Our Combustion Equipment Sheets

Non-Ferrous

Air Liquide

METAL BURNER

- ➔ Good resistance to corrosion
- ➔ Homogeneous heat transfer
- ➔ Easy implementation
- ➔ Self cooled design
- ➔ Flame control and self ignition
- ➔ Low maintenance

The Concept

The **METAL BURNER** is a non-water-cooled oxy-fuel burner especially designed for batch melting furnaces. This patented technology is composed of large range of gas burners with FLAMOXAL B control systems.
This burner is particularly dedicated to applications where automatic ignition system and/or flame supervision are essential.
An ignition pilot burner and a flame supervision cell can be integrated into the burner body.

Applicable Industries

The **METAL BURNER** is suitable for various industrial operations as :

- Enamels melting
- Cast iron melting
- Lead melting
- Aluminum melting
- Ladle preheating

Special Features

The **METAL BURNER** produces a low momentum flame which minimizes dust emission and prevents any refractory aging. The pipe-in-pipe system delivers a symmetrical luminous flame. The flame shape is of cylindrical type. The fuel pipe is located inside the oxygen pipe.
The fuel gas stream surrounded by an oxygen stream is partially burnt in the burner block cavity before the flame develops in the furnace.

The **METAL BURNER** is composed of:

- A square refractory burner block inserted in the furnace wall;
- A metallic burner body attached to the burner block which ensures the oxygen distribution;
- A fuel lance.

Both the metallic and the refractory parts of the burner are cooled by the oxygen flow. Experimental and modeling studies were carried out to design the inner shape of the burner in order to ensure efficient cooling and to prevent any deposit inside the block.

The **METAL BURNER** is a bi-fuel burner which can be operated either with gaseous fuel or with oil fuel. When both liquid and gaseous fuels are available, it is possible to simply switch from one to the other by replacing the gas fuel injector with a fuel oil injector without modifying the burner body nor the burner block. This operation takes two minutes per burner.

The **METAL BURNER** can operate from 30 % to 150 % of its nominal power rate.

The **METAL BURNER** is suitable for natural gas, propane and fuel oil.

The low momentum flame produced by the **METAL BURNER** minimizes dust emission.

Model Range*

METAL BURNER is available in six standard models:

METAL BURNER 200*
METAL BURNER 500
METAL BURNER 1000*
METAL BURNER 1500
METAL BURNER 2000*
METAL BURNER 5000

The **METAL BURNER** technology works with gaseous or liquid fuels.

The **METAL BURNER** minimizes the oxygen pressure requirement, making it suitable for on-site oxygen production (VSA).

(*) Numbers correspond to the nominal capacity (in kW)

Technical data**

Model	Power (in kW)		
	Minimum	Nominal	Maximum
METAL BURNER 200	70	200	300
METAL BURNER 500	150	500	750
METAL BURNER 1000	300	1000	1500
METAL BURNER 1500	450	1500	2250
METAL BURNER 2000	600	2000	3000
METAL BURNER 5000	1500	5000	7500

*** Description for information.*
Air Liquide reserves the right to modify this information without notice.

Nominal power (in kW)	Fuel		Injection speed (m/s) *for NG and propane models*
	*NG, Propane	Oil	
200	Y	-	60
500	Y	Y	30, 60, 90
1000	Y	Y	30, 60, 90
1500	Y	-	30, 60, 90
2000	Y	-	30, 60, 90
5000	Y	-	60

NG : Natural gas

All of the versions include the same burner body and refractory block. The gas fuel versions include a gas fuel lance with 1 or 3 tubes.

The liquid fuel versions include a liquid fuel lance (dual type) associated with an injector and an external nozzle.

Related Offers

METAL BURNER is a part of the **BoostAL™ for Non-Ferrous and BoostAL™ COntrol for Non-Ferrous** Offers which are designed and tailored to meet your specific needs. Thes comprehensive offers combine the best of Air Liquide's gases, application technologies and expert support.

