

Characteristics: FL190B is an agglomerated aluminate-basic flux suitable for joint welding of low-alloy structural steels, fine-grained steels and pipe steel qualities. Designed for DC and AC welding is suitable for two-run or multi-pass technique using single or multi wire process. In combination with appropriate wires, such as Mo, Ni or Ni-Mo alloyed types, uniform mechanical properties with low temperature toughness are achieved. Slag removal, even in narrow-groove welds of thick-walled sections, or at high preheating temperature (>250 °C), together with finely rippled weld bead performance and smooth tie-ins, even when fillet welding using high current, are additional features of this flux.

FL190B is formulated to achieve very low diffusible hydrogen levels (<4 ml/100 g weld metal).

Application: suitable to join low-alloy structural steels with YS up to 420 MPa, boiler and pressure vessels, fine-grain structural steels up to YS 460 MPa and pipe steel qualities up to API-5L X70 grade.

Classification	ISO 14174: S A AB 1 67 AC H5
Basicity index	about 1.7 (according to Boniszewski)
Current	up to 1000 Amp. (DC or AC) using one wire electrode
Flux density	1.1 kg/dm ³
Grain size	according to ISO 14174: 3-20 (0.3-2.0 mm)
Rebaking	at 200 ± 50 °C effective flux temperature
Packaging	in PE 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%	Mo%	Ni%	Cr%	Cu%
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 SH2	EG	0.05-0.08	0.3-0.5	1.0-1.4	0.15	0.8	–	0.5
PITTARC S2Mo	EA2	0.05-0.08	0.2-0.4	1.1-1.5	0.5	–	–	–
PITTARC S3Mo	EA4	0.05-0.08	0.2-0.4	1.5-1.9	0.5	–	–	–
PITTARC S2Ni1	ENi1	0.05-0.08	0.2-0.4	1.1-1.5	–	0.8	–	–
PITTARC S2Ni2	ENi2	0.05-0.08	0.2-0.4	1.1-1.5	–	2.0	–	–
PITTARC S3Ni1Mo	EF3	0.05-0.08	0.2-0.4	1.5-1.9	0.5	0.9	–	–
PITTARC S2Cr1Mo	EB2-R	0.05-0.08	0.2-0.4	1.0-1.4	–	0.5	1.0	–

Mechanical properties of all weld metal

In combination with wire electrode	AWS A5.17 A5.23	Heat treat.	YS [MPa]	UTS [MPa]	El. [%]	Impact ISO-V [Joule]				
						±0 °C +32 °F	-20 °C -4 °F	-40 °C -40 °F	-51 °C -60 °F	-73 °C -100 °F
PITTARC S1	EL12	AW	> 400	> 490	> 24	> 80	> 60	> 47*	-	-
PITTARC S2	EM12K	AW	> 420	> 510	> 24	> 100	> 70	> 47	-	-
PITTARC S2	EM12K	PWHT (1)	> 360	> 450	> 24	> 100	> 70	> 27	-	-
PITTARC S2Si	EM12K	AW	> 440	> 520	> 24	> 100	> 80	> 60	> 47	-
PITTARC S2Si	EM12K	PWHT (1)	> 400	> 480	> 24	> 100	> 80	> 60	> 47	-
PITTARC S3Si	EH12K	AW	> 470	> 560	> 23	> 120	> 100	> 80	> 47	-
PITTARC S3Si	EH12K	PWHT (1)	> 420	> 520	> 24	> 120	> 110	> 70	> 47	-
PITTARC SH2	EG	AW	> 470	> 570	> 23	> 90	> 70	> 47	-	-
PITTARC S2Mo	EA2	AW	> 490	> 580	> 22	> 90	> 60	> 47	-	-
PITTARC S2Mo	EA2	PWHT (2)	> 470	> 560	> 22	> 100	> 70	> 27	-	-
PITTARC S3Mo	EA4	AW	> 540	> 640	> 22	> 90	> 60	> 47	-	-
PITTARC S3Mo	EA4	PWHT (2)	> 540	> 620	> 22	> 90	> 60	> 27	-	-
PITTARC S2Ni1	ENi1	AW	> 440	> 530	> 25	-	> 140	> 100	> 60	> 47
PITTARC S2Ni1	ENi1	PWHT (1)	> 400	> 490	> 26	-	> 150	> 120	> 110	> 47
PITTARC S2Ni2	ENi2	AW	> 480	> 580	> 22	-	> 140	> 100	> 60	> 47
PITTARC S2Ni2	ENi2	PWHT (1)	> 460	> 550	> 23	-	> 150	> 110	> 70	> 47
PITTARC S3Ni1Mo	EF3	AW	> 570	> 670	> 22	> 110	> 100	> 47	-	-
PITTARC S3Ni1Mo	EF3	PWHT (1)	> 570	> 670	> 22	> 120	> 110	> 47	-	-
PITTARC S2Cr1Mo	EB2-R	PWHT (3)	> 470	> 570	> 22	> 80	> 47	> 27	-	-

AW: as welded. PWHT: post weld heat treatment (1) = at 580 °C/15h, (2) = at 620 °C/15h, (3) = at 650 °C/15h/700 °C/2h. (*) @ -30 °C

Classification

In combination with wire electrode	AWS A5.17 AWS A5.23	ISO 14171-A ISO 24598-A	AWS A5.17M AWS A5.23M	AWS A5.17 AWS A5.23
PITTARC S1	EL12	S 38 3 AB S1	F48A3-EL12	F7A2-EL12
PITTARC S2	EM12K	S 42 4 AB S2	F48A4/F43P4-EM12K	F7A4/F6P4-EM12K
PITTARC S2Si	EM12K	S 42 5 AB S2Si	F48A5/P5-EM12K	F7A6/P6-EM12K
PITTARC S3Si	EH12K	S 46 5 AB S3Si	F55A5/F49P5-EH12K	F8A6/F7P6-EH12K
PITTARC SH2	EG	S 46 4 AB S2NiCu	F55A4-EG-G	F8A4-EG-G
PITTARC S2Mo	EA2	S 46 4 AB S2Mo	F55A4/P4-EA2-A2	F8A4/P4-EA2-A2
PITTARC S3Mo	EA4	S 50 4 AB S3Mo	F62A4/P4-EA4-A3	F9A4/P4-EA4-A3
PITTARC S2Ni1	ENi1	S 42 7 AB S2Ni1	F49A7/P7-ENi1-Ni1	F7A10/P10-ENi1-Ni1
PITTARC S2Ni2	ENi2	S 46 7 AB S2Ni2	F55A7-ENi2-Ni2	F8A10/F7P10-ENi2-Ni2
PITTARC S3Ni1Mo	EF3	S 50 4 AB S3Ni1Mo	F62A4/P4-EF3-F3	F9A5/P5-EF3-F3
PITTARC S2Cr1Mo	EB2	S S CrMo1 AB	F55P4-EB2	F8P4-EB2-B2

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

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