

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
Overalloyed electrode for surfacing unalloyed steel, joint welding non-molybdenum alloyed stainless steel to unalloyed steel and for welding clad material.					

\* Obsolete national standards, replaced by EN 10088.

#### Characteristics

AVESTA 309L is an overalloyed electrode intended for welding stainless steel unalloyed or low-alloy steels. It has a rutile-acid type coating and is designed for welding with either AC or positive polarity DC.

AVESTA 309L has a composition that, under normal welding conditions, ensures a crack resistant weld metal.

AVESTA 309L can also be used for welding some high temperature steels. Always consult expertise.

#### Welding directions

When welding stainless steel to unalloyed or low-alloyed steels, it is advisable/necessary to reduce the dilution of the weld as much as possible. Welding should therefore be performed with a limited heat input and appropriate bevel angle.

Welding to primer-coated sheet should be avoided, as there is a significant risk of pore formation. The paint should therefore be removed from all surfaces that are likely to be exposed to temperatures above 932°F (500°C).

#### Packaging data

Diam. inch	Diam. mm	Length mm / inch	Weight/capsule, lbs	Electrodes/capsule, approx.	Weight/carton, lbs
5/64	2.0	300 / 12	3.7	134	22
3/32	2.5	300 / 12	8.0	189	24
1/8	3.25	350 / 14	9.1	116	27
5/32	4.0	450 / 18	11.9	77	36
3/16	5.0	450 / 18	11.9	52	36

**Approvals:** DNV, CWB

#### Standard designations

AWS A5.4 E309L-17

#### Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni
0.02	0.8	0.8	23.0	13.0

Ferrite 15 FN DeLong

#### Mechanical properties

	Typical values (IIW)		
Yield strength, R <sub>p0.2</sub>	450 N/mm <sup>2</sup>	65 ksi	
Tensile strength, R <sub>m</sub>	550 N/mm <sup>2</sup>	80 ksi	
Elongation, A <sub>5</sub>	35 %	35 %	
Impact strength, KV			
+20°C	50 J	37 ft-lb	
-40°C	45 J	33 ft-lb	
Hardness approx.	210 Brinell		

#### Welding data

DC+ or AC	Diam., inch	Current, A
	5/64	30– 60
	3/32	45– 80
	1/8	70–120
	5/32	90–160
	3/16	150–220

**Interpass temperature:** Max. 300°F (150°C).

**Heat input:** Max. 50.8 kJ/in (2.0 kJ/mm).

**Heat treatment:** Generally none. For constructions, which include low-alloy steels in mixed joints, a stress-relieving annealing stage may be advisable. However, this type of alloy may be susceptible to embrittlement-inducing precipitation in the temperature range 1022–1742°F (550–950°C). Always consult the supplier of the parent metal or seek other expert advice to ensure that the correct heat treatment process is carried out.

**Structure:** Austenite with 10–15% ferrite.

**Scaling temperature:** Approx. 1832°F (1000°C) (air).

**Corrosion resistance:** Superior to 308L. When surfacing mild steel a corrosion resistance equivalent to that of ASTM 304 is obtained already in the first bead.

#### Welding positions

