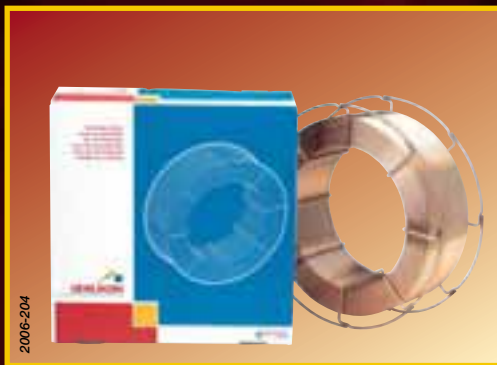


CRISTAL™ F 119 - F 208

A new generation of seamless flux cored wires

“The future of welding is clear”



2006-204

FL00537R

CRISTAL™ F, a new generation of flux cored wires



Our major objective at Air Liquide Welding is to help our customers optimise their performance by offering innovative products. To do so, the Air Liquide Welding dedicated R & D team is permanently working on the development of solutions to improve productivity and quality and to drive technological evolution.

The CRISTAL™ range of tubular flux cored wires consists of two types:

CRISTAL™ F 119

A rutile flux cored wire for all position welding with CO₂ gas shielding.

• *Shipbuilding:*

- construction
- repair



CRISTAL™ F 208

A metal cored wire for a wide range of application with Argon/CO₂ gas shielding.

• *Transportation equipment*

• *Infrastructure*

• *Machines and equipment*

Both manual and automatic or robotic welding.



Comparison of fume emission rates



Comparative fume characteristics with standard wires for diameter 1.2 mm.

Wire	Average emission rate in (g/h)
CRISTAL™ F119 (*1)	47
Standard rutile wire (*1)	58
CRISTAL™ F 208 (*2)	44
Standard metal cored wire (*1)	58

(*1) Results generated by TWI (The Welding Institute Ltd), Cambridge UK, August 2005

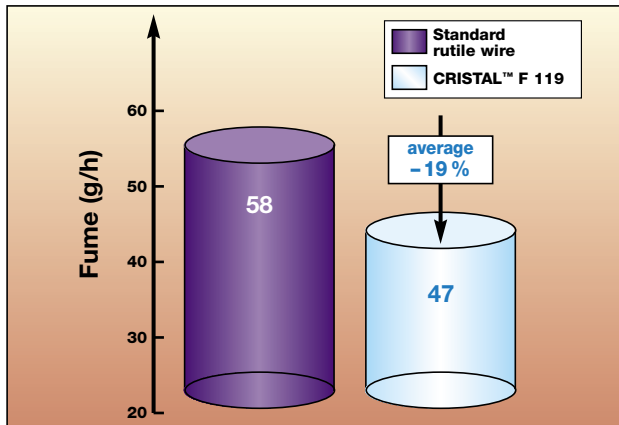
- Emission rate testing according to the methodology defined in pr EN 15011-4, EN ISO 15011-1:2002.
- Welding performed with an inverter on degreased mild steel base material, average current : 302 A – voltage 31 V
- Distance contact tip – plate: 20 mm.

(*2) Results obtained by Air Liquide Welding, July 2005

Different conditions of use can lead to different results.

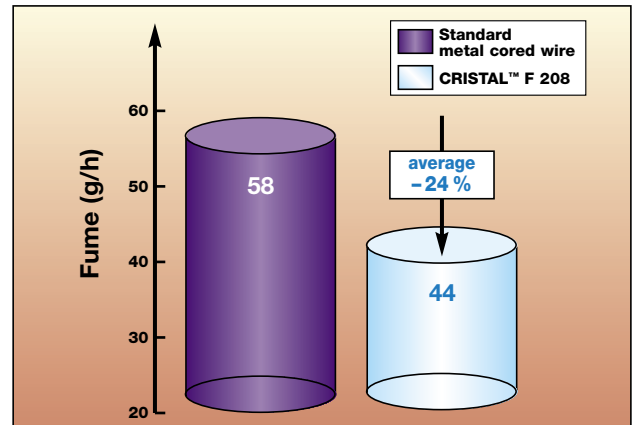
For rutile cored wire

Shielding gas according to EN 439: C1

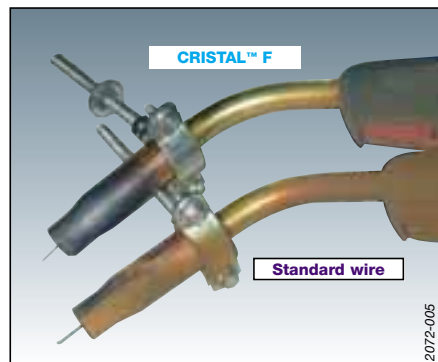


For metal cored wire

Shielding gas: according to EN 439: M21 (82 % Ar + 18 % CO₂)



Comparison of torch nozzles (after welding with standard wire and CRISTAL™ wire)



The above results were obtained with the parameters shown above, during the same period of time.

