

ULTIMATE-90 B3

2 ¼ Cr 1 Mo steels.

SFA 5.5 AWS E 9018-B3 H4

BS 2493 2 CrMo BH

DIN 8575 E CrMo 2 B 2 6

EN 1599 E CrMo 2 B 4 2 H5

Identification: Name Printed.

Hydrogen controlled iron powder type electrode designed for welding creep resisting steels & cast steels of 2 ¼ Cr-1% Mo class. Weld metal displays resistance to elevated temperatures up to 600°C & resistance to hydrogen attack.

APPLICATIONS:

The 2.25 Cr-1Mo steel weld deposit can withstand prolonged elevated temperature service up to 600°C. Hence it is suitable for steam generating power plant - boiler superheat tubes & steam pipes, turbine castings, valve bodies, steam chests. Good corrosion resistance to sulphur-bearing crude oil up to 450°C, renders it suitable in refinery service. Also used in chemical & petrochemical industries, for hydrocracker, coal liquefaction plant.

CHARACTERISTICS:

ULTIMATE-90B3 represents a unique combination of numerous features which every welder and welding engineer look for on shop floor and at erection site:

- ❖ Ease of operation in all positions
- ❖ Smooth and stable arc which is easy to strike & restrike, combined with low spatter and with due control on molten pool.
- ❖ Slag detachability with little effort.
- ❖ Finely rippled bead with regular profile.
- ❖ Welds of consistent X-Ray quality.
- ❖ Low level of diffusible hydrogen.

Chemical Analysis of All Weld Deposit (%):

C	Mn	Si	Cr	Mo	S	P
0.05 - 0.12	0.50 - 0.90	0.50 max	2.0 - 2.50	0.90 - 1.20	0.025 max	0.025 max

All Weld Mechanical Properties: (After PWHT as per SFA 5.5):

UTS (MPa)	0.2% Proof Stress (MPa)	% Elongation (L = 4d)	CVN impact Energy (J) (+20°C)
630 min	540 min	20 - 25	> 47

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Hydrogen in weld metal : 4 ml / 100 g. max.

(Mercury method)

Moisture content < 0.20%

WELDING CURRENT RANGES FOR SIZES MANUFACTURED

Use DC+ or AC (70 V min)

Dia (mm)	2.50	3.15	4.00	5.00
Length (mm)	350	450	450	450
Current (Amp)	70 - 100	100 - 140	140 - 180	180 - 240

Additional Information:

1) **Preheat & Intrpass Temperatures:**

There are differences in national codes. Thus,

AWS : 160° - 190° C,

BS : 200° - 300° C,

DIN : 200° - 300° C.

2) **PWHT as per SFA 5.5 - 2007.**

690° ± 15° C for one hour

Materials to be Welded:

ASTM GRADES		DIN GRADES
➤ Plates	A 387 D	10 CrMo 9 10 12 CrMo 9 10
➤ Pipes	A 335 Gr. P22 A 369 F P22 A 426 CP21, CP22	Castings: GS - 18 CrMo 9 10 (1.7379) GS - 12 CrMo 9 10 (1.7380)
➤ Tubes	A 199 } T3b, T4 A 200 } T21, T22 A 213 T 22	
➤ Forgings	A 182 Gr F 22 A 336 Gr. F 22 A 541 Gr. 22	
➤ Castings	A 217 WC9	

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Notes on Usage:

1. Redrying cycle:
 - (a) 250°C/2 hr to control hydrogen below 10ml/100gm;
 - (b) 325°C/2 hr to control hydrogen below 5ml/100 gm.
2. Avoid overdrying so as to prevent damage to coating. Restrict redrying to two cycles by using holding oven & quivers with temperature of 80-100°C.
3. For detailed information on storage & redrying, please refer to our Notes on L.H. Electrodes (copy available on request).
4. Use short arc & minimize weaving to the extent possible.
5. Due attention has to be given to preheat & interpass temperature to ensure crack free welds & control on hardness of weld deposit & HAZ.
6. Preheat - Interpass temperature range 200° - 300°C depending on thickness.
7. In welding thick sections (over 15 mm), it is safe practice to maintain temperature of 200°C - 250°C for 1 - 2 hours after completion of welding. This facilitates reduction in hydrogen level.

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