

## Classifications

<b>EN ISO 14343-A</b>	<b>AWS A5.9 / SFA-5.9</b>	<b>EN ISO 14174</b>
S 22 9 3 N L	ER2209	S A FB 2 DC

## Characteristics and typical fields of application

**Thermanit 22/09 - Marathon 431** is a wire/flux combination for submerged arc welding of duplex steel grades such as 1.4462 / S31803 used in offshore, shipyards, chemical tankers, chemical/petrochemical, pulp & paper, etc.

Solid wire of S 22 9 3 N L / ER2209 type with high Cr and Mo-contents for good resistance to pitting corrosion and stress corrosion cracking in chlorine and hydrogen sulfide-bearing environment. Over-alloyed in nickel to promote austenite formation. Suitable for service temperatures from -40°C to 250°C.

**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

Similar duplex stainless steels, also combinations of duplex, ferritic and austenitic steels

1.4462 X2CrNiMoN22-5-3, 1.4362 X2CrNiN23-4, 1.4162 X2CrNiMoN21-5-1

UNS S32205, S31803, S32304, S32101

2205, 2304, LDX 2101®, SAF 2205, SAF 2304

## Typical analysis

wt.-%	C	Si	Mn	Cr	Ni	Mo	N
wire	0.015	0.40	1.5	23.3	8.8	3.2	0.15
all-weld metal	0.015	0.50	1.3	22.8	8.8	3.1	0.14

## 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	-40°C
u	≥ 450	≥ 690	≥ 20	≥ 80	≥ 40

u untreated, as-welded

## Operating data

	Polarity	DC +	Dimension mm	Current A	Voltage V
	2.0	250 – 350	28 – 33		
	2.5	300 – 500	28 – 33		
	3.0	380 – 580	29 – 34		

Suggested heat input is max. 2.0 kJ/mm and interpass temperature max. 150°C. Polarity: DC+. No preheating.

Post-weld heat treatment generally not needed. In special cases, solution annealing can be performed at 1050°C followed by water quenching.

## Approvals

TÜV (06112), ABS, DNV GL, LR, CE