

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 rutile has a rutile-basic coating, which gives the electrode similar reliability and position welding properties as basic type electrodes in cases where high X-ray requirements are stipulated.

AVESTA 309L rutile is an over-alloyed electrode intended for welding stainless steel unalloyed or low-alloy steels. The electrode has a composition that, under normal welding conditions, ensures a crack resistant weld metal.

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

Welding directions

AVESTA 309L rutile should be welded using a short arc and DC (positive polarity) but welding with AC is also possible. High amperages causing overheating of the electrode should be avoided. To avoid large weld pools, it is important to choose the proper amperage and welding speed.

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
3/32	2.5	300 / 12		205	
1/8	3.25	350 / 14		126	
5/32	4.0	350 / 14		96	

Approvals: DNV, CWB, ABS

Standard designations

AWS A5.4 E309L-16

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni
0.03	0.6	1.6	23.0	13.0

Ferrite 15 FN DeLong

Mechanical properties

	Typical values (IIW)		
Yield strength, R _{p0.2}	480 N/mm ²	70 ksi	
Tensile strength, R _m	610 N/mm ²	90 ksi	
Elongation, A ₅	35 %	35 %	
Impact strength, KV +20°C	60 J	44 ft-lb	
Hardness approx.	200 Brinell		

Welding data

DC+ or AC	Diam., inch	Current, A
	3/32	60–80
	1/8	80–110
	5/32	120–150

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

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

Heat treatment: Generally none. For constructions that 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

