarity
- provides a "soft arc" for reduced burn through and improved gap bridging capability
- deposition rates 30-40% higher than solid wire make the product ideally suited for semi-automatic, automatic and robotic welding on clean mild steel of thicknesses of 1/4" or less
- welds have exceptional bead appearance with minimal amounts of spatter

**Typical Applications:**

- non-alloyed and fine grain steels
- thin materials
- storage vessels
- automotive

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 90% Ar/10% $CO_2$ |
|---|---|---|
| Carbon | 0.06 | 0.06 |
| Manganese | 1.28 | 1.35 |
| Silicon | 0.65 | 0.70 |
| Phosphorus | 0.011 | 0.011 |
| Sulphur | 0.011 | 0.010 |

**Typical diffusible hydrogen:**

| 2.1 ml/100g | 2.2 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 90,000 (621 MPa) | 95,500 (658 MPa) |
| Yield Strength (psi) | 80,500 (555 MPa) | 82,500 (569 MPa) |
| Elongation % in 2" (50mm) | 24% | 22% |

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

| | | |
|---|---|---|
| Avg. at -20°F (-30°C) | 45 ft.lb. (61J) | 42 ft.lb. (57J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 150-300 | 21-27 | 5/8" (16 mm) |
| .052" (1.4 mm) | 250-400 | 24-29 | 5/8" (16 mm) |
| 1/16" (1.6 mm) | 300-450 | 26-30 | 3/4" (19 mm) |

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

**Type of Current:** DCEN

**Approvals and Conformances:**

- AWS A5.18, E70C-6M H4
- AWS A5.18M, E48C-6M H4
- ASME SFA 5.18, E70C-6M H4

## FabCOR® 702

FLAT & HORIZONTAL

**AWS E70C-3C**

**Benefits:**

- metal core 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
- earth moving equipment
- rail cars

**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) | 69,600 (480 MPa) |
| Elongation % in 2" (50mm) | 24.2% |

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

| | |
|---|---|
| Avg. at 0°F (-20°C) | 57 ft.lbs. (77J) |
| Avg. at -20°F (-30°C) | 54 ft.lbs. (73J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| 1/16" (1.6 mm) | 300-450 | 30-37 | 3/4" (19 mm) |
| 3/32" (2.4 mm) | 450-600 | 29-36 | 1" (25 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® F6

FLAT & HORIZONTAL

**AWS E70C-GS**

**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

**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

## Metalloy® Vantage™ Ni1

FLAT & HORIZONTAL

**AWS E80C-Ni1 H4**

**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 steels

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 95% Ar/5% $O_2$ |
|---|---|---|
| Carbon | 0.05 | 0.04 |
| Manganese | 1.38 | 1.40 |
| Silicon | 0.65 | 0.57 |
| 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 $CO_2$, 95-99% Ar/Balance $O_2$, E55C-Ni1-H4

## FabCOR® 209

FLAT & HORIZONTAL

**AWS E80C-Ni1 H4**

**Benefits:**

- excellent gap bridging capability minimizes risk of burn-through, and part rejection
- higher deposition rates and travel speeds than solid wire increases productivity, more parts per hour
- high impact strengths at low temperatures help resist cracking in severe applications

**Typical Applications:**

- high-strength low-alloy steels
- structural applications
- single or multi-pass welding
- weathering steels

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 95% Ar/5% $O_2$ |
|---|---|---|
| Carbon | 0.05 | 0.04 |
| Manganese | 1.38 | 1.40 |
| Silicon | 0.65 | 0.80 |
| Phosphorus | 0.013 | 0.008 |
| Sulphur | 0.011 | 0.009 |
| Nickel | 1.00 | 0.95 |

**Typical diffusible hydrogen:**

| 1.2 ml/100g | 3.0 ml/100g |
|---|---|

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 92,000 (634 MPa) | 94,000 (648 MPa) |
| Yield Strength (psi) | 81,000 (558 MPa) | 81,000 (558 MPa) |
| Elongation % in 2" (50mm) | 25% | 26% |

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

| | | |
|---|---|---|
| Avg. at -50°F (-45°C) | 44 ft.lb. (60J) | 61 ft.lb. (83J) |

