

CRISTAL™ F 100 - F 206

A new generation of flux cored wires

“The future of welding is clear”



2006-200

FL00537R

CRISTAL™ F: a new generation of flux cored wires



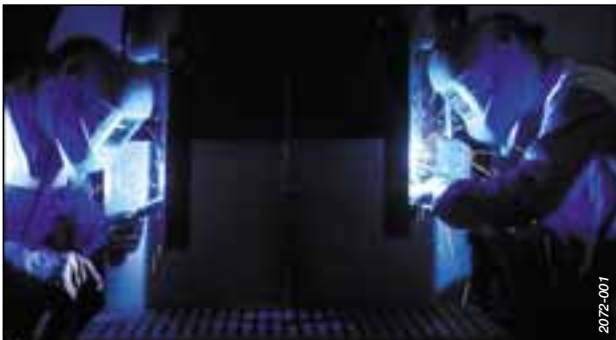
Our objective at Air Liquide Welding is to help our customers optimise their performance by offering innovative products. To do so, the Air Liquide Welding dedicated R & D team is permanently working on the development of solutions to improve productivity and quality and to drive technological evolution.

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

CRISTAL™ F 100

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

- **Shipbuilding:**
 - construction
 - repair



CRISTAL™ F 206

A metal cored wire for a wide range of applications with Ar/CO₂ gas shielding.

- **Transportation equipment**
- **Infrastructure**
- **Machines and equipment**

Both manual and automatic or robotic welding.



Comparison of fume emissions rates



Comparative fume characteristics with standard wires for diameter 1.2 mm.

Wire	Average emission rate in (g/h)
CRISTAL™ F100 (*2)	47
Standard rutile wire (*1)	58
CRISTAL™ F 206 - Ar/CO ₂ (*1)	34
CRISTAL™ F 206 - Ar/CO ₂ /O ₂ (*1)	8
Standard metal cored wire (*1)	58

Different conditions of use can lead to different results.

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

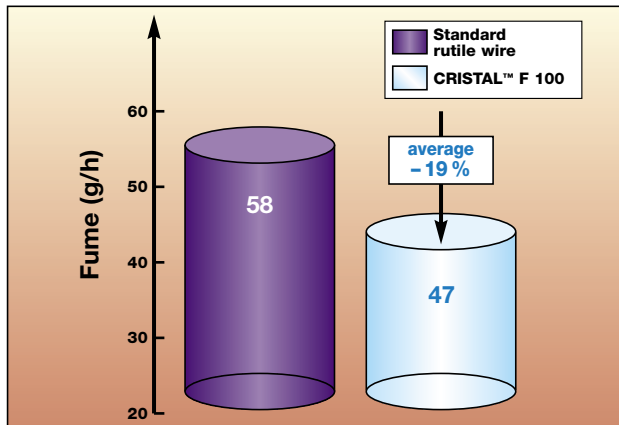
- Emission rate testing according to the methodology defined in pr EN 15011-4, EN ISO 15011-1:2002.
- Welding performed with an inverter on degreased mild steel base material:
 - average current rutile : 300 A – voltage 32 V,
 - average current metal cored wire Ar/CO₂ : 300 A – voltage 32 V,
 - average current metal cored wire Ar/CO₂/O₂ : 300 A – voltage 28 V.
- Distance contact tip – plate: 20 mm.

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

NB: The gas mixtures used are Air Liquide products:
Ar/CO₂: is ATAL 5, Ar/CO₂/O₂ : is ATAL 14.

