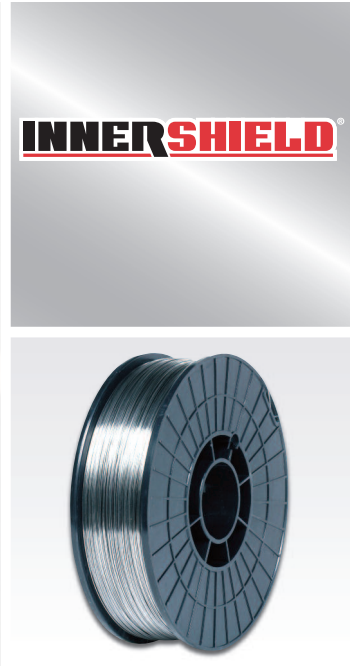


Innershield® NR®-233

AWS E71T-8-H16



Innershield® NR®-233 is a good choice for training or novice welders while also meeting the mechanical property requirements listed in AWS D1.8. It is recommended for vertical up and overhead fillet and groove welds. For easy out-of-position operability and impact properties capable of exceeding 27 J (20 ft•lbf) at -29°C (-20°F) – choose Innershield® NR®-233.

KEY FEATURES

- ▶ **Meets FEMA and D1.8 Lot Waiver Requirements** – Test results available at www.lincolnelectric.com/d1.8.
- ▶ **Impact Properties Tested at -29°C (-20°F)** – Exceed minimum requirement.
- ▶ **Easy to Operate** – Accommodates low operator skill in training.

CONFORMANCE

AWS A5.20/A5.20M: 2005	E71T-8-H16
ASME SFA-5.20	E71T-8-H16
ABS	E71T-8-H16
FEMA	All
D1.8	All

APPLICATIONS

- ▶ Seismic structural steel erection.
- ▶ General structural steel erection.
- ▶ Ship and barge fabrication.
- ▶ Vertical up and overhead fillets and groove welds.

WELDING POSITIONS

All Position

DIAMETERS / PACKAGING

Diameter in. (mm)	12.5 lb (5.7 kg) Plastic Spool	25 lb (11.3 kg) Plastic Spool	Vacuum Sealed Foil Bag
	50 lb (22.6 kg) Master Carton		25 lb (11.3 kg) Plastic Spool
1/16 (1.6)	ED030933	ED030934	ED031576
0.072 (1.8)		ED031030	ED031577
5/64 (2.0)		ED033039	ED033024

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MECHANICAL PROPERTIES⁽¹⁾ - As Required per AWS A5.20/A5.20M: 2005

	Yield Strength ⁽²⁾ MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)	Hardness Rockwell B
Requirements⁽⁴⁾ AWS E71T-8-H16	400 (58) min.	480 - 655 (70 - 95)	22 min.	27 (20) min.	—
Typical Performance	440 - 460 (63 - 66)	570 - 600 (83 - 86)	26 - 29	34 - 54 (25 - 40)	87 - 89

DEPOSIT COMPOSITION⁽¹⁾ - As Required per AWS A5.20/A5.20M: 2005

	%C	%Mn	%Si	%S	%P	%Al
Requirements AWS E71T-8-H16	0.30 max.	1.75 max.	0.60 max.	0.03 max.	0.03 max.	1.8 max.
Typical Performance	0.15 - 0.20	0.61 - 0.65	0.17 - 0.21	≤0.03	≤0.01	0.5 - 0.6

TYPICAL OPERATING PROCEDURES

Diameter Polarity CTWD	Wire Feed Speed m/min (in/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate kg/hr (lb/hr)	Deposition Rate kg/hr (lb/hr)	Efficiency (%)
1/16 in. (1.6 mm) DC- 1 in. (25 mm)	3.8 (150)	17-19	220	2.4 (5.3)	1.9 (4.2)	80
	5.1 (200)	19-21	245	3.2 (7.1)	2.5 (5.4)	76
	6.4 (250)	21-23	270	4.0 (8.9)	3.0 (6.6)	74
	7.6 (300)	23-25	295	4.7 (10.4)	3.5 (7.7)	75
	8.9 (350)	25-27	315	5.6 (12.3)	4.3 (9.4)	77
0.072 in. (1.8 mm) DC- 3/4 - 1 in. (19 - 25 mm)	2.5 (100)	17-18	184	2.0 (4.5)	1.6 (3.6)	80
	3.8 (150)	18-19	250	3.1 (6.7)	2.5 (5.4)	80
	5.1 (200)	20-21	295	4.0 (8.9)	3.2 (7.1)	81
	6.4 (250)	22-23	330	5.1 (11.2)	4.0 (8.9)	79
	7.6 (300)	23-24	355	6.1 (13.4)	4.8 (10.6)	79
5/64 in. (2.0 mm) DC- 3/4 - 1 in. (19 - 25 mm) ⁽³⁾	2.3 (90)	18-19	210	2.2 (4.9)	1.8 (4.1)	82
	3.2 (125)	19-20	260	3.2 (7.0)	2.6 (5.6)	81
	3.8 (150)	20-21	300	3.8 (8.4)	3.0 (6.7)	80
	5.1 (200)	21-22	340	5.1 (11.2)	4.1 (9.0)	81
	6.1 (240)	22-23	380	6.1 (13.3)	4.9 (10.8)	81

⁽¹⁾ See test results disclaimer below. ⁽²⁾ Measured with 0.2% offset. ⁽³⁾ CTWD for 5/64 in. (2.0 mm) for 5.1 and 6.1 m/min (200 and 240 in/min.) is 1 - 1 1/4 in. (25 - 32 mm).

⁽⁴⁾ The strength and elongation properties reported were obtained from a .505 in. tensile specimen artificially aged at 220°F (104°C) for 48 hours, as permitted by AWS A5.20-05. A naturally aged tensile specimen may take months to achieve the specified properties. See AWS A5.20-05, paragraph A6.3. The time required for the natural aging of weld deposits is dependent upon ambient conditions, weldment geometry, the metallurgical structure of the weld deposit and other factors.

NOTE: For horizontal welding, subtract 1 volt. NOTE: FEMA and AWS D1.8 structural steel seismic supplement test data can be found on this product at www.lincolnelectric.com.

FEMA 353 & AWS D1.8

This electrode has been tested in accordance with FEMA 353 & AWS D1.8 - Structural Welding Code - Seismic Supplement and is capable of depositing weld metal that delivers minimum CVN properties of 40 ft•lbf at 70° F (54 Joules at 21° C) at low and high heat input levels. As required by the AWS classification, it meets a minimum CVN of 20 ft•lbf at -20° F (27 Joules at -29° C), when tested in accordance with AWS 5.20-05. This electrode will also deposit metal that will meet the requirements for H16 as tested according to AWS A4.3. FEMA and AWS D1.8 certificates are available upon request.

TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change - This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

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