ARC WELDING – Mild Steel and Low Hydrogen/Low Alloy Electrodes

MILD & LOW ALLOY STEEL ELECTRODE INFORMATION
PROPERTIES MILD & LOW ALLOY STEEL ELECTRODES
PART NUMBERS & PRICES

USA 9018M
AWS A5.5 Class E9018M

DESCRIPTION
USA 9018M is an all-position, low-hydrogen, iron-powder electrode containing manganese, molybdenum and nickel. USA 9018M is designed for welding low alloy, high tensile, quenched and tempered steels such as T1, HY80 and HY90. Weld deposits have excellent impact properties and are X-ray quality.

PREHEATING AND POSTHEATING
Depending upon the thickness and hardening characteristics of the work piece, preheating at a temperature between 140-220°F is recommended.

TYPICAL APPLICATIONS
USA 9018M is commonly used to make attachment welds on steels in the 90,000 psi tensile strength range. Typical applications would involve pressure vessels, bridges, machinery and penstocks. Base metals would include ASTM A225 Gr. B, A235 Gr. G, A288 class 2, A291 class 1, 2 and many others.

TYPICAL WELD METAL CHEMISTRY (%)

C	0.07
Si	0.51
Mn	1.10
Ni	1.58
Mo	0.20

TYPICAL MECHANICAL PROPERTIES OF WELD DEPOSIT (as welded)

Yield point (psi)	83,000
Tensile strength (psi)	97,000
Elongation in 2" (%)	30
Charpy V-notch at -60°F (ft. lbs.)	65

AVAILABLE SIZES AND RECOMMENDED CURRENTS (AC or DC+)

Dia. (in.)		3/32	1/8	5/32	3/16	1/4
Lgth. (in.)		14	14	14	14	14
Amps	F	50-100	90-130	140-190	190-240	250-310
	V&O	40-80	80-115	110-160	140-170	-

CALL FOR INFORMATION ON LARGE DIAMETER ELECTRODES

USA 11018M
AWS A5.5 Class E11018M

DESCRIPTION
USA 11018M low hydrogen, iron powder electrodes are used for fast, efficient deposition of weld metal with mechanical properties equal to or exceeding that of the base metal. This electrode produces X-ray quality weld deposits with medium penetration and easy slag removability. Although USA 11018M electrodes may be used in any position, they are particularly suited for horizontal and downhand welding with either AC or DC (reverse polarity).

TYPICAL APPLICATIONS
USA 11018M electrodes were designed for welding quenched and tempered steels with tensile strengths of up to 110,000 psi such as ASTM A514 and A517, HY80, T-1, SSS-100, etc.

USA 9018-B3 AWS A5.5 Class E9018-A1 (Weld deposit also meets the requirements of E9015-B3 and E9016-B3)

DESCRIPTION
USA 9018-B3 is an all position, iron powder-low hydrogen electrode developed for welding 2-1/4% Cr-1% Mo steel which is subjected to elevated temperatures such as those found in the power piping and boiler industries. This electrode has extremely high deposition efficiency, producing X-ray quality weld deposits with mechanical properties that meet or exceed AWS-ASTM requirements. USA 9018-B3 electrodes yield a stable arc with low spatter. AC or DC (reverse polarity) may be used.

PREHEATING AND POSTHEATING
Depending upon the thickness and hardening characteristics of the work piece, preheating at a temperature between 400-650°F and postheating at 1250-1350°F (for 1 hour) is required.

TYPICAL APPLICATIONS
USA 9018-B3 is used in piping steels (A335-P22), boiler and heat exchanger steel tubes (A199-T22, A200-T22, A213-T22), rolled steels (A387-D), cast steels (A217-WC) and forged steels (A182-F22, 336-F22).

TYPICAL WELD METAL CHEMISTRY (%)

C	0.080
Mn	0.770
Si	0.500
Cr	2.250
Mo	1.020
P	0.014
S	0.010

TYPICAL MECHANICAL PROPERTIES OF WELD DEPOSIT (stress-relieved)

Yield point (psi)	99,000
Tensile strength (psi)	110,000
Elongation in 2" (%)	21
Charpy V-notch at 75°F (ft. lbs.)	85

AVAILABLE SIZES AND RECOMMENDED CURRENTS (AC or DC+)

Dia. (in.)		3/32	1/8	5/32	3/16	1/4
Lgth. (in.)		14	14	14	14	18
Amps	F	55-85	90-130	135-185	190-250	250-320
	V&O	50-80	80-120	110-170	-	-

TYPICAL WELD METAL CHEMISTRY (%)

C	0.08
Mn	1.49
Si	0.41
Cr	0.32
Mo	0.32
Ni	1.86

TYPICAL MECHANICAL PROPERTIES OF WELD DEPOSIT (as welded)

Yield point (psi)	104,000
Tensile strength (psi)	120,000
Elongation in 2" (%)	23
Charpy V-notch at-60°F (ft. lbs.)	44

AVAILABLE SIZES AND RECOMMENDED CURRENTS (AC or DC+)

Dia. (in.)		3/32	1/8	5/32	3/16	1/4
Lgth. (in.)		14	14	14	14	18
Amps	F	55-85	90-130	140-190	180-230	250-300
	V&O	50-80	80-120	110-150	130-190	-

USA 8018-B3L
AWS A5.5 Class E8018-B3L

DESCRIPTION
(9018-B3L is now obsolete, use: 8018-B3L for a chemical match, or 9018-B3 for a tensile strength match)
USA 8018-B3L is a low hydrogen, low alloy, chrome-moly electrode containing extra low carbon and designed for welding 2-1/4% chromium -1% molybdenum steel. The extra low carbon content of USA 8018-B3L proves microstructure stability during high temperature service applications such as found in pressure piping or boiler work. USA 8018-B3L can be used in any position with AC or DC (reverse polarity) and offers good arc stability, low spatter and high deposition efficiency. Excellent mechanical properties and X-ray quality weld deposits.

PREHEATING AND POSTHEATING
Depending upon the thickness and hardening characteristics of the work piece, preheating at a temperature between 400-650°F and postheating at 1250-1350°F (for 1 hour) is required. Note: In many cases the lower carbon content of USA 8018-B3L will permit a lower preheat temperature.

TYPICAL APPLICATIONS
Most commonly used for castings, forgings and plates of 2-1/4 chromium -1 % molybdenum steel, pressure piping such as found in steam power generating equipment, boiler and heat exchanger steel tubes, marine equipment, chemical processing equipment and oil refinery equipment.

TYPICAL WELD METAL CHEMISTRY (%)

C	0.035
Mn	0.770
Si	0.500
Cr	2.250
Mo	1.020
P	0.014
S	0.010

TYPICAL MECHANICAL PROPERTIES OF WELD DEPOSIT (stress-relieved*)

Yield point (psi)	67,000
Tensile strength (psi)	80,000
Elongation in 2" (%)	21
Charpy V-notch at 72°F (ft. lbs.)	42
Reduction of area (%)	67

*1 hour at 1275°F.

AVAILABLE SIZES AND RECOMMENDED CURRENTS (AC or DC+)

Dia. (in.)		3/32	1/8	5/32	3/16	7/32	1/4
Lgth. (in.)		14	14	14	14	18	18
Amps	F	60-100	90-130	130-190	190-250	230-270	250-300
	V&O	60-90	80-120	110-170	-	-	-

MSDS THIS PAGE AVAILABLE