**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) |

**Shielding Gas:** 75-95% Ar/Balance $CO_2$, 95% Ar/5% $O_2$

**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

## Metalloy® 80N1

FLAT & HORIZONTAL

**AWS E80C-Ni1**

**Benefits:**

- high deposition rates provide faster travel speed, higher productivity
- no slag covering reduces inter-pass cleanup
- good low temperature impacts reduces potential of weld bead cracking
- better penetration profile than solid wire reduces possibility of cold-lap and lack of fusion

**Typical Applications:**

- high-strength low-alloy steels
- heavy equipment
- weathering steel applications
- all position welding with pulse or short circuit

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 98% Ar/2% $O_2$ |
|---|---|---|
| Carbon | 0.06 | 0.06 |
| Manganese | 0.80 | 1.05 |
| Silicon | 0.25 | 0.45 |
| Phosphorus | 0.006 | 0.006 |
| Sulphur | 0.011 | 0.012 |
| Nickel | 0.95 | 0.95 |
| Copper | 0.06 | 0.07 |
| Molybdenum | 0.14 | 0.14 |
| Vanadium | < 0.01 | < 0.01 |

**Typical Mechanical Properties (AW):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 82,000 (565 MPa) | 86,000 (593 MPa) |
| Yield Strength (psi) | 74,000 (510 MPa) | 77,000 (531 MPa) |
| Elongation % in 2" (50mm) | 24% | 27% |

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

| | | |
|---|---|---|
| Avg. at -50°F (-45°C) | 40 ft.lb. (54J) | 30 ft.lb. (41J) |

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 200-350 | 25-31 | 3/4" (19 mm) |
| .052" (1.4 mm) | 250-400 | 26-32 | 3/4" (19 mm) |

**Shielding Gas:** 75-95% Ar/Balance $CO_2$, 98% Ar/2% $O_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.28, E80C-Ni1
- AWS A5.28M, E55C-Ni1
- ASME SFA 5.28, E80C-Ni1
- ABS, 80% Ar/20% $CO_2$, 3YSA
- CWB, 75-90% Ar/Balance $CO_2$, 95% Ar/5% $O_2$, E55C-Ni1-H8

## Metalloy® 80N2

FLAT & HORIZONTAL

**AWS E80C-Ni2**

**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 enviornments
- 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 |

**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
- AWS A5.28M, E55C-Ni2
- ASME SFA 5.28, E80C-Ni2

## FabCOR® 90

### Metalloy® 90

FLAT & HORIZONTAL

**AWS E90C-K3 H4**

**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) |
| .052" (1.4 mm) | 250-400 | 27-31 | 3/4" (19 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

## Metalloy® 100

FLAT & HORIZONTAL

**AWS E100C-K3**

**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

**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) |
| 1/16" (1.6 mm) | 300-450 | 28-34 | 1" (25 mm) |

**Shielding Gas:** 90-95% 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

### Metalloy® 110

FLAT & HORIZONTAL

**AWS E110C-K4**

**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, E76C-K4-H4

## Metalloy® 80D2

FLAT & HORIZONTAL

**AWS E90C-D2**

**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
- 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 |
|---|---|---|---|
| .035" (0.9 mm) | 150-250 | 26-28 | 5/8"(16 mm) |
| .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

## Metalloy® Vantage™ D2

FLAT & HORIZONTAL

**AWS E90C-D2**

**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 multiple-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 (Aged 24 Hrs. @ 200°F/93°C):**

| | | |
|---|---|---|
| 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

## Metalloy® 80B2

FLAT & HORIZONTAL

**AWS E80C-B2**

**Benefits:**

- good wetting characteristics assists in producing smooth weld beads with uniform fusion
- excellent gap bridging capabilities helps minimize burn-through and part rejection rates
- suitable for welding 1/2 Cr-1/2 Mo, Cr-1/4 Mo and 1-1/4 Cr-1/2 Mo steels

**Typical Applications:**

- single or multi-pass welding of chrome-moly steels
- high temperature applications
- P11 pipe

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 98% Ar/2% $O_2$ |
|---|---|---|
| Carbon | 0.06 | 0.07 |
| Manganese | 0.82 | 0.78 |
| Silicon | 0.29 | 0.42 |
| Chromium | 1.36 | 1.25 |
| Molybdenum | 0.50 | 0.47 |

**Typical Mechanical Properties (PWHT 1 hr @ 1150°F/620°C):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 83,300 (574 MPa) | 96,900 (668 MPa) |
| Yield Strength (psi) | 69,600 (480 MPa) | 83,700 (577 MPa) |
| Elongation % in 2" (50mm) | 23% | 23% |

