

Classifications

EN ISO 21952-A	EN ISO 21952-B	AWS A5.28	AWS A5.28M
G CrMo91	G 62 M12 9C1MV	ER90S-B9	ER62S-B9

Characteristics and typical fields of application

GMAW wire for high temperature, creep resistant martensitic 9 – 12 % chromium steels in turbine and boiler fabrication and in the chemical industry. Especially designed for the ASTM steels T91 / P91. Approved in long-term condition up to +650 °C service temperature.

Base materials

Similar alloyed creep resistant steels

1.4903 X10CrMoVNb9-1, GX12CrMoVNbN9-1

ASTM A 335 Gr. P91, A 336 Gr. F91, A 369 Gr. FP91, A 387 Gr. 91, A 213 Gr. T91

Typical analysis of solid wire (wt.-%)

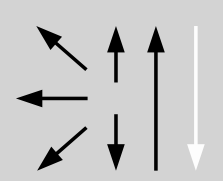
	C	Si	Mn	Cr	Ni	Mo	V	Nb
wt.-%	0.12	0.3	0.5	9.0	0.5	0.9	0.2	0.06

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	620 (≥ 415)	760 (≥ 620)	18 (≥ 17)	80 (≥ 47)

a annealed 760 °C / 2 h / furnace down to 300 °C / air – shielding gas Argon + 2.5 % CO₂

Operating data

	Polarity DC (+)	Shielding gases: Argon + 2.5 % CO ₂	ø (mm) 1.0 1.2
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Preheating 200 – 250 °C, interpass temperature 200 – 300 °C. After welding, the weld joint should cool down below 100°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 hrs, 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 (approx. 2 mm).