

Classifications

EN ISO 14343-A	AWS A5.9 / SFA-5.9	EN ISO 14174
S 23 12 L	ER309L	S F CS 2 DC

Characteristics and typical fields of application

Thermanit 309L - Marathon 213 is a wire/flux combination for submerged arc welding. This is a standard combination for welding dissimilar joints, and the first layer in weld overlay (wire cladding). The average ferrite content is 16 FN. Solid wire of S 23 12 L / ER309L type for joining unalloyed/low-alloyed steels and cast steel grades or stainless heat resistant Cr-steels to austenitic steels. For depositing intermediate layers when welding the side of plates clad with low-carbon unstabilized and stabilized austenitic CrNi(MoN)-alloys. Favorably high chromium and nickel contents, low carbon content. Max. service temperature 350°C. Well-suited for depositing intermediate layers when welding clad materials. The former product name of the SAW wire was "Thermanit 25/14 E-309L".

Marathon 213 is an fused flux with good welding properties with nice bead appearance and good slag detachability. For more information regarding this sub-arc welding flux, see the separate datasheet.

Base materials

Dissimilar joint welds: Of and between high-strength, mild steels and low-alloyed QT-steels, stainless, ferritic Cr and austenitic CrNi-steels, manganese steels.

Surfacing: For the first layer of corrosion resistant weld surfacing on ferritic-pearlitic steels in boiler and pressure vessel parts up to fine-grained steel S500N, as well as of high temperature steels such as 1.6310 20MnMoNi5-5, 1.6755 22NiMoCr4-7 and 1.6759 GS-18NiMoCr3-7.

Typical analysis

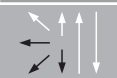
wt.-%	C	Si	Mn	Cr	Ni
wire	0.01	0.50	1.8	24.0	13.5
all-weld metal	0.01	0.70	1.3	23.5	13.5

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
u	≥ 380	≥ 580	≥ 30	≥ 80

u untreated, as-welded

Operating data

	Dimension mm	Current A	Voltage V
1	2.4	300 – 400	29 – 33
2	3.2	350 – 500	29 – 33
3	4.0	425 – 575	30 – 34

Preheating and interpass temperature as required by the base metal. Polarity: DC+.

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 postweld heat treatment should be performed above 300°C due to the risk of carbide precipitation in the weld fusion zone causing loss of toughness.

Approvals

TÜV (09617), CE