

Classifications

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

Characteristics and typical fields of application

GMAW solid wire of type 309L / 23 12 L for welding dissimilar joints. Well suited for depositing intermediate layers when welding clad materials. The average ferrite content is >10 FN (> 16 FN on request). Suitable for service temperatures between -80°C and 300°C.

Base materials

Dissimilar Joints of and between high-strength, mild steels and low-alloyed QT-steels, stainless, ferritic Cr and austenitic Cr-Ni-steels, high manganese steels
Surfacing: for the first layer of corrosion resistant weld surfacing on ferritic-perlitic steels in boiler and pressure vessel parts up to fine-grained steel S500N, as well as of high temperature steels.

Typical analysis

	C	Si	Mn	Cr	Ni
wt.-%	≤ 0.02	0.5	1.7	24.0	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	-80°C
u	420 (≥ 320)	570 (≥ 510)	32 (≥ 25)	90 (≥ 47)	(≥ 32)

u untreated, as-welded – shielding gas Ar + 2.5% CO₂

Operating data

	Polarity	DC+	Dimension mm	
	Shielding gas (EN ISO 14175)	M12		0.9
		M13		1.0
				1.2
				1.6

Post-weld heat treatment generally not needed. For constructions that include low-alloyed steels in mixed joints, a stress-relieving annealing stage may be advisable. However, this type of alloy may be susceptible to embrittlement-inducing precipitation in the temperature range 550 – 950°C. Always consult the supplier of the parent metal or seek other expert advice to ensure that the correct heat treatment process is carried out. Heat input max. 2.0 kJ/mm, interpass temperature max. 150°C.
Shielding gas: Ar + 8 – 10% CO₂, Ar + 2 – 3% CO₂, Ar + 1 – 2% O₂

Approvals

TÜV (19604), DB (43.132.77), CE