

ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ  
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*The best, the beast*

## E&M Combustión

The best choice  
in industrial burners  
and combustion  
equipment



# A Global Technology Leader

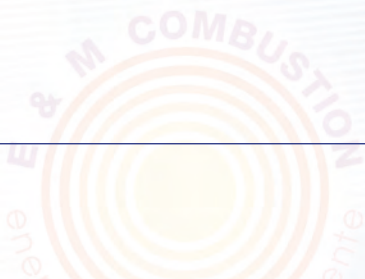


- Global Operations
- Output Capacity
- Technology and Service
- Environmental Awareness

## Patents and Quality Certificates

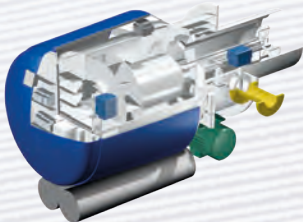


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## Extensive experience in the field of combustion

- 1.000 **installed** equipments
- Presence in **30 countries**
- Pemex, Sabc, Iberdrola, Repsol, Siemens, Diageo, etc. **have trusted us**
- 4 **patents**
- **Quality** system accreditation

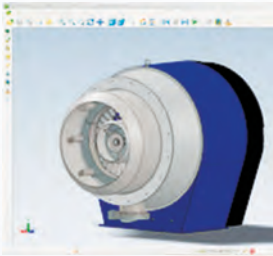


- **Innovative** in technological and industrial combustion
- **World leader** in segments such as **ATEX** and **NEC** burners and **Hydrogen Combustion Systems**
- **Global** technology leader : **design, manufacture, installation and maintenance** of burners





# The Company · Global Operations: From Bilbao to the World



## A technical solution for each industrial need

Our mission is to create equipment and **designs to meet our customers' requirements**, so we develop burner technology with **low contaminating** emissions that at the same time ensure **major energy savings**.

E&M Combustión manufactures and markets burners, with the overriding aim being to provide customised solutions for industrial combustion processes. The **wide range** of burners we offer enables us to respond to most of the needs arising in a company, especially in the energy, oil & gas, steel and metal-working sectors.

Besides the use of traditional fuels, **E&M Combustión** undertakes its own designs in order to adapt to the ever more frequent cases in which the energy resource used involves lean gases, recycled oils and other types of alternative fuels. Our designs also consider the possibility that a single burner may be used for **several types of fuels**. E&M Combustión develops combustion equipment with wholly innovative and cutting-edge designs, creating a highly attractive product for the end customer. Our technological developments are designed to provide top-drawer know-how in matters of **energy efficiency and the reduction in contaminating emissions**, contributing to the sustainable development of our environment.

## Heirs to a great industrial tradition



**E&M Combustión** was founded in **Bilbao** – Spain – in March 2004. It emerged into an **industrial setting** with a long tradition of **manufacturing capital goods**, a tradition based on the processing of iron, which in just a few years has evolved toward a **scenario of innovation-focused companies**.

## Key milestones · There follows a **brief summary** of our constant progress

- 2004** • **Incorporation of the company**. Design of the first prototypes.
- 2005** • Market launch of the **JBM range**.
- 2006** • Start of the company's **internationalization process**.
- 2008** • Securing of a **second patent** and international market launch of the JBD models.
- 2009** • Commercialisation of the **JBM-HP** and **JVA** models.
- 2010** • Opening of the first commercial **office in China**.
- 2011** • Commissioning of the **new Artea plant**, with over 2000 m2 dedicated to the manufacture of equipment.
- 2012** • **Extension of the range** of burners up to 85 MW.
- 2014** • E&M Combustión is a consolidated business, **selling its equipment in over 20 countries**.
- 2016** • Opening of the commercial **office in India**.
- 2020** • Design, manufacture and commissioning of **Hydrogen Combustion Systems**.
- 2021** • Launch of **Portable incinerator furnaces**.

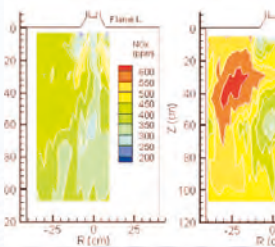


# The Company • Innovation and R+D+i



## Investment in innovation

The main pillars of our business vision are **investment in innovation**, R+D+i, with the development of original prototypes, as well as **the ability to swiftly adapt our designs to a customer's requirements**, always seeking the highest energy efficiency and the lowest levels of contaminating emissions.



