Stick Consumable Charts

STICK WELDING (SMAW)

AWS CLASS	POSITION	POLARITY	USAGE
ELECTRODES STICK 6011	All	AC, DCEP	All-purpose stick electrode; used for carbon and galvanized steel; deep penetration and ideal for welding light to medium amounts of dirty, rusty or painted materials; 60,000 PSI tensile strength.
ELECTRODES STICK 6013	All	AC, DCEN, DCEP	Light to medium penetrating all-purpose stick electrode; for use on carbon steel; good for general all-purpose applications and joints with poor fit-up; 60,000 PSI tensile strength.
ELECTRODES STICK 7014	All	AC, DCEN, DCEP	For higher-deposition requirements; ideal for applications requiring light penetration and faster travel speeds; 70,000 PSI tensile strength.
ELECTRODES STICK 7018	All	DCEP	Low-hydrogen electrode; for low, medium and high-carbon steels; ideal for out-of-position welding and tacking; not recommended for low-voltage AC Welders; 70,000 PSI tensile strength.

ELECTRODE AMPERAGE CHART

AWS CLASS	DIA. (IN.)	AMPERAGE RANGE: MIN. / 50A / 100A / 150A / 200A / MAX.
ELECTRODES STICK 6011	3/32	1/16"- 1/4" *
	1/8	1/8"- 1/2" *
	5/32	1/4"- Up *
ELECTRODES STICK 6013	5/64	Min. - 1/8" *
	3/32	1/16"-1/4" *
	1/8	1/8"-1/2" *
	5/32	1/4"- Up *
ELECTRODES STICK 7014	3/32	1/16"- 1/4" *
	1/8	1/8"- 1/2" *
	5/32	1/4"- Up *
ELECTRODES STICK 7018	3/32	1/16"- 1/4" *
	1/8	1/8"- 1/2" *
	5/32	1/4"- Up *

*Plate Thickness

Carbon Steel

Carbon steel, or plain-carbon steel, is mostly iron and carbon with other elements in quantities too small to affect their properties. A low carbon content means it is similar to iron, soft, and easily formed. The more carbon content, the harder and stronger the metal becomes, but it is also less moldable and harder to weld. At a higher carbon content, the metal's melting point is lower and it has less resistance to higher temperatures. Such steel should not be used in an environment where sparks would pose a potential safety problem.

Stainless Steel

Stainless steel contains a high chromium and low carbon content, and upon contact with oxygen creates a chromium oxide layer that gives passive protection against corrosion from moisture. When certain high-strength alloys such as aluminum come into contact with carbon steel, such as being brushed by carbon steel wire, a deposit of carbon steel is left behind that can cause rust. That same carbon steel transfer can happen in the other direction, which is why once a stainless steel brush is used on carbon steel it should never be used on stainless steel again. Also, stainless steel brushes should be stored away from any area that might contain carbon steel particles, such as a steel workbench. Stainless steel wire brushes should be degreased before operation, and if they are stored after use they should be degreased and wrapped in plastic. If they are stored without protection, their magnetic properties could allow particles to be collected that lead to after-rust.

Stick Electrode Overview

ELECTRODE PART NUMBER CHART

Rod Size	1 lb Box	5 lb Box	10 lb Box	50 lb Box
TYPE 6011 STICK ELECTRODE				
3/32"	1440-0115	1440-0116	1440-0117	1440-0118
1/8"	1440-0105	1440-0106	1440-0107	1440-0108
‡5/32"	1440-0095	1440-0096	1440-0097	1440-0098
TYPE 6013 STICK ELECTRODE				
3/32"	1440-0145	1440-0146	1440-0147	1440-0148
1/8"	1440-0134	1440-0135	1440-0136	1440-0137
‡5/32"	1440-0124	1440-0125	1440-0126	1440-0127
TYPE 7014 STICK ELECTRODE				
3/32"	1440-0205	1440-0206	1440-0207	1440-0208
1/8"	1440-0200	1440-0201	1440-0202	1440-0203
‡5/32"	1440-0150	1440-0151	1440-0152	1440-0153
TYPE 7018 STICK ELECTRODE				
3/32"	1440-0195	1440-0196	1440-0197	1440-0198
1/8"	1440-0185	1440-0186	1440-0187	1440-0188
‡5/32"	1440-0180	1440-0181	1440-0182	1440-0183

