

## Classifications

EN ISO 14343-A	AWS A5.9 / SFA-5.9	EN ISO 14174
S 19 9 L	ER308L	S A FB 2 DC

## Characteristics and typical fields of application

**Thermanit JE-308L Cryo - Marathon 431** is a wire/flux combination for submerged arc welding of stainless steel grades such as 1.4306 / 304L. Solid SAW wire of S 19 9 L / ER308L type with controlled weld metal ferrite content (6 FN), particularly for good cryogenic toughness and lateral expansion down to  $-196^{\circ}\text{C}$ . Max. service temperature  $350^{\circ}\text{C}$ . Applications can be found in multiple cryogenic applications like LNG. The former product name of the SAW wire was "BÖHLER EAS 2-UP (LF)".

**Marathon 431** is an agglomerated basic flux that ensures 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

1.4301 X5CrNi18-10, 1.4306 X2CrNi19-11, 1.4307 X2CrNi18-9, 1.4311 X2CrNiN18-9, 1.4312 GX10CrNi18-8, 1.4541 X6CrNiTi18-10, 1.4546 X5CrNiNb18-10, 1.4550 X6CrNiNb18-10  
UNS S30400, S30403, S30453, S32100, S34700  
AISI 304, 304L, 304LN, 302, 321, 347

## Typical analysis

wt.-%	C	Si	Mn	Cr	Ni	FN
wire	0.02	0.40	1.8	20.0	11.0	3 – 8
all-weld metal	0.02	0.55	1.5	19.5	10.8	3 – 8

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

Condition	Yield strength	Tensile strength	Elongation A	Impact energy ISO-V KV J		Lateral expansion
	$R_{p0.2}$	$R_m$	( $L_0=5d_0$ )			mm
	MPa	MPa	%	$20^{\circ}\text{C}$	$-196^{\circ}\text{C}$	$-196^{\circ}\text{C}$
u	410 ( $\geq 320$ )	580 ( $\geq 550$ )	36 ( $\geq 30$ )	85 ( $\geq 65$ )	( $\geq 40$ )	( $\geq 0.38$ )

u untreated, as-welded

## Operating data

Dimension mm	Current A	Voltage V
2.4	200 – 300	26 – 30
3.2	300 – 400	29 – 33

Suggested heat input is max. 1.5 kJ/mm and interpass temperature max.  $100^{\circ}\text{C}$ . Polarity: DC+

Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at  $1050^{\circ}\text{C}$  followed by water quenching.

## Approvals

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