

Characteristics: FL188F is an agglomerated aluminate-basic welding flux suitable for joint welding of low alloy structural steels, boiler steels, pipe steels and fine grain steels. The flux is suitable for single and multilayer welding of longitudinal, circumferential and fillet welds. It can be used for single, tandem, twin and multi-wire welding system. Excellent slag removal in narrow groove welds of thick wall sections. Typical characteristics of this flux is a medium Manganese and Silicon pick up as well as a very low diffusible hydrogen level. This type of flux is suitable for both AC and DC welding.

Application: the main applications of this flux are joint welding of non-alloy and low-alloy structural steels according to EN ISO 10025, fine-grain structural steels with YS < 420 MPa and boiler steels such P265GH (H II) and 16Mo3/A355 grade 91.

Classification	ISO 14174: S A AB 1 67 AC H5 (*)
Basicity index	about 1.7 (according to Boniszewski)
Current	DC or AC, in single or multi-wires up to 1500 Amp. using one wire electrode
Grain size	according to ISO 14174: 2-16 (0.2-1.6 mm.)
Density	about 1.1 kg./dm ³
Rebaking	at 200 ± 50 °C effective temperature
Packaging	in plastic bags of 25 kg

Main chemical constituents

SiO ₂ + TiO ₂	Al ₂ O ₃ + MnO	CaO + MgO	CaF ₂
20%	30%	30%	15%

Chemical composition of all weld metal acc. to ISO 15792-1 and AWS A5.17/A5.23

In combination with wire electrode	AWS A5.17 AWS A5.23	C%	Si%	Mn%	Cu%	Ni%	Cr%	Mo%
PITTARC S1	EL12	0.05-0.08	0.2-0.4	0.9-1.3	–	–	–	–
PITTARC S2	EM12K	0.05-0.08	0.2-0.4	1.1-1.5	–	–	–	–
PITTARC S2Si	EM12K	0.05-0.08	0.3-0.5	1.1-1.5	–	–	–	–
PITTARC S3Si	EH12K	0.05-0.08	0.3-0.5	1.5-1.9	–	–	–	–
PITTARC S2Mo	EA2	0.04-0.08	0.2-0.4	1.1-1.5	–	–	–	0.5
PITTARC SH2	EG	0.05-0.08	0.2-0.5	1.1-1.5	0.5	0.7	0.2	0.1
PITTARC S3Ni1Mo0,2	ENi5	0.05-0.08	0.2-0.5	1.5-1.9	–	0.9	–	0.2
PITTARC S3Ni1Mo	EF3	0.06-0.10	0.2-0.5	1.5-1.9	–	0.9	–	0.5

Mechanical properties of all weld metal

In combination with wire electrode	Heat treat.	YS [MPa]	UTS [MPa]	Elong. [%]	Impact ISO-V [Joule]			
					± 0 °C + 32 °F	-20 °C -4 °F	-30 °C -22 °F	-40 °C -40 °F
PITTARC S1	AW	> 400	> 500	> 24	> 70	> 50	–	–
PITTARC S2	AW	> 420	> 500	> 22	> 100	> 70	> 47	> 27
PITTARC S2	PWHT ⁽¹⁾	> 400	> 490	> 22	> 100	> 70	> 47	> 27
PITTARC S2Si	AW	> 430	> 500	> 22	> 100	> 70	> 60	> 47
PITTARC S2Si	PWHT ⁽¹⁾	> 400	> 490	> 22	> 100	> 70	> 60	> 47
PITTARC S3Si	AW	> 470	> 560	> 22	< 100	> 80	> 70	> 47
PITTARC S3Si	PWHT ⁽¹⁾	> 400	> 500	> 22	> 100	> 80	> 70	> 27
PITTARC S2Mo	AW	> 490	> 570	> 20	> 100	> 80	> 47	–
PITTARC S2Mo	PWHT ⁽²⁾	> 470	> 550	> 22	> 100	> 80	> 47	–
PITTARC SH2	AW	> 470	> 550	> 22	> 100	> 70	> 47	–
PITTARC SH2	PWHT ⁽¹⁾	> 400	> 500	> 20	> 100	> 70	> 47	–
PITTARC S3Ni1Mo0,2	AW	> 560	> 640	> 20	–	–	> 70	> 47
PITTARC S3Ni1Mo0,2	PWHT ⁽¹⁾	> 500	> 590	> 20	–	–	> 50	–
PITTARC S3Ni1Mo	AW	> 580	> 680	> 20	–	–	> 70	> 47

Heat treatment: AW = as welded

PWHT = post weld heat treatment ⁽¹⁾ at 580 °C x 1 hours; ⁽²⁾ at 620 °C x 15 hours

Classification

In combination with wire electrode	AWS A5.17 AWS A5.23	ISO 14171-A (Test ass. ISO 15791-1 type 1.3)	AWS A5.17M AWS A5.23M	AWS A5.17 AWS A5.23
PITTARC S1	EL12	S 38 2 AB S1	F48A2-EL12	F7A0-EL12
PITTARC S2	EM12K	S 42 3 AB S2	F48A4/P4-EM12K	F7A4/P4-EM12K
PITTARC S2Si	EM12K	S 42 3 AB S2Si	F48A4/P4-EM12K	F7A4/P4-EM12K
PITTARC S3Si	EH12K	S 46 4 AB S3Si	F55A4/F49P4-EH12K	F8A5/F7P4-EH12K
PITTARC S2Mo	EA2	S 46 3 AB S2Mo	F55A3/P3-EA2-A2	F8A2/P2-EA2-A2
PITTARC SH2	EG	S 46 3 AB S2NiCu	F55A3/F49P3-EG-G	F8A2/F7P2-EG-G
PITTARC S3Ni1Mo0,2	ENi5	S 50 4 AB S3Ni1Mo0,2	F62A4/P4-ENi5-Ni5	F8A5-ENi5-Ni5
PITTARC S3Ni1Mo	EF3	S 50 4 AB S3Ni1Mo	F69A4-EF3-F3	F9A4-EF3-F3

Note: (*) Diffusible hydrogen (H5) determined in deposited metal in according to the method described in ISO 3690, type of current DC and redrying conditions at 200 ± 50 °C.

The above-mentioned values are indicative and may change without prior notice.

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