

*Drying plants  
for foundries*



*HMB*

*the right equilibrium  
between radiation  
and hot air*



**PLANTS WITH GAS-TIGHT TUBULAR  
HEAT GENERATORS**

*Combustion under negative pressure  
= Maximum safety*



**COMEX  
GROUP**  
TUTTO UN ALTRO CLIMA



**HMB**  
(Heating Modulation Burner)

**THE NEW DRYING  
SYSTEM FOR FOUNDRY**

## **DRYING AND HEATING PLANTS WITH GAS-TIGHT TUBULAR HEAT GENERATORS**

**COMEX GROUP** proposes a wide range of plants:

- ✓ Drying of water-based coatings on foundry cores and moulds
- ✓ Sand heating
- ✓ High temperature heat generators “Industrial Driers”

*...and equipped with:*

- ✓ Suitable mechanical handling
- ✓ Special manipulation
- ✓ Computer management by a special software



## **THE COMPANY**

**Comex Group** was established in 1987 as manufacturer of industrial ovens; then it has grown on the basis of a fundamental value: **reliability**, which, together with a great experience in the field of combustion technologies, has always characterized its activity.

Research and innovation have distinguished from the beginning its approach to this sector. Using at the best the existing technologies, combining them in the most efficient way and choosing the most reliable materials have made **Comex Group** drying systems a combination of the best solutions in the market.

A result which has brought great advantages for the customer, in terms of energy saving, safety and ease of using and which, thanks to the high technical and technological contents, gives to community the safeguard of environment observing the strictest rules in the field.

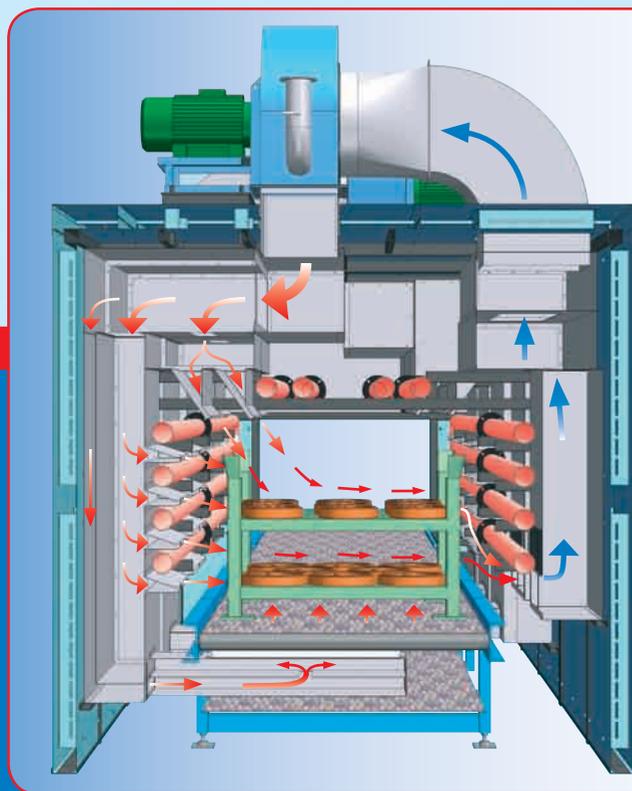
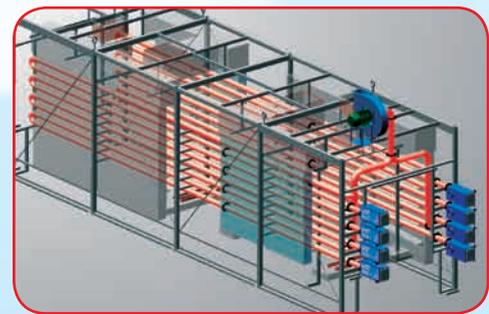
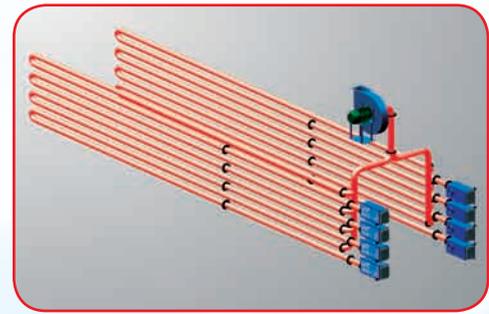