## Simulations and testing

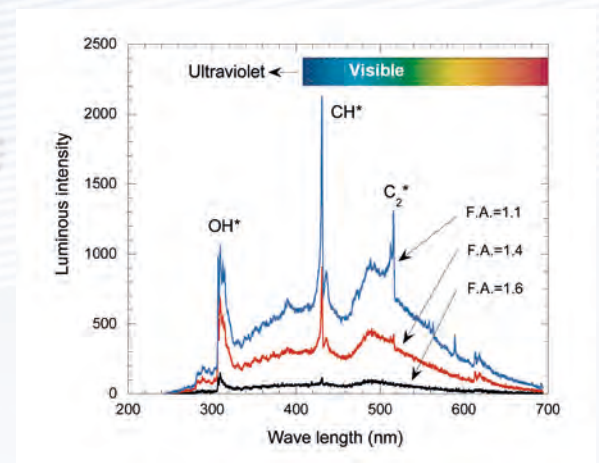
We have an extensive range of work tools. We start by using **state-of-the-art software for fluid simulation**. Our equipment is subsequently **tested in a comprehensive array of dedicated installations**. Finally, our burners **undergo trials on boilers and in plants** to ensure we provide the market with a fully reliable product, and above all one which is innovative.



## R+D+i

Our R+D+i department **collaborates with combustion technology centres in different countries**. This means we are working with a top-tier team of researchers, allowing us to share information and pursue several lines of research. The final outcome is the pooling of different options for improvement, which are embodied in a **highly satisfactory and innovative product** for the customer.

One example of this is the **I+DEA 2 project**, conducted over the course of four years, focusing on the study of burners to be used with different biofuels, especially several mixtures of bioethanol and bioethanol-biodiesel, which have made us a **global benchmark in the combustion of eco-fuels**.





# The Company • Energy and Environment



## Respect for nature is in our DNA

The natural environment is implicit in our very name “**E&M Combustión • Energía y Medio Ambiente**”, with the reduction of emissions being an ongoing concern. We continue to develop and improve our **Low NOx technology**, and our burners are constantly improving their emissions performance.

The burners are designed with “**à la carte**” **flame lengths and widths**; in other words tailor made to the customer requirements offering significant value addition as opposed to standard / off-the shelf designs.



## More efficient burners, less emissions

It is our mission to offer the market with strikingly **more innovative equipment**.

The **3 key objectives** of our corporate mission:

- 1 - To produce increasingly more efficient burners.**
- 2 - Reduction of emissions** without any loss of energy.
- 3 - User and maintenance friendly designed equipment.**





# The Company · Internationalization



In **DFW** company.  
Shanghai.

## The quest to become a global company

Another **fundamental pillar of our business development** is based on internationalization. E&M Combustión markets its industrial burners and combustion equipment **in more than 30 countries**, among which **China's commercial office**, and the recent establishment of the **office in India** to cater to the South east Asian market requirements.

**E&M Combustión** commitment to international activity with an **open and receptive attitude**, adapting to the culture of each market and country.



Conference in **Russia** involving our ATEX range of burners.

E&M Combustión's stand.  
**Shanghai** Trade Fair.

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# The Company • A Great Team



## People, our mainstay

Our main asset, and one which **we are extremely proud of, is our staff**, as without the people that make up our team our project would not have a future. Our staff is our true capital. Our **personalised customer service** is provided to different companies and cultures, from whom we wish to continue learning, and who in E&M Combustión will always find a helping hand ready to enter into a successful partnership.

**Our vision is based on honesty and sincerity, with cooperation** being the driver of success. The aim of our customer-focus is to find partners with whom human values are paramount and close links are forged over and above those of a purely business and commercial nature.

***If you are tired of the way you are being treated by multinationals, we are the company for you!***



**Iñigo Bejar and Aitor Jausoro.**

Founding Partners of E&M Combustión.

