

TUFMET 3NiMo

ALL-POSITIONAL MMA ELECTRODE WITH HIGH STRENGTH AND TOUGHNESS

PRODUCT DESCRIPTION

MMA electrode with a low hydrogen basic flux on a high purity mild steel core wire. Moisture resistant coating ensures very low weld metal hydrogen levels.

The electrode was specially designed for welding HY80 and Q1(N) castings which are N+T following welding. Also suitable for other high strength steels requiring minimum tensile strength of about 820MPa (120ksi) in the as-welded and stress-relieved condition; or yield strength up to about 800MPa in the as-welded condition.

Recovery is about 110% with respect to core wire, 65% with respect to whole electrode.

SPECIFICATIONS

AWS A5.5M E12016-G H4
Approvals: MoD NES 769 for Q1(N) in Q+T condition.

ASME IX QUALIFICATION

QW432 F-No 4
QW442 A-No 10

WELDING POSITIONS (ISO/ASME)



CHEMICAL COMPOSITION (WELD METAL WT %)

	C	Mn	Si	S	P	Cr	Ni	Mo
min.	0.02	0.8	--	--	--	0.6	3.5	0.4
max.	0.06	1.5	0.5	0.025	0.025	1.0	4.5	0.8
Typical	0.045	1.2	0.4	0.01	0.015	0.8	4	0.5

ALL-WELD MECHANICAL PROPERTIES

Typical values	min	As-welded	Stress relieved 600-620°C/1h	Q+T 900°C/1-6h WQ + 635-650°C/1-6h WQ
Tensile strength [MPa]	830	950	920	710-770
0.2% proof strength [MPa]	740	870	870	590-660
Elongation (%) 4d	14	20	22	--
5d	--	18	20	20-25
Reduction of area (%)	--	55	58	65-70
Impact ISO-V(J) 0°C	--	65	--	--
-50°C	--	45	30	65-135
CTOD (mm) -5°C	--	--	--	>0.46

OPERATING PARAMETERS, DC +VE OR AC (OCV: 70V MIN)

Diameter (mm)	3.2	4.0	5.0
min. A	80	100	140
max. A	140	180	240

PACKAGING DATA

Diameter (mm)	3.2	4.0	5.0
Length (mm)	350	450	450
kg/carton	13.8	17.7	16.5
Pieces/carton	381	267	156

STORAGE

3 hermetically sealed ring-pull metal tins per carton, with unlimited shelf life.

Direct use from tin will give hydrogen <5ml/100g weld metal during 8h working shift.

For electrodes that have been exposed:

Redry 250 – 300°C/1-2h to ensure H₂ <10ml/100g, 300 – 350°C/1-2h to ensure H₂ <5ml/100g. Maximum 420°C, 3 cycles, 10h total.

Storage of redried electrodes at 100 – 200°C in holding oven, or 50 – 150°C in heated quivers: no limit, but maximum 6 weeks recommended.

FUME DATA

Fume composition, wt % typical

Fe	Mn	Ni	Cr	Cu	F	OES (mg/m ³)
14	<7	<0.5	<0.5	0.2	18	5