Avesta Welding

318-Si/SKNb-Si

For welding steels such as Outokumpu	EN	ASTM	BS	NF	SS
4571	1.4571	316Ti	320S31	Z6 CNDT 17-12	2350

Standard designations

EN ISO 14343 G 19 12 3 Nb Si

Characteristics and welding directions

AVESTA 318-Si/SKNb-Si is used for welding titanium and niobium stabilised steels of type 17 Cr 11 Ni 2.5 Ti or similar, providing improved high temperature properties, e.g. creep resistance, compared to low-carbon non-stabilised materials. 318-Si/SKNb-Si shows better properties than 316L-Si/SKR-Si at elevated temperatures and is therefore recommended for applications where service temperatures exceed 400°C.

Welding data

	Diameter mm	Current A	Voltage V
Short arc	0.80	90 – 120	18 – 22
	1.00	110 – 140	19 – 22
Spray arc	1.00	160 – 220	25 – 29
	1.20	200 – 270	26 – 30
Pulsed arc	1.20	I_{peak} = 350 – 450 A I_{bkg} = 50 – 150 A Freq = 100 – 150 Hz	

Shielding gas

Ar + 2% O_2 or 2 – 3% CO_2.
Gas flow rate 12 – 16 l/min.

Chemical composition, wire (typical values, %)

C	Si	Mn	Cr	Ni	Mo	Nb
0.04	0.85	1.3	19.0	12.0	2.6	>12xC

Ferrite 10 FN DeLong
7 FN WRC-92

Mechanical properties	Typical values (IIW)	Min. values EN ISO 14343
Yield strength $R_{p0,2}$	420 N/mm^2	350 N/mm^2
Tensile strength R_m	600 N/mm^2	550 N/mm^2
Elongation A_5	33 %	25 %
Impact strength KV		
+20°C	85 J	
–40°C	80 J	
Hardness	220 Brinell	

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

• CE • DB • TÜV