

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 MVNB AC/DC is a niobium-stabilised electrode with a rutile-acid type coating. The electrode is easy to weld using either positive pole DC or AC.

AVESTA 347/MVNB is used for welding titanium and niobium-stabilised steels of the ASTM 321 and ASTM 347 types.

A stabilised weldment possesses improved high temperature properties, e.g. creep resistance, compared to low-carbon non-stabilised materials. 347/MVNB is therefore primarily used for applications where service temperatures exceed 400°C. Constructions with lower service temperatures can be welded with AVESTA 308L/MVR, which offers better resistance to hot cracking.

Welding directions

AVESTA 347/MVNB should be welded using a short arc or with its coating sliding along the workpiece. However, a slightly prolonged arc produces somewhat more attractive deposit surfaces.

Both positive pole DC and AC can be used, but DC is to be preferred. Avoid overheating the material. All titanium and niobium-stabilised materials are somewhat more susceptible to hot cracking than the corresponding non-stabilised materials.

Weld deposit data at maximum welding current

Diam. mm	Length mm	N	B	H	T	Metal recovery, approx. %
2.0	250					
2.5	300	0.57	89	0.92	44	109
3.25	350	0.59	45	1.51	53	109
4.0	450	0.62	30	2.07	58	107
5.0	450	0.67	17	3.06	70	106

Packaging data

Diam. mm	Length mm	Weight/ capsule, kg	Approx. No. of electrodes/ capsule	Weight/ carton, kg
2.0	250	1.36	124	8.16
2.5	300	4.10	175	12.30
3.25	350	4.10	109	12.30
4.0	450	5.40	74	16.20
5.0	450	6.10	61	18.30

Approvals: CWB, DB, DNV, TÜV.

Standard designations

EN 1600 E 19 9 Nb R
AWS A5.4 E 347-17

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni	Nb
0.02	0.8	0.8	19.5	10.0	≥10xC

Ferrite 10 FN DeLong

Mechanical properties

	Typical values (IIW)	Min. values EN 1600
Yield strength, Rp _{0.2}	470 N/mm ²	350 N/mm ²
Tensile strength, R _m	620 N/mm ²	550 N/mm ²
Elongation, A ₅	35 %	25 %
Impact strength, KV		
+20°C	55 J	
-40°C	45 J	
Hardness approx.	225 Brinell	

Welding data

DC+ or AC	Diam. mm	Current, A
	2.0	35– 60
	2.5	50– 80
	3.25	80–120
	4.0	100–160
	5.0	160–220

Interpass temperature: Max. 100°C.

Heat input: Max. 1.5 kJ/mm.

Heat treatment: Generally none. 347 types can be used for cladding, which normally requires stress relieving at around 590°C. Such a heat treatment will lower the ductility 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. 850°C (air)

Corrosion resistance: 347/MVNB 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.

Welding positions