Mechanical, chemical characteristics and conformance



CRISTAL™ F 119 rutile cored wire

All data are given with CO₂ shielding gas, according EN 439: C1 (100 Vol % CO₂)

■ Conformance

- EN 758: T 46 2 P C 1 H5
- AWS/ASME: SFA 5.20 E71T-1H4

■ Approvals

BV - LRS - DNV - ABS - GL - TÜV - DB - RINA

■ Chemical analysis and mechanical properties

Chemical analysis of all weld metal (typical %)

C	Mn	Si	P	S
0.03	1.5	0.5	0.012	0.006

Mechanical properties
(single values are minimum values)

UTS (MPa)	YS (MPa)	E (l = 5d) (%)	CVN (Joule) -20 °C
550-650	>460	>22	>55

■ Product information

Ø mm	Packaging	Cat. no.
1.2	K 300 - 16 kg	W 000 030 047
1.2	K 200 - 5 kg	W 000 030 048
1.2	D 200 - 5 kg	W 000 030 049
1.4	K 300 - 16 kg	W 000 030 050

Drums or alternative packaging: contact us

CRISTAL™ F 208 metal cored wire

All data are given with Ar CO₂ shielding gas, according EN 439: M 21 (82 Vol % Ar + 18 Vol % CO₂)

■ Conformance

- EN 758: T 42 2 M M 1 H5
- AWS/ASME: SFA 5.18 E70C-3MH4

■ Approvals

TÜV - BV - LRS - DNV

■ Chemical analysis and mechanical properties

Chemical analysis of all weld metal (typical %)

C	Mn	Si	P	S
0.02	1.6	0.8	0.013	0.005

Mechanical properties
(single values are minimum values)

UTS (MPa)	YS (MPa)	E (l = 5d) (%)	CVN (Joule) -20 °C
510-600	>420	>24	>50

■ Product information

Ø mm	Packaging	Cat. no.
1.2	K 300 - 16 kg	W 000 030 051
1.4	K 300 - 16 kg	W 000 030 052
1.2	Drum 200 kg	W 000 030 053
1.4	Drum 200 kg	W 000 030 054

Drums or alternative packaging: contact us

CRISTAL™ F: a new generation of flux cored wires

The welding industry is a modern industry, where efficiency, productivity, quality and innovation are key to competitive advantage. Welders are highly skilled professionals, whose performance can be optimized by the use of the innovative and unique range of CRISTAL™ welding consumables.

How do the seamless CRISTAL™ F flux cored wires help to optimise your welders' performance.

Improved performance

- Better visibility of the weld pool
- Less cleaning of welded pieces and lower consumption of wear parts through low spatter levels and low fume emission.
- Easy to use and good feedability, even with long harnesses.

Quality

- Mechanical properties down to -20 °C
- Very good bead appearance



Working environment ⁽¹⁾

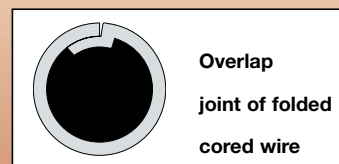
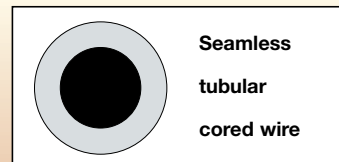
- Significant reduction of welding fumes emission, up to 24% ⁽²⁾, compared to standard wires, making welding safer and more comfortable.

The advantages of tubular technology (seamless cored wires)

Seamless tubular technology flux cored wires are unique to Oerlikon on the European welding market offering numerous advantages compared to folded wires.

The advantages are derived from the use of a closed tube.

- Good feedability, even with long harnesses
- Precise wire positioning automatic applications
- Excellent electrical transfer at the contact tip because of the coppered surface and thus :
 - Smoother and more stable arc
 - Longer life time of the wear parts, especially contact tips.
- Low hydrogen potential



(1) The use of CRISTAL™ does not replace the need for precautions to be taken when welding.

(2) CRISTAL™ F 208 with M21 shielding gas.



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