# NAG 19.9.L.R

## RUTILE MMA ELECTRODE FOR WELDING NITRIC ACID GRADE 304L STAINLESS STEEL

## **PRODUCT DESCRIPTION**

MMA electrode - rutile flux coated 308L electrode on special high purity 304L core wire.

A special flux system is used to maintain carbon, sulphur and phosphorus within specified limits and also give porosity-free deposits.

All electrode sizes have optimum versatility for downhand welding with high cosmetic finish and weld metal integrity; and all positional welding with the 2.5/3.2 mm electrodes.

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

### SPECIFICATIONS

SPECIFICATIONS		ASME IX QU	ALIFICATION
AWS A5.4M	E308L-16	QW432	F-No 5
BS EN ISO 3581	E 19 9 L R 3 2	QW442	A-No 8
BNFL (now Sellafield Ltd.)	NF 0086/1		

#### WELDING POSITIONS (ISO/ASME)



#### **CHEMICAL COMPOSITION (WELD METAL WT %)**

	С	Mn	Si	S	Р	Cr	Ni	Мо	Cu	W	В	FN
min.		0.2				18.0	9.0					3
max.	0.025	2.0	0.80	0.015	0.018	21.0	11.0	0.20	0.30	0.30	0.0010	10
Typical	0.02	1	0.5	0.01	0.015	19.5	10	0.05	0.1	0.01	0.0005	6

## ALL-WELD MECHANICAL PROPERTIES

As welded		Min.	Typical			
Tensile strength (M	MPa)	510	590			
0.2% proof strength (MPa)		320		420		
Elongation	ı (%) 4d	35		45		
	5d	30		42		
Reduction of area	ı (%)			55		
Impact ISO	-V(J) +20°C		90			
OPERATING PARAMETERS, DC +VE						
Diameter (mm)	2.5	3.2	4.0	5.0		
min. A	60	75	100	130		
max. A	90	120	155	210		
PACKAGING DATA						
Diameter (mm)	2.5	3.2	4.0	5.0		
Length (mm)	300	350	350	350		
kg/carton	12	13.5	12.9	12.9		
Pieces/carton	684	411	237	156		
Diameter (mm) Length (mm) kg/carton Pieces/carton	<b>2.5</b> 300 12 684	<b>3.2</b> 350 13.5 411	<b>4.0</b> 350 12.9 237	<b>5.0</b> 350 12.9 156		

#### STORAGE

3 hermetically sealed ring-pull metal tins per carton, with unlimited shelf life. Direct use from tin is satisfactory for longer than a working shift of 8h. Excessive exposure of electrodes to humid conditions will cause some moisture pick-up and increase the risk of porosity.

For electrodes that have been exposed:

Redry 150 - 250°C/1-2h to restore to as-packed condition. Maximum 300° C, 3 cycles, 10h total.

Storage of redried electrodes at 50 - 200°C in holding oven or heated quiver: no limit, but maximum 6 weeks recommended. Recommended ambient storage conditions for opened tins (using plastic lid): < 60% RH, > 18°C.

#### FUMF DATA

Fume composition (wt %) typical

Fe	Mn	Ni	Cr	Мо	Cu	F	OES (mg/m <sup>3</sup> )
8	5	0.8	5		<0.2	16	1

