

SAW Fluxes Stainless and Heat resistant steels

OP 33 is a special semi-basic welding flux for welding stainless and heat resistant steels in combination with wires according to AWS A5.9. In respect to the carbon content of the weld metal, OP 33 is neutral.

The welds are smooth and have a fine ripple without undercut at the toes and without slag residues. Slag detachability is superb, therefore this flux is ideal for fillet welding on DC+ with up to 800 A. Damp flux should be re-dried at 300-350°C. Grain size according to EN 760: 2-20.

Wire	Classification
	EN 760: SA AF 2 54 DC

Wire	Approvals	Grades
OE-316L N	RINA	
OE-309LMo	RINA	
OE-316L	TÜV	
OE-S 22 09	RINA	

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

Flux Analysis	
CaF ₂	50 %
SiO ₂ + TiO ₂	10 %
Al ₂ O ₃ + MnO	35 %

Basicity to Boniszewski 1,8

Typical Applications

Wire	Materials
OE-20.16L	ASME: EN: X2CrNiMoN17-13-3 (1.4429), X2CrNiMoN18-14-3 (1.3952); X2CrNiMo18-14-3 (1.4435)
OE-308 H	ASME: AISI 304H EN: X 2 Cr Ni 18 9 (1.4306)
OE-308L	ASME: AISI 304 - 304L - 302 EN: X 5 Cr Ni 18 8 (1.4301), X 2 Cr Ni 18 8 (1.4300)
OE-309LMo	ASME: Cladding of carbon steel and low alloy steel EN: Cladding of carbon steel and low alloy steel
OE-316L	ASME: ASTM A351 Grades CF3M, CF3MA EN: X 2 Cr Ni Mo 18 12 (1.4435), X 2 Cr Ni Mo 18 10 (1.4404), X 5 Cr Ni Mo 18 10 (1.4401)
OE-318	ASME: AISI 318L EN: X 10 Cr Ni Mo Ti 18 12 (1.4573), X 10 Cr Ni Mo Nb 18 12 (1.4583), X 10 Cr Ni Mo Ti 18 10 (1.4571), X 10 Cr Ni Nb 18 9 (1.4450), X 10 Cr Ni Mo Nb 18 10 (1.4580), X 12 Cr Ni Ti 18 9 (1.4870)
OE-347	ASME: ASTM A336 Grades F321, F347 EN: X 10 Cr Ni Ti 18 9 (1.4541), X 10 Cr Ni Nb 18 9 (1.4550), X 5 Cr Ni Nb 18 9 (1.4543), X 12 Cr Ni Ti 18 9 (1.4870)
OE-347	ASME: AISI 347 - 321 EN: X 12 Cr Ni Ti 18 9 (1.4878), X 10 Cr Ni Ti 18 9 (1.4541), X 10 Cr Ni Nb 18 9 (1.4550), X 5 Cr Ni Nb 18 9 (1.4543),
OE-S 22 09	ASME: A182 Grade F51, UNS S31803 - S31500 - S31200 - S32304 EN: X 2 Cr Ni Mo N 22 5 (1.4462)
OE-904L	ASME: AISI 904L; URANUS B6; EN: 1.4539 (X1NiCrMoCu25-20-5); 1.4439 (X2CrNiMoN17-13-5); 1.4537 (X1CrNiMoCuN25-25-5)

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

Wire	C	Mn	Si	Cr	Ni	Mo	Nb	N	Cu
OE-20.16L	≤	5	0.60	18.80	15	2.75	0.025	0.15	-
OE-308L	≤ 0.03	-	-	18	9	-	-	-	-
OE-309LMo	≤ 0.03	-	-	21	15	≥ 3	-	-	-
OE-316L	≤ 0.03	-	-	18	10	2.50	-	-	-
OE-318	≤ 0.07	-	-	18	10	2.50	-	-	-
OE-347	≤ 0.07	-	-	18	9	-	-	-	-
OE-S 22 09	≤ 0.03	-	-	23	9	3	-	-	-
OE-904L	≤	-	-	19	22	4	-	-	1.50

All-weld metal Mechanical Properties

Wire	Heat Treatment	Yield Strength N/mm ²	Tensile Strength N/mm ²	Elongation A5 (%)
OE-20.16L	As Welded	≥ 390	≥ 570	≥ 35
OE-308L	As Welded	≥ 350	≥ 500	≥ 35
OE-309LMo	As Welded	≥ 420	≥ 600	≥ 25
OE-316L	As Welded	≥ 350	≥ 525	≥ 30
OE-318	As Welded	≥ 370	≥ 600	≥ 30
OE-347	As Welded	≥ 370	≥ 575	≥ 30
OE-S 22 09	As Welded	≥ 550	≥ 750	≥ 25
OE-904L	As Welded	≥ 370	≥ 560	≥ 35

All-weld metal Mechanical Properties - Cv

Wire	Heat Treatment	Charpy V Notch Impact Toughness (J)							
		+20	0	- 20	- 30	- 40	- 60	- 80	- 196
OE-20.16L	As Welded	70 min	-	-	-	-	-	-	30 min
OE-308L	As Welded	75	-	-	-	-	-	-	-
OE-309LMo	As Welded	80	-	-	-	-	-	-	-
OE-316L	As Welded	75	-	-	-	-	-	-	-
OE-318	As Welded	65	-	-	-	-	-	-	-
OE-347	As Welded	65	-	-	-	-	-	-	-
OE-S 22 09	As Welded	-	-	-	-	-	70	-	-
OE-904L	As Welded	-	-	-	-	-	100	-	-

Packaging data

25kg heavy duty sealed polythene sacks

Further forms of delivery on request.

Current condition

DC+