

309L-Si

For welding steels such as Outokumpu	EN	ASTM	BS	NF	SS
AVESTA 309L-Si is primarily used when surfacing unalloyed or low-alloy steels and when joining non-molybdenum-alloyed stainless and carbon steels.					

Standard designations

EN ISO 14343 G 23 12 L Si
AWS A5.9 ER309LSi

Characteristics and welding directions

AVESTA 309L-Si is a high-alloy 23 Cr 13 Ni wire primarily intended for surfacing of low-alloy steels and dissimilar welding between mild steel and stainless steels, offering a ductile and crack resistant weldment.

The chemical composition, when surfacing, is equivalent to that of ASTM 304 from the first run. One or two layers of 309L are usually combined with a final layer of 308L, 316L or 347.

Welding data

	Diameter mm	Current A	Voltage V
Short arc	0.80	60 – 100	20 – 22
	1.00	110 – 140	20 – 22
Spray arc	1.00	160 – 220	25 – 29
	1.20	200 – 260	27 – 30
	1.60	250 – 330	29 – 32
Pulsed arc	1.20	$I_{peak} = 350 - 450$ A $I_{bkg} = 50 - 150$ A Freq = 80 – 120 Hz	

Shielding gas

Ar + 2% O₂ or 2 – 3% CO₂.
Gas flow rate 12 – 16 l/min.

Approvals

- CE
- DB
- TÜV

Chemical composition, wire (typical values, %)

C	Si	Mn	Cr	Ni
0.02	0.80	1.8	23.5	13.5
Ferrite	13 FN	DeLong;	9 FN	WRC-92

Mechanical properties	Typical values (IIW)	Min. values EN ISO 14343
Yield strength R _{p0,2}	400 N/mm ²	320 N/mm ²
Tensile strength R _m	600 N/mm ²	510 N/mm ²
Elongation A ₅	32 %	25 %
Impact strength KV +20°C	110 J	
Hardness	200 Brinell	

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 5 – 10% ferrite.

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

Corrosion resistance: Superior to type 308L. When surfacing on mild steel a corrosion resistance equivalent to ASTM 304 is obtained at the first bead.