Rod Size	1 lb Box	5 lb Box	10 lb Box	Job Pack†
E6024 QUICK START ELECTRODE				
1/16"	1440-0412	1440-0413		
308 STAINLESS STEEL ELECTRODE				
3/32"	1440-0165			
1/8"	1440-0155	1440-0156		
E-309L STAINLESS STEEL ELECTRODE				
3/32"			1440-0497	
1/8"			1440-0496	
NICKEL 55 CAST IRON				
3/32"				1440-0440
1/8"	1440-0083			
NICKEL 99 CAST IRON				
3/32"				1440-0423
1/8"	1440-0425	1440-0374		1440-0424
E4043 ALUMINUM ARC ELECTRODE				
1/8"	1440-0419	1440-0420		

†See Page 59 for Job Packs Available
‡For 230V Operation Only

ELECTRODE DESCRIPTIONS

TYPE 6011 Mild Steel — **Current: AC/DC**
All position electrode. Use when you are unable to prepare a welding surface. Its deep penetration allows welds through rust, scale, oil and dirt.
STICK EXPERIENCE: EXPERT

TYPE 6013 Mild Steel — **Current: AC/DC**
All position electrode. Best used with clean or prepared welding surface. Excellent for low heat applications designed for general purpose.
STICK EXPERIENCE: NOVICE

TYPE 7014 Iron Powder — **Current: AC/DC**
All position electrode. Best used with clean or prepared welding surface with Medium to Low penetration. Designed for high deposition and high electrode travel speed.
STICK EXPERIENCE: NOVICE

TYPE 7018 Low Hydrogen — **Current: AC/DC**
All position electrode. Best used with clean or prepared welding surface with Medium penetration. Designed to produce X-ray quality welds.
STICK EXPERIENCE: SKILLED

E6024 Quick Start Mild Steel — **Current: AC/DC**
Best used with clean or prepared welding surface and excellent for low heat applications. Flat & horizontal fillet only.
STICK EXPERIENCE: NOVICE

308 Stainless Steel — **Current: AC/DC**
Used for all 200 and 300 series stainless up to and including 308. Provides equal or better corrosion resistance than base metal and can also be used to fabricate and repair austenitic manganese steel.
STICK EXPERIENCE: NOVICE

E-309L — **Current: AC/DC**
Used for welding/joining of 300 series stainless to mild steel. Provides equal or better corrosion resistance than base metal.
STICK EXPERIENCE: NOVICE

Nickel 55 Cast Iron — **Current: AC/DC***
Best used for repairing cast iron/ heavy cast iron selections. Repairs cylinder blocks, exhaust manifold, and machines bases. Smooth arc characteristics produce strong welds at low amps.
STICK EXPERIENCE: NOVICE

Nickel 99 Cast Iron — **Current: AC/DC***
All position electrode. Best used on cast iron parts that are subject to heating and cooling, such as engine blocks, cylinder heads, exhaust manifolds.
STICK EXPERIENCE: NOVICE

E4043 Aluminum Arc — **Current: DC**
Best used for weld with strength ductility and corrosion resistance equal to parent metal. Applications include aluminum, sheet metal, plates, castings, tanks and piping.
STICK EXPERIENCE: EXPERT

*DC Recommended

Firepower Stick Electrode Selection Sheet

ELECTRODES	MST 140i	MST 180i	MST 220i	TIG 140 ACDC	TIG 200 ACDC	TIG 160S
	Up to 3/32"	Up to 5/32"	Up to 5/32"	Up to 3/32"	Up to 5/32"	Up to 5/32"
Type 6011 Mild Steel	NO	EXPERT	EXPERT	NO	EXPERT	EXPERT
Type 6013 Mild Steel	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
Type 7014 Iron Powder	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
Type 7018 Low Hydrogen	SKILLED	SKILLED	SKILLED	SKILLED	SKILLED	SKILLED
E6024 Quick Start	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
308 Stainless Steel	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
E-309L Stainless Steel	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
Nickel 55 Cast Iron	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
Nickel 99 Cast Iron	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE	NOVICE
E4043 Aluminum Arc	EXPERT	EXPERT	EXPERT	EXPERT	EXPERT	EXPERT

Each electrode is unique and when working with different materials (Steel, Stainless Steel, Cast Iron, etc.) they require different preparations. We recommended researching the proper welding preparation guidelines for the materials before welding.

