PITTARC FL164B

Characteristics: FL164B is a fluoride-basic flux with high basicity and low impurities level such as P and S.
As a result of low oxygen level in the weld metal high toughness at low temperature and uniform mechanical properties are achieved.
FL164B is suitable for welding on DC and AC using single and tandem wire processes.

Application: The low hydrogen levels after redraying and the optimum mechanical properties enables welding of thick-walled construction steels with yield strength up to 420 MPa, off-shore application with YS up to 460 MPa on base materials like BS 4360-Grade 50 D and S355 2G3 according to EN 10025, fine grain structural steel for low temperature requirements with impact toughness at -60 °C or bellow, high tensile fine grain steel such as S690QL1 and N-A-XTRA 70, boiler and pressure vessels steels such as 16Mo3/A204 grade A, 13CrMo4-5/A387 grade 12 or 10CrMo9-10/A387 grade 22.

Classification	**ISO 14174: S A FB 1 55 AC H5**
Basicity index	about 3.0 (according to Boniszewski)
Current	up to 800 Amp. (DC or AC) using one wire electrode
Grain size	according to ISO 14174: 2-20 (0.2-2.0 mm.)
Density	about 0.95 kg./dm³
Packaging	in PE-coated Aluminum bags (dry-bags) of 25 kg
Storage and Redrying	unopened original packed flux can be stored up to 1 years in dry storage rooms after date of delivery. Redrying conditions specific to the flux: 300-350 °C effective temperature of the flux to obtain diffusible hydrogen 5 ml/100 gr.

Main chemical constituents

$SiO_2 + TiO_2$	$Al_2O_3 + MnO$	$CaO + MgO$	CaF_2
15%	20%	40%	25%

Chemical composition of all weld metal

In combination with wire electrode	AWS A5.17 AWS A5.23	C%	Si%	Mn%	Mo%	Ni%	Cr%
PITTARC S2/S2Si	EM12K	0.05-0.09	0.1-0.5	0.8-1.2	-	-	-
PITTARC S3Si	EH12K	0.05-0.09	0.2-0.5	1.2-1.6	-	-	-
PITTARC S2Mo	EA2	0.05-0.09	0.1-0.3	0.8-1.2	0.5	-	-
PITTARC S2Ni1	ENi1	0.05-0.09	0.1-0.3	0.8-1.2	-	1.0	-
PITTARC S2Ni2	ENi2	0.05-0.09	0.1-0.3	0.8-1.2	-	2.0	-
PITTARC S2Ni3	ENi3	0.05-0.09	0.1-0.3	0.8-1.2	-	3.0	-
PITTARC S3Ni1Mo0,2	ENi5	0.05-0.09	0.2-0.4	1.1-1.5	0.25	1.0	-
PITTARC S3Ni1Mo	EF3	0.05-0.09	0.1-0.3	1.2-1.6	0.5	1.0	-
PITTARC S3Ni2½CrMo	~EM4	0.05-0.09	0.1-0.3	1.2-1.6	0.5	2.5	0.5
PITTARC S2Cr1Mo	EB2	0.05-0.09	0.1-0.3	0.5-0.9	0,5	-	1.2
PITTARC S1Cr2Mo1	EB3	0.05-0.09	0.1-0.3	0.4-0.7	1	-	2.3