# HMB THE CORE OF THE SYSTEM

- ✓ **HMB** produces heat by the right combination of **gas-tight tubular exchangers** equipped with **forced intake burners** and a suitable **air ventilation system**
- ✓ **HMB**, represents the **greatest safety warranty** in the market, since there is no possibility that the combustion products invades the working environment

***Combustion under negative pressure***  
**= *Maximum safety***

- ✓ **HMB**, thanks to the **complete independence** of every **single burner**, will **never stop totally**: the possible breakdown of one or more burners does not jeopardize the working of the other ones, **granting the constancy** of the production process
- ✓ **HMB**, allows to carry out the **maintenance operations** of the single burners **without the need to stop the entire production process**
- ✓ **HMB** is the **modular system par excellence**: the thermal power is duly adjusted to suit the real thermal requirement, granting a **fundamental energy saving**



- ✓ **HMB** the right equilibrium between radiation and forced air convection, granting the **best drying** also for out of sight surfaces
- ✓ **HMB**, allows to dry at temperatures **between 100 and 140 °C**, sharply lowering the global thermal need
- ✓ **Low drying temperature** means:
  - **Little heat losses**
  - **Higher resistance** of cores during the pouring
  - **Less fumes** during the drying
  - **Easier manipulation** at the end of the drying

