

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

OP 120TT is a fully basic agglomerated submerged-arc welding flux that is used with Oerlikon low alloy submerged-arc wires for the welding of high strength low alloy steels.

Manganese and silicon pick-up occurs and as such the flux is suitable for use with submerged-arc wires containing lower levels of manganese such as OE-S2. The flux has a low hydrogen content in the as-manufactured condition and is resistant to moisture pick-up following exposure under workshop conditions.

The flux promotes a very stable arc characteristics over a wide parameter range with the resultant weld beads exhibiting a fine surface ripple with a regular profile and even toe blending. The slag is easily detached and in the majority of applications is self-releasing. Suitable for welding with DC+ or AC, with a maximum current carrying capacity of 1000A on a single wire. Damp flux should be re-dried at 300-350°C. Grain size according to EN 760: 2-20.

Wire	Classification
OE-S2	AWS 5:17: F7A6 EM12K
OE-S2Mo	AWS 5:23: F8A4 EA2-A2
OE-SD2 1NiCrMo	AWS 5:23: F10P4 EG-G
OE-SD3NiMo1	AWS 5:23: F9P4 EF3-F3
	EN 760: SA FB1 66 AC H10

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

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

Flux Analysis	
Al <sub>2</sub> O <sub>3</sub> + MnO	20 %
CaF <sub>2</sub>	30 %
CaO + MgO	30 %
SiO <sub>2</sub> + TiO <sub>2</sub>	15 %

**Basicity to Boniszewski** 3,1

## Typical Applications

Wire	Materials
OE-S1	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-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)420
OE-SD3	ASME: A131 Grades E, EH32, EH46; A 572 Grades 42, 50; A633 Grades A, C, D; A285 Grades A, B,C; A537 Class 1; A662 Grades A, B, C; A737 Grades B; A841 - S(P)235-S(P)460
OE-S2Mo	ASME: X 60, X 65, ASTM A355 Gr. P1; A182M Gr. F1 EN:16 Mo 3, S(P)420-S(P)500; L245-L485
OE-SD2 1NiCrMo	ASME: ASTM A302 Grade B, ASTM A336 Grade F30, ASTM A487 Class 1N, 1Q 2N, 2Q, 4130 EN: S(P)460-S(P)555
OE-SD3NiMo1	ASME: X70, X80, N-A-XTRA 55, HY80, QIN EN: 'S(P)420-S(P)500; L245-L485; 20MnMoNi5-5, 15NiCuMoNb5
OE-S2CrMo1	ASME: A199 and A200 grade T11, A213 Grades T11, T12 EN: '13CrMo4-5, 13CrMoSi5-5

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

Wire	C	Mn	Si	Cr	Ni	Mo	Nb	N	Cu
OE-S1	0.05	0.80	0.20	-	-	-	-	-	-
OE-S2	0.06	1.20	0.40	-	-	-	-	-	-
OE-S2Mo	0.06	1.20	0.40	-	-	0.50	-	-	-
OE-SD2 1NiCrMo	0.06	2.10	0.50	1	0.90	0.60	-	-	-
OE-SD3NiMo1	0.05	1.60	0.40	-	0.90	0.50	-	-	-
OE-S2CrMo1	0.07	1.20	0.30	1	-	0.50	-	-	-

## All-weld metal Mechanical Properties

Wire	Heat Treatment	Yield Strength N/mm <sup>2</sup>	Tensile Strength N/mm <sup>2</sup>	Elongation A5 (%)
OE-S1	As Welded	≥ 360	440 - 540	≥ 25
OE-S2	As Welded	≥ 420	500 - 600	≥ 24
OE-S2Mo	As Welded	≥ 450	600 - 700	≥ 24
OE-SD2 1NiCrMo	PWHT 660°C x 3h	≥ 590	690 - 720	≥ 26
OE-SD2 1NiCrMo	As Welded	≥ 760	840 - 870	≥ 24
OE-SD3NiMo1	PWHT 620°C x 2h	≥ 580	680 - 720	≥ 30
OE-S2CrMo1	PWHT 680°C x 2h	≥ 380	570 - 670	≥ 22
OE-S2CrMo1	PWHT 920°C/air+720°C	≥ 310	430 - 530	≥ 28

## All-weld metal Mechanical Properties - Cv

Wire	Heat Treatment	Charpy V Notch Impact Toughness (J)							
		+20	0	- 20	- 30	- 40	- 60	- 80	- 101
OE-S1	As Welded	150 min	90 min	-	-	-	-	-	-
OE-S2	As Welded	160 min	130 min	100 min	-	70 min	40 min	-	-
OE-S2Mo	As Welded	130 min	90 min	70 min	-	40 min	-	-	-
OE-SD2 1NiCrMo	PWHT	-	-	-	-	27 min	-	-	-
OE-SD2 1NiCrMo	As Welded	-	-	-	-	40 min	-	-	-
OE-SD3NiMo1	PWHT	-	-	-	-	40 min	-	-	-
OE-S2CrMo1	PWHT	200 min	150 min	-	-	-	-	-	-

### Packaging data

25kg heavy duty sealed polythene sacks

Further forms of delivery on request.

### Current condition

**AC; DC+**