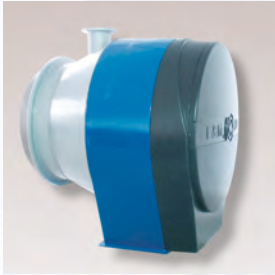


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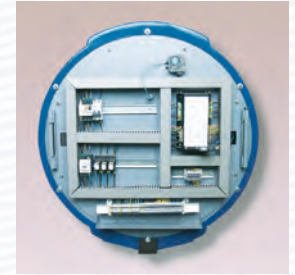


# Our Products • Industrial Burners

The most extensive range of industrial burners



- Low Temperature Burners
- ATEX and NEC Areas Burners
- Air Draught Burners



- High Temperature Burners



- Biomass Burners
- Hydrogen Burners & Combustion
- Other Combustion Solutions





## Our Products • Low Temperature Burners

### EM Burners • Monoblock burners from 12 to 6,395 KW

Burners for **all types of liquid and gas fuels**. The standard range includes burners for traditional fuels, such as gas-oil, natural gas and LPG, fuel oil and **combined burners** for gas-gas-oil and gas-fuel oil. We also cater for **special arrangements** for the combustion of biogases, recycled oils and other types of **alternative fuels**.



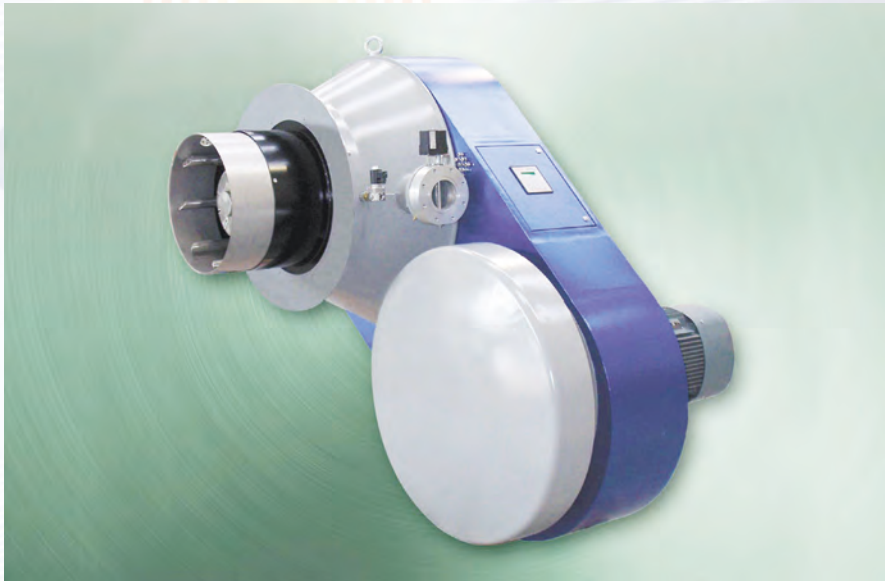
### JBM Burners • Latest generation monoblock burners from 2,500 to 14,500 KW

Latest generation burners for **all types of liquid and gas fuels**. The standard range includes burners for traditional fuels, such as gas-oil, natural gas and LPG, fuel oil and combined burners for gas-gas-oil and gas-fuel oil. Furthermore, our range features **design and innovation of the highest quality**.

We also cater for **special arrangements** for the combustion of biogases, recycled oils and **other types of alternative fuels**.



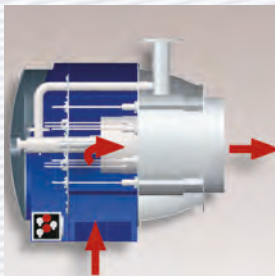
## Our Products • Low Temperature Burners



### JBM • HP Burners • Compact Monoblock burners from 1,000 to 25,000 KW

Latest generation burners for **all types of liquid and gas fuels**. The standard range includes burners for **traditional fuels** such as gas-oil, natural gas and LPG, fuel oil and combined burners for gas-gas-oil and gas-fuel oil. We also cater for special arrangements for the combustion of biogases, recycled oils and other types of **alternative fuels**.

Burners **designed to deal with high overpressures in the combustion chamber**.



### JBD Burners • Duoblock high-performance burners, from 1,000 to 85,000 KW

Latest generation burners for **all types of liquid and gas fuels**. The standard range includes burners for **traditional fuels** such as gas-oil, natural gas and LPG, fuel oil and combined burners for gas-gas-oil and gas-fuel oil. We also cater for special arrangements for the combustion of biogases, recycled oils and other types of **alternative fuels**.

