

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
4541	1.4541	321	2337	321S31	Z6 CNT 18-10
-	1.4550	347	2338	347S31	Z6 CNNb 18-10

* Obsolete national standards, replaced by EN 10088.

CHARACTERISTICS

AVESTA 347 is used for welding titanium and niobium stabilised steel of type 19 Cr 10 Ni Ti or similar, providing improved high temperature properties e.g. creep resistance, compared to low-carbon non-stabilised materials. 347 is therefore primarily used for applications where service temperatures exceed 752°F (400°C).

Avesta Welding also supplies a 347 type wire with high silicon content (0.85 %) named 347-Si. The higher silicon content will improve the fluidity of the melt pool slightly.

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

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 ft³/hour (6–8 l/min).

Addition of about 30% helium (He) or 1–5% hydrogen (H₂) 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. Commonly used purging gases are pure Ar or Formier gas (90%N₂+10%H₂) with a flow of 20-42 ft³/hour (10–20 l/min).

Standard designations

EN 12072	19 9 Nb Si
AWS A5.9	ER347

Chemical composition - Typical values, %

C	0.04	Cr	19.5
Si	0.40	Ni	9.5
Mn	1.3	Nb	>12xC
Ferrite:	6 FN	DeLong	
	7 FN	WRC-92	

Mechanical properties – Typical values, IIW

	Typ. values	Typ. values
Yield strength, R _{p0.2}	520 N/mm ²	75 ksi
Tensile strength, R _m	680 N/mm ²	99 ksi
Elongation, A ₅	33 %	33 %
Impact strength, KV	+20°C -40°C	110 J 100 J
Hardness	210 Brinell	81 ft·lb

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

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

Heat treatment: Generally none. The 347 types can be used for cladding, which normally requires stress relieving at around 1094°F (590°C). Such a heat treatment will reduce the ductility of the weld at room temperature. Always consult the supplier of the parent metal or seek other expert advice to ensure that the correct heat treatment is carried out.

Structure: Austenite with 5–10% ferrite.

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

Corrosion resistance: 347 is primarily intended for high temperature service or applications that should be heat treated. However, the corrosion resistance corresponds to that of 308H, i.e. good resistance to general corrosion.

Approvals: CWB