

Classifications

EN ISO 17634-A	EN ISO 17634-B	AWS A5.29 / SFA-5.29
T ZCrMo9Vnb P M21 1 H5	T 69 T1-1M21-9C1MV-H5	E91T1-B91M-H4

Characteristics and typical fields of application

FOXcore C 9 MV RC is a rutile- basic flux cored wire for the welding of creep resistant, tempered 9 % 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

	Gas	C	Si	Mn	Cr	Ni	Mo	V	Nb	N
wt.-%	M21	0.10	0.2	0.7	9.0	0.2	1.0	0.2	0.04	0.04


Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$	Tensile strength R_m	Elongation A ($L_0=5d_0$)	Impact energy ISO-V KV J
	MPa	MPa	%	20°C
s	580 (≥ 565)	720 ($\geq 690 - 760$)	18 (≥ 14)	60 (≥ 32)
s1	590 (≥ 565)	730 ($\geq 690 - 760$)	18 (≥ 14)	40 (≥ 32)

s - stress relieved 760°C / 4 h / furnace down to 300°C / air (acc. EN-ISO) shielding gas Ar + 18% CO2

s1 - stress relieved 760°C / 2 h / furnace down to 300°C / air (acc. AWS) shielding gas Ar + 18% CO2

Operating data

	Polarity	DC +	Dimension mm
	Redrying	possible, 150°C/24 h	1.2
	Shielding gas (EN ISO 14175)	M21	

Welding with conventional or pulsed power sources (preferably slightly trailing torch position, angle approx. 80°). Recommended stick out 15 - 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 (19235)