

PRODUCT DATA SHEET

Afrox 78MR



Specially formulated with a unique moisture resistant coating, 78MR is designed to reduce hydrogen at its primary source – moisture in the electrode coating. This means 78MR starts with a low initial moisture content and moisture regain, after extended exposure to the atmosphere, and is extremely low when compared with conventional hydrogen-controlled electrodes. Aprox 78MR is an AC/DC all-position basic coated hydrogen-controlled electrode which features excellent mechanical properties and low moisture regain rates after baking. The low moisture content of the coating and the high resistance to moisture re-absorption is a major benefit long recognised by manufacturers of critical components where avoidance of hydrogen induced cracking is of crucial importance. Aprox 78MR exhibits outstanding all positional welding characteristics with excellent bead profile and appearance. The arc is smooth and stable, giving a fully penetrating weld bead. The slag release in all positions is excellent and the electrode operates with minimal spatter on both AC and DC. Aprox 78MR is recommended for all structural applications where stringent mechanical properties and X-ray quality joints in all positions are required.

Applications

Aprox 78MR is recommended for welding a wide range of carbon manganese and low alloy steels used in structural applications and for the construction of pressure vessels.

Technique

As with all hydrogen-controlled electrodes, as short an arc as possible should be kept at all times. When starting with a new electrode, the arc should be initiated a short distance ahead of the start of the weld or crater and worked back over this distance before continuing the weld in the required direction. On heavier sections, several stringer beads should be used in preference to one large weave bead to ensure optimum mechanical properties.

Re-drying Procedure

Hydrogen-controlled electrodes must be re-baked prior to use, the baking temperature required being governed by the maximum hydrogen content tolerable in the deposited weld metal. For 5-10 ml H₂/100 g, re-bake at a temperature of 250-270°C for 1-2 hours, and for <5 ml H₂/100 g, a temperature of 370-400°C for 1-2 hours. (Please consult the section regarding the storage, handling and treatment of low hydrogen electrodes given on page 305 of this section.)

Aprox 78MR is manufactured and tested in accordance with the requirements of AWS A5.1.

Classifications

AWS	A5.1	E7018-1 H4 R
SABS	455	E5118/-4427H
EN	2560	E 42 4 B 32 H5

Approvals

Lloyds Register of Shipping Grade DXVuO,BF,3m,3Ym,H15

American Bureau of Shipping Grade 3Y,3H

Germanischer Lloyd Grade 3YH10

South African Bureau of Standards

Typical Chemical Analysis (All weld metal)

% Carbon	0,05 - 0,09	% Sulphur	0,025 max
% Manganese	1,25 - 1,5	% Phosphorous	0,025 max
% Silicon	0,25 - 0,45		

Typical Mechanical Properties (All weld metal)

Yield Strength	420 MPa min
Tensile Strength	510 - 650 MPa
% Elongation on 50 mm	26 min
Charpy V-Notch at -20°C	120 J min
Charpy V-Notch at -29°C	100 J min
Charpy V-Notch at -40°C	80 J min

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Typical Current Values (DC+/- or AC 70 OCV min)

Diameter (mm)	Current (A)
2,5	70 - 100
3,15	100 - 150
4,0	140 - 200
5,0	160 - 285
6,3	250 - 390

Deposition Data

Note:

- 1) The deposition data given was established at the optimum current rating which would be approximately in the middle of the specified range.
- 2) The mass of weld metal deposited per arc hour is a theoretical value which does not take into account welder efficiency.

Diameter (mm)	Mass of an Electrode (g)	Burn-off Time (sec)	Mass of Metal Deposited per Electrode (g)	Mass of Weld Metal Deposited per Arc Hour (g)	No. Electrodes per kg of Weld Metal	kg Weld Metal per kg of Electrodes
2,5	22,2	66,5	13,7	742	73	0,61
3,15	34,3	71,3	21,5	1 084	47	0,62
4,0	54,6	78,5	34,5	1 582	29	0,63
5,0	108,5	114,3	72,0	2 270	14	0,66
6,3	155,5	116,0	106,9	3 312	10	0,68

Packing Data

Diameter (mm)	Electrode Length (mm)	Item Number (1kg pack)	Approx. No. Electrodes/kg	Pack mass (kg)	Item Number (multi-kg pack)
2,5	350	W072272	45	3 x 4,0	W075272
3,15	350	W072273	29	3 x 4,0	W075273
4,0	350	-	18	3 x 4,0	W075274
5,0	450	-	9	3 x 6,0	W075275
6,3	450	-	6	3 x 6,0	W075277

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For more information contact the Afrox Customer Service Centre Tel: 0860 02 02 02
E-mail: customer.service@afrox.linde.com Website: www.afrox.com