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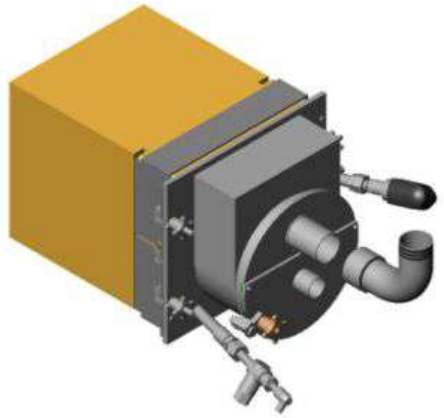
METAL BURNER-FC

- ➔ Good resistance to corrosion
- ➔ Homogeneous heat transfer
- ➔ Easy implementation
- ➔ Self cooled design
- ➔ Reduced NOx emissions
- ➔ Flame control and self ignition
- ➔ Low maintenance



The Concept

The **METAL BURNER-FC** is a non-water-cooled oxy-fuel burner especially designed for batch melting furnaces. This patented technology is composed of large range of gas burners with FLAMOXAL B control systems.
This burner is particularly dedicated to applications where automatic ignition system and/or flame supervision are essential.
An ignition pilot burner and a flame supervision cell can be integrated into the burner body.

Applicable Industries

The **METAL BURNER-FC** is suitable for batch melting furnaces (enamels, aluminum...).

Special Features

The **METAL BURNER-FC** is designed to mix fuel and oxygen outside the burner block. Both fluids are introduced into the furnace via a unique configuration of injectors that produces a highly luminous flame, up to three times wider than conventional oxy-fuel burners.

The **METAL BURNER-FC** is composed of:

- A square refractory burner block inserted in the furnace wall;
- A metallic burner body attached to the burner block which ensures the oxygen distribution;
- A fuel injection system.

Both the metallic and the refractory parts of the burner are cooled by the oxygen flow. Experimental and modeling studies were carried out to design the inner shape of the burner in order to ensure efficient cooling and to prevent any deposit inside the block.

The fuel is distributed at the bottom of refractory burner block via three fan-shaped fuel gas injectors, so that the fuel steam forms a wide sheet of gas in the furnace. Oxygen is injected at lower velocity via two injectors located at the top of the block which direct the oxygen flow towards the fuel jets.

The flame shape and luminosity are controlled by injecting a small proportion of the oxygen flow (from 3 % to 15 % of the combustion oxygen) via 2 orifices around each of the three natural gas injectors at the bottom of the block in a pipe-in-pipe configuration.

The **METAL BURNER-FC** can operate from 50 % to 150 % of its nominal power rate.

The low momentum flame produced by the **METAL BURNER-FC** minimizes dust emission.

Model Range*

METAL BURNER is available in two standard models:

METAL BURNER-FC 1000*
METAL BURNER-FC 2000*

The **METAL BURNER-FC** technology works with gaseous or liquid fuels.

The **METAL BURNER-FC** minimizes the oxygen pressure requirement, making it suitable for on-site oxygen production (VSA).

(*) Numbers correspond to the nominal capacity (in kW)

Technical data**

Model	Power (in kW)		
	Minimum	Nominal	Maximum
FC 1000	500	1000	1500
FC 2000	1000	2000	3000

*** Description for information.*
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Nominal power (in kW)	Fuel	
	NG, Propane	Oil
FC 1000	Y	-
FC 2000	Y	Y

NG : Natural gas

The **METAL BURNER-FC 1000** and the **METAL BURNER-FC 2000** are provided with a set of 6 calibrated orifices (2 orifices with a 8 mm diameter, 2 orifices with a 10 mm diameter and 2 orifices with a 12 mm diameter). These orifices are used for adjusting the oxygen flow rate which is injected around the three natural gas injectors.

