AVESTA 308LSi

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Welding wire MIG

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
4301	1.4301	304	2333	304S31	Z7 CN 18-09
4307	1.4307	304L	2352	304S11	Z3 CN 18-10
4311	1.4311	304LN	2371	304S61	Z3 CN 18-10 Az
4541	1.4541	321	2337	321S31	Z6 CNT 18-10

* Obsolete national standards, replaced by EN 10088.

CHARACTERISTICS

AVESTA 308LSi is designed for welding austenitic stainless steel type 19 Cr 10 Ni or similar. The filler metal is also suitable for welding titanium and niobium stabilised steels, e.g. ASTM 321 and ASTM 347, in cases where the construction will be operating at temperatures not exceeding 752°F (400°C). For higher temperatures a niobium stabilised consumable such as AVESTA 347Si is required.

AVESTA 308LSi has enhanced silicon content (0.85 %), which improves the fluidity of the melt pool with a minimum of spatter and porosity. This ensures a nice and smooth weld surface. The high silicon content does not increase the risk of hot cracking.

WELDING DIRECTIONS

MIG welding can be performed as short, spray or pulsed arc. Short arc is preferably used for thin gauges, both for horizontal and positional welding. Spray arc increases the deposition rate.

Welding with pulsed arc gives excellent possibilities for a good result in varying plate thicknesses in all positions. The highest flexibility using pulsed arc is achieved with ∅0.045″ (1.14 mm) wire.

WELDING DATA

	∅ (inch)	∅ (mm)	Current (A)	Voltage (V)
Short arc	0.030″	0.76	90–120	18–22
	0.035″	0.89	110–140	19–22
Spray arc	0.035″	0.89	160–220	25–29
	0.045″	1.14	200–270	26–30
	1/16″	1.60	250–330	29–32
Pulsed arc	0.045″	1.14	I_{peak} = 350–450 A I_{bkg} = 50–150 A Freq = 80–120 Hz	

For further recommendations, please contact Avesta Welding.

Shielding gas recommendations

Ar + 2% O_2 or Ar + 2–3% CO_2

The addition of O_2 or CO_2 provides good arc stability. Welding can also be performed using an addition of 30% helium (He), which will increase the energy of the arc. The fluidity is hereby improved and the weld is generally wider. The welding speed can therefore be increased. Addition of He will increase the blackening slightly.

Gas flow rate: 25-34 ft^3/hour (12–16 l/min).

Standard designations

EN 12072	19 9 L Si
AWS A5.9	ER308LSi

Chemical composition - Typical values, %

C	0.02	Cr	20.0
Si	0.85	Ni	10.5
Mn	1.8		

Ferrite: 11 FN DeLong
9 FN WRC-92

Mechanical properties – Typical values, IIW

		Typ. values		Typ. values	
Yield strength, $Rp_{0.2}$		420	N/mm²	61	ksi
Tensile strength, R_m		600	N/mm²	87	ksi
Elongation, A5		36	%	36	%
Impact strength, KV	+68°F	110	J	81	ft·lb
	–321°F	60	J	44	ft·lb
Hardness		200	Brinell		

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

Heat input: Max. 51 kJ/in (2.0 kJ/mm)

Heat treatment: Generally none. In special cases quench annealing at 1922°F (1050°C).

Structure: Austenite with 5–10 % ferrite.

Scaling temperature: Approx. 1562°F (850°C) (air).

Corrosion resistance: Corresponding to ASTM 304, i.e. fairly good under severe conditions such as oxidising and cold dilute reducing acids.

Approvals: CWB