

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22 / SFA-5.22
T 13 4 P M21 (C1) 1 (H5)	TS 410NiMo-F M21 (C1) 1 H5	E410NiMoT1-4(1)

Characteristics and typical fields of application

Rutile flux-cored wire of T 13 4 P / E410NiMoT1 type for welding of 13Cr-4Ni soft martensitic stainless steels such as 1.4313 / UNS S41500. Applications are for instance turbine components in the hydropower industry. Results in very low weld metal hydrogen content (HD of 1 – 3 ml/100 g) and high weld metal impact toughness after post-weld heat treatment. Fast freezing slag offers excellent weldability and slag control in all positions. Easy handling and high deposition rate result in high productivity with excellent welding performance and very low spatter formation. Increased travel speeds as well as self-releasing slag with little demand for cleaning and pickling provide considerable savings. The wide arc ensures even penetration and side-wall fusion to prevent lack of fusion.

Base materials

1.4313 X3CrNiMo13-4, 1.4317 GX4CrNi13-4, 1.4407 GX5CrNiMo13-4, 1.4414 GX4CrNiMo13-4
ACI Grade CA 6 NM, UNS S41500, J91540

Typical analysis

	C	Si	Mn	Cr	Ni	Mo
wt.-%	0.03	0.7	0.9	12.0	4.5	0.5

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

Condition	Yield strength	Tensile strength	Elongation A	Impact energy ISO-V KV J		
	$R_{p0.2}$	R_m	$(L_0=5d_0)$	20°C	-20°C	-50°C
u	800	1100	11	30	28	25
a	790 (≥ 500)	920 (≥ 760)	17 (≥ 15)	50	45	40
a1	760 (≥ 500)	900 (≥ 760)	16 (≥ 15)	45	40	35

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

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a annealed, 600°C / 2 h / cooling in air - shielding gas M21 (Ar + 18 % CO₂)

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a1 annealed, 600°C / 2 h / cooling in air - shielding gas C1(100 % CO₂)

Operating data

	Polarity	DC +	Dimension mm
	Shielding gas (EN ISO 14175)	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% CO₂ as shielding gas offers the best weldability. 100% CO₂ can also be used, but the voltage should be increased by 2 V. Suitable gas flow rate is 16 – 25 l/min. Recommended stick out 18 – 20 mm, 100 – 150°C preheating and 150°C interpass temperature. The heat input should not exceed 1.5 kJ/mm. Annealing performed at 590 – 620°C.

Approvals

TÜV (18993), CE