Agglomerated Welding Flux BF 6.5

Flux type: Fluoride-Basisch
Classification: ISO 14174 – S A FB 1 67 AC H5*

Characteristics:
A semi-basic multi-purpose flux suitable for single and multi-wire (up to 5 wires) SAW-processes. The flux exhibits good weldability characteristics over a wide range of welding parameters and is characterized by a low consumption rate. BF 6.5 is especially recommended for longitudinal pipe fabrication (two-run or multi-layer technique) due to its high welding speed characteristic. Weld bead performance and slag release, even in narrow gaps, are excellent providing flat welds with low reinforcement and flat weld interfaces free from undercuts. The flux shows a high resistance to 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.5ml/100g), oxygen levels of about 350 ppm and low nitrogen levels (max. 70 ppm) in the weld deposits, uniform mechanical properties with low temperature toughness are obtained.

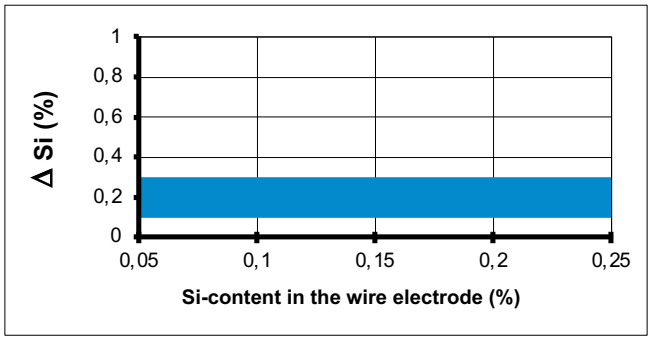
Application:
Manufacture of helical (spiral) and longitudinal seam steel pipes in grades L360 or X52 to L555 or X80 according to ISO 3183/API Spec. 5L with appropriate filler metals. Non-alloy and low-alloy structural steels acc. to EN 10025; boiler steels such as 16Mo3/A335 Gr. P1 and 13CrMo4- 5/A387Gr. 12; fine-grain structural steels with yield strengths up to 700 MPa observing the specific material requirements.

Characteristic chemical Constituents:

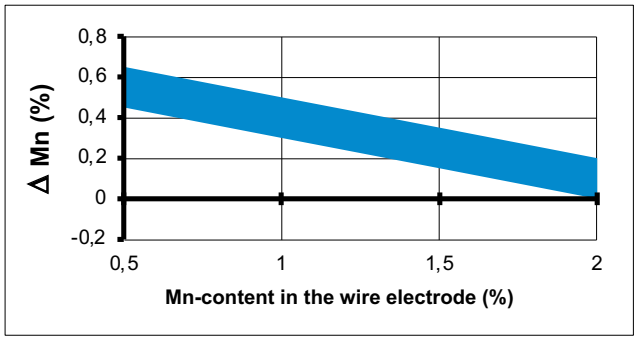
$SiO_2 + TiO_2$	$Al_2O_3 + MnO$	$CaO + MgO$	CaF_2
20 %	30 %	25 %	17 %
Basicity according to Boniszewski: ~1.7			

Metallurgical behaviour acc. to ISO 14174 type of current DC:

Pick-up Silicon



Pick-up/Burn-out Manganese



Flux density: 0.95 kg/dm³ (l)
Grain size acc. to ISO 14174: 2–20 (Tyler 8×65)
Current-carrying capacity: up to 1,000 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 300–350 °C

All-weld metal multiple pass classification of wire-flux combinations for welding pipe steels:

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-S2	EM12(K)	ISO 14171-A: S 38 4 FB S2	F48A4/P4-EM12(K)	F7A4/P4-EM12(K)
BA-S2Si	EM12K	ISO 14171-A: S 38 4 FB S2Si	F48A4/P4-EM12K	F7A4/P4-EM12K
BA-S3	EH10K	ISO 14171-A: S 46 4 FB S3	F55A4-EH10K	F8A4-EH10K
BA-S3Si	EH12K	ISO 14171-A: S 46 4 FB S3Si	F55A4-EH12K	F8A4-EH12K
BA-S2Mo	EA2	ISO 14171-A: S 46 3 FB S2Mo	F55A3/P3-EA2-A2	F8A2/P2-EA2-A2
BA-S3Mo	EA4	ISO 14171-A: S 50 3 FB S3Mo	F62A4-EA4-A4	F9A4-EA4-A4
BA-S2Ni1	ENi1	ISO 14171-A: S 42 6 FB S2Ni1	F49A6/P6-ENi1-Ni1	F7A8/P8-ENi1-Ni1
BA-S3NiMo1	EF3	ISO 14171-A: S 50 4 FB S3Ni1Mo	F62A4-EF3-F3	F9A4-EF3-F3

Two-run classification of wire-flux combinations for welding pipe steels:

