



TM-91B3

GAS-SHIELDED FLUX-CORED WIRE
AWS E90T1-B3C, E90T1-B3M

061218 (replaces 060828)

TM-91B3 is intended for welding applications involving 2-1/4 Cr/1 Mo steels, such as are found in steam or chemical piping systems where elevated temperature conditions prevail. Weld contents match the base metal chromium and molybdenum levels, providing high temperature creep resistance and some oxidation resistance. In suitable applications, TM-91B3 replaces the E9018-B3 covered electrode, which provides similar weld metal chemistry. In addition to the economic advantages of semi-automatic welding, TM-91B3 offers excellent welder appeal and good bead geometry. TM-91B3 is recommended for single-and multiple-pass welding in the flat and horizontal positions with 100% CO₂ or 75% Ar/25% CO₂ shielding gas.

PRODUCT CHARACTERISTICS:

- Excellent welder appeal with good bead geometry.
- Intended for 2-1/4 Cr/1 Mo applications, such as steam or chemical piping systems.
- Very good creep resistance.

SPECIFICATIONS:

E90T1-B3C, E90T1-B3M per AWS A5.29, ASME SFA 5.29

SHIELDING GAS:

100% CO₂, 75% Ar/25% CO₂, 35-50 cfh

WELDING POSITIONS:

Flat and horizontal

STANDARD DIAMETERS:

1/16", 3/32"

WELD TEST PARAMETERS:

TM-91B3 3/32" diameter electrode was welded using 100% CO₂ shielding gas with flow rate of 40 cfh, 425 amps (170 ipm), DCEP and 31 volts, with 1" electrical stickout and 300± 25°F interpass temperature. A total of five layers were welded, with one full pass for Layer 1 and two passes each for Layers 2 through 5. The direction of travel was reversed for each layer.

TYPICAL UNDILUTED WELD METAL CHEMISTRY*:

C	Mn	Si	P	S	Mo	Cr
0.06	0.64	0.25	0.010	0.013	1.06	2.47

TYPICAL MECHANICAL PROPERTIES*:

Tensile Strength 106,000 psi (731 MPa)
Yield Strength 93,000 psi (641 MPa)
Elongation 19%
CVN not required

Stress Relieved 1 hr. @ 1275°F

The above properties were determined with 100% CO₂ shielding gas.

*The information contained or otherwise referenced herein is presented only as "typical" without guarantee or warranty, and Hobart Brothers Company expressly disclaims any liability incurred from any reliance thereon. Typical data is obtained when welded and tested in accordance with AWS A5.29 specification. Other tests and procedures may produce different results. No data is to be construed as a recommendation for any welding condition or technique not controlled by Hobart Brothers Company.



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RECOMMENDED OPERATING PARAMETERS:

The information below was determined by welding performed with 100% CO₂ shielding gas at a flow rate of 35 cfh.

Diameter, Electrical Stickout (ES) Position	Arc Voltage (volts)	Current DCEP (+) (amps)	Approx. Wire Feed Speed (in/min)	Deposition Rate (lb/hr)
1/16"	24	200	180	7.0
	30	350	350	11.9
	35	450	490	21.6
3/32"	27	150	100	4.0
	30	425	195	14.6
	38	600	290	22.8

Bold— Optimum parameters for welder appeal.

Notice:

Actual use of the product may produce varying results due to conditions and welding techniques over which Tri-Mark has no control, including, but not limited to, plate chemistry, weldment design, fabrication methods, electrode size, welding procedure, service requirements, and environment. The purchaser is solely responsible for determining the suitability of Tri-Mark products for the purchaser's own use. Any prior representations shall not be binding. Tri-Mark disclaims any warranty of merchantability or fitness for any particular purpose with respect to its products.

Caution:

Consumers should be thoroughly familiar with the safety precautions shown on the Warning Label posted on each shipment and in American National Standards Z49.1, "Safety in Welding and Cutting," published by the American Welding Society, 550 NW Lejeune Road, Miami, Florida, 33126, and OSHA Safety and Health Standards 29 CFR 1910, available from the U.S. Department of Labor, Washington, D.C. 20210.