

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

OP 180S is an agglomerated aluminate- basic type flux for welding of general structural steels, boiler and pipe steels, shipbuilding steels, as well as fine grain structural steels. It produces a low silicon pick-up and a moderate manganese pick-up, so that it can be used in combination with OE-S1 and OE-S2 wires. OP 180S is used in shipbuilding, being suitable for twin wire, tandem and multi-wire welding, as well as for welding from both sides in one pass.

Lower strength shipbuilding steels are welded with OP180S + OE-S1 wire, the higher strength steels are welded with OE-S2 wire. The weld metal is not susceptible to cracking and the slag removal is good. OP 180S is suitable for use on either DC+ or AC up to 1000 A. Damp flux should be re-dried at 300-350°C. Grain size according to EN 760: 2-20.

Wire	Classification
OE-S1	AWS 5.17: F6A0 EL12
OE-S2	AWS 5.17: F7A0 EM12K
OE-S2Mo	AWS 5.25: F8A0 EA2-A2
	EN 760: SA AB 1 67 AC

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

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

Flux Analysis	
CaO + MgO	15 %
Al <sub>2</sub> O <sub>3</sub> + MnO	40 %
SiO <sub>2</sub> + TiO <sub>2</sub>	25 %
CaF <sub>2</sub>	15 %

**Basicity to Boniszewski** 1,2

### Typical Applications

Wire	Materials
OE-S1	ASME: EN: 'S(P)235-S(P)355; L245-L360
OE-S2	ASME: EN: 'S(P)235-S(P)355; Shipbuilding steels A,B,D,E,AH32 to EH36
OE-S2Mo	ASME: EN:16 Mo 3, 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	0.05	1	0.20	-	-	-	-	-	-
OE-S2	0.05	1.40	0.30	-	-	-	-	-	-
OE-S2Mo	0.05	1.40	0.30	-	-	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	430 - 530	≥ 25
OE-S2	As Welded	≥ 400	520 - 620	≥ 22
OE-S2Mo	As Welded	≥ 450	600 - 700	≥ 20

## 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	100 min	60 min	35 min	-	-	-	-	-
OE-S2	As Welded	120 min	70 min	50 min	-	-	-	-	-
OE-S2Mo	As Welded	60 min	50 min	35 min	-	-	-	-	-

## Packaging data

25kg heavy duty sealed polythene sacks

Further forms of delivery on request.

## Current condition

**AC; DC+**