309L-4D

Covered electrodes

www.avestawelding.com

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-4D is an overalloyed electrode intended for welding stainless steel unalloyed or low-alloy steels. It has a thin, rutile-acid type coating and is designed for welding with either AC or positive polarity DC.

AVESTA 309L-4D has a composition that, under normal welding conditions, ensures a crack resistant weld metal.

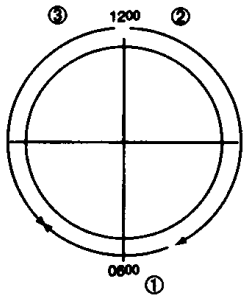
AVESTA 309L-4D can also be used for welding some high temperature steels. Always consult expertise.

Welding directions

AVESTA 309L-4D is designed for the continuous welding of pipes.

The combination of low welding currents and good fluidity means that pipes with a wall thickness of 2 mm can be welded using an electrode with a diameter of 2 mm.

Pipe welding can be performed in several different ways. One possibility is to start welding in overhead position (1), followed by vertical-down on both sides from 12 o'clock position (2 and 3). Another possibility is to start at the 7 o'clock position and weld vertical up to the 11 o'clock position on both sides. This requires an inverter power source with a remote control.



When welding stainless to unalloyed thin plates and pipes, DC– is often preferred.

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.

Packaging data

Diam. mm	Length mm	Weight/ capsule, kg	Approx. No. of electrodes/ capsule	Weight/ carton, kg
2.0	300	1.90	173	11.40
2.5	300	1.90	115	11.40
3.25	350	4.10	123	12.30

Approvals: –

Standard designations

EN 1600	E 23 12 L R
AWS A5.4	E309L-17

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni
0.02	0.8	1.0	23.3	12.8

Ferrite 15 FN DeLong

Mechanical properties	Typical values (IIW)	Min. values EN 1600
Yield strength, $Rp_{0,2}$	460 N/mm²	320 N/mm²
Tensile strength, R_m	590 N/mm²	510 N/mm²
Elongation, A_5	29 %	25 %
Impact strength, KV		
+20°C	50 J	
Hardness approx.	210 Brinell	

Welding data

DC+/– or AC	Diam., mm	Current, A
	2.0	25– 55
	2.5	30– 85
	3.25	45–110

Interpass temperature: Max. 150°C.

Heat input: Max. 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 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. 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