

ROYALFIL GS-91B9 (E91T1-B9C)

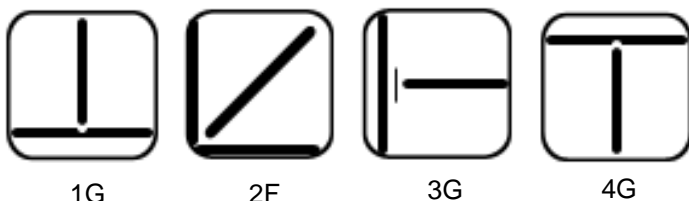
AWS A / SFA 5.29 E91T1-B9C

Applications

Royalfil GS-91B9 is recommended for welding of ASTM A213-T91 tube, A335 – P91 pipe, A 182/A336 F91 forgings, A217 C12 A castings, A234 WP91 & A369 FP91 type material. Widely used for components such as headers, main steam piping and turbine castings, power generation plant, oil refineries, coal liquefaction and gasification plants.

Characteristics on Usage

Royalfil GS-91B9 is martensitic alloy type all position Rutile based flux cored wire depositing approx 9% Cr, 1.00% Mo, 0.5% Ni, weld metal with CO₂ shielding. The slag coverage is complete & easily removable. The weld metal is of radiographic quality. In PWHT condition, microstructure consists of tempered martensite with alloyed carbides. Thermal treatment is critical and must be controlled. The temperature at which the microstructure has complete transformation into martensite is relatively low. Therefore after welding is completed, it is recommended to cool down weldment to atleast 93°C to maximize transformation to martensite. Mn + Ni % in the weld should not exceed 1.50% (Typical value = 1.20%). By restricting the Mn + Ni%, PWHT temperature will be sufficiently below the lower transformation temperature to avoid the partial transformation of microstructure.

Welding Positions**Recommended stick out**

15-20 mm

Shielding Gas

Carbom Dioxide (CO₂)
Shielding Gas Flow : 20-25
Lit / Min

Chemical Composition Of Weld Metal

Element	C%	Mn%	Si%	S%	P%	Cr %	Ni %	Mo %
Typical Values	0.090	0.70	0.30	0.010	0.016	9.0	0.50	1.0
Spec. Reqd	0.08-0.13	1.20 Max	0.50 Max	0.015 Max	0.020 Max	8.0-10.50	0.80 Max	0.85-1.20

Element	V%	Al%	Cu%	Nb%	Nitrogen%
Typical Values	0.20	0.015	0.050	0.040	0.050
Spec. Reqd	0.15-0.30	0.040 Max	0.25 Max	0.02-0.10	0.020 -0.07

Mechanical Properties Of Weld Metal

After PWHT at 760 ± 15 °C for 2 hours

Property	U.T.S. (N/mm ²)	Y.S. (N/mm ²)	ELONGATION (L = 4d) %
Typical Values	780	660	20
Spec. Reqd.	620-830	540 Min	16 Min

Welding Parameters (DC + VE)

Diameter (mm)	Flat & Horizontal (A)	Flat & Horizontal (V)	Vertical - Up (A)	Vertical - Up (V)	Overhead (A)	Overhead (V)
1.20	180-250	26-30	120-210	22-26	150-200	26-30
1.60	210-280	26-30	160-250	22-27	190-240	26-30

Packing

15 Kgs. Vacuum packed plastic spool.