

Classifications

EN ISO 17634-A	EN ISO 17634-B	AWS A5.36	AWS A5.36M
T ZCrMo9VNb P M 1	T 69 T1-1M-9C1MV	E91T1-M21PY-B91	E621T1-M21PY-B91

Characteristics and typical fields of application

BÖHLER C 9 MV Ti-FD is a rutile- basic flux cored wire for the welding of creep resistant, tempered 9 – 12% chromium steels in turbine-, boiler- and pipework construction as well as in the foundry industry. The wire is especially designed for the ASTM steels T91 / P91. The flux cored wire is designed for out of position welding technology. The chemistry of the product is according to LOW NICKEL content requirements, meaning (Ni + Mn) < 1wt. %.

Base materials

Similar alloyed creep resistant steels like
1.4903 X10CrMoVNb9-1, G-X12CrMoVNbN9-1

ASTM A335 Gr. P91, A336 Gr. P91, A369 Gr. FP91, A387 Gr. 91, A213/213M Gr. T91 A 234 WP91, A182 F91

Typical analysis of all-weld metal

	C	Si	Mn	Cr	Ni	Mo	V	Nb	N
wt.-%	0.10	0.2	0.7	9.0	0.2	1.0	0.2	0.04	0.04

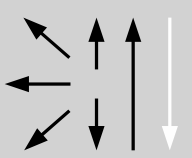
Mechanical properties of all-weld metal

Heat Treatment	Shielding gas	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 ₁	Ar + 18% CO ₂	580 (≥ 565)	720 (690 – 830)	18 (≥ 14)	60 (≥ 32)
a ₂	Ar + 18% CO ₂	590 (≥ 565)	730 (690 – 830)	18 (≥ 14)	40 (≥ 32)

a₁ annealed 760°C / 4 h / furnace down to 300°C / air (EN-ISO requirements)

a₂ annealed 760°C / 2 h / furnace down to 300°C / air (AWS requirements)

Operating data

	Polarity: DC (+)	Shielding gas: (EN ISO 14175) M21 Consumption: approx. 15 – 18 l/min.	Redrying: if necessary 150°C/24 h	ø (mm) 1.2	Amps A 160 – 300	Voltage V 25 – 35
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Welding with conventional or pulsed power sources (preferably slightly trailing torch position, angle approx. 80°). Recommended stick out 18 - 20 mm and length of arc 3 – 5 mm. Preheating and interpass temperature 200 – 300°C (392 – 572 °F). After welding, the weld joint should cool down below 80 °C (176 °F) 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 (1400 °F)/min. 3h, max. 10h, heating and cooling rates below 550 °C (1022 °F) max. 150 °C (302 °F)/h, above 550 °C (1022 °F) max. 80 °C (176 °F).

Approvals:

(TÜV*) *requested