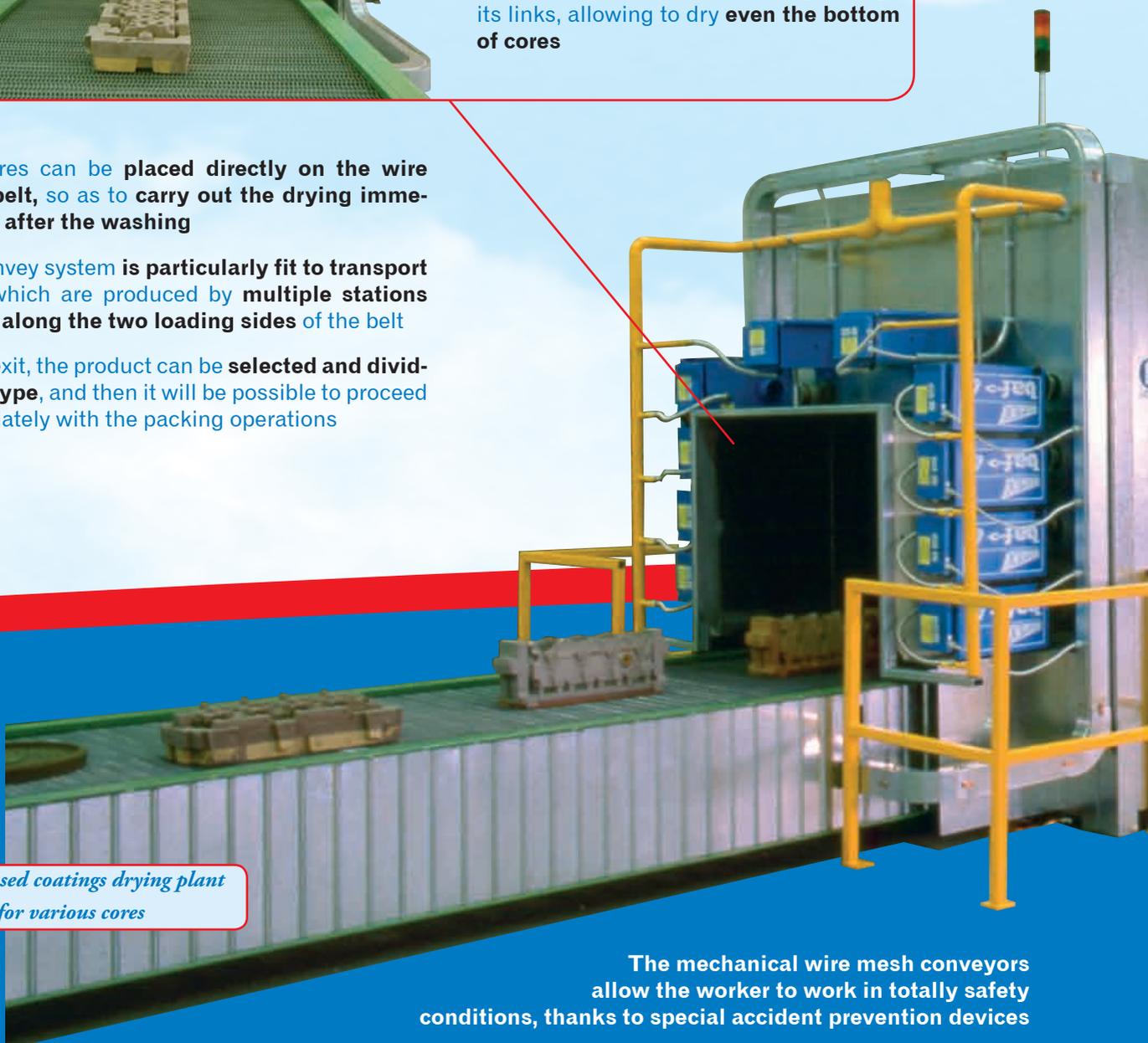


# DRYING *TUNNEL* WITH WIRE MESH MECHANICAL CONVEYOR FOR WATER-BASED COATINGS ON FOUNDRY CORES



- ✓ **HMB** wraps the cores to be dried for the entire length of the *tunnel*, exerting on their painted surface a **radiating and convective action with a high degree of efficiency**
- ✓ **HMB** speeds up the drying thanks to the great amount of generated hot air, which brushes the wet surfaces of the cores interstices
- ✓ The wire mesh belt conveyor allows to **work directly on the belt at the maximum safety**
- ✓ The wire mesh makes air passing through its links, allowing to dry **even the bottom of cores**

- ✓ The cores can be placed directly on the wire mesh belt, so as to carry out the drying immediately after the washing
- ✓ The convey system is particularly fit to transport cores which are produced by multiple stations placed along the two loading sides of the belt
- ✓ At the exit, the product can be selected and divided for type, and then it will be possible to proceed immediately with the packing operations



*Water-based coatings drying plant for various cores*

The mechanical wire mesh conveyors allow the worker to work in totally safety conditions, thanks to special accident prevention devices

***The wire mesh mechanical conveyor can be used also for the handling of overlaid levels pallets, for high quantities of cores to be dried.***



*Water-based coatings drying plant for various cores with overlaid levels pallets*

- ✓ This technology, using overlaid support surfaces, allows to **reduce the length of the plants** utilizing the greatest specific load of cores.
- ✓ In this case **HMB** grants a **uniform spread of heat** for all the height of the pallets, allowing an **optimal drying** of all the cores placed in the various overlaid levels.



*Drying plant for Brake-disk cores*



# DRYING *TUNNEL* WITH MECHANICAL CONVEYOR FOR OVERLAID LEVELS PALLETS

## DRYING WATER-BASED COATINGS ON FOUNDRY CORES

Water-based coatings drying plant on foundry cores



- ✓ **HMB** wraps the cores to be dried, placed on the pallets levels, for the entire length of the *tunnel* exerting on their painted surface a **radiating and convective action** with a high degree of efficiency
- ✓ **HMB speeds up the drying** thanks to the great amount of generated hot air, which brushes the wet surfaces of the cores interstices
- ✓ This technology, using overlaid support surfaces, allows to **reduce the length of the plants** utilizing the greatest specific load of cores
- ✓ **HMB grants a uniform spread of heat** sfor all the height of the pallets, allowing an **optimal drying** various overlaid levels



Water-based coatings drying plant on foundry cores

The handling of pallets is "step by step", the mechanical conveyors and provided with all the safety devices for the loading and unloading, which have to be carried out by mechanical means.



