

**Classifications**

<b>EN ISO 17633-A</b>	<b>EN ISO 17633-B</b>	<b>AWS A5.22 / SFA-5.22</b>
T 22 9 3 N L R M21 (C1) 3	TS 2209-F M21 (C1) 0	E2209T0-4(1)

**Characteristics and typical fields of application**

Rutile flux-cored wire of T 22 9 3 N L R / E 2209T0 type primarily designed for welding 2205 (1.4462 / UNS S32205, S31805) duplex stainless steels used in offshore, shipyards, chemical tankers, chemical / petro-chemical, pulp & paper, etc. Provides excellent weldability in flat as well as horizontal-vertical position. The wide arc ensures even penetration and sidewall fusion to prevent lack of fusion. The wire shows good wetting behavior and results in a smooth weld finish. The weld metal has very good resistance to pitting and stress corrosion cracking in chloride containing environments. Meets the corrosion test requirements per ASTM G 48 Methods A, B and E for 24 h up to 22°C in as-welded condition and 30°C in solution-annealed condition, ASTM G 36, ASTM A262 Practice B, C and E, and NACE TM 0177 Method A. Over-alloyed in nickel to promote austenite formation. Ferrite measured with FeritScope MP30 40 – 50 FN. Suitable for service temperatures from –40°C to 250°C. For welding in vertical-up and overhead positions, FOXcore 2209-T1 is recommended as well as for thicker base material application.

**Base materials**

1.4462 X2CrNiMoN22-5-3, 1.4362 X2CrNiN23-4, 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 <sub>N</sub>	FN
wt.-%	0.024	0.7	0.9	22.8	8.9	3.2	0.14	≥ 35	40 – 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 <sub>p0.2</sub>	R <sub>m</sub>	(L <sub>0</sub> =5d <sub>0</sub> )	20°C	–40°C	
u	MPa	MPa	%	60	≥ 32	HB
	620 (≥ 450)	800 (≥ 690)	27 (≥ 20)	60	≥ 32	260

u untreated, as-welded – shielding gas M21 (Ar + 18% CO<sub>2</sub>)

**Operating data**

	<b>Polarity</b>	DC +	<b>Dimension mm</b>
	<b>Shielding gas (EN ISO 14175)</b>	M21, (C1)	1.2
			1.6

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<sub>2</sub> offers the best weldability. 100% CO<sub>2</sub> can be also used, but the voltage should be increased by 2 V and the weld metal austenite content increases somewhat. Suitable 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 – 1150°C followed by water quenching.

**Approvals**

TÜV (07133), DB (43.014.31), BV (C1 + Ø 1.2 mm), CWB, DNV GL, LR, RINA (M21), ABS, CE