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

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 200-350 | 20-36 | 5/8" (16 mm) |

**Shielding Gas:** 98% Ar/2% $O_2$, 75-90% Ar/Balance $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.28, E80C-B2
- AWS A5.28M, E55C-B2
- ASME SFA 5.28, E55C-B2

# Metalloy® 90B3

FLAT & HORIZONTAL

**AWS E90C-B3**

**Benefits:**

- excellent arc characteristics improve operator appeal
- minimal number of silicon islands reduce cleanup time, increase productivity
- higher deposition rates than B3 solid wire increase productivity
- maintains high tensile strength at high service temperature
- designed with 2-1/4% Cr, 1% Mo for welding base materials with similar composition

**Typical Applications:**

- single or multi-pass applications
- 2-1/4% Cr & 1% Mo steels
- P22 pipe
- high service temperatures

**Typical Weld Metal Chemistry:**

| | 75% Ar/25% $CO_2$ | 98% Ar/2% $O_2$ |
|---|---|---|
| Carbon | 0.07 | 0.09 |
| Manganese | 0.70 | 0.62 |
| Silicon | 0.35 | 0.39 |
| Phosphorus | 0.015 | 0.011 |
| Sulphur | 0.012 | 0.010 |
| Chromium | 2.30 | 2.07 |
| Molybdenum | 1.00 | 1.01 |

**Typical Mechanical Properties (PWHT 1 hr @ 1275°F/690°C):**

| | | |
|---|---|---|
| Tensile Strength (psi) | 94,000 (648 MPa) | 103,000 (710 MPa) |
| Yield Strength (psi) | 80,000 (552 MPa) | 91,000 (627 MPa) |
| Elongation % in 2" (50mm) | 23% | 20% |

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

**Typical Operating Range:**

| Dia. | Amps | Volts | CTWD |
|---|---|---|---|
| .045" (1.2 mm) | 200-350 | 27-29 | 3/4" (19 mm) |

