

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22 / SFA-5.22
T 19 12 3 L P M21 (C1) 1	TS 316L-F M21 (C1) 1	E316LT1-4(1)

Characteristics and typical fields of application

Rutile flux-cored wire of T 19 12 3 L P / E316LT1 type designed for welding 1.4404, 1.4432 / 316L type stainless steels with good resistance to general, pitting and intergranular corrosion in chloride containing environments. Intended for severe service conditions, e.g. in dilute hot acids. Also suitable for welding steels that are stabilized with titanium or niobium, such as 1.4571 / 316Ti for service temperatures not exceeding 400°C. For higher temperatures a niobium-stabilized consumable such as FOXcore 318-T1 is required. The scaling temperature is approximately 850°C in air. Designed for all-round welding and can be used in all positions without changing the parameter settings. Very good slag detachability and almost no spatter formation. Due to the fast freezing rutile slag, the weldability is excellent also in the vertical-up and overhead positions. The wide arc ensures even penetration and side-wall fusion to prevent lack of fusion. Suitable for service temperatures from -120°C to 400°C. For flat and horizontal welding positions, FOXcore 316L-T0 DG may be preferred.

Base materials

1.4401 X5CrNiMo17-12-2, 1.4404 X2CrNiMo17-12-2, 1.4409 GX2CrNiMo19-11-2, 1.4429 X2CrNiMoN17-12-3 1.4432 X2CrNiMo17-12-3, 1.4435 X2CrNiMo18-14-3, 1.4436 X3CrNiMo17-12-3, 1.4571 X6CrNiMoTi17-12-2 1.4580 X6CrNiMoNb17-12-2, 1.4583 X10CrNiMoNb18-12
UNS S31600, S31603, S31635, S31640, S31653
AISI 316L, 316Ti, 316Cb

Typical analysis

	C	Si	Mn	Cr	Ni	Mo	FN
wt.-%	0.03	0.7	1.5	19.0	12.0	2.7	4 – 13

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

Condition	Yield strength	Tensile strength R_m	Elongation A ($L_v=5d_v$)	Impact energy ISO-V KV J			Hardness
	$R_{p0.2}$ MPa	MPa	%	20°C	-20°C	-120°C	
u	410 (≥ 320)	550 (≥ 510)	34 (≥ 30)	65	55	40 (≥ 32)	210

u untreated, as-welded – shielding gas M21 (Ar + 18% CO₂)

Operating data

	Polarity	DC +	Dimension mm	Current A
	Shielding gas (EN ISO 14175)	M21, (C1)	0.9	100-160
			1.2	150-250
			1.6	200-350

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% CO₂ as shielding gas offers the best weldability. 100% CO₂ 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 2.0 kJ/mm, the interpass temperature be limited to max. 150°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

TÜV (09118), DB (43.014.24), ABS, BV (M21 + Ø 1.2 mm), CWB, DNV GL, LR (M21), CE