OP 121TT

OERLIKON

SAW Fluxes
SAW Basic and Semi-basic Fluxes

OP 121TT is a fully basic agglomerated submerged-arc welding flux that is widely used for the welding of structural and fine grained low alloy steels requiring high integrity welds with low temperature impact and CTOD fracture toughness properties. OP 121TT flux, in combination with a range of Oerlikon submerged-arc wires, in particular with OE-SD3, is established for the welding of offshore structures such as oil platform jackets, piles, decks and modules giving a high level of consistency and mechanical property performance. The flux is widely used for the welding of thick section components in the offshore, nuclear and pressure vessel industries. The flux exhibits a low hydrogen content in the as manufactured condition and gives a high resistance to moisture pick up during exposure under workshop conditions. The flux promotes a very stable arc characteristic during use with excellent slag detachment. The weld is of a uniform even profile with regular fine ripple formation and smooth toe blending. OP 121TT flux is suitable for use with DC+ or AC and is ideal for single wire, twin wire, tandem arc [DC+/AC] and other multi-arc systems using up to 1000A with single wire welding. Grain size according to EN-ISO 14174: 2-20.

Classification		
	EN ISO	14174: SA FB 1 55 AC H5
OE-S1 CrMo2	AWS	A5.23: F8P2-EB3-B3
OE-S2 CrMo1	AWS	A5.23: F8P4-EB2R-B2
OE-S2 Mo	AWS	A5.23: F8A4-EA2-A2
OE-S2 Mo	AWS	A5.23: F8P4-EA2-A2
OE-S2 Ni2	AWS	A5.23: F7A10-ENi2-Ni2
OE-S2 Ni2	AWS	A5.23: F7P10-ENi2-Ni2
OE-SD3 Mo	AWS	A5.23: F8A6-EA4-A4
OE-SD3 Mo	AWS	A5.23: F8P6-EA4-A4
OE-TIBOR 22	AWS	A5.23: F7A8-EG-G
OE-TIBOR 33	AWS	A5.23: F8A6-EG-G
OE-S2	AWS	A5.17: F6P8-EM12K
OE-S2	AWS	A5.17: F7A6-EM12K
OE-SD3	AWS	A5.17: F7A8-EH12K
OE-SD3	AWS	A5.17: F7P8-EH12K
OE-SD3 1Ni ¼Mo	AWS	A5.23: F8A10-EG-G
OE-SD3 1Ni ¼Mo	AWS	A5.23: F8P10-EG-G
OE-SD3 1Ni ½Mo	AWS	A5.23: F9A8-EF3/EG-F3
OE-SD3 1Ni ½Mo	AWS	A5.23: F9P8-EF3/EG-F3
OE-SD3 2NiCrMo	AWS	A5.23: F11A8-EG-G
OE-SD3 2NiCrMo	AWS	A5.23: F11P5-EG-G

