

Agglomerated Welding Flux BF 6.9 HELIX

Flux type: Aluminate-Basic

Classification: ISO 14174 – S A AB 1 67 AC H5*

Characteristics:

A semi-basic flux suitable for high speed welding with single and multi-wire submerged-arc processes. BF 6.9 HELIX is designed for spiral pipe fabrication employing the two-run technique. Weld bead performance and slag release are excellent providing flat welds with low reinforcement and flat weld interfaces free from undercut. The flux shows a high resistance to pock-marks, flux-abrasion and a low consumption rate with good flux feeding properties in the transport and

recovery system. As a result of low hydrogen levels (max. 5 ml/100g), oxygen levels of about 350 ppm and low nitrogen levels in the weld deposits, uniform mechanical properties with low temperature toughness are obtained. Due to achievable low hardness levels the weld deposits made with the flux BF 6.9 HELIX are also resistant to sour gas environment.

Application:

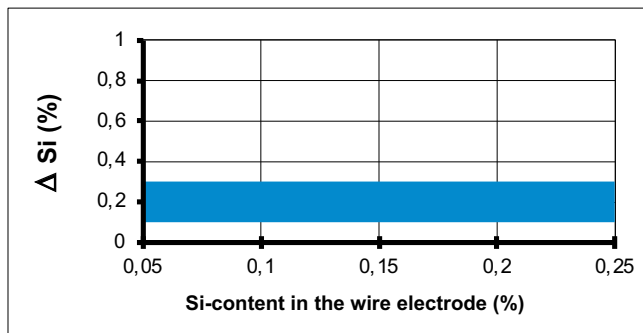
Low-alloy structural steels up to 500 N/mm², boiler steels and especially pipe steel qualities acc. to EN 10208-2/API-5L/5LX/5LS up to X 80 with special low-alloy filler materials.

Characteristic chemical Constituents:

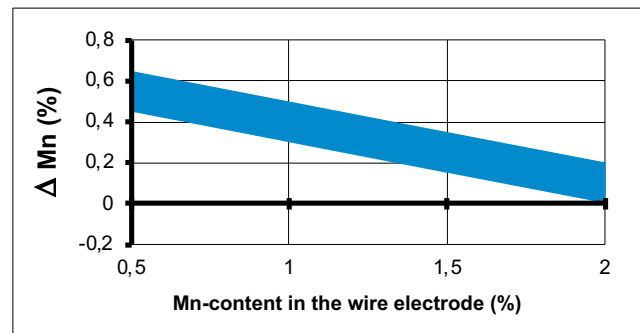
SiO ₂ + TiO ₂	Al ₂ O ₃ + MnO	CaO + MgO	CaF ₂
25 %	35 %	20 %	20 %
Basicity according to Boniszewski: ~1.2			

Metallurgisches Verhalten nach DIN EN 760:

Pick-up Silicon



Pick-up/Burn-out Manganese



Flux density: 0.95 kg/dm³ (l)

Grain size acc. to ISO 14174: 2–16 (Tyler 10 × 65)

Current-carrying capacity: 1,500 A (DC or AC) using one wire

* Diffusible hydrogen content H5: determined in deposited metal acc. to the method described in ISO 3690 Type of current DC; redrying conditions 200–250 °C

Two-run classification of wire-flux combinations:

Wire electrode		Two-Run/ISO 15792-2: type 2.5	AWS A5.17M/5.23M	AWS A5.17/5.23
ISO 14171-A	AWS A5.17/23			
BA-S2	EM12(K)	ISO 14171-A: S 3T 2 AB S2	F43TA2-EM12(K)	F6TA0-EM12(K)
BA-S2Si	EM12K	ISO 14171-A: S 3T 2 AB S2Si	F43TA2-EM12K	F6TA0-EM12K
BA-S3Si	EH12K	ISO 14171-A: S 4T 3 AB S3Si	F49TA3-EH12K	F7TA2-EH12K
BA-S2Mo	EA2	ISO 14171-A: S 5T 2 AB S2Mo	F62TA2-EA2	F9TA0-EA2
BA-S3Mo	EA4	ISO 14171-A: S 5T 3 AB S3Mo	F62TA3-EA4	F9TA2-EA4
BA-S3MoTiB	EG	ISO 14171-A: S 5T 5 AB SZ	F62TA5-EG	F9TA6-EG

Mechanical properties of two-run weld metal of pipe steels:

(characteristical values)

Wire electrode		Yield strength N/mm ²	Tensile strength N/mm ²	Impact ISO-V (J)					
				RT	± 0 °C +32 °F	-20 °C -4 °F	-30 °C -22 °F	-40 °C -40 °F	-51 °C -60 °F
BA-S2	EM12(K)	>400	>500	>130	>70	>50			
BA-S2Si	EM12K	>400	>500	>130	>70	>50	>47		
BA-S3Si	EH12K	>460	>560	>130	>80	>50			
BA-S2Mo	EA2	>560	>630	>130	>90	>50	>47		
BA-S3Mo	EA4	>570	>650	>130	>100	>80			
BA-S3MoTiB	EG	>570	>650	>150	>130	>100	>90	>70	>50

Mechanical properties are influenced up to 70 % by dilution of base-material.

All-weld metal multiple pass classification of wire-flux combinations:

Wire electrode		Test assembly ISO 15792-1: type 1.3	AWS A5.17M/5.23M	AWS A5.17/5.23
ISO 14171-A	AWS A5.17/.23			
BA-S2Si	EM12K	ISO 14171-A: S 38 3 AB S2Si	F48A3-EM12K	F7A2-EM12K
BA-S3Si	EH12K	ISO 14171-A: S 42 4 AB S3Si	F48A4-EH12K	F7A4-EH12K
BA-S2Mo	EA2	ISO 14171-A: S 46 3 AB S2Mo	F55A3-EA2-A2	F8A2-EA2-A2
BA-S3Mo	EA4	ISO 14171-A: S 50 3 AB S3Mo	F62A3-EA4-A4	F9A2-EA4-A4

Chemical composition of all-weld metall acc. to EN ISO 15792-1 und AWS A5.17/5.23:

(characteristical values in wt. %)

Wire electrode		C	Si	Mn	Mo	Ni	Cr
BA-S2Si	EM12K	0.05–0.08	0.2–0.5	1.0–1.4			
BA-S3Si	EH12K	0.05–0.08	0.2–0.5	1.4–1.7			
BA-S2Mo	EA2	0.05–0.08	0.2–0.5	1.0–1.4	0.4–0.6		
BA-S3Mo	EA4	0.05–0.09	0.2–0.5	1.3–1.7	0.4–0.6		

Mechanical properties of all-weld metal acc. to EN ISO 15792-1 and AWS A5.17/5.23:

(characteristical values)

Wire electrode		Yield strength N/mm ²	Tensile strength N/mm ²	Elong. %	Impact ISO-V (J)				
					RT	-20 °C -4 °F	-30 °C -22 °F	-40 °C -40 °F	-51 °C -60 °F
BA-S2	EM12(K)	>400	>490	>24	>100	>60	>50	>47	
BA-S3Si	EH12K	>470	>560	>23	>130	>80	>70		
BA-S2Mo	EA2	>490	>580	>23	>110	>80	>47		
BA-S3Mo	EA4	>550	>630	>22	>110	>80	>47		

Packaging: 25 kg PE-Bags or 500–1,250 kg Big Bags

Storage and redrying: Unopened originally packed flux bags can be stored up to one year in dry storage rooms after date of delivery ex factory.

Redrying conditions specific to the flux:

200–250 °C effective flux temperature