Thermanit 309L

TIG rod, high-alloyed, austenitic stainless, special applications

Classifications

EN ISO 14343-A	AWS A5.9 / SFA-5.9
W 23 12 L	ER309L

Characteristics and typical fields of application

TIG rod of W 23 12 L / ER309L type for welding dissimilar joints. Well-suited for depositing intermediate layers when welding of cladded materials. Designed for very good welding and wetting characteristics as well as good safety after dilution when welding dissimilar joints. The average ferrite content is >10 FN (> 16 FN on request).
Suitable for service temperatures between –80ºC and 300ºC.

Base materials

Primarily used for surfacing (buffer layer) unalloyed or low-alloyed steels and when joining non-molybdenum-alloyed stainless and carbon steels.
Joints and mixed joints between austenitic steels such as
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
AISI 304, 304L, 316, 316L, 316Ti, 321, 347
or mixed joints between austenitic and heat resistant steels such as
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 fine grained structural steels to P355N, ship building steel grades A – E, AH 32 – EH 36, A40 – F40, etc.

Typical analysis

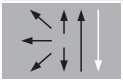
	C	Si	Mn	Cr	Ni
wt.-%	0.02	0.5	1.7	23.5	13.2

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

Condition	Yield strength $R_{p0.2}$	Tensile strength R_m	Elongation A (L_0=5d_0)	Impact energy ISO-V KV J	
	MPa	MPa	%	20°C	–120°C
u	440 (≥ 320)	580 (≥ 510)	34 (≥ 25)	150 (≥47)	(≥ 32)

u untreated, as-welded – shielding gas Ar

Operating data



Polarity	DC-
Shielding gas (EN ISO 14175)	I1
Rod marking	+ W 23 12 L / ER 309 L

Dimension mm
1.6 × 1000
2.0 × 1000
2.4 × 1000
3.2 × 1000

Heat input max. 1,5 kJ/mm, interpass temperature max. 100ºC.
Preheating and interpass temperature as required by the base metal. In case of post weld heat treatment of dissimilar joints, attention must be paid to resistance to intercrystalline corrosion and to susceptibility of the austenitic metal side to embrittlement. For dissimilar joining with unalloyed or low-alloyed steels, no post-weld heat treatment should be performed above 300ºC due to the risk of carbide precipitation in the weld fusion zone causing loss of toughness.

Approvals

TÜV (19602), DB (43.132.78), DNV, ABS, CE