	Approvals	Grade
OE-S2 Mo	ABS	3YM-3YT
FLUXOCORD 31	DB	●
FLUXOCORD 31HD	DB	●
FLUXOCORD 42	DB	●
OE-S2 Mo	DB	●
OE-S2 Ni2	DNV	5YM H5, 3YT H5
OE-S2 Ni2	GL	in Progress
OE-S2 Mo	LRS	3Y40T, 4Y40M H5
FLUXOCORD 31HD	LRS	4Y
FLUXOCORD 41	TÜV	●
OE-S1 CrMo2	TÜV	●
OE-S2 CrMo1	TÜV	●
OE-S2 Mo	TÜV	●
OE-S2 Ni1	TÜV	●
OE-S2 Ni2	TÜV	●
OE-S2 Ni3	TÜV	●
OE-SD3 Mo	TÜV	●
OE-S2	LRS	3M, 3YM
OE-S2	TÜV	●
OE-S3	DB	●
OE-S3	TÜV	●
OE-SD3	ABS	5YQ420 H5
OE-SD3	BV	5Y42M H5
OE-SD3	DB	●
OE-SD3	DNV	5Y42M H5
OE-SD3	GL	6Y42M H5
OE-SD3	LRS	5Y42M H5
OE-SD3	RMRS	5Y40M HHH
OE-SD3	TÜV	●
OE-SD3 1Ni ¼Mo	ABS	4Y Q460M
OE-SD3 1Ni ¼Mo	DB	●
OE-SD3 1Ni ¼Mo	TÜV	●
OE-SD3 1Ni ½Mo	ABS	5Y Q550M
OE-SD3 1Ni ½Mo	DNV	5Y55M H5
OE-SD3 1Ni ½Mo	LRS	3Y50M H5
OE-SD3 1Ni ½Mo	TÜV	●
OE-SD3 2NiCrMo	ABS	5Y Q690M
OE-SD3 2NiCrMo	DB	●
OE-SD3 2NiCrMo	DNV	5Y69M H5
OE-SD3 2NiCrMo	LRS	5Y69M H5
OE-SD3 2NiCrMo	TÜV	●

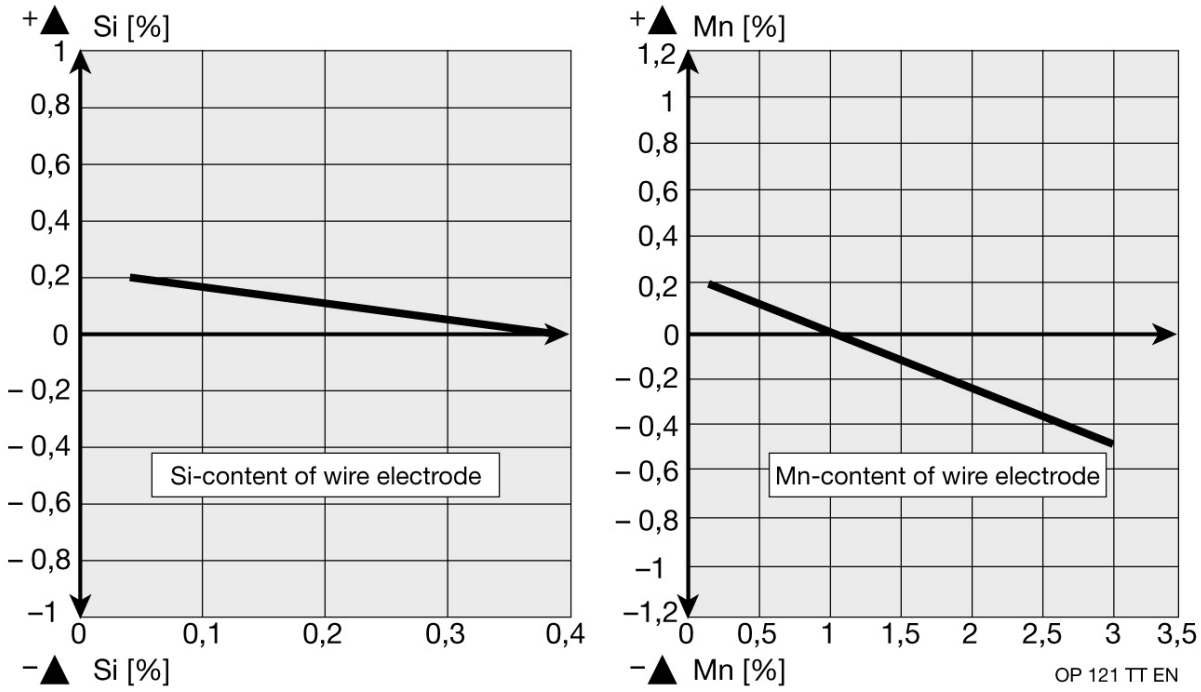
Flux Main Components	
CaO + MgO	35 %
CaF2	25 %
Al2O3 + MnO	20 %
SiO2 + TiO2	15 %