Gas burners at forced intake

*Water-based coatings drying plant on foundry cores*

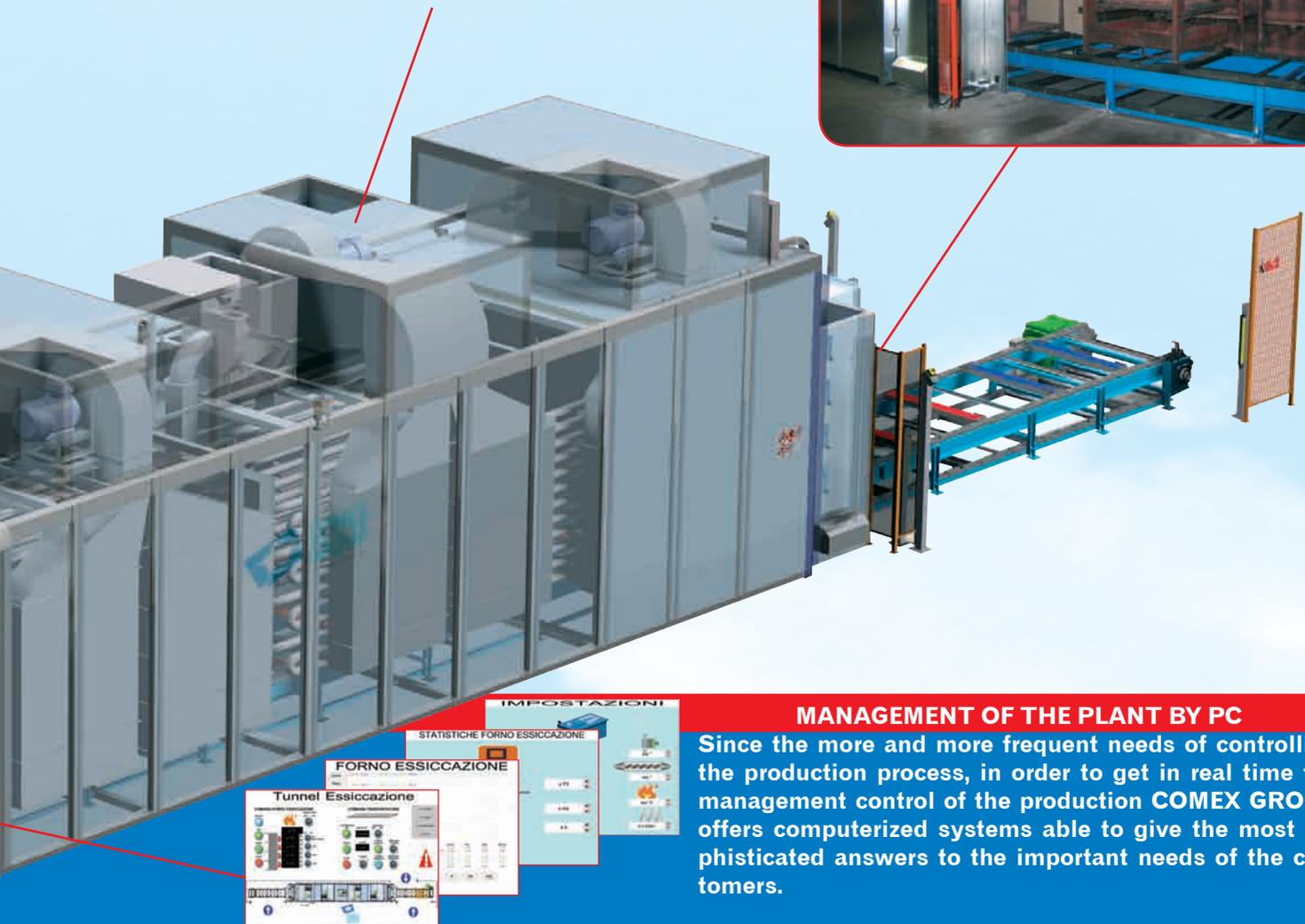


- ✓ The drying plants with pallets convey system are particularly fit for the **drying of great amounts of cores**, , up to 12000 kg/h of production
- ✓ In order to further reduce heat wastes, it is possible to equip the plant with automatic systems of opening and closing of the pallets entry and exit mouths