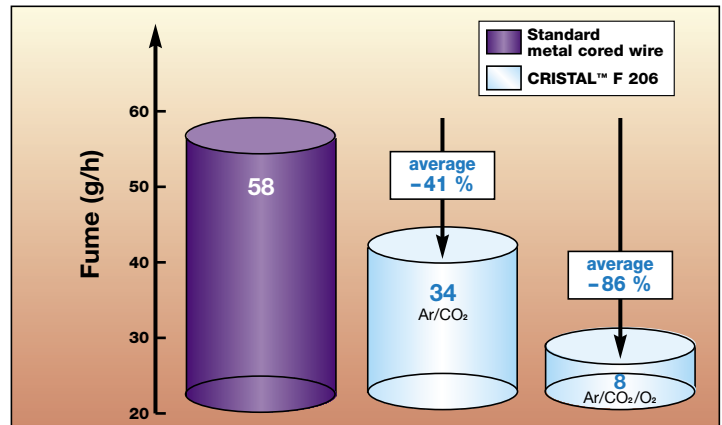
For rutile cored wire

Shielding gas according to EN 439: C1

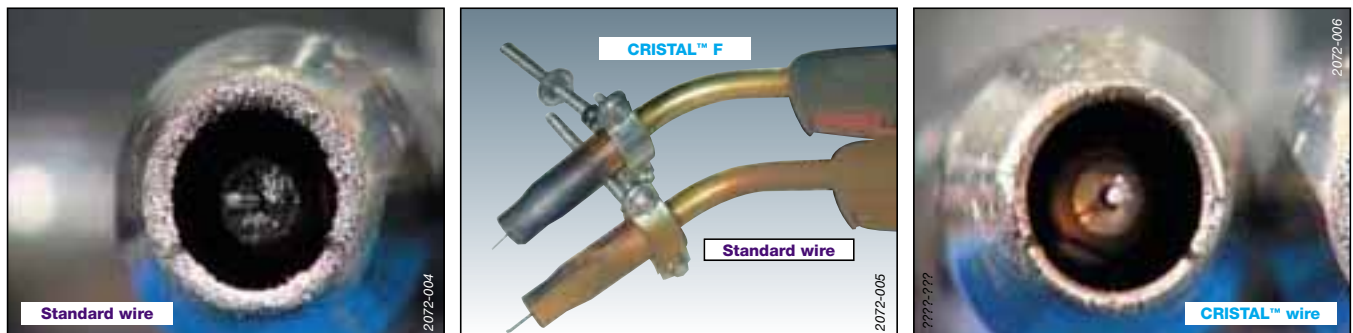


For metal cored wire

Shielding gas according to EN 439: M21 for Ar/CO₂ - M14 for Ar/CO₂/O₂



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 100 rutile cored wire

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

■ Conformance

- EN 758: T 42 2 P C 1 H5
- AWS/ASME: SFA 5.20 E71T-1

■ Approvals

BV - LRS - DNV - ABS - GL

■ Chemical analysis and mechanical properties

Chemical analysis of all weld metal (typical values in %)

C	Mn	Si	P	S
0.03	1.5	0.6	0.018	0.018

Mechanical properties of all weld metal
(single values are minimum values in %)

UTS (MPa)	YS (MPa)	E (l = 5d) (%)	CVN (Joule) -20 °C
510-610	>420	>24	>55

■ Ordering information

Ø mm	Packaging	Cat. no.
1.2	K 300 - 16 kg	W 000 262 200
1.2	K 200 - 5 kg	W 000 262 199

Alternative packaging: contact us

CRISTAL™ F 206 metal cored wire

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

■ Conformance

- EN 758: T 42 3 M M 1 H5
- AWS/ASME: SFA 5.18 E70C-6MH4

■ Approvals

TÜV - BV - LRS - DNV - DB

■ Chemical analysis and mechanical properties

Chemical analysis of all weld metal (typical values in %)

C	Mn	Si	P	S
0.02	1.5	0.8	0.013	0.019

Mechanical properties of all weld metal
(single values are minimum values in %)

UTS (MPa)	YS (MPa)	E (l = 5d) (%)	CVN (Joule) -20 °C -30 °C
510-610	>420	>26	>80 >65

■ Ordering information

Ø mm	Packaging	Cat. no.
1.2	K 300 - 16 kg	W 000 262 195
1.2	Drum - 230 kg	W 000 262 197
1.4	K 300 - 16 kg	W 000 262 196
1.4	Drum - 230 kg	W 000 262 198

Alternative packaging: contact us

CRISTAL™: 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 CRISTAL™ flux cored wires help to optimize 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 $-30\text{ }^{\circ}\text{C}$
- Very good bead appearance



Working environment ⁽¹⁾

- Strong reduction of welding fumes emission, up to 86% ⁽²⁾ compared to standard wires, making welding safer and more comfortable.

Discover our range of flux cored wires for applications in shipbuilding, off-shore, infrastructures...

Contact your local Oerlikon office see back page or www.airliquidewelding.com



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

(2) CRISTAL™ F 206 with ARCAL14 shielding gas.

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