Burners **designed to deal with high overpressures in the combustion chamber**.





# Our Products • ATEX and NEC Areas Burners

## ATEX and NEC Areas • Special **monoblock** and **duoblock** burners

A hallmark of E&M Combustión in recent years has been the design of special **burners to be installed in areas with explosion-proof classification** according to both ATEX and NEC directives and standards.

This type of design is becoming increasingly widespread and is now of almost **mandatory use in industries** such as refineries, petrochemical plants, power generating plants, etc.

E&M Combustión's specialisation in this type of equipment makes us **one of the market's most competitive companies in this sector**, with ample experience and an assurance of expertise in arrangements of this nature.



## ATEX Area Definition

ATEX is called a series of European directives governing hazardous and also regulate the measures to ensure security and prevent an explosion.

Explosive atmospheres are given in terms of :

- a. Presence of **fuel**
- b. Existence of **oxidant** (oxygen )
- c. An **energy source** to initiate the reaction

The equipments have a category depending on the level of protection provided. The **Category 1** (very high protection) are installed in Zone with constant explosive potential; the **Category 2** (high protection) is the one with potentially explosive atmosphere; and **Category 3** (normal protection), one that is not normally explosive, but it is in short periods. These assumptions require either intrinsically safe or explosion proof increased safety.



# Our Products • ATEX and NEC Areas Burners



## Special features ATEX burners

Once the customer defines the type and characteristics ATEX burners Zone, **E&M Combustión** design and manufacture burners, so that the equipments made are appropriate.

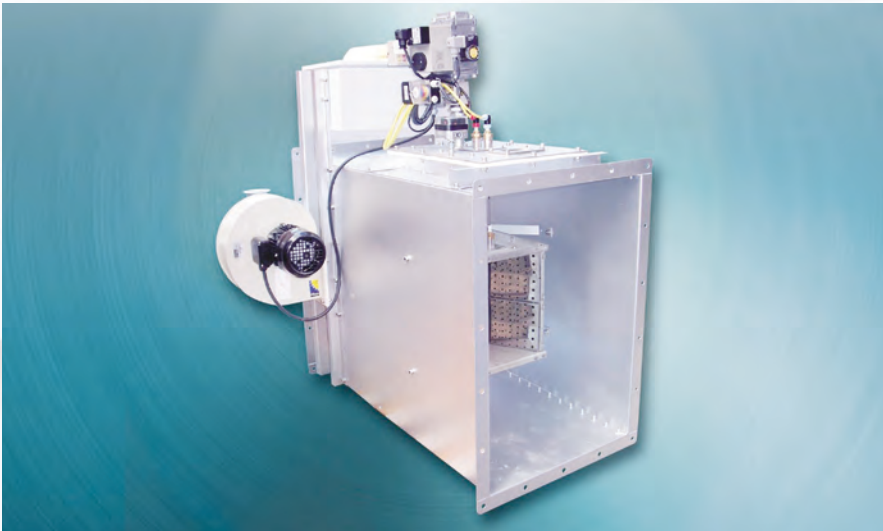
Although increasingly manufacturing of **ATEX and NEC equipment** is more widespread, few companies are capable of manufacturing burners based on specific customer requirements with regard to the definition of hazardous areas.

**E&M Combustión is a leading and a competitive company** in this area and are able to manufacture customized equipment, in a relatively short time, considering the different complexities offered by NEC and ATEX standards with attractive prices for the customer.





