

SAW Basic and Semi-basic Fluxes C-Mn and low alloy steels

OP121TT 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. OP121TT 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. OP121TT 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.

Wire	Classification
OE-S1 CrMo2	AWS 5.23: F8P2 EB3-B3
OE-S2 CrMo1	AWS 5.23: F8P4 EB2-B2
OE-SD3	AWS 5.17: F7P8 EH12K
OE-SD3	AWS 5.17: F7A8 EH12K
OE-S2Mo	AWS 5.23: F8A4 EA2-A2
OE-S2Mo	AWS 5.23: F8P4 EA2-A2
OE-SD3Mo	AWS 5.23: F8A6 EG-A4
OE-SD3Mo	AWS 5.23: F8P6 EG-A4
OE-SD3NiMo1	AWS 5.23: F9A8 EF3-F3
OE-SD3NiMo1	AWS 5.23: F9P8 EF3-F3
OE-S2 Ni2	AWS 5.23: F7P10 ENi2-Ni2
OE-S2 Ni2	AWS 5.23: F7A10 ENi2-Ni2

Wire	Approvals	Grades
OE-S2	LRS	
OE-S2	TÜV	
OE-SD3	ABS	
OE-SD3	BV	
OE-SD3	DB	
OE-SD3	DNV	
OE-SD3	GL	
OE-SD3	LRS	
OE-SD3	RS	
OE-SD3	TÜV	
OE-S2Mo	ABS	
OE-S2Mo	LRS	

see Appendix, Classification Society Approvals, for details pag. 521

Flux Analysis	
CaF2	25 %
CaO + MgO	40 %
Al2O3 + MnO	20 %
SiO2 + TiO2	15 %

Basicity to Boniszewski 3,1

Typical Applications

Wire	Materials
OE-S2 CrMo1	ASME: A199 and A200 grade T11, A213 Grades T11, T12 EN: '13CrMo4-5, 13CrMoSi5-5
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 grades EN S(P)235-S(P)420
OE-S2Mo	ASME: X 60, X 65, ASTM A355 Gr. P1; A182M Gr. F1 EN:16 Mo 3, S(P)355-S(P)460, L245-L450
OE-SD3 1Ni 1/4Mo	ASME:ASTM A131 AH40, DH40, EH40, X65, X70 EN:S(P)275-S(P)460
OE-SD3NiMo1	ASME: X70, X80, N-A-XTRA 55, HY80, QIN EN: 'S(P)420-S(P)500; L245-L485; 20MnMoNi5-5, 15NiCuMoNb5
OE-S2 Ni2	ASME: EN: 11MnNi5-3, 15NiMn-3
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

Analysis of all-weld metal (Typical values in %)

Wire	C	Mn	Si	Cr	Ni	Mo	Nb	N	Cu
OE-S2	0.07	0.90	0.20	-	-	-	-	-	-
OE-SD3	0.07	1.60	0.30	-	-	-	-	-	-
OE-S2Mo	0.07	0.90	0.20	-	-	0.50	-	-	-
OE-SD3 1Ni 1/4Mo	0.07	1.30	0.30	-	0.80	0.20	-	-	-
OE-SD3NiMo1	0.07	1.50	0.30	-	1	0.50	-	-	-
OE-S2 Ni2	0.07	0.90	0.30	-	2	-	-	-	-
OE-S2 Ni3	0.06	0.90	0.20	-	3	-	-	-	-
OE-S2CrMo1	0.07	0.90	0.30	1	-	0.50	-	-	-
OE-S1CrMo2	0.08	0.60	0.30	2.20	-	1	-	-	-

All-weld metal Mechanical Properties

Wire	Heat Treatment	Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation A5 (%)
OE-S2	As Welded	≥ 360	450 - 550	≥ 28
OE-SD3	As Welded	≥ 450	530 - 630	≥ 25
OE-S2Mo	As Welded	≥ 500	580 - 680	≥ 24
OE-SD3Mo	PWHT 620°C x 1h	≥ 520	600 - 660	≥ 27
OE-SD3Mo	As Welded	≥ 550	610 - 670	≥ 29
OE-SD3 1Ni 1/4Mo	PWHT 600°C x 2h	≥ 490	580 - 620	≥ 26
OE-SD3 1Ni 1/4Mo	As Welded	≥ 530	600 - 650	≥ 24
OE-SD3NiMo1	PWHT 600°C x 2h	≥ 540	630 - 730	≥ 22
OE-SD3NiMo1	As Welded	≥ 540	650 - 750	≥ 20
OE-S2 Ni2	PWHT 600°C x 2h	≥ 430	500 - 600	≥ 26
OE-S2 Ni2	As Welded	≥ 450	550 - 600	≥ 24
OE-S2 Ni3	As Welded	≥ 480	560 - 660	≥ 25
OE-S2CrMo1	PWHT 680°C x 2h	≥ 380	530 - 630	≥ 24
OE-S2CrMo1	PWHT 920°C/air+700-720°C	≥ 310	430 - 530	≥ 30
OE-S1CrMo2	PWHT 940°C/air+730-750°C	≥ 400	520 - 620	≥ 22
OE-S1CrMo2	PWHT 720°C x 8h	≥ 450	550 - 650	≥ 22

All-weld metal Mechanical Properties - Cv

Wire	Heat Treatment	Charpy V Notch Impact Toughness (J)							
		+20	0	- 20	- 30	- 40	- 50	- 60	- 80
OE-S2	As Welded	180 min	160 min	100 min	-	50 min	-	-	-
OE-SD3	As Welded	160 min	100 min	-	-	60 min	50 min	-	-
OE-SD3Mo	PWHT	-	-	-	-	130 min	60 min	-	-
OE-SD3Mo	As Welded	-	-	-	-	110 min	80 min	-	-
OE-SD3 1Ni 1/4Mo	PWHT	-	-	-	-	160 min	-	120 min	-
OE-SD3 1Ni 1/4Mo	As Welded	-	-	-	-	145 min	-	120 min	-
OE-SD3NiMo1	As Welded	150 min	120 min	90 min	-	70 min	-	50 min	-
OE-S2 Ni2	PWHT	180 min	160 min	140 min	-	130 min	-	100 min	80 min
OE-S2 Ni2	As Welded	160 min	140 min	120 min	-	100min	-	70 min	50 min
OE-S2 Ni3	As Welded	180 min	160 min	140 min	-	130 min	-	100 min	80 min
OE-S2CrMo1	PWHT	200 min	180 min	-	-	-	-	-	-
OE-S1CrMo2	PWHT	140 min	100 min	-	-	-	-	-	-

Packaging data

25kg heavy duty sealed polythene sacks
25kg & 500kg Dry Bag packaging on demand

Further forms of delivery on request.

Current condition

AC; DC+