Boniszewski Basicity	3.1

AIR LIQUIDE WELDING

METALLURGICAL BEHAVIOUR

Pick-up and burn-out of the alloying elements Si and Mn = f (alloy content of wire electrode)
DVS-Merkblatt 0907 Part 1



Chemical analysis (Typical values in %)

		C	Mn	Si	Cr	Ni	Mo	Ti	B
All weld metal	OE-S1 CrMo2	0.08	0.6	0.3	2.2	-	1	-	-
All weld metal	OE-S2 CrMo1	0.07	0.9	0.3	1.1	-	0.5	-	-
All weld metal	OE-S2 Mo	0.07	0.9	0.2	-	-	0.5	-	-
All weld metal	OE-S2 Ni2	0.07	0.9	0.3	-	2.3	-	-	-
All weld metal	OE-S2 Ni3	0.06	0.9	0.2	-	3.3	-	-	-
All weld metal	OE-SD3 Mo	0.07	1.3	0.2	-	-	0.5	-	-
All weld metal	OE-TIBOR 22	0.06	1	0.1	-	-	0.3	0.013	0.0010
All weld metal	OE-TIBOR 33	0.07	1.2	0.3	-	-	0.5	0.15	0.012
All weld metal	OE-S2	0.07	0.9	0.2	-	-	-	-	-
All weld metal	OE-SD3	0.07	1.6	0.3	-	-	-	-	-
All weld metal	OE-SD3 1Ni ¼Mo	0.07	1.3	0.3	-	0.9	0.2	-	-
All weld metal	OE-SD3 1Ni ½Mo	0.07	1.5	0.3	-	0.95	0.5	-	-
All weld metal	OE-SD3 2NiCrMo	0.07	1.4	0.4	0.6	2.2	0.5	-	-

All-weld metal Mechanical Properties

	Heat Treatment	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation A5 (%)
OE-S1 CrMo2	720°Cx8h	≥ 450	550-650	≥ 22
OE-S1 CrMo2	940°C/air+740°C	≥ 400	520-620	≥ 22
OE-S2 CrMo1	680°Cx2h	≥ 380	530-630	≥ 24
OE-S2 CrMo1	920°C/air+710°C	≥ 310	430-530	≥ 30
OE-S2 Mo	As Welded	≥ 470	550-680	≥ 24
OE-S2 Ni2	As Welded	≥ 450	550-600	≥ 24
OE-S2 Ni2	600°Cx2h	≥ 430	500-600	≥ 26
OE-S2 Ni3	As Welded	≥ 480	560-660	≥ 25
OE-SD3 Mo	As Welded	≥ 550	610-670	≥ 29
OE-SD3 Mo	620°Cx1h	≥ 520	600-660	≥ 27
OE-TIBOR 22	As Welded	≥ 430	500-650	≥ 20
OE-TIBOR 33	As Welded	≥ 530	580-700	≥ 20
OE-S2	As Welded	≥ 360	450-550	≥ 28
OE-SD3	As Welded	≥ 450	530-630	≥ 25
OE-SD3	600°Cx2h	≥ 400	490-590	≥ 27
OE-SD3 1Ni ¼Mo	As Welded	≥ 500	560-680	≥ 22
OE-SD3 1Ni ¼Mo	600°Cx2h	≥ 470	550-660	≥ 24
OE-SD3 1Ni ½Mo	As Welded	≥ 550	650-750	≥ 20
OE-SD3 1Ni ½Mo	600°Cx2h	≥ 540	630-730	≥ 22
OE-SD3 2NiCrMo	As Welded	≥ 720	760-900	≥ 18
OE-SD3 2NiCrMo	580°Cx2h	≥ 600	700-850	≥ 19