*Example of pallets unloading area at overlaid levels*



Special systems for the reduction of sound pressure



### MANAGEMENT OF THE PLANT BY PC

Since the more and more frequent needs of controlling the production process, in order to get in real time the management control of the production **COMEX GROUP** offers computerized systems able to give the most sophisticated answers to the important needs of the customers.

- ✓ **Management and plant supervision** software which allows to manage all the electrical-mechanical parts
- ✓ **Real time visualization** of the various parts state
- ✓ **Graphic visualization and management** of the settled and real temperatures set-point
- ✓ **Saving and storage on database** of production sensitive data
- ✓ **Management and recording of events** in case of alarm
- ✓ **Graphic representation (layout) of the plant** for an easier and more immediate functionality

**The possibility of monitoring and recording in real time the production events gives an important contribute to the worth of the finished good, greatly increasing its quality level.**



# CONVEY, HANDLING, COATING AND MOULDS DRYING PLANTS

## HMB

is particularly fit for the drying of water-based coatings for “No-Bake” moulds

*The drying of coated moulds, with deep and narrow hollows, is not a problem anymore*

- ✓ The radiation at low temperature and the targeted forced ventilation of hot air grant the **right drying of surfaces also in depth**
- ✓ **Dryings up to 130 °C keep away the risk of splits, causes defects on the finished good**
- ✓ **Strengthen convey systems, “powered rollers”, reduce the losses of sand which normally occur using other systems**
- ✓ **Special manipulators, expressly planned, allow to carry out actions of overturning, coating and transfer, in a clean and safe way**
- ✓ **Special management and supervision software allow systematically to get controlled quality and costs**



*Convey, handling, coating and water-based coatings drying plant on No-Bake moulds*

**Shifting-Lifting fork machine**



**Moulds Manipulator-Tipper**



**Flow coating station with controlled density**

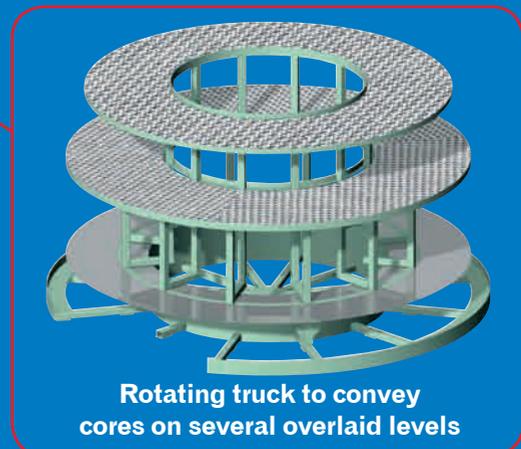
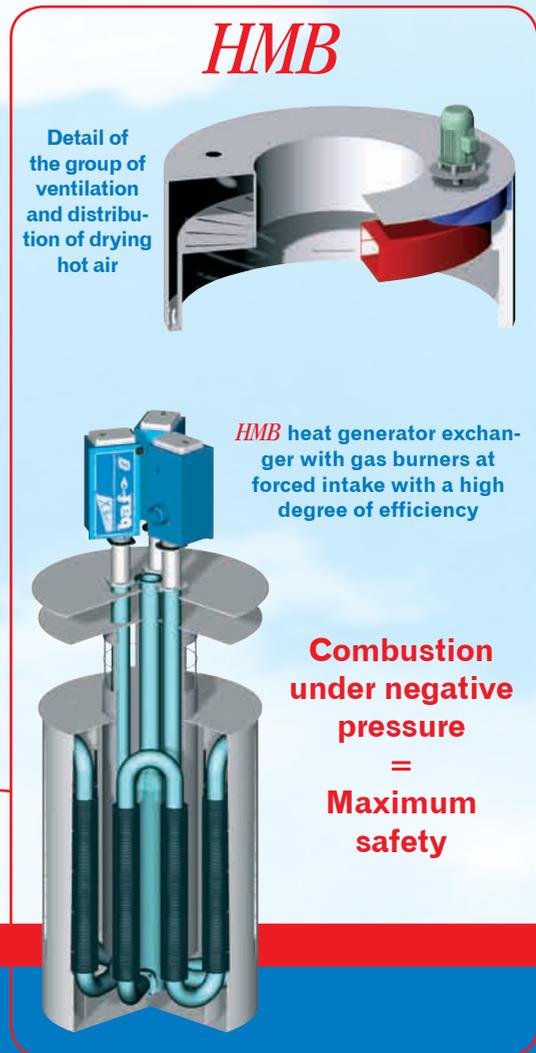