Related Offers

METAL BURNER-FC is a part of the **BoostAL™ for Non-Ferrous and BoostAL™ COntrol for Non-Ferrous** Offers which are designed and tailored to meet your specific needs. Thes comprehensive offers combine the best of Air Liquide's gases, application technologies and expert support.

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ALJET 1000 & 1500 ST

- ➔ Good resistance to corrosion
- ➔ Homogeneous heat transfer
- ➔ Easy implementation
- ➔ Self cooled design
- ➔ Flame control and self ignition
- ➔ Low maintenance
- ➔ Bi-fuel

The Concept

The **ALJET 1000 & 1500 ST** burner is a non-water-cooled oxy-fuel burner especially designed for batch melting furnaces. This patented technology is composed of large range of gas burners with FLAMOXAL B control systems.

Applicable Industries

The **ALJET 1000 & 1500 ST** is suitable for various industrial operations as :

- Enamel melting
- Lead melting
- Aluminum melting
- Ladle preheating

Special Features

The configuration of **ALJET 1000 & 1500 ST** burner is of pipe-in-pipe type; the fuel pipe is located inside the oxygen pipe. The fuel gas stream or fuel oil spray surrounded by an oxygen stream is partially combusted in the burner block cavity then the flame develops in the furnace.
The pipe-in-pipe system delivers a symmetric luminous flame of cylindrical shape.

Because fuel and oxygen are mixed inside the burner block and react immediately, the combustion is very intense, resulting in a high peak temperature flame.

The **ALJET 1000 & 1500 ST burner** gas fuel is composed of:

- A burner block made of refractory material with an inner shape inserted in the furnace door or wall;
- A ceramic paper gasket to be positioned between the burner block and the burner body;
- A burner body made of stainless steel equipped with its VITON gasket;
- Three stainless steel hooks with thread M8 and brass nuts to fixed the burner body on the burner block;
- A fuel gas lance equipped with three high temperature alloy injectors , to be positioned between the burner body and the gas chamber by four M8 bolts (stainless steel screw and brass nut);
- A gas chamber equipped with its VITON gasket.

The **ALJET 1000 ST** burner fuel oil version is composed of:

- A burner block made of refractory material with an inner shape inserted in the furnace door or wall;
- A ceramic paper gasket to be positioned between the burner block and the burner body;
- A burner body made of stainless steel equipped with its VITON gasket;
- Three stainless steel hooks with thread M8 and brass nuts to fixed the burner body on the burner block;
- A fuel oil lance equipped with a high temperature alloy injector, to be positioned on the burner body with a VITON gasket by four M8 bolts (stainless steel screw and brass nut).

An ignition system and a flame supervision cell can be integrated into the burner body of the **ALJET 1000 & 1500 ST** burners.

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Model Range*

ALJET ST is available in two standard models:

The **ALJET ST** range consists of two standard models defined according to their nominal firing rate (expressed in kW):

- ALJET 1000* ST
- ALJET 1500* ST

The **ALJET 1000 ST** model is referenced for natural gas and fuel oil.
When both liquid and gaseous fuels are available, it is possible to switch from one to the other by replacing the gas fuel lance with a fuel oil lance, without modifying the burner body or the burner block.

The **ALJET 1500 ST** model is referenced for natural gas only.

All the versions include the same burner body and refractory block, the differences lie in the type of lance (1 lance for natural gas equipped with a gas chamber and 1 lance for fuel oil).

(*) Numbers correspond to the nominal capacity (in kW)

Technical data**

Model	Power (in kW)		
	Minimum	Nominal	Maximum
ALJET 1000 ST Natural gas version	500	1000	1500
ALJET 1000 ST Fuel oil version	500	1500	1750
ALJET 1500 ST Natural gas version	1000	1500	2000

*** Description for information.*
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The lance of the **ALJET 1000 ST** burner fuel oil is equipped with a "Y atomizer" based on design with 1 outlet connected to 2 injections of atomizing gas;
The "Y atomizer" is directly welded on the fuel oil lance in order to avoid maintenance and improper operation.

