

For welding steel such as:

Outokumpu	EN	ASTM	SS*	BS*	NF*
4571	1.4571	316Ti	2350	320S17	Z6 CNDT 17-12

* Obsolete national standards, replaced by EN 10088.

Characteristics

AVESTA 318/SKNb 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 318/SKNb is recommended for welding titanium and niobium-stabilised steels of the ASTM 316Ti type.

A stabilised weld metal possesses improved high temperature properties, e.g. creep resistance, compared to low-carbon non-stabilised materials. 318/SKNb shows somewhat better properties than 316L/SKR at elevated temperatures and is therefore recommended for applications where service temperatures exceed 400°C. Constructions with lower service temperatures can be welded with 316L/SKR, which offers better resistance to hot cracking.

Welding directions

AVESTA 318/SKNb should be welded using a short arc or with its coating sliding along the workpiece.

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. %
2.5	350	0.58	75	1.05	46	110
3.25	350	0.59	45	1.58	51	109
4.0	450	0.63	26	2.23	63	108

Packaging data

Diam. mm	Length mm	Weight/ capsule, kg	Approx. No. of electrodes/ capsule	Weight/ carton, kg
2.0	300	1.70	128	10.20
2.5	350	4.10	180	12.30
3.25	350	4.10	109	12.30
4.0	450	5.30	73	15.90
5.0	450	5.40	51	16.20

Standard designations

EN 1600 E 19 12 3 Nb R
AWS A5.4 E318-17

Typical analysis % (All weld metal)

C	Si	Mn	Cr	Ni	Mo	Nb
0.02	0.8	0.8	18.5	12.0	2.8	≥10xC

Ferrite 10 FN DeLong

Mechanical properties

	Typical values (IIV)	Min. values EN 1600
Yield strength, R _{p0.2}	470 N/mm ²	350 N/mm ²
Tensile strength, R _m	605 N/mm ²	550 N/mm ²
Elongation, A ₅	32 %	25 %
Impact strength, KV		
+20°C	50 J	
-40°C	45 J	
Hardness approx.	220 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. In special cases quench annealing at 1050°C.

Structure: Austenite with 5–10 % ferrite.

Scaling temperature: Approx. 850°C (air)

Corrosion resistance: The corrosion resistance corresponds to that of ASTM 316Ti, i.e. good resistance to general, pitting and intercrystalline corrosion.

Approvals: DB, DNV, TÜV

Welding positions

