

Technical Data Sheet

EXHAUST® F1

Chemical composition (%)

C	Si	Mn	Ni	Cr	Mo	Cu	Nb
≤ 0.02	≤ 0.5	≤ 0.8	≤ 0.5	17.8 – 18.8	≤ 0.5	≤ 0.5	0.05 + 7x(C+N) – 0.5

30-09-2021 – REV 05

General presentation

Exhaust® F1 welding wire is an improvement in the technology of welding of the exhaust line.

» Quality: welds have a better behavior in exhaust line than if obtained with type 308LSi, 307Si or 409Nb

» Cost: improvement of the productivity by an increasing welding speed.

» Price: no influence by the Nickel quotation.

Classification

Stabilised ferritic grade

Designation

Material No.

Europe – EN ISO 14343-A	USA – AWS A5.9	Europe – WNr.
18 L Nb		(1.4511)

Approvals

	MIG	TIG	SAW
TÜV (Germany)			
CE	X	X	X
DB			

Mechanical properties on as weld deposit (typical values)

Tensile test

On welded assemblies have mechanical properties at least equivalent as those of the base metal.

Hardness measurements

The micro hardness profiles HV 100g across the welded seams are 'flat' thanks to a wholly ferritic structure.

Erichsen cupping test

Erichsen deflection of weld seams is greater than 90% of the values obtained on base metals. Their drawability is much better than the drawability of assemblies with austenitic wires.

Fatigue tests at high temperature and thermal fatigue

Welds of ferritic stainless steel sheets obtained with EXHAUST® F1 wire exhibit, compared to that obtained with 308LSi or 307Si, behaviors:

» Far better in thermal fatigue between 250 and 900°C

» Identical in high cycle fatigue at 300, 750, 850 and 950°C



Swiss Steel Group

Production sites: Ugitech SA
www.swisssteel-group.com

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Corrosion resistance

- » No intergranular corrosion on stabilized stainless steel assemblies (according to ASTM A262E test procedure), provided that the gas specifications are respected.
- » Dip-Dry simulation of external or internal corrosion between 300°C and 800°C shows a corrosion resistance of the weld zone equivalent to that of the base metal.
- » The cyclic oxidation test didn't show any penetration of oxide on ferritic AISI 441/AISI 441 assemblies, whereas assemblies obtained with austenitic wires show.

Welding

EXHAUST® F1 filler wire is designed for welding stabilized ferritic stainless steel sheets, whatever their stabilizing element (1.4509, 1.4510, 1.4511, 1.4512, etc.). It can, however, also be used in certain cases for heterogeneous welding of ferritic stainless steel/austenitic stainless steel or austenitic stainless steel/austenitic stainless steel.

The niobium present in the filler grade ensures its stabilization (essential for preventing intergranular corrosion phenomena in the WM during use).

Although stabilization with niobium ensures a stabilized WM, including when highly oxidizing and recarburising gases such as Argon + 8% CO₂ are used

Welding parameters

MIG Process

Recommended shielding gases are:

- » Argon + Oxygen (1 to 3%)
- » Argon + CO₂ (1 to 2.5%)
- » Nitrogen and hydrogen are forbidden

To avoid growth in the weld zone, welding wires are limited to 1.2 mm maxi diameter and pulsed current is recommended.



TIG Process

GTAW parameters are similar to those of welding wire type 308LSi:

Intensity (A)	Voltage (V)	Shielding-gas
50-250	10 to 15	Pure argon

Nitrogen and hydrogen are forbidden.



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Available products

Process	Shape	Diameter Range	Packaging	Weight
TIG	Rods	1.0 – 4.0 mm	Cardboard tubes	5 kg
MIG	Wire	0.8 – 1.6 mm	Metallic spools – BS 300	15 – 18 kg
		0.8 – 1.2 mm	Plastic spools – D 200	5 kg
		1.0 – 1.6 mm	Plastic spools – D 300	15 kg
		0.8 – 1.2 mm	Plastic spools – D 350	25 – 27 kg
		0.8 – 1.2 mm	Pay off pack - Drums	250 – 500 kg
SAW	Wire	1.6 – 3.2 mm	Rims K415 / 300 / 94	20 – 25 kg
			Rims K435 / 300 / 70	

Contact us for dimensions

Applications

Welding of stabilized ferritic stainless steels used in exhaust applications

EN	1.4512	1.4510	1.4526	1.4509
AISI	409	439	436	441

Welding of heterogeneous assemblies in exhaust system applications including carbon steel (Fe 37...) and austenitic (AISI 304...) or ferritic stainless steel base metals.



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