MILD & LOW ALLOY STEEL ELECTRODES

ELECTRODE PART NUMBERS & PRICES

PROPERTIES MILD & LOW ALLOY STEEL ELECTRODES

Welding Mild and Low Alloy Steels

To ensure the best results, maintain a medium-long arc. This will assure good wetting and puddling of the deposit to permit gases to escape--which in turn controls the weld's shape and appearance. For flat and horizontal fillets, hold the electrode at an angle of 45° to each plate and manipulate slightly back and forth in the direction of travel. This method allows proper penetration on the forward sweep, and assures that undercut and bead shape are controlled on the backward sweep in the crater.

Making overhead fillet and butt welds are similar to horizontal fillet welds with the exception that the oscillation in the direction of travel might require longer sweep in order to allow the molten crater to set up.

For root passes in vertical fillet or butt welds, hold the electrode perpendicular to the root of the joint and tilt slightly in the direction of travel. When traveling up the joint, it may be necessary at high current settings to "whip" the electrode in the direction of travel. Keep the arc long enough that no metal is deposited at the top of the whip, and shorten when back in the crater to deposit and spread the molten metal. This controls bead size and undercut.

Stringer beads or narrow weaves are recommended for multiple-pass horizontal or overhead welds, with wider weaves used for vertical-up welding. The root pass for a vertical-down weld is made with straight travel, without weave or whip. To hold the puddle in place, arc force is directed upward. A weave may be used on subsequent passes vertically down.

Low Hydrogen Electrodes

Low hydrogen electrode coatings are designed to promote ease of welding. A steady, short arc is recommended for optimum results. After striking the arc, hold the electrode at an angle of 15° in the direction of travel, touching the tip of the electrode to the work to control arc length. Weaving may be used up to three times the diameter of the electrode. Do not use a whipping technique, as porosity can result from constant variation of the arc length.

ELECTRODE IDENTIFICATION

1. The "E" in Exxxx represents an arc-welding electrode.
2. The first two digits of a 4 digit number or the first three digits of a 5 digit number indicate the minimum tensile strength of the weld deposit expressed in thousands of pounds per square inch (psi). For example E70XX indicates that this electrode has a minimum tensile strength of 70,000 psi and E110XX indicates a minimum tensile strength of 110,000 psi.
3. The next-to-last digit indicates the position in which this electrode may be used. Exx1x represents all positions while Exx2x indicates that this electrode is used for flat or horizontal positions only. For example E7018 indicates that this electrode may be used in all positions while E7028 indicates that this electrode is for flat and horizontal positions only.
4. The last digit combined with the next-to-last digit indicates the type of coating on the electrode and the type of current that may be used. For example:

Electrode	Coating	Current
Exx10	High cellulose	DC reverse polarity only
Exx11	High cellulose	AC or DC reverse polarity
Exx12	High titania (rutile)	AC or DC straight polarity
Exx13	High titania (rutile)	AC or DC either polarity
Exx14	Futile iron powder	AC or DC either polarity
Exx16	Low hydrogen	AC or DC reverse polarity
Exx18	Iron powder- low hydrogen	AC or DC reverse polarity
Exx24	Futile- iron powder	AC or DC either polarity
Exx27	Iron powder-iron oxide	AC or DC either polarity
Exx28	Iron powder- low hydrogen	AC or DC reverse polarity

5. Finally: the suffix of the electrode indicates the estimated alloy content of the electrode. For example:

Suffix	Alloy Content
Exxxx-A1	1/2% Mo
Exxxx-B1	1/2% Cr, 1/2% Mo
Exxxx-B2	1-1/4% Cr, 1/2% Mo
Exxxx-B3	2-1/4% Cr, 1% Mo
Exxxx-C1	2-1/2% Ni
Exxxx-C3	1% Ni,.35% Mo,.15% Cr
Exxxx-G	.50% Ni, .30% Cr, .20% Mo, .10% Vn (all minimum percent and only one is required)
Exxxx-M	1.3-1.8% Mn, 1.25-2.50% Ni,.40% Cr, .25-.50% Mo,.5% Max. Vn

Summary example: E7018-A1 would indicate an (a) arc welding electrode with a (b) minimum tensile strength of 70,000 psi (c) that can be used in any position (d) with AC or DC reverse polarity. This number also indicates that it is an iron powder- low hydrogen electrode which yields a weld deposit containing 1/2% Mo.

TYPICAL ELECTRODE SIZES & WELDING CURRENTS

Diameter of Wire	Arc Voltage (V)	Amperage Ranges (A)	
		Flat	Vertical / Overhead
3/32 inches 2.4 mm	21-25	65-80	65-75
1/8 inches 3.2 mm	21-25	90-110	80-95
5/32 inches 4.0 mm	21-26	135-160	120-140
3/16 inches 4.8 mm	22-26	160-210	140-160
7/32 inches 5.6 mm	23-28	200-240	
1/4 inches 6.4 mm	23-28	220-260	

CAUTION: THIS TABLE IS PROVIDED AS A GENERAL REFERENCE.

ELECTRODE PROPERTIES, PROVIDED ON THE NEXT 6 PAGES, SHOULD BE USE ASSIST IN DETERMINED THE RECOMMENDED VOLTAGE AND AMPERAGE RANGE FOR EACH SPECIFIC ELECTRODE.