**Shielding Gas:** 98% Ar/2% $O_2$, 75% Ar/25% $CO_2$

**Type of Current:** DCEP

**Approvals and Conformances:**

- AWS A5.28, E90C-B3
- AWS A5.28M, E62C-B3
- ASME SFA 5.28, E90C-B3

# 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** | TM-11 | — | Dual Shield 111-RB | Select Super 70 |
| | | **E70T-1C/9C** | FabCO® RXR & TM-RX7, TM-72, FabCO® TR-70 | Outershield® 70, Outershield® XLH-70, UltraCore® 70C | Dual Shield 700X | Select 71, Select 71A, Select 70TR |
| | | **E70T-1C/9C J** | Premier 70 | — | — | — |
| | | **E70T-1C/9C/12C J** | FabCO® 70XHP | — | Dual Shield R-70 Ultra® | — |
| | | **E70T-1M/9M** | FabCO® 70XHP | — | Dual Shield 70 Ultra® Plus | Select 70TR, Select 97 |
| | | **E70T-2C** | TM-73 | — | — | Select 72, Select Super 72 |
| | | **E70T-5CJ E70T-5MJ** | FabCO® 85, TM-55 | UltraCore® 75C | Dual Shield T-75 | Select 75 |
| | All Position | **E71T-1M** | Triple 7, TM-711M | — | — | Select 710 |
| | | **E71T-1M/9M** | Excel-Arc™ 71, FabCO® Hornet, 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** | Formula XL-525, TM-770, TM-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** | Triple 7, TM-711M | — | Dual Shield 7100 Ultra® | Select 710 |
| | | **E71T-1C/9C** | Excel-Arc™ 71, FabCO® Hornet, Element E71T1C, 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** | Formula XL-550, TM-771 | UltraCore® 712C, UltraCore® HD-12C | Dual Shield II 71 Ultra®, Dual Shield II 711X | — |
| Low-Alloy | Ni | **E80T1-Ni1C E80T1-Ni1M** | TM-81N1 | — | — | Select 81-Ni1 |
| | | **E81T1-Ni1C** | Formula XL-8Ni1, TM-811N1 | — | Dual Shield 810X-Ni1 | Select 810-Ni1, Select 820-Ni1 |
| | | **E81T1-Ni1C H4** | TM-811N1 | UltraCore® 81Ni1C-H | — | — |
| | | **E81T1-Ni1M** | Formula XL-8Ni1, TM-811N1 | — | Dual Shield 810X-Ni1 | Select 810-Ni1, Select 820-Ni1 |
| | | **E81T1-Ni1M H4** | TM-811N1 | UltraCore® 81Ni1A75-H | Dual Shield 80-NiH4 | — |
| | | **E81T1-Ni2C** | TM-811N2, FabCO® 803 | UltraCore® 81Ni2C-H | Dual Shield 8000-Ni2 | Select 810-Ni2, Select 820-Ni2 |
| | | **E81T1-Ni2M** | TM-811N2, FabCO® 803 | UltraCore® 81Ni2A75-H | — | Select 810-Ni2, Select 820-Ni2 |
| | | **E91T1-Ni2C** | TM-911N2 | — | Dual Shield 9000-C1 | Select 910-Ni2 |
| | K | **E90T5-K2C** | TM-95K2 | — | — | Select 95-K2 |
| | | **E90T5-K2M** | TM-95K2 | — | — | — |
| | | **E91T1-K2C** | TM-991K2 | Outershield® 91K2-H | Dual Shield II 90-K2 | Select 910-K2, Select 920-K2 |
| | | **E91T1-K2M** | TM-991K2 | — | — | Select 910-K2, Select 920-K2 |
| | | **E100T1-K3C** | TM-101K3 | — | — | Select 100-K3 |
| | | **E110T5-K3C** | TM-115 | — | — | Select 115 |
| | | **E110T5-K3M** | TM-115 | — | — | — |
| | | **E111T1-K3C** | TM-1101K3-C | — | — | Select 111-K3C |
| | | **E111T1-K3M** | FabCO® 110K3-M, TM-1101K3-M, FabCO® 110 | Pipeliner® G90M | Dual Shield II 110 | Select 111-K3M |
| | | **E110T5-K4C** | FabCO® 115 | — | Dual Shield T-115 | Select 115-K4 |
| | | **E120T5-K4C** | TM-125K4 | — | — | Select 125-K4 |
| | B | E81T1-B2C | TM-811B2 | Cormet® 1 | Dual Shield 8000-B2 | Select 810-B2 |
| | | E81T5-B2M | FabCO® XTREME™ B2 | — | — | — |
| | | E90T1-B3C | TM-91B3 | — | — | Select 91-B3 |
| | | E91T1-B3C E91T1-B3M | TM-911B3 | Cormet® 2 | Dual Shield 9000-B3 | Select 910 B3 |
| | | E91T5-B3M | FabCO® XTREME™ B3 | — | — | — |
| | | E81T1-B6C | TM-B6 | — | Dual Shield B6 | — |
| | | E81T1-B6M | TM-B6 | — | Dual Shield B6 | Select 810-B6 |
| | | E91T1-B9M | TM-B9 | Supercore® F91 | Dual Shield B9 | Select 910-B9 |
| | A | E81T1-A1C | TM-811A1 | — | Dual Shield 7000-A1 | Select 810-A1 |
| | W | E81T1-W2C | TM-811W | — | — | Select 810-W |

## 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<br>TM-44 | 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<br>TM-121 | Innershield® NR®-211MP<br>Innershield® NR®-212 | Coreshield® 11 | Select 701 |
| | **E71T-14** | Fabshield® 23<br>TM-123 | Innershield® NR®-52<br>— | Coreshield® 14<br>— | 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+ | — | — |
| | **E91T8-G** | Fabshield® X90 | Innershield® NR®-208 H | — | — |

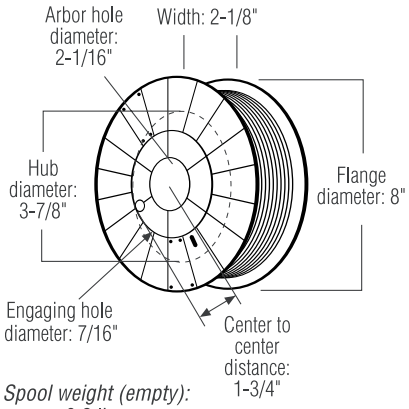
## Carbon-Steel & Low-Alloy Metal-Cored Electrodes

