



Unibrazed 90S-B9/EB-9

Specifications

AWS A5.28 /ASME SFA5.28 Class ER90S-B9 (GMAW/GTAW) UNS S50482

AWS A5.23/ASME SFA 5.23 Class EB-9 (SAW) UNS S50482 - *Non-Copper Coated*

Description: Unibrazed 90S-B9/EB-9 is used to weld 9Cr/1Mo Steels modified with Nb and V to provide strength, toughness, fatigue life, oxidation and corrosion resistance at elevated temperatures up to 1200°F (650°C). The higher temperature properties of Unibrazed 90S-B9/EB-9 allows components fabricated from stainless or ferritic steels to be fabricated with a single alloy, eliminating problems associated with dissimilar welds. Applications include A335-P91 pipe, A387 Gr. 91 plate, A182 F91 forgings, and A213-T91 tube. It provides long term creep resistance in fossil fuel power generation, including turbine rotors, steam piping and wall components.

Typical Chemistry

Product	C	Mn*	Si	P	S	Ni*	Cr	Mo	V	Al	Cu	Nb	N	Others**
Typical	.087	.52	.22	.007	.004	.47	8.9	.93	.20	.005	.04	.04	350ppm	
90S-B9	.07- .13	1.20 max	.15 - .50	.010 max	.010 max	.80 max	8.0 – 10.50	.85 – 1.20	.15 - .30	.04 max	.20 max	.02 - .10	.03 – .07	.50 max
EB-9	.05 - .13	1.25 max	.50 max	.010 max	.010 max	1.0 max	8.0- 10.50	.85 – 1.15	.05 - .25		.10 max	.02 - .10	.03 – .07	.50 max

*Ni + Mn ≤ 1.5 max

**Included in others: As=.005 max, Sn=.005 max Sb= .005 max (Necessary for Fx requirements)

Typical Mechanical Properties (PWHT 1400°F for 2 hrs.)

Tensile Strength	110,100 psi
Yield Strength	97,000 psi
Elongation	18%
Charpy Impacts	40 ft•lbs
X Factor (Fx)	<15

Note: Fx = (10P + 5Sb + 4Sn + As) / 100 (elements in ppm)

Recommended Welding Parameters

Process	Dia.	Amps	Volts	Gas/Flux
GTAW	1/16"	50-120	7 – 13	Argon
	3/32"	120-200	10- 16	Argon
	1/8"	150-220	12 - 18	Argon
GMAW Short Arc	.035"	90-160	14 – 20	CO ₂
	.045"	120-200	16 - 20	CO ₂ or 75Ar/ 25CO ₂
GMAW Spray Transfer	.035"	180-230	25-28	98Ar/2CO ₂
	.045"	250-350	25-30	75Ar/25CO ₂
	.1/16"	280-400	26-36	75Ar/ 2 CO ₂
SAW	3/32"	250-400	28-32	Please Call
	1/8	400-600	30-34	

Notice: The results reported are based upon testing of the product under controlled laboratory conditions in accordance with American Welding Society Standards. Actual use of the product may produce different results due to varying conditions. An example of such conditions would be electrode size, plate chemistry, environment, weldment design, fabrication methods, welding procedure and service requirements. Thus the results are not guarantees for use in the field. The manufacturer disclaims any warranty of merchantability or fitness for any particular purpose with respect to its products.