

For welding steels such as						
Outokumpu	EN	ASTM	BS	NF	SS	
Over-alloyed electrode used for surfacing unalloyed steel, joint welding stainless steel to unalloyed steel and for welding clad material. Also suitable for use with certain high temperature steels.						

Standard designations

AWS A5.4 E309Nb-17 (E309Cb-17)

Characteristics and welding directions

AVESTA 309Nb has a rutile acid-type coating and is designed for welding with either AC or positive pole DC.

AVESTA 309Nb is a high-alloy 23 Cr 13 Ni electrode which, due to its addition of niobium and reduced carbon content, offers good resistance to carbide precipitation and thus increased intergranular corrosion resistance. It also provides higher strength in elevated temperature service, which makes it suitable for welding high temperature steels such as ASTM 347 clad steel or for overlay welding of carbon steel.

AVESTA 309Nb may also be used for dissimilar welding of mild steel to stainless steels. It has a composition which, under normal welding conditions, ensures a crack resistant weld metal with a ferrite content of min. 3 %.

When welding stainless steel to unalloyed or low-alloy 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 500°C.

Welding data

DC+ or AC	Diameter, mm	Current, A
	3.25	80 – 120
	4.0	100 – 160

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni	Nb
0.03	0.8	0.8	23.0	13.0	0.8

Ferrite 15 FN DeLong

Mechanical Properties

	Typical values (IIW)	Min. values EN 1600
Yield strength $R_{p0.2}$	525 N/mm ²	
Tensile strength R_m	650 N/mm ²	550 N/mm ²
Elongation A_5	35 %	30 %
Impact strength KV		
+20°C	50 J	
Hardness, approx.	210 Brinell	

Interpass temperature: Max. 150°C.

Heat input: Max. 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 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 approx. 10–15 % ferrite.

Scaling temperature: Approx. 1000°C (air).

Corrosion resistance: Primarily designed for high temperature service or applications that should be heat treated. However, the corrosion resistance is superior to that of 308L.

Welding positions