| AWS Classification | | Manufacturer | | | |
|---|---|---|---|---|---|
| | | Hobart Filler Metals | Lincoln Electric | ESAB | Select Arc |
| Carbon Steel | **E70C-6M** | FabCOR® 86R<br>Metalloy® 76<br>Matrix<br>Metalloy® X-Cel | 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<br>Metalloy® Vantage<br>FabCOR® Edge MC | — | Coreweld® 77-HS | Select 70C-6LS |
| | **E70C-6M** | Metalloy® 70X | — | — | Select 70C-7 |
| | **E70C-3C** | FabCOR® 702 | — | — | — |
| | **E70C-GS** | FabCOR® F6 | — | — | — |
| Low-Alloy | **E80C-Ni1** | Metalloy® 80N1<br>Metalloy® Vantage Ni1<br>FabCOR® 209 | Metalshield® MC®-80Ni1 | Coreweld® 80C-Ni1<br>Coreweld® 88HS Ni1 | Select 80C-Ni1<br>Select 80C-Ni1LS |
| | **E80C-Ni2** | Metalloy® 80N2 | — | — | Select 80C-Ni2 |
| | **E90C-K3** | FabCOR® 90<br>Metalloy® 90 | Metalshield® MC®-90 | — | Select 90C-M2 |
| | **E110C-K3** | Metalloy® 100 | — | Coreweld® 110 | — |
| | **E110C-K4** | FabCOR® 1100<br>Metalloy® 110 | Metalshield® MC®-110 | — | Select 110C-M2<br>Select 110C-K4 |
| | **E90C-D2** | Metalloy® 80D2<br>Metalloy® Vantage D2 | — | — | Select 80C-D2 |
| | **E80C-B3** | Metalloy® 80B3 | — | — | — |
| | **E90C-B3** | Metalloy® 90B3 | — | — | Select 90C-B3 |

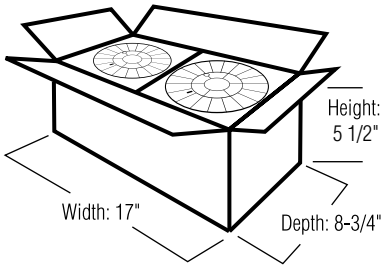
# Tubular Wires

## 10-lb. Spool

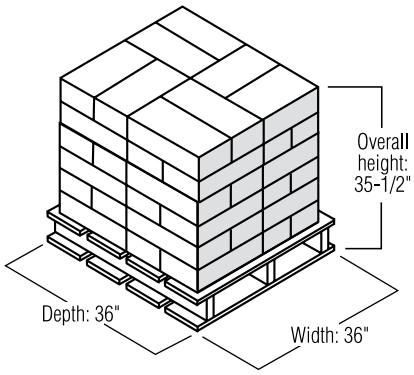
- Color-coded labels for easy wire identification
- Colorful packaging–great for P.O.P. displays
- Handy application and wire size reference chart on back
- Individually packed for increased portability and protection




*Spool weight (empty):* 0.8 lbs.



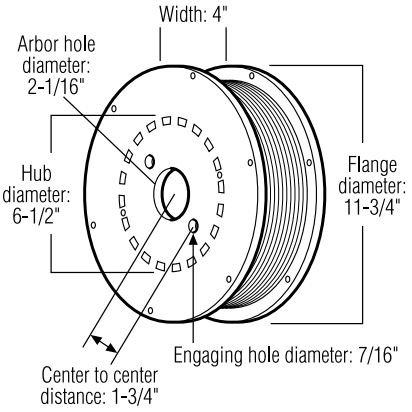

*Weight:* 40 lbs.
*Spools per master carton:* 4



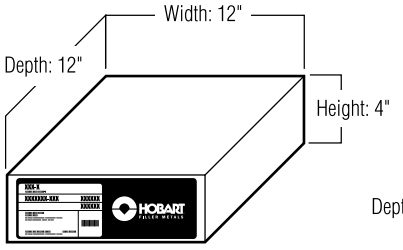

*Weight:* 1,920 lbs. *Net; 2115 lbs. gross*
*Stacking sequence:* 4 wide, 4 deep, *6 high*
*Master cartons per pallet: 48*
*Spools per pallet:* 192

## 33-lb. Spool

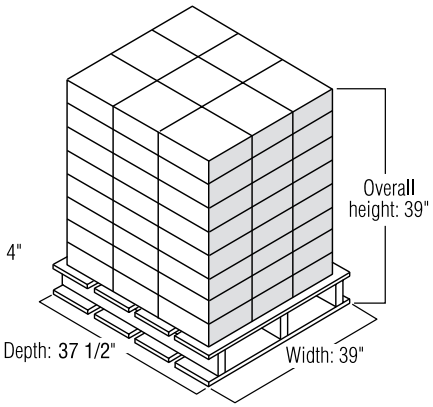
- Uses standard spool hub – no special adapters required
- Durable – designed to withstand most kinds of everyday wear and tear
- Convenient, easy to change over




*Spool weight (empty):* 2.6 lbs.