# Our Products • JVA Air Draught Burners / JBP Biomass Burners



## The best solution for drying processes

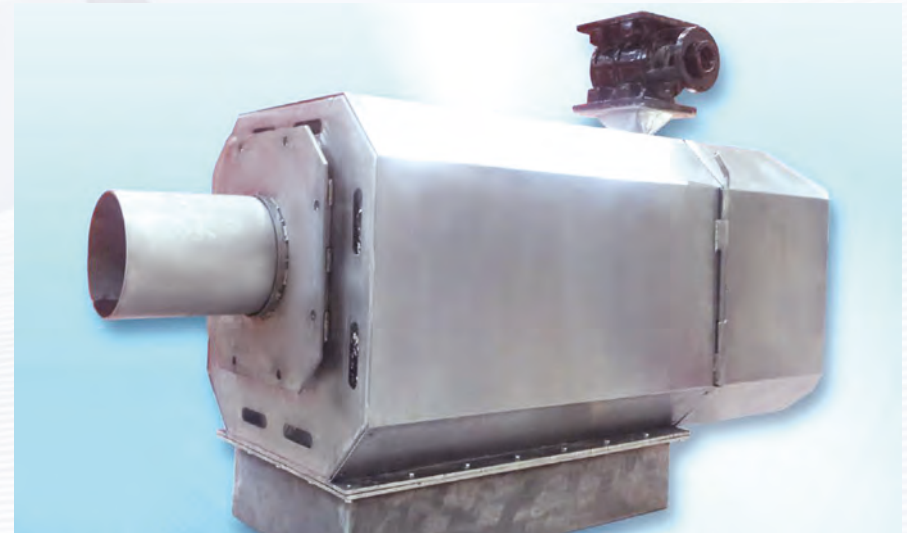
Burners used for **numerous applications** in the industrial sector when there is direct heating.

- **Paint** lines.
- **Ceramics** industry.
- **Food** industry.
- Direct heating of **industrial** premises.

## JBP • biomass burners high energy efficiency

**E&M Combustión**, through its **R+D+i**, and with the collaboration of technological centers in several countries, specialized in combustion technology, has developed a range of biomass burners of latest generation burning different types of solid fuels whose main attributes are high energy efficiency and low ash. They can be used with **various types of fuels** such as wood pellets, olive pits, etc.

Biomass burners can be **adapted to conventional boilers without any modification** to the latter.





# Our Products • Hydrogen Burners and Combustion Systems



## Hydrogen, a new era

**E&M Combustion** is a leading company in thermal combustion installations. Within the value chain, **it contributes to hydrogen combustion with the development, manufacture and installation of burners and combustion systems** that are increasingly efficient and ecological, providing basic support in accompanying his clients for the incorporation of hydrogen into their industrial processes

To date, there are already **several hydrogen generation technologies that can turn this gas into an ecological and profitable solution in a short term**. “With this perspective, the experience of our technologists and the guarantee of reliable hydrogen combustion systems is essential, and advice on this matter, essential”.

The first great challenge of adopting hydrogen to decarbonize industry is **adapting existing plants to the new fuel**. E&M Combustion is developing an efficient and less polluting combustion technology with hydrogen, a field in which it has previous experience.

We design our equipment and combustion systems taking into account:

- **Low density of hydrogen.** The design of the hydrogen nozzles and injectors is similar to that of other gases, but without exceeding high speeds at the injection points.
- **High flame temperature.** The flame temperature obtained with hydrogen is approximately 170°C higher than GN. It is necessary to lower the temperature to avoid deterioration of the homes.
- **Pollutant emissions.** Hydrogen does not emit CO<sub>2</sub> in its combustion, but it does emit NO<sub>x</sub>. The plants thus risk exceeding the values allowed by the EU.
- **Flame detection.** One of the great challenges posed by hydrogen is the invisibility of its flames. E&M Combustion proposes to incorporate systems for its detection, and sensors capable of detecting flickering in the burners.



- **Leaks. Hydrogen safety.** The leakage capacity in pipes and valve unions is greater due to the small size of the hydrogen molecules. To minimize the risk of explosion, a good alternative is to manufacture the burner and the gas lines with elements that comply with the ATEX anti-explosion regulations.



## Methods to reduce polluting emissions.

- **Gas recirculation.** NO<sub>x</sub> reduction technology. Protects existing equipment and guarantees a higher average life.
- **Mix with natural gas.** Mixture of hydrogen with natural gas to increase the calorific value and achieve stable and efficient combustion.



# Our Products • Special Solutions

## Hot Gas Generators

Hot gas generators are compact combustion chambers **used in industrial applications of drying process** in food, minerals, wood, etc. or in cement manufacturing. They produce gases at different temperatures starting from the combustion of natural gas, diesel, fuel oil, etc. Our chambers are **single or double walled, to minimize heat losses**. They are **robust and resistant** and internally they are coated with refractory to **resist temperatures of up to 1500°C**.

