High Temperature Alloys

DATA SHEET **C-45**

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THERMET 25.35.Nb

Alloy type

0.1%C-25%Cr-35%Ni-0.6%Nb (HP10Cb) austenitic cast alloy for heat resisting service.

Materials to be welded

Similar cast alloys:
Alloy HP10Cb (ACI-ASTM terminology)
Paralloy CR39W (Doncasters Paralloy)
Lloyds T57 (LBA)
Centralloy H101 (Centracero)

Applications

This electrode is specially designed to deposit weld metal which matches the composition of similar castings. This alloy was developed from 800 type alloys with increased chromium and nickel contents and exhibits improved carburisation and oxidation resistance. It is used at temperatures up to 1100°C and is resistant to thermal shock and fatigue.

Applications include the welding of centrifugally cast **pyrolysis coils**, **reformer tubes**, **return bends** and **tees** for the **petrochemical industry**.

Microstructure

In the as-welded condition the weld metal microstructure consists of austenite with some grain boundary carbides.

Welding guidelines

Generally no preheat or PWHT are required; interpass temperatures below 150°C are recommended.

Related alloy groups

There is no directly equivalent solid wire, the nearest available is Metrode 21.33.Nb/21.33.Mn (see data sheet C-40).

Products available

Process	Product	Specification
MMA	**Thermet 25.35.Nb**	--

THERMET 25.35.Nb

Basic all-positional MMA electrode for 'HP10Cb' type castings

Product description

MMA electrode with basic flux coating made on nearly matching core wire. The electrode is optimised for DC+ welding in all positions including fixed pipework in ASME 5G/6G positions. Moisture resistant coating giving sound porosity-free deposits.

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

Specifications

There are no relevant national standards.

ASME IX Qualification

QW432 --.

Composition (weld metal wt %)

	C	Mn	Si	S	P	Cr	Ni	Mo	Nb	Cu	Pb	Sn
min	0.08	2.5	0.2	--	--	24.0	34.0	--	0.50	--	--	--
max	0.14	4.0	1.0	0.02	0.03	28.0	39.0	0.5	1.50	0.15	0.01	0.01
typ	0.12	3.5	0.5	0.01	0.01	26	36	0.2	0.8	0.05	<0.001	0.005

All-weld mechanical properties

As welded		min	typical
Tensile strength	MPa	520	660
0.2% Proof stress	MPa	300	460
Elongation on 4d	%	20	34
Elongation on 5d	%	20	32
Reduction of area	%	--	42

Operating parameters

DC +ve

ø mm	2.5	3.2	4.0
min A	60	75	100
max A	90	120	155

Packaging data

ø mm	2.5	3.2	4.0
length mm	265	320	320
kg/carton	10.5	12.0	12.0
pieces/carton	555	330	204

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 350° 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.

Fume data

Fume composition, wt % typical:

Fe	Mn	Ni	Cr	Mo	Cu	F	OES (mg/m^3)
4	6	2	7	<0.1	<0.2	18	0.7