All-weld metal Mechanical Properties - CV

	Heat Treatment	Impact Energy (J)				
		0 °C	-20 °C	-40 °C	-60 °C	-80 °C
OE-S1 CrMo2	720°Cx8h	≥ 100				
OE-S1 CrMo2	940°C/air+740°C	≥ 90				
OE-S2 CrMo1	680°Cx2h	≥ 180				
OE-S2 CrMo1	920°C/air+710°C	≥ 200				
OE-S2 Mo	As Welded	≥ 120	≥ 100	≥ 50		
OE-S2 Ni2	As Welded	≥ 140	≥ 120	≥ 100	≥ 70	≥ 50
OE-S2 Ni2	600°Cx2h	≥ 160	≥ 140	≥ 130	≥ 100	≥ 80
OE-S2 Ni3	As Welded	≥ 160	≥ 140	≥ 130	≥ 100	≥ 80
OE-SD3 Mo	As Welded			≥ 110	≥ 80	
OE-SD3 Mo	620°Cx1h			≥ 130	≥ 60	
OE-TIBOR 22	As Welded				≥ 50	
OE-TIBOR 33	As Welded			≥ 50		
OE-S2	As Welded	≥ 160	≥ 100	≥ 50		
OE-SD3	As Welded	≥ 180		≥ 100	≥ 70	
OE-SD3	600°Cx2h	≥ 200		≥ 120	≥ 90	
OE-SD3 1Ni ¼Mo	As Welded			≥ 145	≥ 70	
OE-SD3 1Ni ¼Mo	600°Cx2h			≥ 160	≥ 70	
OE-SD3 1Ni ½Mo	As Welded	≥ 120	≥ 90	≥ 70	≥ 47	
OE-SD3 1Ni ½Mo	600°Cx2h	≥ 140	≥ 120	≥ 90	≥ 70	
OE-SD3 2NiCrMo	As Welded				≥ 69	
OE-SD3 2NiCrMo	580°Cx2h			≥ 47		

Typical applications

	Materials
OE-S2 Mo	ASME: X60, X65, ASTM A355 Gr. P1; A182M Gr. F1 EN: 16Mo3, S(P)355-S(P)460, L245-L450
OE-S2 Ni3	ASME: ASTM A333 Grade 3, ASTM A334 Grade 3; A352LC3; ASTM A203 D, E EN: 12Ni14, S(P)275-S(P)460
OE-TIBOR 22	ASME: X70; S(P)420-S(P)460; L245-L485
OE-S2 CrMo1	ASME: A199 and A200 grade T11, A213 Grades T11, T12 EN: 13CrMo4-5, 13CrMoSi5-5
OE-S2 Ni2	EN: 11MnNi5-3, 15NiMn5-3
OE-TIBOR 33	ASME: X70, X80;S(P)420-S(P)500; L245-L550
OE-TIBOR 22	ASME: X70; S(P)420-S(P)460; L245-L485
OE-TIBOR 33	ASME: X70, X80;S(P)420-S(P)500; L245-L550
OE-TIBOR 22	ASME: X70; S(P)420-S(P)460; L245-L485
OE-TIBOR 33	ASME: X70, X80;S(P)420-S(P)500; L245-L550
OE-S2	ASME: ASTM A131 Grades A, B, D, DS; A253 all Grades; A529 Grades 42, 50; A570 all Grades; A572 Grades 42, 50; A709 Grades 36, 50 EN: S(P)235-S(P)355; L245-L360
OE-SD3	ASME: A516 all GradesEN: S(P)235-S(P)420
OE-SD3 1Ni ¼Mo	ASME: ASTM A131 AH40, DH40, EH40, X65, X70EN: S(P)275-S(P)460
OE-SD3 1Ni ½Mo	ASME: X70, X80, N-A-XTRA 55, HY80, QINEN: S(P)420-S(P)500; L245-L485; 20MnMoNi5-5, 15NiCuMoNb5

Redrying	Current Conditions
300-350°Cx2-4h	AC; DC+

Packaging data

Packaging Type	PE	DRY
Weight (kg)	25	25
-	W000280041	W000280042