

Classifications						
EN ISO 17633-A		EN ISO 17633-B			AWS A5.22	
T 23 12 L R M21/C1 3		TS 309L-F M21/C1 0			E309LT0-4/-1	
Characteristics and typical fields of application						
<p>Rutile flux-cored wire of T 23 12 L R / E309LT0 type for welding of dissimilar joints of Cr and CrNi(Mo) steels and unalloyed or low-alloyed steels, as well as weld cladding of unalloyed or low-alloyed base metals preferably in flat or horizontal position. Ferrite measured with Fischer Feritescope 14 – 22 FN. 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 in time and money. The wire shows good wetting behavior and results in a finely rippled surface pattern. The wide arc ensures even penetration and side-wall fusion to prevent lack of fusion. Suitable for service temperatures from –60°C to 300°C.</p> <p>BÖHLER CN 23/12-FD Ø 1.2 mm can be used for a wall thickness ≥ 3 mm. For welding in vertical-up and overhead positions, BÖHLER CN 23/12 PW-FD should be preferred.</p>						
Base materials						
<p>Primarily used for surfacing (buffer layer) unalloyed or low-alloyed steels and when joining non-molybdenum-alloyed stainless and carbon steels.</p> <p>Joints and mixed joints between austenitic steels such as</p> <p>EN 1.4301 X5CrNi18-10, 1.4306 X2CrNi19-11, 1.4308 GX5CrNi19-10, 1.4401 X5CrNiMo17-12-2, 1.4404 X2CrNiMo17-12-2, 1.4408 GX5CrNiMo19-11-2, 1.4435 X2CrNiMo18-14-3, 1.4436 X3CrNiMo17-12-3, 1.4541 X6CrNiTi18-10, 1.4550 X6CrNiNb18-10, 1.4552 GX5CrNiNb19-11, 1.4571 X6CrNiMoTi17-12-2, 1.4580 X6CrNiMoNb17-12-2, 1.4581 GX5CrNiMoNb19-11-2, 1.4583 X10CrNiMoNb18-12, 1.4948 X6CrNi18-10</p> <p>UNS S30400, S30403, S30809, S31600, S31603, S31635, S32100, S34700, S31640</p> <p>AISI 304, 304L, 316, 316L, 316Ti, 321, 347</p> <p>or mixed joints between austenitic and heat resistant steels such as</p> <p>1.4713 X10CrAlSi7, 1.4724 X10CrAlSi13, 1.4742 X10CrAlSi18, 1.4826 GX40CrNiSi22-10, 1.4828 X15CrNiSi20-12, 1.4832 GX25CrNiSi20-14, 1.4837 GX40CrNiSi25-12</p> <p>with ferritic steels to pressure boiler steels P295GH and fine grained structural steels to P355N, ship building steel grades A – E, AH 32 – EH 36, A40 – F40, etc.</p>						
Typical analysis of all-weld metal						Ferrite WRC-92
	C	Si	Mn	Cr	Ni	FN
wt.-%	0.03	0.7	1.4	23.0	12.5	12 – 23
Mechanical properties of all-weld metal – typical values (minimum values)						
Condition	Yield strength R _{p0.2}	Tensile strength R _m	Elongation A (L ₀ =5d ₀)	Impact work ISO-V KV J		
	MPa	MPa	%	20°C	–60°C	
u	400 (≥ 320)	540 (≥ 520)	33 (≥ 30)	55	45 (≥ 32)	
u untreated, as welded – Ar + 18 % CO ₂						
Operating data						

	Ø (mm)	Wire feed m/min	Arc length mm	Current A	Voltage V
	1.2	5.0 – 15.0	~ 3	130 – 280	22 – 30
	1.6	4.5 – 9.5	~ 3	200 – 350	25 – 30

Welding with standard GMAW power source with DC+ polarity. No pulsing needed. Backhand (drag) technique preferred with a work angle of appr. 80°. Ar + 15 – 25 % CO₂ as shielding gas offers the best weldability. 100 % CO₂ can be also used, but the voltage should be increased by 2 V. The gas flow should be 15 – 18 l/min. The wire stick-out should be 15 – 20 mm and the heat input not exceed 2.0 kJ/mm. For dissimilar welding, slight weaving is recommended for all welding positions. The scaling temperature is approx. 1000°C in air. Post-weld heat treatment generally not needed. Preheat and interpass temperatures as required by the base material.

Approvals

TÜV (05350.), DB (43.014.16), DNV GL, LR, CE, RINA, BV (C1+Ø1.2), CE