

**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 P M21 (C1) 1	TS 2209-F M21 (C1) 1	E2209T1-4(1)

**Characteristics and typical fields of application**

Rutile duplex stainless steel flux-cored wire of T 22 9 3 N L P / E2209T1 type for welding of 22Cr steel grades such as 1.4462 / UNS S31803, S32205 and similar. It can also be used for dissimilar joints and weld cladding. Designed to fulfil the high demands set in offshore, shipyards, chemical tankers, chemical/petro-chemical, pulp & paper, etc. Very good resistance to pitting, intergranular corrosion and stress corrosion cracking in chloride containing environments i.e. seawater. Meets the corrosion test requirements per ASTM G48 Methods A, B and E (25°C). It is 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 wide arc ensures even penetration and sidewall fusion to prevent lack of fusion. Suitable for service temperatures from -46°C to 250°C. Over-alloyed in nickel to promote austenite formation. Ferrite measured with Fischer Feritescope 35 – 45 FN. For flat and horizontal welding positions (1G, 1F and 2F), FOXcore 2209-T0

**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.-%	0.026	0.6	1.1	23.0	9.0	3.2	0.14	≥ 35	40 – 60

**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	-46°C	
u	MPa	MPa	%			
	600 (≥ 450)	800 (≥ 690)	27 (≥ 20)	58	45 (≥ 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

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 – 1185°C followed by water quenching.

**Approvals**

TÜV (07666), ABS, BV (C1 + Ø 1.2 mm), CCS (C1 + Ø 1.2 mm), CWB, DNV GL, LR, RINA (M21), CE