# ROTORDRY THE ROTATING OVEN FOR THE DRYING OF WATER-BASED COATINGS ON FOUNDRY CORES

*High production capacity in a little space*

- ✓ ROTORDRY is a very flexible oven which suits to both low levels of production, with manual loading, and to high levels of production, with automatic loading
- ✓ ROTORDRY, in its simplest version, be coupled to a single moulding machine, revolutionizing the traditional core shop layout
- ✓ ROTORDRY thanks to its constructive simplicity, allows to get a high production/price ratio and to have a great saving in the maintenance costs
- ✓ ROTORDRY thanks to a unique loading/unloading station, requires the intervention of only a worker
- ✓ ROTORDRY has been planned placing a special attention to energy consumptions; in fact, its particular closed structure allows to limit the losses of caloric energy



- ✓ The coupling to an automatic convey system makes ROTORDRY, the optimum oven to dry high amounts of mass produced cores (ex. brake-disks)
- ✓ The possibility of stowing the cores on several levels, allows to reach very high levels of production compared to the little occupied area



# VERTICAL DRY VERTICAL OVEN FOR THE DRYING OF WATER-BASED COATINGS ON FOUNDRY CORES

*System with chain mechanical conveyor with vertically moved trays to carry the cores*

- ✓ **VERTICAL DRY** is an oven specially planned to **solve space problems**; it develops vertically and it is fit for the drying of water-based coatings on foundry cores
- ✓ **VERTICAL DRY** consists of trays, “suspended trays conveyors for cores”, connected to two parallel chains and pulled by toothed wheels. In this way it is possible to develop the drying vertically, saving precious space on the ground.