Burners are used to generate the hot gases, generally pressurized air for liquid fuels and duct burners for gases.



## Portable incinerator furnaces

Portable incinerator furnaces **for the treatment of hazardous hospital waste and corpses**, especially **in remote or difficult-to-access places**. The range of mobile structures developed brings together several series of capacities of this **equipment according to customer demand** to use in the cremation of hospital waste, corpses, bone remains and animals from farms and zoos.

The design of the equipment **is made up of all the necessary elements for immediate start-up**. The container is prepared to be transported by truck to the workplace and can be assembled and disassembled with a crane.

## Combustion Air Preheaters

Combustion air preheaters designed to **improve the energy efficiency of thermal and steam power plants**. They allow the transfer of heat from the combustion exhaust gases, which are reintroduced towards the burner or combustion hearth.

They **reduce polluting emissions**, the chimney outlet temperature and save fuel. They can operate with all types of fuels: diesel, biomass, biogas, hydrogen ...





# Our Products • Bespoke Manufacturing for Industry

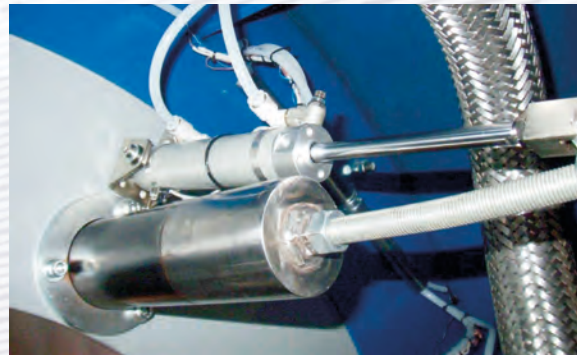
Another of **E&M Combustión's** hallmarks is the manufacture of **bespoke combustion equipment** for different industrial applications, **hand-in-hand with the customer.**

As an engineering firm, we are in a position to provide **a technical solution to fulfil each and every need**, regardless of the industrial sector in which our customer operates.

Among these applications, there are **the following highlights:**

## Start-up burners for a fluidised bed biomass boiler

These burners are **used for starting up boilers of this kind** and require a special design. We also make these types of burners with **a retractable manifold system** so that an air-lock trap system can be used to fully seal the equipment when the manifold is not in use and the boiler is operating.



Detail of a retractable manifold system.

## Vertical burners for thermal oil boilers

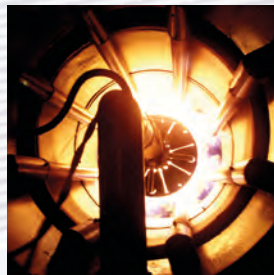
These burners are used in **thermal fluid boilers and require a special flame** for their perfect adjustment to the boiler. They are mounted in a **vertical position** and operate with air temperatures of around 200 °C. They are also **low-emission devices.**

## Special applications

E&M Combustión, as an engineering firm specialising **in the bespoke design of combustion equipment**, places its technology at the customer's disposal for its application in other kinds of processes requiring a burner. This includes incinerators, rotary sieves for asphalt plants, dryers, etc. We make **our technology available to ensure the success of our customers' industrial applications.**

## Burners for gas mixtures and gases with a high H<sub>2</sub>S content

E&M Combustión makes burners that **operate with several types of gases at the same time.** These include gases with a high H<sub>2</sub>S content, such as coke gases, and gases from the Claus process, etc.





## Projects • Some References



2 boilers (25 T/hr) • 2 x JBD-20.000-G  
Diageo plant in USVI • USA



2 water-tube boilers (220 T/hr)  
18 JBD-32.000-G burners  
Electrical power plant in Jilin • China



Three JBD-11,500-G burners  
for water-tube biomass boilers  
Martifer plant • Romania



Three 4.5 MW hot water boilers  
3 JBM-6.000-G monoblock burners  
Novgorov • Russia



