

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

OP 192 is an agglomerated semi basic type flux for welding general structural steels, pressure vessel steels, pipe steels and fine-grain steels. The flux behaviour in terms of manganese is neutral, the use of wires with a relatively high manganese content is therefore required (OE-S1 - OE-SD3) OP 192 is suitable for submerged- arc twin-wire, tandem and multi-wire welding as well as for welding with the two-run technique, e.g. in the production of large pipes. OP 192 can be welded on DC+ and AC.

Damp flux should be re-dried at 300-350°C. Grain size according to EN 760: 2-20.

Wire	Classification
OE-S1	AWS A5.17:F6A2 F6P2-EL12
OE-S2	AWS A5.17: F7A2 F7P4 - EM12K
OE-SD3	AWS A5.17:F7A6 F7P6-EH12K
OE-S2Mo	AWS A5.23:F8A3 F8P2-EA2 A2
OE-S2NiCu	AWS A5.23:F7A2 - EG-G
	EN 760: S A AB 1 87 AC H5

Wire	Approvals	Grades
OE-S2 / OE-S2 Mo	LRS	
OE-S2 / OE-S2 Mo	RINA	
OE-S2	ABS	
OE-S2	GL	
OE-S2	TÜV	

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

Flux Analysis	
SiO <sub>2</sub>	20 %
CaO + CaF <sub>2</sub> + MgO	39 %
MnO + FeO	9 %
Al <sub>2</sub> O <sub>3</sub> + TiO <sub>2</sub> + ZrO <sub>2</sub>	30 %

**Basicity to Boniszewski** 1,3

### 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)355; L245-L360
OE-SD3	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-S2Mo	ASME: ASTM A285 Grades A, B, C; A106 Grades A, B, C; X 60, X 65 EN:16 Mo 3, S(P)355-S(P)460, L245-L450
OE-S2NiCu	ASME: EN:'S235J0W; S235J2W; S355J0W; S355J2W; S355K2W
OE-SD3Mo	ASME:ASTM A381 Class Y60 EN:S(P)355-S(P)460, L245-L450

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

Wire	C	Mn	Si	Cr	Ni	Mo	Nb	N	Cu
OE-S1	0.03	1	0.40	-	-	-	-	-	-
OE-S2	0.03	1.50	0.60	-	-	-	-	-	-
OE-SD3	0.04	1.70	0.70	-	-	-	-	-	-
OE-S2Mo	0.04	1.50	0.60	-	-	0.40	-	-	-
OE-S2NiCu	0.04	1.40	0.60	-	0.70	-	-	-	≤ 0.40
OE-SD3Mo	0.04	1.70	0.60	-	-	0.40	-	-	-

## 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	450 - 550	≥ 24
OE-S1	620°C x 1 h	≥ 330	420 - 550	≥ 22
OE-S2	As Welded	≥ 430	520 - 620	≥ 24
OE-S2	620°C x 1 h	≥ 400	490 - 650	≥ 22
OE-SD3	As Welded	≥ 440	530 - 650	≥ 22
OE-SD3	620°C x 1 h	≥ 420	510 - 650	≥ 22
OE-S2Mo	As Welded	≥ 500	560 - 680	≥ 22
OE-S2Mo	620°C x 1 h	≥ 480	560 - 690	≥ 20
OE-S2NiCu	As Welded	≥ 450	500 - 600	≥ 25
OE-SD3Mo	As Welded	≥ 490	560 - 680	≥ 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-S1	As Welded	-	-	80 min	27 min	-	-	-	-
OE-S1	620°C x 1 h	-	-	80 min	27 min	-	-	-	-
OE-S2	As Welded	-	-	100 min	70 min	27 min	-	-	-
OE-S2	620°C x 1 h	-	-	100 min	60 min	47 min	-	-	-
OE-SD3	As Welded	-	-	90 min	-	70 min	-	-	-
OE-SD3	620°C x 1 h	-	-	-	-	60 min	-	-	-
OE-S2Mo	As Welded	-	-	100 min	27 min	-	-	-	-
OE-S2Mo	620°C x 1 h	-	-	90 min	27 min	-	-	-	-
OE-S2NiCu	As Welded	-	-	60 min	27 min	-	-	-	-
OE-SD3Mo	As Welded	-	-	80 min	50 min	-	-	-	-

## Packaging data

25kg heavy duty sealed polythene sacks

Further forms of delivery on request.

## Current condition

**DC+; AC**