

# Pie 18

## SAW Rutile-Acid Fluxes C-Mn and low-alloy steels

Pie 18 is a fused calcium silicate type flux for welding structural steels up to StE 355. It is commonly used in conjunction with OE-S2 as general purpose flux in ship building, heavy machinery, and the railway industry. Pie 18 is available in two grain sizes: 2 – 25 for general applications and 2 – 10 for tube-web-tube joints in heat exchangers or as a backing flux in one-sided welding.

Pie 18 is not recommended for small diameter circumferential welds or thin section fillet welds (< 4mm). Connection of the welding electrode to DC+ electrode polarity is recommended. Damp flux should be re-dried at 300-350°C. Grain size according to EN 760: 2-20.

Wire	Classification
	EN 760: SF CS 1 77

Wire	Approvals	Grades
OE-S2	DB	
OE-S2	TÜV	
OE-S2Mo	DB	
OE-S2Mo	TÜV	

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

Flux Analysis	
CaF <sub>2</sub>	5 %
Al <sub>2</sub> O <sub>3</sub> + MnO	20 %
CaO + MgO	25 %
SiO <sub>2</sub> + TiO <sub>2</sub>	45 %

**Basicity to Boniszewski** 1,0

### Typical Applications

Wire	Materials
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-S2Mo	ASME: API 5L Grades A, B, X42, X46, X52, X56 EN: 16 Mo 3; S(P)235-S(P)355; L245-L360
OE-S2NiCu	ASME: EN: S235J0W; S235J2W; S355J0W; S355J2W; S355K2W

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

Wire	C	Mn	Si	Cr	Ni	Mo	Nb	N	Cu
OE-S2	0.06	1.20	0.50	-	-	-	-	-	-
OE-S2Mo	0.06	1.20	0.50	-	-	0.40	-	-	-
OE-S2NiCu	0.06	1.20	0.50	-	0.70	0.40	-	-	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-S2	As Welded	≥ 420	550 - 640	≥ 20
OE-S2Mo	As Welded	≥ 460	550 - 680	≥ 19
OE-S2NiCu	As Welded	≥ 460	530 - 680	≥ 19

## All-weld metal Mechanical Properties - Cv

Wire	Heat Treatment	Charpy V Notch Impact Toughness (J)							
		+20	0	- 20	- 30	- 40	- 60	- 80	- 101
OE-S2	As Welded	100 min	75 min	50 min	-	-	-	-	-
OE-S2Mo	As Welded	60 min	47 min	28 min	-	-	-	-	-
OE-S2NiCu	As Welded	60 min	47 min	28 min	-	-	-	-	-

## Packaging data

25kg heavy duty sealed polythene sacks

Further forms of delivery on request.

## Current condition

DC+