STICK EXPERIENCE NOVICE

These easy-to-use electrodes are multi-position electrodes and are simple to use when welding. Little preparation time, forgivable arc lengths, and wide range of techniques are possible with these electrodes.

STICK EXPERIENCE SKILLED

Using the intermediate electrodes will require some skill. The electrodes and metals you're working with will require more preparation before welding and require you to maintain the Arc Length.

STICK EXPERIENCE EXPERT

Professional welding skills are needed to use these electrodes. These electrodes require precision while welding, as there is minimal leeway for operator error, and unique techniques maybe required.

Arc Welding Electrodes

Type 6010	1 lb Box	5 lb Box	10 lb Box	50 lb Box
ROD SIZE	PART NO.	PART NO.	PART NO.	PART NO.
3/32"	N/A	1440-0474	N/A	N/A
1/8"	N/A	1440-0473	1440-0476	1440-0093
5/32"	N/A	1440-0475	N/A	N/A

Type 6011	1 lb Box	5 lb Box	10 lb Box	50 lb Box
ROD SIZE	PART NO.	PART NO.	PART NO.	PART NO.
3/32"	1440-0115	1440-0116	1440-0117	1440-0118
1/8"	1440-0105	1440-0106	1440-0107	1440-0108
5/32"	1440-0095	1440-0096	1440-0097	1440-0098

Type 6013	1 lb Box	5 lb Box	10 lb Box	50 lb Box
ROD SIZE	PART NO.	PART NO.	PART NO.	PART NO.
3/32"	1440-0145	1440-0146	1440-0147	1440-0148
1/8"	1440-0134	1440-0135	1440-0136	1440-0137
5/32"	1440-0124	1440-0125	1440-0126	1440-0127

Type 7014	1 lb Box	5 lb Box	10 lb Box	50 lb Box
ROD SIZE	PART NO.	PART NO.	PART NO.	PART NO.
3/32"	1440-0205	1440-0206	1440-0207	1440-0208
1/8"	1440-0200	1440-0201	1440-0202	1440-0203
5/32"	1440-0150	1440-0151	1440-0152	1440-0153

Type 7018	1 lb Box	5 lb Box	10 lb Box	50 lb Box
ROD SIZE	PART NO.	PART NO.	PART NO.	PART NO.
3/32"	1440-0195	1440-0196	1440-0197	1440-0198
1/8"	1440-0185	1440-0186	1440-0187	1440-0188
5/32"	1440-0180	1440-0181	1440-0182	1440-0183

6010 FEATURES

- Premium AWS Class E-6010
- Mild steel type
- Deep penetration, welds through rust, scale, oil and dirt
- Excellent for pipe welding, root
- DC, reverse polarity
- 60,000 PSI tensile strength
- All position electrode

6011 FEATURES

- Premium AWS Class E-6011
- Mild steel type
- Deep penetration, welds through rust, scale, oil and dirt
- Use when you are unable to prepare the welding surface
- AC or DC, reverse polarity
- 60,000 PSI tensile strength
- All position electrode

6013 FEATURES

- Premium AWS Class E-6013
- Mild steel type
- Designed for General Purpose
- Excellent for low heat applications
- Best used with clean or prepared welding surface
- AC or DC, reverse polarity
- 60,000 PSI tensile strength
- All position electrode

7014 FEATURES

- Premium AWS Class E-7014
- Iron powder type
- Designed for high deposition and high electrode travel speed
- Medium to low penetration
- Best used with clean or prepared welding surface
- AC or DC, reverse polarity
- 70,000 PSI tensile strength
- All position electrode

7018 FEATURES

- Premium AWS Class E-7018
- Low Hydrogen Type
- Designed to produce X-Ray quality welds
- Medium penetration
- Best used with clean or prepared welding surface
- AC or DC, either polarity
- 70,000 PSI tensile strength
- All position electrode