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PITTARC FL164B

Mechanical properties of all weld metal

In combination with wire electrode	Heat treat.	YS [MPa]	UTS [MPa]	El. [%]	Impact ISO-V [Joule] RT	-20 °C -4 °F	-40 °C -40 °F	-60 °C -76 °F	-80 °C -112 °F
PITTARC S2/S2Si	AW	≥400	≥490	≥26	≥120	≥100	≥70	≥47	-
PITTARC S3Si	AW	≥470	≥550	≥25	≥120	≥100	≥80	≥47	-
PITTARC S3Si	PWHT (1)	≥430	≥530	≥26	≥120	≥100	≥90	≥47	-
PITTARC S2Mo	AW	≥490	≥570	≥23	≥100	≥90	≥47	-	-
PITTARC S2Mo	PHWT (2)	≥440	≥530	≥24	≥100	≥90	≥47	-	-
PITTARC S2Ni1	AW	≥440	≥540	≥26	≥160	≥140	≥120	≥90	≥47(*)
PITTARC S2Ni2	AW	≥470	≥550	≥25	≥160	≥140	≥120	≥80	≥47
PITTARC S2Ni2	PWHT (1)	≥420	≥520	≥26	≥160	≥140	≥120	≥90	≥47
PITTARC S2Ni3	AW	≥500	≥590	≥24	≥160	≥150	≥120	≥100	≥27(**)
PITTARC S2Ni3	PHWT (1)	≥470	≥560	≥25	≥160	≥150	≥120	≥100	≥27(**)
PITTARC S3Ni1Mo0,2	AW	≥480	≥560	≥26	≥160	≥140	≥120	≥47	-
PITTARC S3Ni1Mo0,2	PHWT (1)	≥470	≥550	≥26	≥160	≥150	≥120	≥47	-
PITTARC S3Ni1Mo	AW	≥570	≥670	≥22	≥140	≥110	≥80	≥47	-
PITTARC S3Ni1Mo	PWHT (1)	≥550	≥640	≥22	≥150	≥110	≥80	≥47	-
PITTARC S3Ni2½CrMo	AW	≥690	≥820	≥18	≥140	≥90	≥70	≥47	-
PITTARC S2Cr1Mo	PWHT (3)	≥470	≥570	≥22	≥100	≥47	-	-	-
PITTARC S1Cr2Mo1	PWHT (3)	≥470	≥570	≥23	≥100	≥47	-	-	-

AW = as welded.
PWHT: (1) = 590 °C/15 hours, (2) = 620 °C/15 hours, (3) = 700 °C/10 hours
(*) Impact test @ -70 °C,
(**) Impact test @ -101 °C

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

In combination with wire electrode	AWS A5.17 AWS A5.23	ISO 14171-A ISO 26304-A ISO 24598-A	AWS A5.17M AWS A5.23M	AWS A5.17 AWS A5.23
PITTARC S2/S2Si	EM12-K	S 38 6 FB S2	F48A6/P6-EM12K	F7A8/P8-EM12K
PITTARC S3Si	EH12K	S 46 6 FB S3Si	F55A6/F49P6-EH12K	F8A8/F7P8-EH12K
PITTARC S2Mo	EA2	S 46 4 FB S2Mo	F55A4/F49P4-EA2-A2	F8A4/F7P4-EA2-A2
PITTARC S2Ni1	ENi1	S 42 7 FB S2Ni1	F49A7/P7-ENi1-Ni1	F7A10/P10-ENi1-Ni1
PITTARC S2Ni2	ENi2	S 46 8 FB S2Ni2	F55A7/F49P7-ENi2-Ni2	F8A10/F7P10-ENi2-Ni2
PITTARC S2Ni3	ENi3	S 50 8 FB S2Ni3	F55A7/P7-ENi3-Ni3	F8A10/P10-ENi3-Ni3
PITTARC S3Ni1Mo0,2	ENi5	S 46 6 FB S3Ni1Mo0,2	F55A6/P6-ENi5-Ni5	F8A8/P8-ENi5-Ni5
PITTARC S3Ni1Mo	EF3	S 55 6 FB S3Ni1Mo	F62A6/P6-EF3-F3	F9A8/P8-EF3-F3
PITTARC S3Ni2½CrMo	~EM4	S 69 6 FB S3Ni2½CrMo	F76A6/P6~EM4-M4	F11A8/P8~EM4-M4
PITTARC S2Cr1Mo	EB2-R	S CrMo1 FB	F55P2-EB2R-B2R	F8P0-EB2R-B2R
PITTARC S1Cr2Mo1	EB3-R	S CrMo2 FB	F55P2-EB3R-B3R	F8P0-EB3R-B3R

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

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