

## Classifications

<b>EN ISO 24598-A</b>	<b>AWS A5.23 / SFA-5.23</b>
S S ZCrMo91 FB	F9PZ-EB91-B91-H4

## Characteristics and typical fields of application

**Thermanit MTS 3-LNi – Marathon 543** is a wire – flux combination for Submerged Arc Welding high temperature and creep resistance 9% chromium steel like P91.

Compared with standard Thermanit MTS 3- SAW wire, this wire has extra low content of Ni, to limit Mn + Ni < 1,0% in the weld metal. Creep rupture properties: According to the parent metal T (P) 91.

**Marathon 543** is an agglomerated welding flux of the fluoride basic type with high basicity. For more information regarding this welding flux see our detailed data sheet.

## Base materials

Similar alloyed creep resistant steels.

A213-T91, A335-P91, X10CrMoVNb9-1, ASTM A 387 Gr. 91, ASTM A 336 Gr. F91

## Typical analysis

wt.-%	C	Si	Mn	Cr	Ni	Mo	V	Nb	N
wire	0.11	0.25	0.50	9.0	0.45	0.95	0.20	0.06	0.04
all-weld metal	0.09	0.20	0.80	8.9	< 0.15	0.95	0.18	0.05	0.040

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

Condition	Yield strength R <sub>p0.2</sub>	Tensile strength R <sub>m</sub>	Elongation A (L <sub>0</sub> =5d <sub>0</sub> )	Impact energy ISO-V KV J
	MPa	MPa	%	20°C
a1, DC+	560 (≥ 540)	700 (≥ 620)	19 (≥ 17)	75 (≥ 41)
a1 = 4 hours 740 °C				

## Operating data

	<b>Polarity</b>	DC +	<b>Dimension mm</b>
			1.6
			2.4
			3.2

Preheating and interpass temperature 200 – 260°C. Heat Input < 1,8kJ/mm.

After welding the joint should cool down to below 80°C to finish the martensite transformation. Pipe welds with wall thickness up to 45 mm can be cooled down to room temperature. For heavier wall thicknesses or stressed components, unfavourable possible stress condition must be considered.

The recommended PWHT weld heat treatment is annealing at 760°C/ 4 hrs (min 2hrs. -max. 10 hrs); heating/cooling rates below 550°C max. 150°C/hr, above 550°C max 80°C/hr.

## Approvals

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