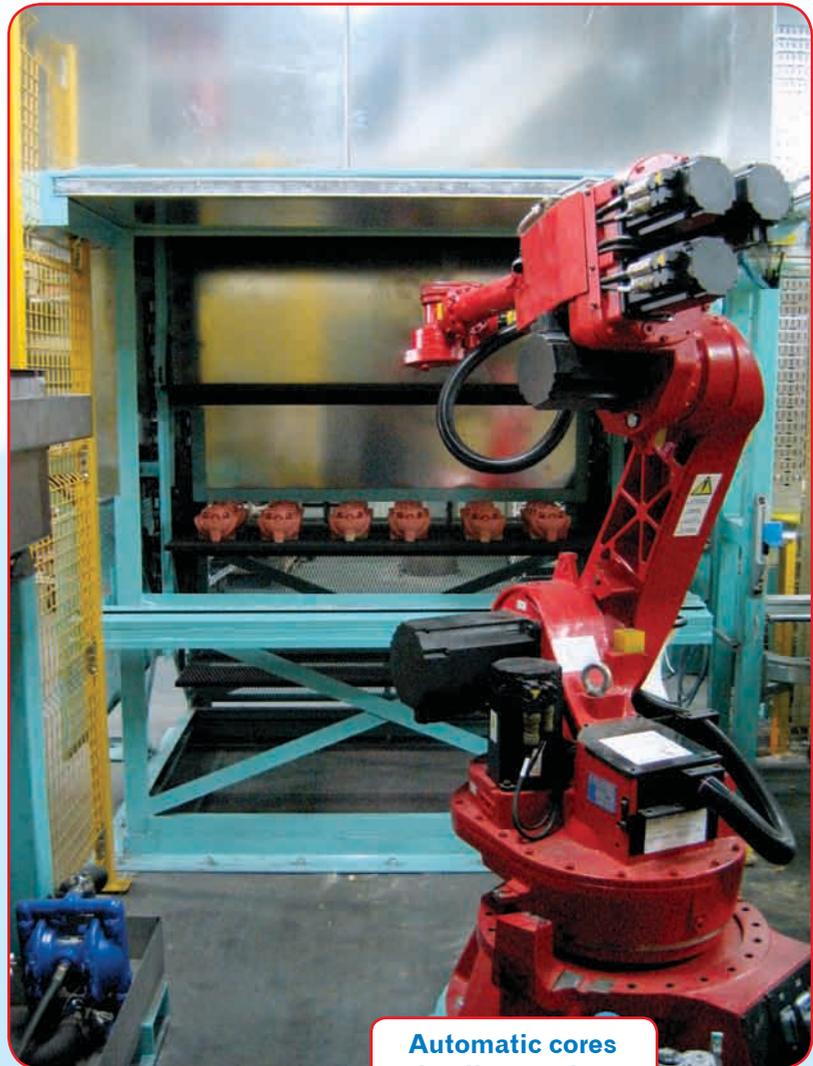
- ✓ The **HMB**, system generates the heat by the right combination of gas-tight tubular exchangers, provided with forced intake burners, and a suitable group of hot air ventilation
- ✓ **HMB** grants a uniform temperature on the entire height of **VERTICAL DRY**, exerting an adequate heat destratification
- ✓ By **VERTICAL DRY** the drying of the water-based coating can be carried out **also at the temperature of 100 °C**.  
At so low temperatures:
  - the loss of tying resins is prevented;
  - the fumes are extremely reduced;
  - the finished good is of very high quality;
  - the environment is safeguarded.

Gas burners at forced intake

Water-based coatings drying plant on foundry cores with **VERTICAL DRY**

## VERTICALDRY IS SUITABLE FOR AUTOMATION AND FLEXIBILITY

- ✓ **VERTICALDRY** is an **extremely flexible** oven which suits to both low levels of production, with **manual loading**, and to high levels of production, with **automatic loading**
- ✓ The suspended **tray conveyors** for cores of **VERTICALDRY** can be **customized on the basis of the typology of core** to be dried and of the kind of the expected loading/unloading
- ✓ **VERTICALDRY** offers also the possibility of loading and unloading the cores from a unique station, transforming the semi-automatic version (automatic loading, manual unloading) into a completely manual version, increasing the flexibility of use
- ✓ **VERTICALDRY** is provided with very reliable devices which grants the **worker's safety**, and is equipped with particular **sound proofing systems** which make it suitable for any working environment
- ✓ **VERTICALDRY** has been planned placing a special attention to energy consumptions; the core of the **HMB** system contributes to speed up the drying, while the destratification reduces the heat wastes, increasing the overall degree of efficiency of the oven



Automatic cores loading station



Manual cores unloading station



# GIBSON THE HEATER FOR FOUNDRY SANDS

## HMB

### *Heating with gas-tight tubular exchangers system*

#### **Heating the sand means:**

- ✓ Lower consumption of resins and catalysts
- ✓ No more losses of production during the winter period
- ✓ Quicker time for the hardening of moulds (constant all year round)
- ✓ Lower loss of ignition



#### **Heating with GIBSON sands heater means**

- ✓ Very low energy consumption
- ✓ Very little heater maintenance
- ✓ Having an immediate sand heating plant
- ✓ An optimum control of the temperature of the exit sand
- ✓ Very little encumbrances
- ✓ Very high adaptability to the existing storage and distribution plants
- ✓ Wide range of models, from 3 Ton/h up to 60 Ton/h with  $\Delta t$  of 20 °C
- ✓ No more possibility of ice presence during the winter period, which characterises the hot water plants