Job Packs

Specifications

Part No.	Description	No. Rods
1440-0400	Bronze Flux Coated Brazing Rods, 3/32" diameter x 14" long; No brazing flux needed	4
1440-0401	Bronze Bare Brazing Rods, 3/32" diameter x 14" long; Requires brazing flux	4
1440-0402	E4043 Aluminum Welding Electrodes, 1/8" diameter x 14" long; Use with ANY Aluminum Application	3
1440-0404	Steel Welding Electrodes, 3/32" diameter x 14' long; Excellent problem solver type electrode	4
1440-0405	6013 General Purpose Electrodes, 1/16" x 10" long	4
1440-0406	6013 General Purpose Electrodes, 3/32" diameter x 14" long; Excellent for use with all types of Arc Welders	4
1440-0409	6011 Welding Electrodes, 1/8" diameter x 14" long; Excellent for Maintenance & Repair Applications	3
1440-0411	Nickel 55 Welding Electrodes, 1/8" diameter x 14" long	4
1440-0423	ENiCl Pure Nickel Electrode 3/32" diameter x 14" long	5
1440-0424	ENiCl Pure Nickel Electrode 1/8" diameter x 14" long	3
1440-0440	Cast Iron (55% Nickel) 3/32" diameter x 14" long	3
1440-0441	6011 Mild Steel 3/32" diameter x 14" long	4

Electrodes - Mild & Stainless Steel

Mild Steel / E6024 Quick Start Electrodes

Specifications

Part No.	Description
1440-0412	1/16" 1 lb
1440-0413	1/16" 5 lbs

APPLICATIONS

Mild steel type electrode has a special quick start tip. Stable arc and automatic action that makes it easy to use on thin metals requiring low amperage. Features self-cleaning action that works well in all positions. Tensile Strength 60,000 PSI.

CURRENT	AC/DC

	AMPS	DIAMETER
AMPERAGE RECOMMENDATIONS	25-90	1/16"

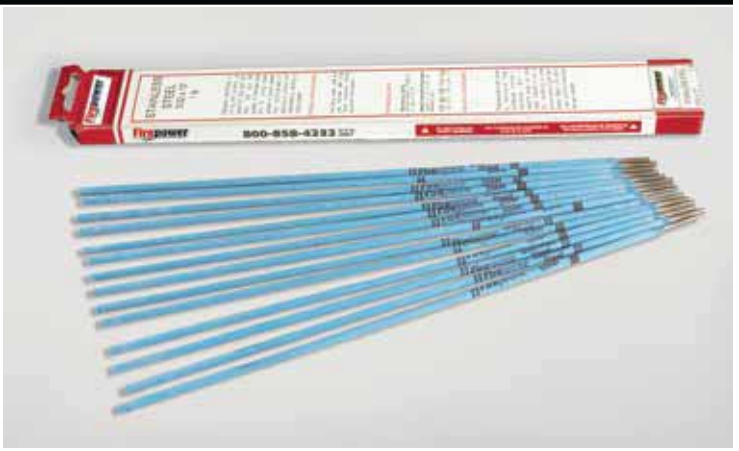
Stainless Steel / 308 Stainless Steel Electrodes

Specifications

Part No.	Description
1440-0165	3/32" x 14" 1 lb box
1440-0155	1/8" x 14" 1 lb box
1440-0156	1/8" x 14" 5 lbs box

FEATURES

- For welding all 200 and 300 series stainless up to and including 308
- Provides equal or better corrosion resistance than the base metal
- Can be used for fabricating and repairing austenitic manganese steel



Stainless Steel / E-309L

Specifications

Part No.	Description
1440-0497	3/32" x 14" 10 lb box
1440-0496	1/8" x 14" 10 lb box

FEATURES

- For welding/joining of 300 series stainless to mild steel.
- Provides equal or better corrosion resistance than the base metal

Nickel Base / ESt Cast Iron Electrodes (Non-Machinable, Steel Core)

Specifications

Part No.	Description
1440-0449	1/8" 1 lb
1440-0443	1/8" 5 lbs

APPLICATIONS

This cast iron electrode is specifically developed for dirty and oil soaked cast iron applications. It is also ideal for heat affected cast iron repairs. This electrode offers the least expensive method of repairing cast iron. Great for repairing castings, transmission housings, etc. Non-Machinable. Tensile strength 62,000 PSI. Elongation 20%

