

OP 190 is an agglomerated aluminate-basic type flux for the welding of general structural steels, boiler and pipe steels, as well as fine-grain structural steels. To be used in combination with the wire electrodes OE-S2, OE-SD2 and OE-S2 Mo. OP 190 is suitable for twin-wire, tandem and multi-wire welding using the single layer or multi-layer techniques. For higher level of toughness, an OE-S2 Mo wire electrode is recommended when welding from both sides in one pass or when welding one-sided with the single layer technique. The finely rippled bead surface and the good slag detachability make OP 190 perfectly suited for fillet welds. It can be welded on DC and AC up to 1000 A with the single-wire technique.

Grain size according to EN-ISO 14174: 2-20.

Classification		
	EN ISO	14174: S A AB 1 67 AC H5
OE-S2 Mo	EN ISO	14171-A: S 46 5 AB S2Mo
OE-S2 Si2	EN ISO	14174: S 46 4 AB S2Si2
OE-SD2	EN ISO	14171-A: S 38 5 AB S2Si
OE-S2	EN ISO	14171-A: S 38 4 AB S2
OE-S2 Mo	AWS	A5.23: F8A5-EA2-A4
OE-S2 Mo	AWS	A5.23: F8P2-EA2-A4
OE-S2 Si2	AWS	A5.17: F7P6 EM13K
OE-S2 Si2	AWS	A5.17: F8A6 EM13K
OE-SD2	AWS	A5.17: F7A8-EM12K
OE-S1	AWS	A5.17: F6A0-EL12
OE-S2	AWS	A5.17: F6P5-EM12K
OE-S2	AWS	A5.17: F7A5-EM12K

Flux Main Components	
Al2O3 + MnO	30 %
CaO + MgO	25 %
SiO2 + TiO2	25 %
CaF2	15 %

Approvals	Grade
OE-S2 DB	●
OE-S2 DNV-GL	
OE-S2 LR	
OE-S2 TÜV	●
OE-S2Mo DB	●
OE-S2Mo DNV-GL	
OE-S2Mo LR	
OE-S2Mo TUV	

**Boniszewski Basicity** 1.5

### Chemical analysis (Typical values in %)

		C	Mn	Si	Mo
All weld metal	OE-S2 Mo	0.06	1.35	0.2	0.5
All weld metal	OE-S2 Si2	0.06	1.5	0.8	-
All weld metal	OE-SD2	0.06	1.35	0.4	-
All weld metal	OE-S1	0.05	1.0	0.2	-
All weld metal	OE-S2	0.06	1.35	0.2	-

## All-weld metal Mechanical Properties

	Heat Treatment	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation A5 (%)
OE-S2 Mo	As Welded	≥ 500	600-680	≥ 22
OE-S2 Mo	620°Cx1h	≥ 480	560-670	≥ 22
OE-S2 Si2	As Welded	> 470	550-680	> 24
OE-S2 Si2	620°Cx1h	> 400	480-660	> 26
OE-SD2	As Welded	≥ 400	480-600	≥ 22
OE-S1	As Welded	> 360	420-520	>24
OE-S2	As Welded	≥ 400	510-690	≥ 22
OE-S2	620°Cx1h	≥ 340	430-550	≥ 22

## All-weld metal Mechanical Properties - CV

	Heat Treatment	Impact Energy (J)			
		-20 °C	-40 °C	-46 °C	-60 °C
OE-S2 Mo	As Welded		≥ 60	≥ 47	
OE-S2 Mo	620°Cx1h		≥ 47		
OE-S2 Si2	As Welded	> 60	> 47		
OE-S2 Si2	620°Cx1h	> 60	> 47		
OE-SD2	As Welded		≥ 100	≥ 80	≥ 40
OE-S1	As Welded	>47			
OE-S2	As Welded		≥ 80	≥ 47	
OE-S2	620°Cx1h		≥ 60	≥ 27	

## Typical applications

	Materials
OE-S2 Mo	ASME: ASTM A285 Grades A, B, C; A106 Grades A, B, C; API: X60, X65, X70 EN: 16Mo3, S(P)355-S(P)460, L245-L450, L485ME
OE-S2 / SD2	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 Si2	ASME: ASTM A285 Grades A, B, C; A106 Grades A, B, C; S(P)355-S(P)460, L245-L450

### Redrying

300-350°Cx2-4h

### Current Conditions

AC; DC+

## Packaging data

Packaging Type	PE
Weight (kg)	25
-	W