## MANAGEMENT OF THE PLANT BY PC

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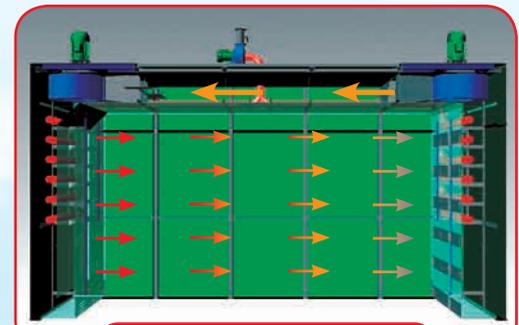
The possibility of monitoring and recording in real time the production events gives an important contribute to the worth of the finished good, greatly increasing its quality level.



## DRYING *PLANTS* WITH STATIC OVENS

### *The most traditional way of drying water-based coatings on foundry cores*

- ✓ **COMEX GROUP** has provided for the use of *HMB*; even in the most traditional drying systems; the caloric energy of the system comes from the right combination of **gas-tight tubular exchangers**, provided with **forced intake burners**, and a suitable **air ventilation system**
- ✓ The drying air, passing through the exchangers of the *HMB* system, heats up and then turns to the coated surfaces of cores to dry them
- ✓ A special air distribution system, exclusive of **COMEX GROUP**, grants a uniform flow for the entire internal height of the static oven, such as to ensure a uniform drying of cores
- ✓ Special turnaround systems of the air flow allow to work even by big size static
- ✓ Suitable systems for the control of the micro-climate inside the cabin allow to have an environment with a constant drying temperature
- ✓ Special management electrical boards allow to control not only the electrical-mechanical devices, but also the drying temperature



Principle of air distribution with cycle turnaround



Static oven for the drying of water-based coatings on foundry cores, two-chambers version



Static oven for the drying of water-based coatings on foundry cores, one-chamber version with double door

Static oven for the drying of water-based coatings on foundry cores, four-chambers version

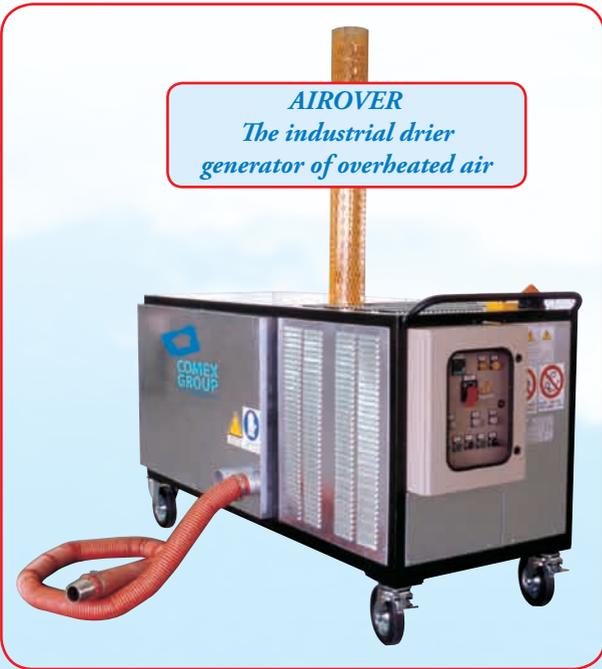




# OTHER PLANTS with **HMB**



*AIROVER  
The industrial drier  
generator of overheated air*



*Shell moulds pre-heating oven  
for aluminum castings*



*Cores hot moulding  
turntable*



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COATING TANK



MARBLE STRIPS DRYING



RESINS DRYING



AUBERGINES COOKING AND GRILLING



*The long experience and the high level of technology, together with the constant research of excellent and aimed at energy saving results, make **Comex Group** the leading company in the sector.*



The company



Training school



**COMEX  
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