## Projects • Some References



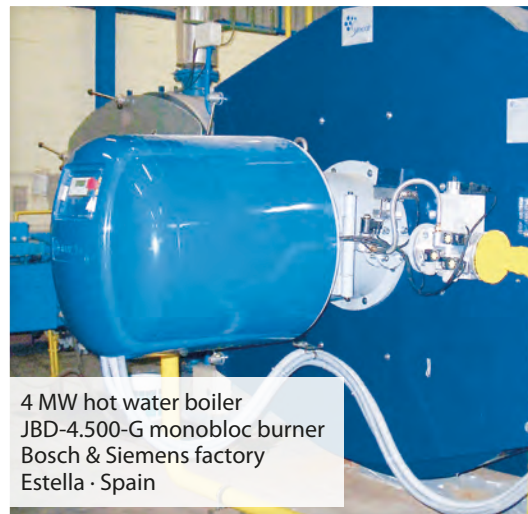
Six JBD-50,000-GFO steam atomised burners for zone 1 with EEx D classified equipment  
Repsol refinery · Tarragona · Spain



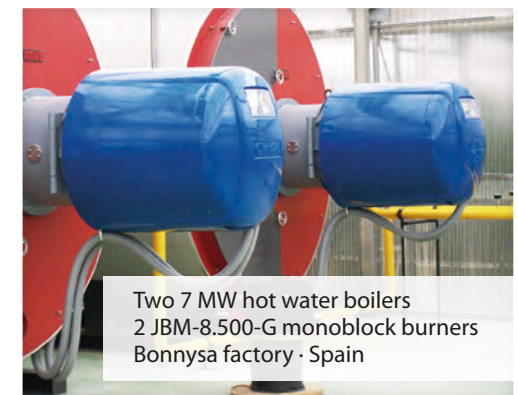
JBD-14,500-G and JBD-20000-G burners for 14 MW / 20 MW natural gas dryers  
Fomesa Plant · Valencia · Spain



Over one hundred JBD burners  
Between 25 and 85 MW  
Wuxishi Liyalu Heat Energy · China



4 MW hot water boiler  
JBD-4.500-G monobloc burner  
Bosch & Siemens factory  
Estella · Spain



Two 7 MW hot water boilers  
2 JBM-8.500-G monoblock burners  
Bonnyasa factory · Spain



