

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 347 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

Welding is performed using direct current negative polarity (DC-). Welding can also be performed using pulsed current, which can be advantageous when welding in positions and for the welding of thin gauges.

### WELDING DATA

Ø (inch)	Ø (mm)	Current (A)	Voltage (V)
0.035"	0.89	40–60	8–10
0.045"	1.14	60– 80	9–11
1/16"	1.60	80–110	10–12
3/32"	2.40	130–160	16–18
1/8"	3.20	160–200	17–19
5/32"	4.00	180–220	18–20

For further recommendations, please contact Avesta Welding.

### Shielding gas recommendations

The most frequently used shielding gas is pure argon (Ar) with a gas flow of 12-17 ft<sup>3</sup>/hour (6–8 l/min).

Addition of about 30% helium (He) or 1–5% hydrogen (H<sub>2</sub>) will increase the energy of the arc. This will give a wider weld and a better fluidity of the melt pool. It is also advantageous because the welding speed can generally be increased why these kind of shielding gases often are used in automatic welding.

Welding tubes, pipes etc. often requires a purging gas protection. Common purging gases are pure Ar or Formier gas (90%N<sub>2</sub>+10%H<sub>2</sub>) with a flow of 20-42 ft<sup>3</sup>/hour (10–20 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, R <sub>p0.2</sub>	470 N/mm <sup>2</sup>	68 ksi
Tensile strength, R <sub>m</sub>	640 N/mm <sup>2</sup>	93 ksi
Elongation, A <sub>5</sub>	34 %	34 %
Impact strength, KV	+20°C	140 J
	-196°C	80 J
Hardness		103 ft·lb
		59 ft·lb
	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 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