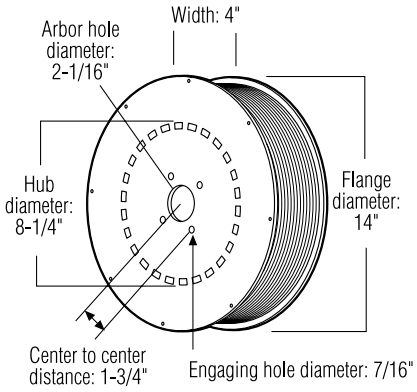



*Weight: 2376 lbs. net; 2645 lbs., gross (est.)*
*Stacking sequence:* 3 wide, 3 deep, 8 high
*Spools per pallet:* 72

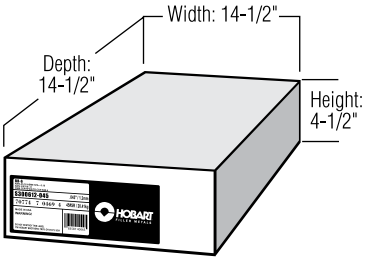


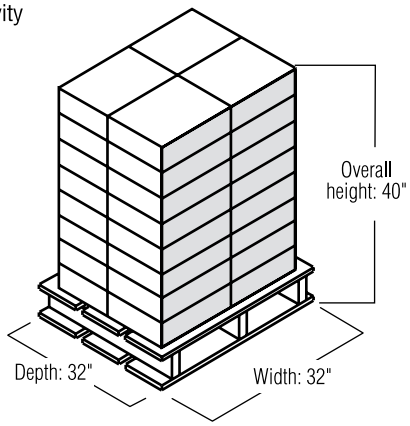

## 50-lb. Spool

- Convenient, easy to changeover
- Simplicity reduces changeover time, increases productivity
- More wire on spool means fewer changeovers




*Spool weight (empty):* 3 lbs.

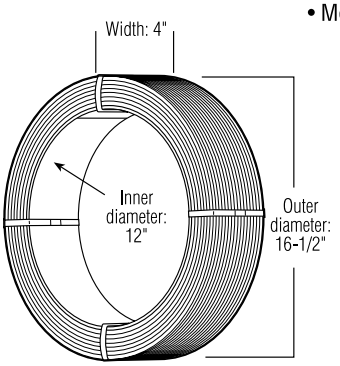


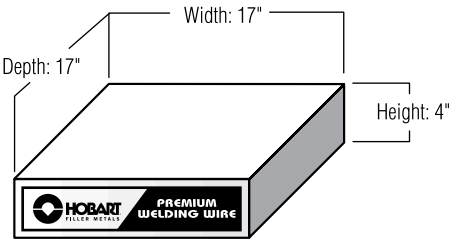

*Weight:* 1,920 lbs. net; 2,115 lbs., gross (est.)
*Stacking sequence:* 2 wide, 2 deep, 8 high
*Spools per pallet:* 32

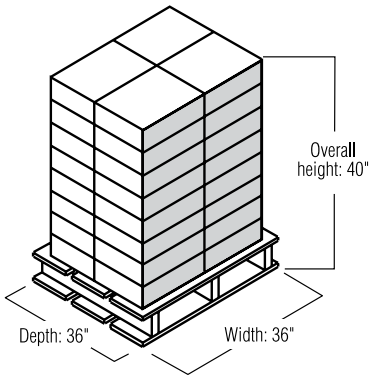
## 60-lb. Coil

- 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.

