

# ULTRAMILD

## Product description

Special low strength MMA electrode made with a basic low hydrogen coating on pure iron core wire. Moisture resistant coating gives weld metal hydrogen content <5ml/100g.

Recovery is about 120% with respect to core wire, 65% with respect to whole electrode.

## Specifications

**AWS A5.1** E6018

## ASME IX Qualification

QW432 F-No 1, QW442 A-No 1.

## Materials to be welded

Mild and CMn steels.

## Applications

Ultramild gives a soft, ductile low strength weld metal designed to absorb high shrinkage strains and minimise the build-up of residual stresses. It is a basic low hydrogen electrode with the lowest levels of alloying, microalloying and deoxidation compatible with satisfactory radiographic quality, resulting in ductile weld metal of about 300MPa yield strength.

Applications include **repair** of fabrication-induced cracks in CMn and low alloy steels, **buttering** layers to avoid lamellar tearing in areas of high restraint, **restrained root runs** under adverse conditions of low ambient temperature (-20°C) and minimal or no preheat, and welding of **steel conductor rails** requiring **high electrical conductivity**.

## Microstructure

In the as-welded and PWHT conditions, the microstructure consists of low strength ferrite.

## Welding guidelines

Preheating requirements will be dependent on the grade and thickness of the base material.

## Additional information

Although Ultramild has tensile properties which match those of the commonly used low strength grades of structural and pressure vessel steels, it would not normally be chosen for the complete welding of highly stressed or pressure containment welds. It can, however be used to advantage in the repair of such welds particularly in root areas, buttering layers, and the filling of deep grooves where the high restraint can be absorbed in the weld metal and so minimise the risk of cracking. The bulk of the joint can be completed using the usual higher strength consumable without any loss in performance resulting from the use of Ultramild.

## Composition (weld metal wt %)

	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V
min	--	--	--	--	--	--	--	--	--	--	--
max	0.03	0.6	0.4	0.015	0.020	0.10	0.30	0.10	0.10	0.05	0.05
typ	0.02	0.4	0.3	0.010	0.010	0.02	0.05	0.01	0.03	0.01	0.01

## All-weld mechanical properties

As welded	min	typical
Tensile strength	430	460
0.2% Proof stress	330	370
Elongation on 4d	22	33
Elongation on 5d	--	29
Impact energy	+ 20°C	200
	- 20°C	100
	- 30°C	45
Hardness cap/mid	160/150	

## Parameters

DC +ve or  
AC (OCV: 70V min)



ø mm	3.2	4.0
min A	80	100
max A	140	180

## Packaging data

ø mm	3.2	4.0
length mm	380	450
kg/carton	15.0	18.0
pieces/carton	408	264

## 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 H<sub>2</sub> <10ml/100g, 300-350°C/1-2h to ensure H<sub>2</sub> <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 quiver: no limit, but maximum 6 weeks recommended. Recommended ambient storage conditions for opened tins (using plastic lid): < 60% RH, >18°C.

## Fume data

Fume composition, wt % typical:

Fe	Mn	Ni	Cr	Cu	Pb	F	OES (mg/m <sup>3</sup> )
15	3	<0.1	<0.1	<0.1	<0.1	17	5