The alloy steels employed for the metallic parts (stainless steel 304L type for the burner body and the lances, stainless steel 310 type for the gas fuel and fuel oil injectors) offer good resistance to corrosion for the burner's "cold part" and good resistance to temperature and oxidation for the "hot part".

Related Offers

ALJET 1000 & 1500 ST are a part of the **BoostAL™ for Non-Ferrous and BoostAL™ COntrol for Non-Ferrous** Offers which are designed and tailored to meet your specific needs. Thes comprehensive offers combine the best of Air Liquide's gases, application technologies and expert support.

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ALJET LH

- ➔ High heat transfer rate
- ➔ Compliant with the safety standards
- ➔ No noise
- ➔ Low maintenance

The Concept

The **ALJET LH** burner is a patented oxy-fuel burner especially designed for heating of ladles used in metallurgy. It is adapted for operation under severe working conditions (confined or overheated enclosures).

The configuration of this burner is of pipe-in-pipe type delivering an an cylindric flame develops in the ladle. The implementation of **ALJET LH** burner accelerates the heating and also cleans the ladles from accumulated oxides and the refractory surface by improving heat transfer.

Applicable Industries

The **ALJET LH** burner is suitable for drying and heating of ladles used in metal industries such as ferrous, foundries and non ferrous industries.

Special Features

An ignition pilot burner and a flame supervision cell can be integrated into the burner body.

The configuration of **ALJET LH** burner is of pipe-in-pipe type: the fuel pipe is located inside the oxygen pipe. The fuel and oxygen mix at the burner outlet and the flame develops in the ladle.

The **ALJET LH** burner is composed of :
• A metallic burner body which ensures the oxygen distribution.
• A fuel injection system.

The metallic burner body is cooled by either the water flow or not, depending on the models.

Experimental and modeling studies have been carried out to design the shape of the burner body in order to ensure efficient cooling.

The alloy steels employed for the metallic parts offer good resistance to corrosion for the burner's "cold part" and good resistance to temperature and oxidation for the "hot part".

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The **ALJET** burner produce a low momentum flame which minimizes dust emission and prevents any refractory wear.

The asymmetric luminous flame delivered by the **ALJET LH** burner enables the radiation to be adjusted. The flame shape is of cylindrical type.

The **ALJET LH** burner requires low oxygen and fuel inlet pressures.
The **ALJET LH** burner has been designed to minimize the frequency of maintenance and to make inspection easier (quick dismantling of the components of the burner).
Thanks to a low pressure drop and low gas velocities, the operation of the **ALJET LH** burner is silent.

The mixture of the fuel and oxygen at the **ALJET LH** burner outlet prevents the premixing and risk of backfiring.

Model Range

ALJET LH is available in two standard models:

ALJET 1500* LH
ALJET 750* LH
Each model comes in one natural gas fuel version.

The **ALJET 1500 LH** burner is available in one standard natural gas version.
The natural gas version comprises :
• A metallic burner body which ensures the oxygen distribution.
• a Natural gas lance equipped with an inner oxygen tube and gas feeder
A gasket positioned between the gas feeder and the burner body.

The metallic burner body is cooled by the water flow. Experimental and modeling studies have been carried out to design the shape of the burner body in order to ensure efficient cooling.

The ignition pilot burner and flame supervision cell are not supplied with the burner. However, it is possible to order them. Due to the supervision of the flame through the main oxygen pipe for the **ALJET 1500 LH,** the flame detection is efficient even at low firing rate.

The **ALJET 750 LH** burner model is available in one standard natural gas version.
The natural gas version comprises:
•A burner body made of stainless steel equipped with a VITON gasket, the nozzle of the burner body is made of high temperature resistance stainless steel:
•A fuel lance made of stainless steel equipped with a VITON gasket, the injector of the fuel lance is made of high temperature resistance stainless steel.

