

For welding steel such as:

Outokumpu	EN	ASTM	BS*	NF*	SS*
Avesta 309L is primarily used when surfacing unalloyed or low-alloy steels and when joining non-molybdenum-alloyed stainless and carbon steels.					

* Obsolete national standards, replaced by EN 10088.

Characteristics

AVESTA FCW-3D 309L is a new type of flux-cored wire with very good weldability in all welding positions. The flux composition ensures excellent arc stability, very little spatter, a smooth weld surface and self-releasing slag.

AVESTA FCW-3D 309L is a high-alloyed 23 Cr 13 Ni wire primarily intended for surfacing low alloyed steels and for dissimilar welding between mild steel and stainless steels.

AVESTA FCW-3D 309L has a composition, which under normal welding conditions ensures a crack resistant weld metal with ferrite content of min. 3%.

Welding directions

AVESTA FCW-3D 309L should be welded using direct current positive polarity (DC+) with a recommended wire stick-out of 15-20 mm. When welding stainless to mild steel or low-alloy steel, 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. Compared to the MIG-method, the range of welding current and voltage is considerably wider.

Welding data

Ø inch	Horizontal		Vertical up		Overhead	
	A	V	A	V	A	V
0.045	150-260	24-31	140-180	23-28	150-200	24-29

The above parameters are intended for Ar+CO₂ shielding gas.

For further recommendations, please contact Avesta Welding.

Shielding gas recommendations

Welding is preferably done using an Ar-based shielding gas with addition of 15–25% CO₂, which will give the best result with respect to arc stability, melt pool control and with a minimum of spatter. However, 100% CO₂ can also be used. If 100% CO₂ is used, the welding voltage should be increased by 2–3 V to ensure the right arc length.

Gas flow rate is typically 20–25 l/min.

Standard designations

EN 12073	T 23 12 L P M/C 2
AWS A5.22	E309L T1-4/-1

Chemical composition - Typical values, %

C	0.03	Cr	23.4
Si	0.7	Ni	13.1
Mn	1.4		
Ferrite:	18 FN DeLong		
	15 FN WRC-92		

Mechanical properties – Typical values, IIW

	Typ. values	
Yield strength, R _{p0.2}	380 N/mm ²	55 ksi
Tensile strength, R _m	550 N/mm ²	80 ksi
Elongation, A ₅	32 %	32 %
Impact strength, KV	+20°C	49 J
	-60°C	41 J
Hardness	210 Brinell	–

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

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

Heat treatment: Generally none. For constructions that include low-alloyed 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 10–20 % ferrite.

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

Corrosion resistance: Superior to 308L fillers. When cladding mild steel or low-alloyed steel, the corrosion resistance of the first layer is equivalent to that of ASTM 304.

Approvals: