

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22 / SFA-5.22
T 22 9 3 N L P M21 (C1) 1	TS 2209-F M21 (C1) 1	E2209T1-4(1)

Characteristics and typical fields of application

Rutile flux-cored wire of T 22 9 3 N L P / E 2209T1 type primarily designed for welding 1.4462 / UNS S32205, S31803) duplex stainless steel. Can also be used for dissimilar welding of duplex grades and austenitic stainless steel or carbon steel for high strength joints. Developed to satisfy severe requirements, such as those in NORSOK M-601 and similar standards. The operating temperature range is -50°C to 220°C . Meets the corrosion test requirements per ASTM G48 Methods A, B and E (25°C). Over-alloyed in nickel to promote austenite formation. The weldability is excellent in the vertical-up and overhead welding positions. Very good resistance to pitting and stress corrosion cracking in chloride containing environments. Designed for all-round welding and can be used in all positions without changing the parameter settings. If the focus is on surface appearance and not on high impact toughness, FOXcore 2209-T1 may also be an alternative.

Base materials

EN 1.4462 X2CrNiMoN22-5-3, EN 1.4362 X2CrNiN23-4, EN 1.4162 X2CrNiMoN21-5-1
 UNS S32205, S31803, S32304, S32101
 2205, 2304, LDX 2101®, SAF 2205, SAF 2304

Typical analysis

	C	Si	Mn	Cr	Ni	Mo	N	PRE _L	FN
wt.-%	0.029	0.7	0.9	23.2	9.0	3.2	0.14	≥ 35	40 – 45

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

Condition	Yield strength	Tensile strength R_m	Elongation A	Impact energy ISO-V KV J		Hardness	Lateral expansion mm
	$R_{p0.2}$	MPa	$(L_0=5d_0)$	20°C	-50°C		-50°C
u	635 (≥ 450)	825 (≥ 690)	28 (≥ 20)	75	52 (≥ 32)	250	0.68 (≥ 0.38)

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. Ar + 15 – 25% CO₂ offers the best weldability. 100% CO₂ can be also used, but the voltage should be increased by 2 V and the weld metal austenite content increases somewhat. Gas flow rate 16 – 20 l/min. Suggested heat input is 0.5 – 1.5 kJ/mm, interpass temperature max. 150°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

DNV, CE