

NS-102 COPPERFREE™

AWS ER80S-D2, ER90S-D2



PRODUCT DESCRIPTION:

NS-102 is a copper free low alloy, high strength solid filler metal containing 0.5% molybdenum to maintain hardness and strength following post weld heat treatment. The high manganese and silicon content produce a smooth, uniform weld bead and help minimize spatter.

NS PREMIUM WELDING WIRE CHARACTERISTICS:

- NS-102 CopperFree™ provides the ultimate in flexibility to support your GMAW operations.
- Cast of 35" (.88m) to 55" (1.3m) and Helix below 1" (25.4mm) improve feedability and provide accurate wire positioning
- Excellent mechanical properties
- Manufactured according to ISO9001:2008 quality standards

Low alloy steel GMA welding wire for industrial and light duty applications

CLASSIFICATIONS & APPROVALS:

- AWS A5.28: ER80S-D2 (100% CO₂), ER90S-D2 (Mixed)
- ASME SFA-5.28: ER80S-D2
- MIL-E-23765/2: MIL-80S-3
- CWB W48-01: ER55S-D2

WELDING POSITIONS:

All position welding is possible when using the correct shielding gas blends, welding process and parameters.

NS-102	PRODUCT FEATURES
ARC STARTS	Excellent
ARC STABILITY	Excellent
FEEDABILITY	Excellent
SPATTER	Minimal
COPPER FLAKING	None
DE-OXIDIZERS	High level
WELD APPEARANCE	Excellent
POST WELD CLEANING	Excellent

TYPICAL APPLICATION SHIELDING GAS BLENDS:

- 100% CO₂
- 75-95% Argon/Balance CO₂
- 95-98% Argon/Balance O₂
- Flow Rate: 35-50 CFH

WIRE DIAMETERS (in):

.035	.040	.045	.052	.062
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NS-102 APPLICATIONS:

- ASTM A182, A217, A234 and A335 high temperature pipe, fittings, flanges and valves and A336 pressure vessel forgings
- Excellent for applications needing strength after post weld heat treatment
- Well suited for all metal transfer modes of GMAW
- Robotic, mechanized or semi-automatic welding
- Best results when using 95-98% Argon/Balance Oxygen shielding gas

TYPICAL MECHANICAL PROPERTIES:

	TENSILE STRENGTH PSI	YIELD STRENGTH PSI	MINIMUM ELONGATION %	CVN IMPACT VALUES @ -20° F
NS-102 (ER80S-D2)*	95,700	80,800	24	34 ft-lbf
AWS MINIMUM (ER80S-D2)	80,000	68,000	17	20 ft-lbf
NS-102 (ER90S-D2)*	98,700	84,400	27	52 ft-lbf
AWS MINIMUM (ER80S-D2)	90,000	78,000	17	20 ft-lbf

*ER80S-D2 (100% CO₂), ER90S-D2 (98% Ar/2% O₂)
Wire performance data available upon request

TYPICAL WIRE CHEMISTRY PERCENTAGES:

	C	Mn	Si	P	S	Cu	Mo	Ni
NS-102 TYP.	0.10	1.81	0.63	0.016	0.016	0.06	0.47	0.06
AWS A5.28	0.07/0.12	1.60/2.10	0.50/0.80	0.025 (max.)	0.025 (max.)	0.50 (max.)	0.40/0.60	0.15 (max.)



**COPPERFREE™ WELDING
PARAMETERS AND PACKAGE OPTIONS**



APPROXIMATE WELDING PARAMETERS:

GRADE	DIA.	POLARITY	TRANSFER MODE	WIRE FEED SPEED in/min (m/min)		VOLTAGE		AMPERAGE	
				Min.	Max.	Min.	Max.	Min.	Max.
CopperFree™	0.030	DCEP	Short Circuit	75 (1.9)	300 (7.6)	17	22	45	130
CopperFree™	0.035	DCEP	Short Circuit	100 (2.5)	400 (10.1)	17	24	75	180
CopperFree™	0.035	DCEP	Spray	375 (9.5)	625 (15.9)	23	29	180	280
CopperFree™	0.045	DCEP	Globular	100 (2.5)	425 (10.8)	18	24	125	225
CopperFree™	0.045	DCEP	Short Circuit	125 (3.2)	450 (11.4)	18	24	125	225
CopperFree™	0.045	DCEP	Spray	350 (8.9)	500 (12.7)	26	30	250	350
CopperFree™	0.052	DCEP	Globular	175 (4.4)	300 (7.6)	18	26	150	250
CopperFree™	0.052	DCEP	Short Circuit	200 (5.1)	325 (8.3)	22	26	200	300
CopperFree™	0.052	DCEP	Spray	300 (7.6)	500 (12.7)	27	31	300	425
CopperFree™	0.062	DCEP	Globular	180 (4.6)	320 (8.1)	19	27	150	250
CopperFree™	0.062	DCEP	Short Circuit	190 (4.8)	325 (8.3)	23	27	200	325
CopperFree™	0.062	DCEP	Spray	200 (5.1)	375 (9.5)	27	31	325	425

PACKAGES
33-lb. Fiber Spool - Random Wound
45-lb. Fiber Spool - Random Wound
60-lb. Fiber Spool - Random Wound
250-lb. Smart Pak - 100% Recyclable
300-lb. Tru-Trac®
500-lb. Drum Pack
500-lb. Smart Pak - 100% Recyclable
900-lb. Drum Pack
900-lb. Smart Pak - 100% Recyclable
425-lb. Trigger Trac®
1,000-lb. Tru-Trac®
1,000-lb. Wood Reel
<i>Note: See "Premium Packaging Options" for full description of packages. For additional packages, please contact NS Customer Service at 1-800-777-1618.</i>
Exclusive to NS customers.

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For Material Safety Data Sheets (MSDS) and Certificates of Compliance, visit our website at www.nationalstandard.com

