

## 9016-B9

**CATEGORY** SMAW Stick Electrodes

**TYPE** Basic, Cr and Mo-alloyed electrode for heat resistant steels T/P91 and T/P92

**APPLICATIONS** Headers, main steam piping and turbine casings, in fossil fuelled power generating plants. Oil refineries and coal liquefaction and gasification plants. Preheat and Interpas temperature 200°C - 300°C.

**PROPERTIES** 9016-B9 is designed to weld equivalent 'type T91' T92 CrMo steels modified with small additions of vanadium and tungsten to give improved long term creep properties. These consumables are specifically intended for high integrity structural service at elevated temperature so the minor alloy additions responsible for its creep strength are kept above the minimum considered necessary to ensure satisfactory performance. In this case, weldments will be weakest in the softened (intercritical) HAZ region of parent material, as indicated by so-called 'type IV' failure in transverse weld creep tests.

**CLASSIFICATION** AWS A 5.5: E 9016-B9  
EN ISO 3580-A: E CrMoV1 B 32 H5  
3580-B: EE 62 15-9C1MV1 H5

**SUITABLE FOR** X11CrMo9-1, X12CrMo9.1, X20CrMoV11-1, X20CrMoV12-1, 1.7386, 1.4922, 1.4935 ASTM: A 199Gr.T9, A335Gr.P9, A351, A213/213M Gr.T/P91Gr.T/P92

**APPROVALS** CE approved

**WELDING POSITIONS:**



**ANALYSES %**

C	Mn	Si	Cr	Ni	Mo	V	W
0.08	0.50	0.40	9.0	0.90	0.90	0.20	0.20

PWHT: 750°C/2hr, oven cooling till 300°C and then cooled on air.

**MECHANICAL PROPERTIES**

Heat Treatment	R <sub>p0.2</sub> (N/mm <sup>2</sup> )	R <sub>m</sub> (N/mm <sup>2</sup> )	A <sub>5</sub> (%)	Impact Energy (J) ISO-V			Hardness HRC / HV
				+20°C	-40°C	-60°C	
AW	>500	650-850	>16	>50 J			

AW = as welded

**WELDING PARAMETERS / PACKING**

D (mm)	Welding Parameters			Packing		
	Length (mm)	Current (A)	kg / can	kg / 6pack	kg / 1000	
2.5	300	65-85	2.4	14.4	19.8	
3.2	350	100-130	2.4	14.4	36.4	
4.0	450	140-180	3.0	18	66.7	
5.0	450	180-230	3.0	18	101.9	

**REDRYING TEMPERATURE** 400°C/1hr