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-S2Si	EM12K	ISO 14171-A: S 3T 2 FB S2Si	F43TA3-EM12K	F6TA8-EM12K
BA-S3Si	EH12K	ISO 14171-A: S 4T 3 FB S3Si	F49TA3-EH12K	F7TA2-EH12K
BA-S2Mo	EA2	ISO 14171-A: S 5T 2 FB S2Mo	F62TA3-EA2	F9TA2-EA2
BA-S3Mo	EA4	ISO 14171-A: S 5T 3 FB S3Mo	F62TA3-EA4	F9TA2-EA4
BA-S3NiMo1	EF3	ISO 14171-A: S 5T 3 FB S3Ni1Mo	F62TA3-EF3	F9TA2-EF3
BA-S2MoTiB	EA2TiB	ISO 14171-A: S 5T 5 FB S2MoTiB	F62TA5-EA2TiB	F9TA6-EA2TiB
BA-S3MoTiB	EG	ISO 14171-A: S 5T 5 FB SZ	F62TA5-EG	F9TA6-EG

Mechanical properties of two-run weld metal of pipe steels:
(characteristical values)

Wire electrode		Yield strength N/mm²	Tensile strength	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-S2Si [1]	EM12K	>400	>500	>100	>80	>50			
BA-S3Si [1]	EH12K	>460	>560	>100	>90	>60	>27		
BA-S2Mo [2]	EA2	>560	>620	>100	>80	>50			
BA-S3Mo [2]	EA4	>570	>650	>100	>90	>60	>27		
BA-S3NiMo	EF3	>570	>650	>100	>90	>70	>27		
BA-S2MoTiB [3]	EA2TiB	>560	>630	>100	>90		>80	>60	>50
BA-S3MoTiB [3]	EG	>570	>650	>100	>90		>80	>60	>50

[1] Low Si-base material up to X60 acc. to API Spec. 5L
[2] Si-deoxidized base material X65 and higher acc. to API Spec. 5L
[3] Low temperature toughness: BA-S2MoTiB better suitable for base material with higher Mn-content/BA-S3MoTiB for base material with lower Mn-content

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

Chemical composition of all-weld metal acc. to EN ISO 15792-1 and AWS A5.17/5.23:
(characteristical values in wt. %)

Wire electrode		C	Si	Mn	Mo	Ni	Cr
BA-S2	EM12(K)	0.05–0.08	0.2–0.4	1.2–1.6			
BA-S2Si	EM12K	0.05–0.08	0.2–0.5	1.2–1.6			
BA-S3	EH10K	0.05–0.08	0.2–0.4	1.5–1.8			
BA-S3Si	EH12K	0.05–0.08	0.2–0.5	1.5–1.8			
BA-S2Mo	EA2	0.05–0.08	0.2–0.4	1.2–1.6	0.4–0.6		
BA-S3Mo	EA4	0.05–0.08	0.2–0.4	1.5–1.8	0.4–0.6		
BA-S2Ni1	ENi1	0.05–0.08	0.2–0.4	1.2–1.6		0.8	
BA-S3NiMo1	EF3	0.05–0.08	0.2–0.5	1.5–1.8		0.8–1.0	
BA-S2MoTiB	EA2TiB	0.04–0.07	0.2–0.5	1.2–1.6	0.4–0.6	Ti 0.05	B 0.005
BA-S3MoTiB	EG	0.04–0.07	0.2–0.5	1.4–1.8	0.4–0.6	Ti 0.05	B 0.005
BA-S2CrMo1	EB2	0.05–0.08	0.2–0.4	1.1–1.5	0.5		1.0

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

Wire electrode		Heat treatment	YS MPa	UTS MPa	Elong. %	Impact ISO-V (J)				
						RT	-20 °C -4 °F	-30 °C -22 °F	-40 °C -40 °F	-60 °C -76 °F
BA-S2/S2Si	EM12(K)	AW	>400	>510	>24	>120	>80	>60	>47	
BA-S3Si	EH12K	AW	>470	>560	>23	>100	>80	>60	>60	
BA-S2Mo	EA2	AW	>500	>590	>22	>90	>60	>47		
		S*	>480	>570	>22	>80	>70	>47		
BA-S3Mo	EA4	AW	>540	>630	>20	>80	>70	>47		
BA-S2Ni1	ENi1	AW	>430	>520	>22	>100	>90		>70	>47
		S**	>400	>510	>22	>100	>90		>80	>47
BA-S3NiMo1	EF3	AW	>610	>720	>20	>100	>70	>60	>47	
		S**	>570	>650	>20	>100	>70	>60	>47	
BA-S2CrMo1	EB2	A***	>400	>500	>20	>90	-10°C>40			

Post Weld Heat Treatment: * 620 °C/15 h; ** 580 °C/15 h; *** 690 °C/15 h

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

Packaging: 25 kg PE-Bags or 500–1,250 kg Big Bags
Storage: 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:
300–350 °C effective flux temperature