Phoenix SH Schwarz 3 MK

Stick electrode, basic coated, creep resistant

Classifications

EN ISO 3580-A	EN ISO 3580-B	EN ISO 2560-A	EN ISO 2560-B
E Mo B 4 2	E 4918-G	E 50 4 Mo B 4 2	E 4918-G
AWS A5.5 / SFA-5.5	**AWS A5.5M**		
E7018-G	E4918-G		

Characteristics and typical fields of application

Phoenix SH Schwarz 3 MK is a covered electrode with basic coating for shielded metal arc welding. The 0.5Mo type weld metal microstructure exhibit acicular ferrite and bainite with favorable mechanical properties in the as welded and post weld heat treated condition. The range of application covers joint welding of similar alloyed creep resistant steel and steel casting up to joining of high strength structural, fine grained and pipeline steels. Phoenix SH Schwarz 3 MK is approved for application under creep condition at design temperatures up to 550 ºC. Impact energy is excellent down to temperatures < -40 ºC. The increased manganes content enables the reliable fabrication of high strength steels up to a minimum yield strength of 500 MPa. The optimized coating of Phoenix SH Schwarz 3 MK guarantees low level of diffusible hydrogen in the weld metal.

Base materials

Similar creep resistant steels and cast steels, high strength Engineering, Fine grained and pipeline steels like
16Mo3, 20MnMoNi4-5, 13MnNiMo5-4, 15NiCuMoNb5, 17MnMoV6-4, S235JR-S355JR, S235JO-S355JO, S450JO, S235J2-S355J2, S275N-S460N, S275M-S460M, P235GH-P355GH, P355N, P285NH-P460NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH, L245NB-L415NB, L450QB, L245MB-L485MB, GE200-GE300
ASTM A 29 Gr. 1013, 1016; A 106 Gr. C; A, B; A 182 Gr. F1; A 234 Gr. WP1; A 283 Gr. B, C, D; A 335 Gr. P1; A 501 Gr. B; A 533 Gr. B, C; A 510 Gr. 1013; A 512 Gr. 1021, 1026; A 513 Gr. 1021, 1026; A 516 Gr. 70; A 633 Gr. C; A 678 Gr. B; A 709 Gr. 36, 50; A 711 Gr. 1013; API 5 L B, X42, X52, X60, X65, X70

Typical analysis

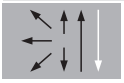
	C	Si	Mn	Mo
wt.-%	0.06	0.35	1.2	0.45

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	-40 °C
U	510 (≥ 500)	590 (560 - 720)	20	120	≥ 47
SR	520 (≥ 500)	600 (560 - 720)	21	120	≥ 47

U: as welded
SR: stress relieved (620 °C / 2 h)

Operating data



Polarity	DC +

Dimension mm	Current A
2.5 × 250	70 - 110
3.2 × 350	100 – 140
4.0 × 350	140 – 190
4.0 × 450	140 – 190
5.0 × 450	180 – 250

Preheating, interpass temperature, and post-weld heat treatment as required by the base metal. Preheating can normally be recommended being in a range of 100 to 250 ºC depending on the wall thickness. Common post weld heat treatments are carried out between 530 and 620 ºC.

Approvals

TÜV (00902), DB (10.014.95), DNV, CE