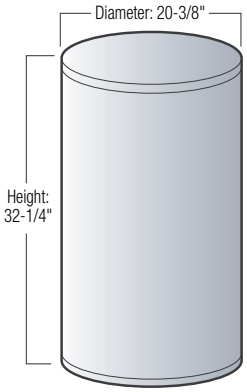


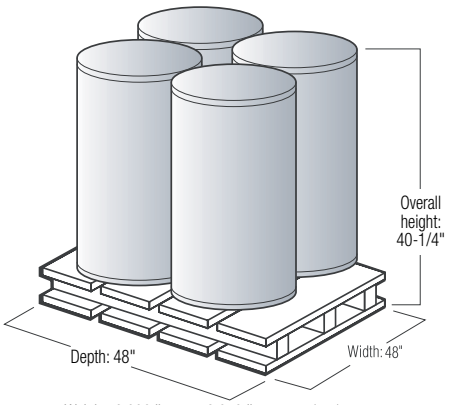

*Weight:* 1,920 lbs. net; 1,987 lbs., gross (est.)
*Stacking sequence:* 2 wide, 2 deep, 8 high
*Coils per pallet:* 32

## 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



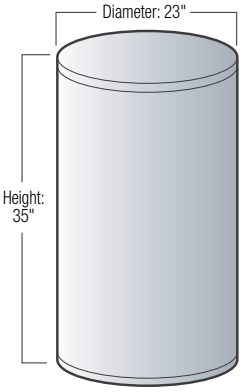

*Drum weight (empty):* 19 lbs.



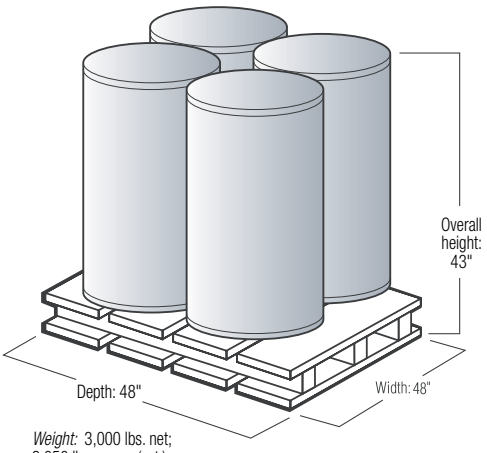

*Weight:* 2,000 lbs. net; 2,050 lbs., gross (est.)
*Drums per pallet:* 4

## 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:

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

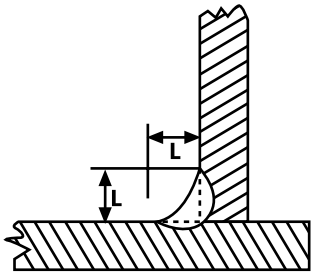
Where:

***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)]

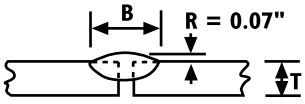
***Table data for square and V-groove joints are based on the efficiency of stick electrodes. To calculate for flux-cored wires, divide D by .80; for solid wire, divide D by .90.***

**HORIZONTAL FILLET WELD**



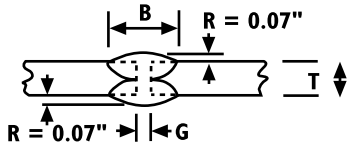

| Size of fillet L (in inches) | Steel deposited per linear foot of weld (lbs.) | Pounds of wires required per linear foot of weld (approx.) | | |
|---|---|---|---|---|
| | | *Stick* (SMAW)* | *Flux-Cored (FCAW)* | *Solid (GMAW)* |
| 1/8 | 0.027 | .049 | .034 | .03 |
| 3/16 | 0.063 | .114 | .079 | .07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



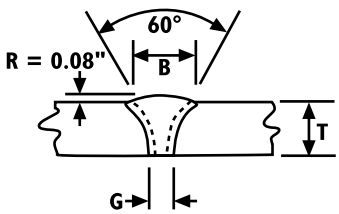

**...welded two sides**

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 (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")* |
| 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) | Product Solid Wire, in/lb | Flux-Cored, in/lb | 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 lbs.) | kg | 907.2 |
| kg | ton | .0011 |
| metric ton (2,200 lbs.) | 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. lbs. | Joule (J) | 1.356 |
| Joule (J) | ft. lbs. | .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 |




## Innovation. Collaboration. Expertise.

From filler metal solutions to application support and welding operation assessments, Hobart Brothers Company is committed to helping improve the business of welding. Our Hobart® filler metals represent a full line of products, including tubular wires (metal-cored and flux-cored varieties), as well as solid wires and stick electrodes designed to help improve quality, productivity and cost savings.

Distributors and end users can rely on our dedicated team of professionals to provide the technical support they need. For industries ranging from fabrication and manufacturing to shipbuilding, construction and more, their deep product and welding knowledge ensures the best filler metal solution for the job — no matter how challenging.

**HobartBrothers.com**



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