BÖHLER FOX C 9 MV LNi

Covered electrode, basic, creep resistant

Classifications

EN ISO 3580-A	EN ISO 3580-B	AWS A5.5 / SFA-5.5	AWS A5.5M
E Z CrMo91 B 4 2 H5	E6215-9C1MV H5	E9015-B91 H4	E6215-B91 H4

Characteristics and typical fields of application

BÖHLER FOX C 9 MV LNi is a core wire alloyed stick electrode with basic coating. The 9Cr-1Mo-VNb type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep strength enhanced ferritic steels like ASTM grade 91 tube, pipe, plate, forgings and castings, used in the thermal power and petrochemical industry.
The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal after post weld heat treatment along with low level of trace elements - Bruscato < 15. Thanks to the restricted Mn+Ni content of less than 1.0 wt. % the Ac1 temperature is certainly above 780 ºC. Its basic coating guarantees low level of diffusible hydrogen in the weld metal.

Base materials

Similar alloyed creep resitant steels and castings like
1.4903 X10CrMoVNb9-1, 1.4955 GX12CrMoVNbN9-1
ASTM Grade 91, T91, P91, F91, FP91, WP91,C12A
10Cr9Mo1VNbN
STPA28, STBA28

Typical analysis

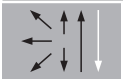
	C	Si	Mn	Cr	Ni	Mo	V	Nb	N
wt.-%	0.1	0.2	0.8	9.0	0.1	1.1	0.2	0.05	0.04

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 20 °C	MPa 550 °C	MPa 20 °C	MPa 550°C	% 20 °C	% 550 °C	20 °C	0 °C
T	580 (≥ 530)	410 (≥ 280)	710 (≥ 620)	460 (≥ 330)	19 (≥ 17)	17 (≥ 15)	70 (≥ 47)	40 (≥ 27)

T: tempered (760 °C / 2 h)

Operating data



		Dimension mm	Current A
Polarity	DC +		
Electrode identification	FOX C 9 MV LNi / E ZCrMo91 B / E9015-B91	2.5 × 250	70 – 100
		3.2 × 350	100 – 145
Redrying	300 - 350 °C / 2 h	4.0 × 350	140 – 190

IPreheat and interpasstemperature should be controlled between 200 and 350 ºC. In order to optimize impact energy a welding technique that ensures small layer thickness and low heat input is recommended. After welding the weld seam must be cooled below 100 ºC in order to complete the martensitic transformation prior to PWHT commonly carried out between 750 and 770 ºC for at least 2 h. The un-tempered martensitic microstructure is very sensitive to cold and stress corrosion cracking. Residual welding and external stresses must be reduced to a minimum. Any exposure to moisture must be avoided in the as welded condition. Keeping a temperature above the dew point or storage in humidity controlled atmosphere is highly recommended bridging the gap between welding and final post weld heat treatment. For heavy wall components conducting a dehydrogenating heat treatment between 260 and 400 ºC before cooling down to room temperature can be recommended. PWHT of cast components might require lower holding temperature of around 730 ºC but extended holding time of ≥ 8 h.

Approvals

CE