SA-B42

CONSUMABLES FOR ALLOY 825

ALLOY TYPE

Cr-Ni-Mo-Cu alloy of the generic 825 type.

MATERIALS TO BE WELDED

Matching 825 materials:

ASTM/ UNS

N08825

DIN

2.4858

BS

1501 & 3072 Grade NA16

Proprietary

Incoloy 825 (Special Metals)

Incoloy 825CP, cast (Special Metals)

Nicrofer 4221 (Krupp VDM)

The E825L-15 MMA electrode is also suitable for the 28%Cr alloy 28 materials:

ASTM/ UNS

N08028

DIN

1.4563

Proprietary

Nicrofer 3127LC (Krupp VDM)

Sanicro 28 (Sandvik)

Also suitable for lower nickel materials of the alloy 20 type.

APPLICATIONS

The consumables deposit Cr-Ni-Mo-Cu weld metal with a high corrosion resistance to organic acids and hot sulphuric acid. The high nickel content gives good resistance to stress corrosion cracking in chloride and H_2S environments.

Applications include tanks and process vessels, pipework systems, heat exchangers, agitators and rotors, and cast pumps and valves for use in the chemical processing and increasingly offshore oil and gas industries. Also suitable for corrosion resistant overlays and for welding dissimilar materials.

MICROSTRUCTURE

In the as-welded condition the weld metal microstructure is fully austenitic.

WELDING GUIDELINES

No preheat required, interpass should be restricted to 150)C maximum and the heat input should be controlled particularly with 4mm and 5mm diameter electrodes.

ADDITIONAL INFORMATION

Some authorities accept or prefer overmatching type 625 weld metal (data sheet D-20) but 825 is the conventional type for welding alloy 825. Both the E825L-15 electrode and 82-50 wire are also suitable for welding the leaner alloy 20 type materials. The MMA electrode E825L-15 (but not the 82-50 wire) can also be used for welding the 28%Cr, alloy 28 type, materials.

RELATED ALLOY GROUPS

The 625 alloy (data sheet D-20) is sometimes used for welding 825 and alloy 28 materials.

PRODUCTS AVAILABLE

Process	Product	Specification
MMA	**NICRO 31/27**	E383-16 *

NICRO 31/27

MMA (SMAW)

MMA ELECTRODE FOR AUSTENITIC ALLOY 825

PRODUCT DESCRIPTION

MMA electrode for welding 825, alloy 28 and alloy 20 type materials. Specially balanced basic-fluoride-rutile flux on high purity 825 core wire. The electrodes are designed for fixed pipework welds including the demanding ASME 5G/6G positions. Careful control of carbon, manganese, silicon and nitrogen to maximise corrosion resistance in the as-welded condition and to ensure high resistance to solidification cracking and microfissuring in multipass welds. The composition is controlled to give a Pitting Resistance Equivalent (PRE) of about 40, where PRE = %Cr + 3.3%Mo.
Recovery is about 110% with respect to core wire, 65% with respect to the whole electrode.

CLASSIFICATIONS

AWS A5.4M (E383-15)
Does not strictly conform; Ni & Cu are higher in E825L-15 compared to the E383-15 classification

DIN EL-NiCr28Mo

ASME IX QUALIFICATION

QW432 F-No 5
(This is nearest because the electrode does not strictly conform to AWS.

WELDING POSITIONS (ISO/ASME)

CHEMICAL COMPOSITION (WELD METAL WT %)

	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	Fe
min.	--	1.0	--	--	--	27.0	35.0	3.2	1.5	--	--
max.	0.03	3.0	0.5	0.015	0.030	31.0	40.0	4.5	3.0	1.0	30
Typical	0.02	2	0.3	0.01	0.01	28	38	3.5	2	0.3	27

ALL-WELD MECHANICAL PROPERTIES

As welded		**Min.**	**Typical**
Tensile strength (MPa)		550	640
0.2% proof strength (MPa)		240	410
Elongation (%)	4d	30	40
	5d	25	39
Reduction of area (%)		--	43
Impact ISO-V(J)	+ 20°C	--	120
	- 196°C	--	65
Hardness (HV)		--	220

OPERATING PARAMETERS, DC +VE

Diameter (mm)	**2.5**	**3.2**	**4.0**
min. A	60	70	90
max. A	80	110	150

PACKAGING DATA

	Diameter (mm)	Length (mm)	Item number	Nb of pieces		Weight (kg)	
				pack	box	pack	box
PE TUBE	2.5	350	544008-1	-	-	-	-
	3.2	350	544015-1	-	-	-	-

Redrying : 200 – 300°C/1-2h to restore to as-packed condition. Maximum 300° C, 3 cycles, 10h total.

FUME DATA (WT % TYPICAL)

Fe	Mn	Ni	Cr	Mo	Cu	F	OES (mg/m³)
4	5	3	7	1	1	20	0.7