CURRENT	AC/DC - DC+ recommended
AMPERAGE RECOMMENDATIONS	70-125 AMPS

Nickel Base / ENiFeCI Nickel 55 Cast Iron Electrodes (Machinable)

Specifications

Part No.	Description
1440-0440	3/32" Job pack (3 rods)
1440-0083	1/8" 1 lb

APPLICATIONS

The most versatile cast iron electrode. The best solution for repairing cast iron, heavy cast iron sections. The smooth arc characteristics produce strong, sound welds at low amps. Repairs cylinder blocks, exhaust manifold, and machine bases. Tensile strength 70,000 PSI. Elongation 12%

CURRENT	AC/DC - DC+ recommended

AMPERAGE RECOMMENDATIONS	AMPS	DIAMETER
	70-90	3/32"
	80-120	1/8"

Nickel Base / ENiCI Pure Nickel 99% Cast Iron Electrodes (Machinable)

Specifications

Part No.	Description
1440-0423	3/32" Job pack (5 rods)
1440-0424	1/8" Job pack (3 rods)
1440-0425	1/8" 1 lb
1440-0374	1/8" 5 lbs

APPLICATIONS

The highest quality nickel electrode available. Welds well in all positions. The high (99%) nickel content has a natural attraction to cast iron giving it superior performance when welding cast iron material. Nickel 99 can be used on cast iron parts that are subject to heating and cooling, such as engine blocks, cylinder heads, exhaust manifolds, etc. Excellent machinability. Tensile strength 55,000 PSI. Elongation 10%

CURRENT	AC/DC - DC+ recommended

AMPERAGE RECOMMENDATIONS	AMPS	DIAMETER
	70-90	3/32"
	70-110	1/8"

Aluminum / E4043 Aluminum Arc Electrodes

Specifications

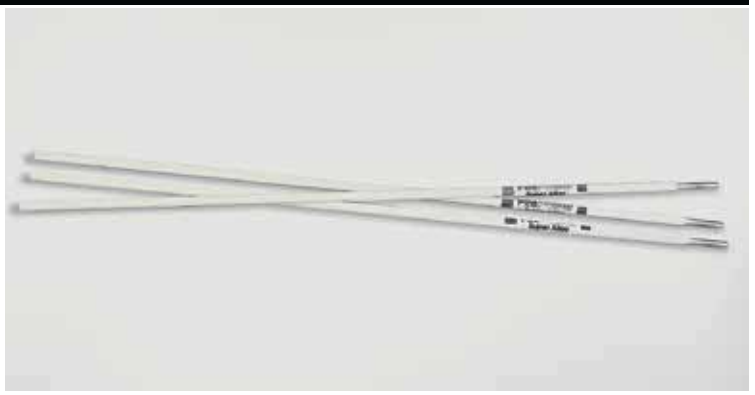
Part No.	Description
1440-0419	1/8" 1 lb
1440-0420	1/8" 5 lbs

APPLICATIONS

This flux coated aluminum electrode is designed to give a weld with strength ductility and corrosion resistance equal to parent metal. Applications include aluminum, sheet metal, plates, castings, tanks and piping. Tensile strength 34,000 PSI. Elongation 18%.

CURRENT	DC+

	AMPS	DIAMETER
AMPERAGE RECOMMENDATIONS	70-120	1/8"



Hardfacing Electrodes

Specifications

Part No.	Description
1440-0080	1/8" 1 lb tube, #35 High Abrasion/Hardfacing
1440-0081	1/8" 5 lbs box, #35 High Abrasion/Hardfacing

APPLICATIONS

This high quality, all purpose electrode produces outstanding impact and abrasion resistance. The high deposition rate prolongs surface life of new and worn parts. Ideal for repairing all types of agriculture, construction equipment, auger, buckets, concrete mixers, etc.

	AMPS	DIAMETER
AMPERAGE RECOMMENDATIONS	110-140	1/8"

Cutting Electrodes

Specifications

Part No.	Description
1440-0426	1/8" 1 lb

APPLICATIONS

A special heavy duty coating produces 7000° heat at high-arc velocity. Use this electrode for a fast, low-cost means of cutting cast iron and stainless steel without special equipment.

CURRENT	AC