

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 308L 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 347 is required.

Avesta Welding also supplies a type 308L wire with high silicon content (0.85 %) named AVESTA 308LSi. The higher silicon content will improve fluidity and weld bead appearance.

### 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 Ø0.045" (1.14 mm) wire

### WELDING DATA

	Ø (inch)	Ø (mm)	Current (A)	Voltage (V)
Short Arc	0.030"	0.76	90–120	18–22
Spray Arc	0.035"	0.89	110–140	19–22
	0.045"	1.14	200–270	26–30
	1/16"	1.60	250–330	29–32
Pulsed Arc	0.045"	1.14	I <sub>peak</sub> = 350–450 A I <sub>bg</sub> = 50–150 A Freq = 80–120 Hz	

For further recommendations, please contact Avesta Welding

### Shielding gas recommendations

Ar + 2% O<sub>2</sub> or Ar + 2–3% CO<sub>2</sub>

The addition of O<sub>2</sub> or CO<sub>2</sub> 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<sup>3</sup>/hour (12-16 l/min).

### Standard designations

EN 12072      19 9 L  
AWS A5.9      ER308L

### Chemical composition – Typical values, %

C	0.02	Cr	20.0
Si	0.40	Ni	10.0
Mn	1.7		
Ferrite: 8 FN	DeLong		
10 FN	WRC-92		

### Mechanical properties – Typical values, IIW

	Typ. values	Typ. values
Yield strength, R <sub>p0.2</sub>	390 N/mm <sup>2</sup>	57 ksi
Tensile strength, R <sub>m</sub>	590 N/mm <sup>2</sup>	85 ksi
Elongation, A <sub>5</sub>	38 %	38 %
Impact strength, KV	+20°C    110 J	81 ft·lb
	-196°C    50 J	37 ft·lb
Hardness	200 Brinell	

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

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

**Heat treatment:** Generally none. In special cases quench annealing at 2102°F (1050°C).

**Structure:** Austenite 5–10 % ferrite.

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

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

**Approvals:** CWB