BÖHLER CN 23/12 Mo PW-FD

Flux-cored wire, high-alloyed, austenitic stainless, special applications

Classifications

EN ISO 17633-A	EN ISO 17633-B	AWS A5.22
T 23 12 2 L P M21/C1 1	TS 309LMo-F M21/C1 1	E309LMoT1-4/1

Characteristics and typical fields of application

Austenitic stainless steel CrNiMo rutile flux-cored wire of T 23 12 2 L P / E309LMoT1 type. The corrosion resistance is superior to E316L type fillers. Primarily designed for welding dissimilar joints between stainless steels and low-alloyed steels. It can also be used for overlay welding, providing an 18Cr-8Ni-2Mo deposit from the very first layer and for joining of various steels. The 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 in time and money. The wide arc ensures even penetration and side-wall fusion to prevent lack of fusion. Provides high resistance to hot cracking even at high dilution. Alloying with molybdenum increases the corrosion resistance and weld metal strength. Suitable for service temperatures from –60°C to 300°C. For flat and horizontal welding positions (1G, 1F, 2F) BÖHLER CN 23/12 Mo-FD may be preferred.

Base materials

Joints and mixed joints between austenitic stainless steels such as

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

UNS S30400, S30403, S30809, S31600, S31603, S31635, S32100, S34700, S31640, S31653

AISI 304, 304L, 304LN, 302, 321, 347, 316, 316L, 316Ti, 316Cb

or duplex stainless steels such as

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

or mixed joints between austenitic and heat resistant steels

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

with ferritic steels to pressure boiler steels P295GH and also fine grained structural steels to P355N, shipbuilding steels grade A – E, AH 32 – EH 36, A40 – F40, etc.

Dissimilar joint welds – overlay welding the first corrosion resistant surface layer on P235GH, P265GH, S255N, P295GH, S355N – S500N; and high-temperature quenched and tempered fine-grained steels.

Typical analysis of all-weld metal

	C	Si	Mn	Cr	Ni	Mo	Ferrite WRC-92
							FN
wt.-%	0.03	0.7	1.4	23.0	12.5	2.7	23 – 36

Mechanical properties of all-weld metal

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	**540** (≥ 350)	**705** (≥ 550)	**28** (≥ 25)	**65**	**44** (≥ 32)

u untreated, as welded – shielding gas Ar + 18 % CO_2

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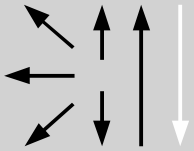
Operating data



Ø (mm)	Wire feed m/min	Arc length mm	Current A	Voltage V
0.9	8.0 – 15.0	~ 3	100 – 160	22 – 27
1.2	6.0 – 13.0	~ 3	150 – 200	22 – 29

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 % CO_2 as shielding gas offers the best weldability. 100 % CO_2 can be also used, but the voltage should be increased by 2 V. The gas flow should be 15 – 18 l/min. The heat input should not exceed 2.0 kJ/mm and the wire stick-out 15 – 20 mm. For dissimilar welding, slight weaving is recommended for all welding positions. The scaling temperature is approx. 950°C in air. Preheat and interpass temperatures as required by the base metal. Post-weld heat treatment generally not needed. For constructions that include dissimilar welding of low-alloyed steels, a stress-relieving annealing stage may be advisable. Always consult the supplier of the parent material or seek other expert advice to ensure that the correct heat treatment process is carried out. Ferrite measured with Fischer Feritescope 15 – 23 FN.

Approvals

TÜV (09116.), BV (C1+Ø1.2), LR (C1) , DNV GL, CWB, CE