The ignition pilot burner and flame supervision cell are supplied with the burner.
The ALJET 750 LH model is of non-water-cooled type.

(*) Numbers correspond to the nominal capacity (in kW)

Technical data**

Model	Power (in kW)		
	Maximum	Nominal	Minimum
ALJET 1500 LH	1800	1500	450
ALJET 750 LH	1000	750	400

*** Description for information.*
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The **ALJET LH** burner complies with the safety standards thanks to the incorporation of an ignition pilot burner and a flame supervision cell.

Related Offer

The **ALJET LH** is a part of the **BoostAL™ for Ladle Heating** offer.
These are comprehensive offers that combine the best of our gases, application technologies and expertise support from Air Liquide.

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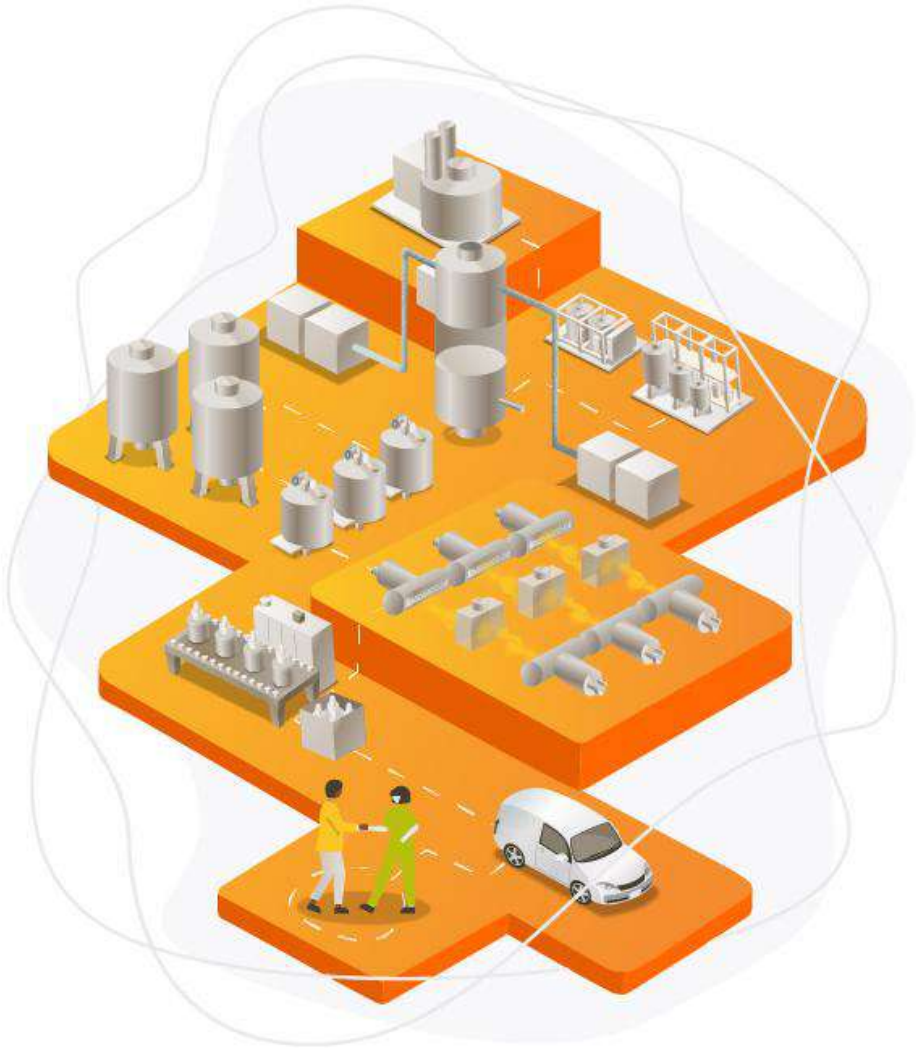

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