# Projects • Sectors

## Petrochemical & Refinery

- Sabic • Petrochemical plant

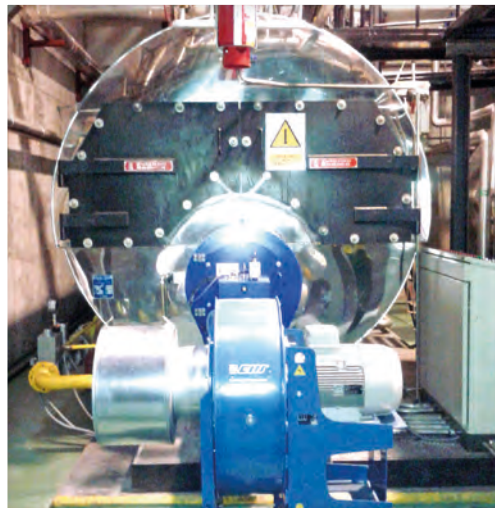


## Energy Generating

- Iberdrola • Combined Cycle
- Bookpoort • Solar Thermal plant

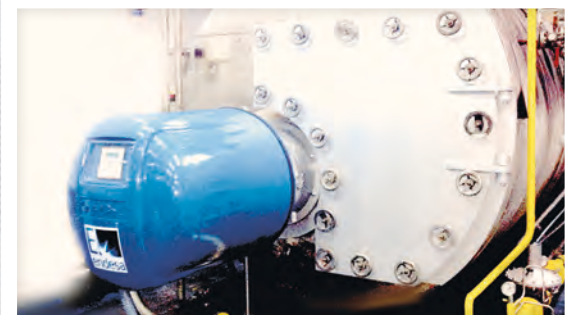


- Pemex • Gas processing

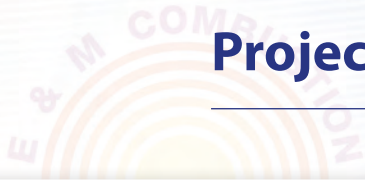


## Food & Beverage

- La Casera / Schweppes • Processes
- Leche Celta • Processing plant



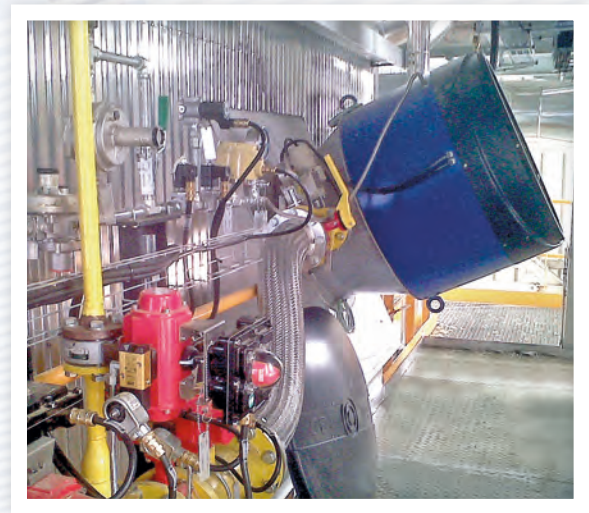




# Projects • Sectors

## Biomass

- Saipol
- Biomass boiler
- Gestamp
- Biomass plant



## Others Industries ••••••••••

Sidenor • Steelworks

Guangzhou • Steam Process

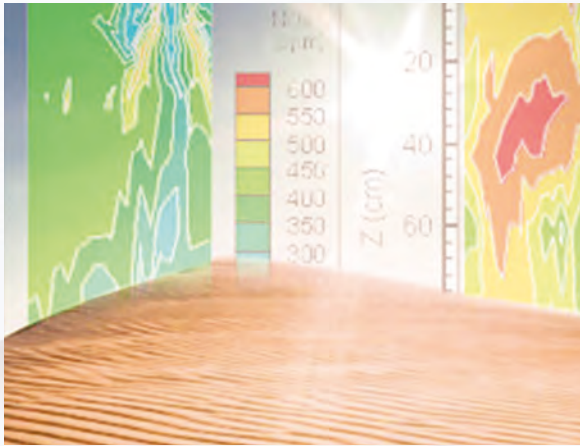


Formica • Steam Process





# Services • Studies on Energy Saving



## Energy saving and lower emissions

Consistent with **E&M Combustión**'s remit to design increasingly more efficient equipment, we place ourselves at the customer's disposal for conducting audits on how to **save fuel** at those plants with combustion equipment.

E&M Combustión performs studies on energy saving in order to **assess the return on the investment made by installing more efficient burners**, equipment for optimizing combustion, frequency adjusters for fans, etc. with no commitment on the customer's part.

## Record a lower level of emissions

In addition, we provide our customers with our **Low NOx technology** in order to overhaul and modify their combustion systems so as to record a lower level of emissions, as social awareness of the need to protect and preserve the environment has now become an unavoidable challenge.

## Training and advising

We provide our customers with **specific advice** through our technicians in the field who understand each project's requirements, and then we deliver a **payment plan** for the equipment that in most cases tends to come as a very pleasant surprise.





# Services • Worldwide Technical Service

## In more than 30 countries

With a view to reinforcing the technical service and providing customers with better care, in 2012 E&M Combustión created **a specific department** to cater for the entire process, from the **commissioning** of the equipment made by the company, through to the **maintenance, repair** and **replacement** and **supply of spares** for on-site equipment.

Saudi Arabia, Mexico, Romania, USA, Poland... these are just some of the countries in which the E&M Combustión technical service has been deployed in recent months in order to ensure the **proper operations of several plants throughout the world.**



## Scheduled maintenance

Seen as a key process for **keeping plants operational and fine-tuning their performance**, the proper running of many facilities also requires a regular review and inspection of their equipment.

## Experience in all kinds of facilities

Based on **experience accumulated over fourteen years** in this sector, we provide a service for facilities in renewable energies, steel, petrochemicals, food and beverages, pharmaceuticals and the car industry.

## Energy saving

We also conduct **audits on energy saving**, which enable us to replace existing burners with new generation electronic models, with low NO<sub>x</sub>, fitted with frequency adjusters, O<sub>2</sub> and CO probes and touch-screen for interfacing with the plant's DCS. **The payment plan for customers is a pleasant surprise.**



ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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