

# CHROMET WB2

## Product description

MMA electrode depositing advanced 9CrMoV alloy with nominal composition 0.12%C-9.5%Cr-1.5%Mo-1%Co-0.25%V-0.05%Nb+B. Low hydrogen moisture-resistant flux covering on high purity steel core wire. Metal recovery is about 120% with respect to core wire, 65% with respect to the whole electrode.

## Specifications

No national specifications.

## Materials to be welded

For advanced creep resistant steel B2 developed in the European COST programme in forged (FB2) or cast (CB2) forms, such as GX-13CrMoCoVNbNB 9-2-1.

## Applications

COST alloy B2 was originally developed as a turbine rotor material and its outstanding creep performance (above P91 and E911) has been confirmed with further optimisation. The weld metal deposited by Chromet WB2 is designed to match the base material composition quite closely for fabricating thick wall components used in the construction of power plants operating with advanced steam parameters up to at least 600°C.

## Microstructure

After PWHT: tempered martensite with finely dispersed precipitates.

## Welding guidelines

Preheat-interpass range 200-300°C. Welding heat input should be kept below ~3kJ/mm. Cooling to ~100°C before PWHT is advisable to ensure full transformation to martensite. PWHT (for >27J): 730°C/16-24h or

preferably 760°C/~4h.

## Related alloy groups

Equivalent solid wire is not currently available; nearest for compatible properties is 9CrWV (P92), see data sheet A-20.

## Parameters

DC+ve or AC (OCV: 70V)



∅ mm	3.2	4.0	5.0	6.0
min A	80	100	140	200
max A	140	180	240	300

## Packaging data

∅ mm	3.2	4.0	5.0	6.0
length mm	380	450	450	450
kg/carton	14.4	16.5	16.5	16.5
pieces/carton	396	240	156	105

## 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 quivers: no limit, but maximum 6 weeks recommended.

## Fume data

Fume composition, wt % typical:

Fe	Mn	Ni	Cr	Cu	Pb	F	OES (mg/m <sup>3</sup> )
15	5	<0.1	<3	0.1	<0.1	18	1.7

## All-weld mechanical properties

PWHT 760°C/4h or equivalent		min	Typical, 760°C/4h	Typical, 740°C/10h
Tensile strength	MPa	650	735	730
0.2% Proof stress	MPa	530	600	590
Elongation on 4d	%	15	23	21
Elongation on 5d	%	17	21	19
Reduction of area	%	--	58	56
Impact energy	+ 20°C J	27	40	40

## Composition (weld metal wt %)

	C	Mn	Si	S	P	Cr	Ni	Mo	V	Nb	N	B	Co
min	0.10	0.40	0.15	-	-	9.0	0.40	1.4	0.20	0.04	0.010	0.005	0.80
max	0.15	1.00	0.50	0.015	0.020	10.5	0.80	1.7	0.30	0.07	0.035	0.015	1.20
typ	0.12	0.6	0.3	0.009	0.010	9.5	0.6	1.5	0.25	0.05	0.02	0.008	1.0