

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22 / SFA-5.22
T 25 9 4 N L P M21 (C1) 2	TS 2594-F M21 (C1) 1	E2594T1-4(1)

Characteristics and typical fields of application

Rutile flux-cored wire of T 25 9 4 N L P / E2594T1 type designed for welding ferritic-austenitic superduplex steel and equivalent steel grades such as 1.4410 / UNS S32750 and 1.4501 / UNS S32760. Can also be used for joints between superduplex grades and austenitic stainless steels or carbon steels. Superduplex steels are particularly popular for desalination, pulp & paper, flue gas desulphurization and sea water systems. Developed to fulfill severe requirements, such as those in NORSOK M-601 and similar standards. Properties of the weld metal match those of the parent metal, offering high tensile strength and toughness as well as an excellent resistance to stress corrosion cracking and localized corrosion in chloride containing environments. Meet the corrosion test requirements per ASTM G 48 Methods A, B and E (40°C). Over-alloyed in nickel to promote austenite formation. Designed for all-round welding and can be used in all positions without changing the parameter settings. The weldability is excellent in the vertical-up and overhead welding positions. The operating temperature range is -40°C to 220°C.

Base materials

25Cr superduplex ferritic-austenitic stainless steel and castings
 1.4410 X2CrNiMoN25-7-4, 1.4467 X2CrMnNiMoN26-5-4 1.4468 GX2CrNiMoN25-6-3,
 1.4501 X2CrNiMoCuWN25-7-4, 1.4507 X2CrNiMoCuN25-6-3, 1.4515 GX2CrNiMoCuN26-6-3,
 1.4517 GX2CrNiMoCuN25-6-3-3
 UNS S32750, S32760, J93380, S32520, S32550, S39274, S32950
 SAF 2507, UR47N, UR52N+

Typical analysis

	C	Si	Mn	Cr	Ni	Mo	N	PRE _N	FN
wt.-%	0.025	0.7	0.9	25.2	9.4	3.7	0.24	> 41	35 -55

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

Condition	Yield strength	Tensile strength	Elongation A	Impact energy ISO-V KV J		Hardness
	R _{p0.2}	R _m	(L ₀ =5d ₀)	20°C	-40°C	
u	MPa	MPa	%	60 (≥50)	38 (≥ 32)	270

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

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% CO₂ offers the best weldability and mechanical properties. Suitable gas flow rate is 16 – 20 l/min. Suggested heat input is 0.5 – 1.5 kJ/mm, interpass temperature max. 120°C and wire stick-out 15 – 20 mm. Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at 1100 – 1185°C followed by water quenching.

Approvals

CE