

## OK Flux 10.99

OK Flux 10.99 is a neutral agglomerated basic flux designed for the submerged arc welding process of austenitic stainless steels with relevant wires, either using AC or DC+ current.

This flux can also be used in both current modes to weld Ni-based alloys with carefully chosen Ni-based wires.

Welding in AC usually provides good mechanical properties and better impact properties (when compared to DC+ current).

The high basicity of OK Flux 10.99 gives better impact values, regardless of the current being used.

It also has very good weldability in 1G and 2G position; the slag is self-lifting or easily detached leaving clean and nice bead appearance.

<b>Classifications</b>	EN ISO 14174 : S A FB 2 55 53 AC
<b>Approvals</b>	NAKS/HAKC RD 03-613-03

Approvals are based on factory location. Please contact ESAB for more information.

<b>Slag Type</b>	Fluoride basic CaF <sub>2</sub> - MgO - Al <sub>2</sub> O <sub>3</sub>
<b>Alloy Transfer</b>	Non alloying
<b>Density</b>	nom 1.0 kg/dm <sup>3</sup>
<b>Basicity Index</b>	nom 2.1
<b>Grain Size</b>	0.2-2.0 mm (10x65 mesh)

### Flux Consumption

Volts	kg Flux / kg Wire DC+	kg Flux / kg Wire AC
26 V	0.7 kg	0.6 kg
30 V	0.8 kg	0.8 kg
34 V	0.9 kg	1.1 kg
38 V	1.1 kg	1.3 kg

Dimensions	Amps	Travel Speed
3.2 mm	400 A	50 cm/min

### Classifications

Wire	SFA/AWS - EN ISO	AWS - As Welded
OK Autrod 308L	A5.9:ER308L/ 14343-A:S 19 9 L	
OK Autrod 309L	A5.9:ER309L/ 14343-A:S 23 12 L	
OK Autrod 316L	A5.9:ER316L/ 14343-A:S 19 12 3 L	
OK Autrod 316LMn	A5.9:ER316LMn/ 14343-A:S 20 16 3 Mn N L	
OK Autrod NiCrMo-4	A5.14:ERNiCrMo-4/ 18274:S Ni 6276 (NiCr15Mo16Fe6W4)	A5.39: F100A32-ERNiCrMo-4/NiCrMo-4

### Approvals

Combined with Wire	LR	CCS
OK Autrod NiCrMo-4	•	•

### Typical Mechanical Properties

Combined with Wire	Condition	Yield Strength	Tensile Strength	Elongation	Charpy V-Notch
OK Autrod 308L	As Welded AChr ()	400 MPa (58 ksi)	560 MPa (81 ksi)	36 %	105 J @ -20°C (78 ft-lb @ -4°F) 100 J @ -40°C (74 ft-lb @ -40°F) 90 J @ -60°C (67 ft-lb @ -76°F) 55 J @ -196°C (41 ft-lb @ -320.8°F)
OK Autrod 308L	As Welded DC+hr ()	400 MPa (58 ksi)	560 MPa (81 ksi)	36 %	85 J @ -20°C (63 ft-lb @ -4°F) 80 J @ -40°C (59 ft-lb @ -40°F) 75 J @ -60°C (56 ft-lb @ -76°F) 50 J @ -196°C (37 ft-lb @ -320.8°F)
OK Autrod 309L	As Welded AChr ()	410 MPa (59 ksi)	575 MPa (83 ksi)	36 %	105 J @ -20°C (78 ft-lb @ -4°F) 100 J @ -40°C (74 ft-lb @ -40°F) 95 J @ -60°C (70 ft-lb @ -76°F) 85 J @ -110°C (63 ft-lb @ -166°F)
OK Autrod 316L	As Welded AChr ()	410 MPa (59 ksi)	570 MPa (83 ksi)	35 %	110 J @ -20°C (81 ft-lb @ -4°F) 105 J @ -40°C (78 ft-lb @ -40°F) 100 J @ -60°C (74 ft-lb @ -76°F) 70 J @ -196°C (52 ft-lb @ -320.8°F)

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### Typical Mechanical Properties

Combined with Wire	Condition	Yield Strength	Tensile Strength	Elongation	Charpy V-Notch
OK Autrod 316LMn	As Welded 400A, 30V, 33m/h AC hr ()	420 MPa (61 ksi)	630 MPa (91 ksi)	40 %	105 J @ -60°C (78 ft-lb @ -76°F) 90 J @ -110°C (67 ft-lb @ -166°F) 55 J @ -196°C (41 ft-lb @ -320.8°F)
OK Autrod NiCrMo-4	As Welded HI ~-0,9-1,1 kJ/mm AC ()	480 MPa (70 ksi)	720 MPa (104 ksi)	42 %	100 J @ -196°C (74 ft-lb @ -320.8°F)
OK Autrod NiCrMo-4	As Welded HI ~-0,9-1,1 kJ/mm DC+ ()	480 MPa (70 ksi)	720 MPa (104 ksi)	42 %	75 J @ -196°C (56 ft-lb @ -320.8°F) 75 J @ -196°C (56 ft-lb @ -320.8°F)

### Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
<b>OK Autrod 308L AC</b>									
0.025	1.9	0.3	0.01	0.02	9.8	19.2	0.1	-	0.2
<b>OK Autrod 308L DC+</b>									
0.02	1.9	0.3	0.01	0.02	9.8	19.2	0.1	-	0.2
<b>OK Autrod 309L AC</b>									
0.030	1.9	0.4	0.01	0.02	13.0	22.0	0.1	-	0.04
<b>OK Autrod 316L AC</b>									
0.025	1.7	0.4	0.01	0.02	12.0	18.3	2.6	-	0.2
<b>OK Autrod 316LMn</b>									
0.03	7.0	0.5	0.01	0.02	16.0	20.0	3.0	-	0.30
<b>OK Autrod NiCrMo-4 AC</b>									
0.015	0.7	0.08	0.002	0.006	Bal	15.2	15.6	0.1	0.1
<b>OK Autrod NiCrMo-4 DC+</b>									
0.01	0.7	0.11	0.002	0.006	Bal	15.2	15.6	0.1	0.1

N	Co	Fe	W	FN WRC-92
<b>OK Autrod 308L AC</b>				
0.07	-	-	-	6
<b>OK Autrod 308L DC+</b>				
0.07	-	-	-	6
<b>OK Autrod 309L AC</b>				
0.09	-	-	-	-
<b>OK Autrod 316L AC</b>				
0.05	-	-	-	6
<b>OK Autrod 316LMn</b>				
0.17	-	-	-	-
<b>OK Autrod NiCrMo-4 AC</b>				
-	0.1	6.5	3.7	-
<b>OK Autrod NiCrMo-4 DC+</b>				
-	0.1	6.5	3.6	-