

316L/SKR Cryo

For welding steels such as					
Outokumpu	EN	ASTM	BS	NF	SS
4436	1.4436	316	316S33	Z7 CND 18-12 03	2343
4432	1.4432	316L	316S13	Z3 CND 17-12-03	2353
4429	1.4429	S31653	316S63	Z3 CND 17-12 Az	2375
4571	1.4571	316Ti	320S31	Z6 CNDT 17-12	2350

Standard designations

EN ISO 17633-B	TS316L-FB1
AWS A5.22	ER316LT1-4/-1

Characteristics and welding directions

AVESTA FCW 316L/SKR Cryo is a flux-cored wire with controlled weld metal ferrite content (FN 3-6). The weld goods produced offers good cryogenic toughness and lateral expansion down to -196°C as specified for LNG applications.

The rutile type flux-cored wire provides excellent positional characteristics and high travel speed. The flux composition ensures excellent arc stability, very little spatter, a smooth weld surface and self-releasing slag.

316L/SKR Cryo is designed for welding austenitic stainless steel type 18 Cr 12 Ni 2.5 Mo, but can also be used for welding titanium stabilised steels such as ASTM 316Ti in cases where the construction will be operating at temperatures below 400°C . For higher temperatures a niobium consumable should be used.

AVESTA FCW 316L/SKR Cryo should be welded using direct current positive polarity (DC+) with a recommended wire stick-out of 15 – 20 mm. Compared to the MIG-method, the range of welding current and voltage is considerably wider.

Welding data

Diameter, mm	Current, A	Voltage, V
1.20	100 – 220	20 – 31

Shielding gas

Ar + 15–25% CO_2 offers the best weldability, but 100% CO_2 can also be used (voltage should be increased by 2V).

Gas flow rate 20 – 25 l/min.

Chemical composition, wire (typical values, %)

C	Si	Mn	Cr	Ni	Mo
0.03	0.7	1.4	18.1	12.5	2,1
Ferrite 3–6 FN WRC-92					

Mechanical Properties

	Typical values (IIW)	Min. values EN ISO 17633
Yield strength $R_{p0,2}$	390 N/mm ²	320 N/mm ²
Tensile strength R_m	550 N/mm ²	510 N/mm ²
Elongation A_5	40 %	30 %
Impact strength KV		
+20°C	75 J	–
–196°C	40 J	–
Lateral expansion –196°C	> 0.38 mm	–

Interpass temperature: Max. 150°C

Heat input: Max. 2.0 kJ/mm

Heat treatment: Generally none. In special cases quench annealing at 1050°C .

Structure: Austenite with approx. 3–6 % ferrite.

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

Corrosion resistance: Excellent resistance to general, pitting and intercrystalline corrosion in chloride containing environments, equivalent to that of ASTM 316L. Intended for severe service conditions, i.e. in dilute hot acids.

Approvals

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