

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22 / SFA-5.22
T Z 19 13 4 N L R M21 (C1) 3	TS 317L-F M21 (C1) 0	E317LT0-4(1)

Characteristics and typical fields of application

Rutile flux-cored wire of T Z 19 13 4 N L R / E317LT0 type for welding of corrosion resistant CrNiMo(N) austenitic stainless steels. Better resistance to general, pitting and intergranular corrosion in chloride containing environments than 1.4436 / 316L. Intended for severe service conditions, e.g. in dilute hot acids and satisfies the high demands of offshore fabricators, shipyards building chemical tankers as well as the chemical/petrochemical, pulp and paper industries. Easy handling and high deposition rate result in high productivity with excellent welding performance and very low spatter formation. Increased travel speeds as well as self-releasing slag with little demand for cleaning and pickling provide considerable savings. The wide arc ensures even penetration to prevent lack of fusion. Suitable for service temperatures from -60°C to 300°C . The weld metal exhibits resistance to pitting corrosion and intergranular corrosion resistance (ASTM A 262 / Practice E) up to 300°C . Ferrite measured with Fischer Feritscope 3 – 8 FN. For corrosion resistant single layer cladding, the wire should be used under mixed gas (Ar + 15 – 25% CO_2) to ensure > 3 FN. For welding in vertical-up and overhead positions, FOXcore 317L-T1 should be preferred.

Base materials

1.4429 X2CrNiMoN17-13-3, 1.4434 X2CrNiMoN18-12-4, 1.4435 X2CrNiMo18-14-3
 1.4438 X2CrNiMo19-14-4, 1.4439 X2CrNiMoN17-13-5
 AISI 316L, 316LN, 317L, 317LN, 317LMN
 UNS S31600, S31653, S31703, S31726, S31753

Typical analysis

	C	Si	Mn	Cr	Ni	Mo	FN
wt.-%	0.03	0.7	1.3	18.8	13.1	3.4	2 – 10

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$	Tensile strength R_m	Elongation A ($L_0=5d_0$)	Impact energy ISO-V KV J	
	MPa	MPa	%	20°C	-60°C
u	420 (≥ 350)	570 (≥ 550)	32 (≥ 25)	50	45 (≥ 32)

u untreated, as-welded – shielding gas M21 (Ar + 18% CO_2)

Operating data

Polarity	DC +	Dimension mm
Shielding gas (EN ISO 14175)	M21, (C1)	1.2

Welding with standard GMAW power source with DC+ polarity. No pulsing needed. Backhand (drag) technique preferred with a work angle of approximately 80° . Ar + 15 – 25% CO_2 as shielding gas offers the best weldability. 100% CO_2 can be also used, but the voltage should be increased by 2 V. Suitable gas flow rate is 15 – 18 l/min. The heat input should not exceed 1.5 kJ/mm, the interpass temperature be limited to max. 100°C and the wire stick-out 15 – 20 mm. Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at 1050°C followed by water quenching.

Approvals

CECE