

## Classifications

EN ISO 14343-A	AWS A5.9 / SFA-5.9	EN ISO 14174
S 19 12 3 L	ER316L	S F CS 2 DC

## Characteristics and typical fields of application

**Thermanit GE-316L - Marathon 213** is a wire-flux-combination for welding of stainless steel grades such as 1.4435 / 316L. Solid SAW wire of S 19 12 3 L / ER316L type for joining and surfacing application with matching and similar unstabilized austenitic CrNi(N) and CrNiMo(N)-steels and cast steel grades. Corrosion resistance similar to matching low-carbon and stabilized austenitic CrNiMo-steels. Max. service temperature 400°C. Low temperature service down to -196°C.

**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

1.4401 X5CrNiMo17-12-2, 1.4404 X2CrNiMo17-12-2, 1.4409 GX2CrNiMo19-11-2, 1.4429 X2CrNiMoN17-12-3, 1.4432 X2CrNiMo17-12-3, 1.4435 X2CrNiMo18-14-3, 1.4436 X3CrNiMo17-12-3, 1.4571 X6CrNiMoTi17-12-2, 1.4580 X6CrNiMoNb17-12-2, 1.4583 X10CrNiMoNb18-12  
UNS S31600, S31603, S31635, S31640, S31653  
AISI 316L, 316Ti, 316Cb

## Typical analysis


wt.-%	C	Si	Mn	Cr	Ni	Mo
wire	0.01	0.45	1.6	18.5	12.2	2.7
all-weld metal	0.015	0.70	1.1	17.9	12.2	2.6

## 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	-60°C
u	405 (≥ 350)	580 (≥ 560)	37 (≥ 30)	90 (≥ 70)	80

u untreated, as-welded

## Operating data

	Dimension mm	Current A	Voltage V
	2.0	250 – 350	28 – 32
	2.4	300 – 400	29 – 33
	3.2	350 – 500	29 – 33
	4.0	425 – 575	30 – 34

No preheating. Suggested heat input is max. 2.0 kJ/mm and interpass temperature max. 150°C. Polarity: DC+  
Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at 1050°C followed by water quenching.

## Approvals

TÜV (09613), CE, DNV GL, LR