

## Classifications

EN ISO 21952-A:	AWS A5.28	AWS A5.28M
W ZCrMoWVNb9 1 1	ER90S-B9 (mod.)	ER62S-B9 (mod.)

## Characteristics and typical fields of application

GTAW-rod for high temperature, creep resistant martensitic 9 % chromium steels, especially designed for the steel E911 and P911. Approved in long-term condition up to +650 °C service temperature.

## Base materials

Similar alloyed creep resistant steels

1.4905 X11CrMoWVNb9-1-1,

ASTM A 182 Gr. F911; A 213 Gr. T911; A 234 Gr. WP 911; A 335 Gr. P911; A 336 Gr. F911

## Typical analysis of the TIG rods (wt.-%)

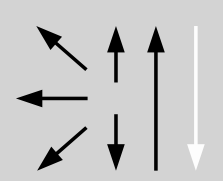
	C	Si	Mn	Cr	Ni	Mo	V	Nb	W	N
wt.-%	0.11	0.35	0.45	9.0	0.75	1.0	0.2	0.06	1.05	0.04

## Mechanical properties of all-weld metal

Condition	Yield strength $R_{p0,2}$	Tensile strength $R_m$	Elongation A ( $L_0=5d_0$ )	Impact work ISO-V KV J
	MPa	MPa	%	+20 °C
a	<b>660</b>	<b>790</b>	<b>16</b>	<b>50</b>

a annealed 760 °C / 2 h / furnace down to 300 °C / air – shielding gas Argon

## Operating data

	<b>Polarity:</b> DC ( - )	<b>Shielding gas:</b> 100 % Argon	<b>Rod marking:</b> front: ✦ E 911 back: -	<b>∅ (mm)</b> 2.0 2.4
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Preheating and interpass temperature 200 – 300 °C. After welding the joint should be cooled down below 80 °C to finish the martensite transformation. In case of greater wall thickness or complex components the possibility of residual stresses must be considered.

The following post weld heat treatment is recommended: annealing 760 °C/min. 2 h, max. 10 h, heating and cooling rates below 550 °C max. 150 °C/h, above 550 °C max. 80 °C/h.

For optimised toughness values a welding technology should be applied which produces thin welding layers (app. 2 mm).

## Approvals

TÜV (9177.), CE