

# CONTINUOUS FLOW DRYER

DRYING 





# A RATIONAL AND PROFITABLE WAY OF ARTIFICIAL DRYING



## ARTIFICIAL DRYING OF AGRICULTURAL PRODUCTS AT A QUALITATIVE HIGH LEVEL

Cimbria have a leading position within the area of process-drying of grains and our drying plants are among the most effective in the world.

Development and research within the drying fields has resulted in Cimbria having obtained full control over the drying parameters as air volumes, temperatures and rates of passage. Thereby we obtain the optimal capacity and economical drying in terms of energy while taking the surrounding environment in account.

Cimbria have supplied plants and equipment for drying and conditioning of numerous products world-wide. This combined with professional counselling is your insurance of a well-working installation.

[CIMBRIA.COM](http://CIMBRIA.COM)



## WORLD WIDE EXPERIENCE

The Cimbria continuous flow dryer can be tailored to meet specific customer demands by use of our standard components all kept in stock. This reduces the delivery time as well as the installation time. If the drying demand increases in the future, it is possible, due to the modular design of the dryer, to increase the size of the unit.

Each dryer is carefully calculated by means of our simulation programme which ensures that the dryer meets the requirements.



### GRAIN CARE IN ALL ASPECTS

- Environmental care is very important to Cimbria. Both in connection with the production, but also with the surrounding environment, where the plant is situated. At all times, we are working to be at the front in the field of environmental demands wherever in the world the plant is to be installed.
- World wide representation through fully owned subsidiaries or extensive dealer network ensures local presence and fast reaction in the critical harvest time. This is your guarantee for minimum down time and maximum operation performance.
- At Cimbria, it has never been enough to test the ideas in artificial surroundings. Therefore we have a full size test plant where all our ideas are carefully tested before they are sent to our customers. By doing so we can ensure that our solutions fulfill all requirements in the best possible way.

## EXAMPLES OF PRODUCTS DRIED IN A CONTINUOUS FLOW DRYER



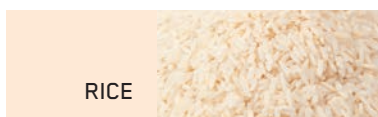
MAIZE



SOYA BEANS



SUN-FLOWER



RICE



BARLEY



PADDY



RAPE SEED



GREEN-COFFEE

- WHEAT
- MAIZE
- RYE
- SUNFLOWER
- OAT
- BARLEY
- MALT
- RAPE SEED
- PEAS
- SOYA BEANS
- RICE
- PADDY
- GREEN COFFEE
- COCOA BEANS
- PEANUTS



# CONTINUOUS FLOW DRYER CONSTRUCTION

The Cimbria continuous flow dryer range comprises of two basic types: The A- and B- range. Each of the two basic types offers a variety of models as each model is built of a number of modules. This modular system offers high flexibility and enables a tailor-made solution for most common drying applications.

The continuous flow dryer is designed for industrial use and the drying sections are therefore built in 2 mm galvanized plates ensuring high durability and a design suited for outdoor installation.

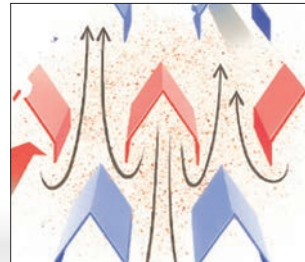
## DRYING/COOLING SECTIONS

Drying/cooling sections are as standard built in galvanized 2 mm plate with inclined and tapered air ducts to ensure homogenous air and grain distribution - a pre-requisite for maintaining product quality without undesirable energy loss. The A-section has a width of 3,4 m and the B-section is 2,2 m wide, both types has a height of 0,63 m and a length of 2,0 m. The modular system ensures a wide range of possible capacities.



## AIR FLOW

The direction of the air through the grain decides how effective and homogenous the grain is dried. All Cimbria continuous dryers are designed as mixed-flow dryers, widely recognized as the most versatile and efficient drying principle for free flowing crops. The alternating exposure to hot- and cold air ensures a gentle treatment and a homogenous drying of the grain.



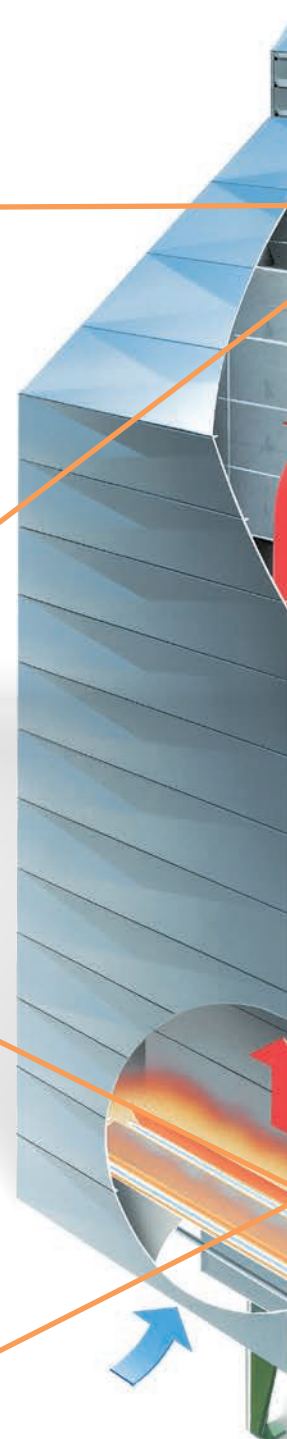
## GAS BURNER

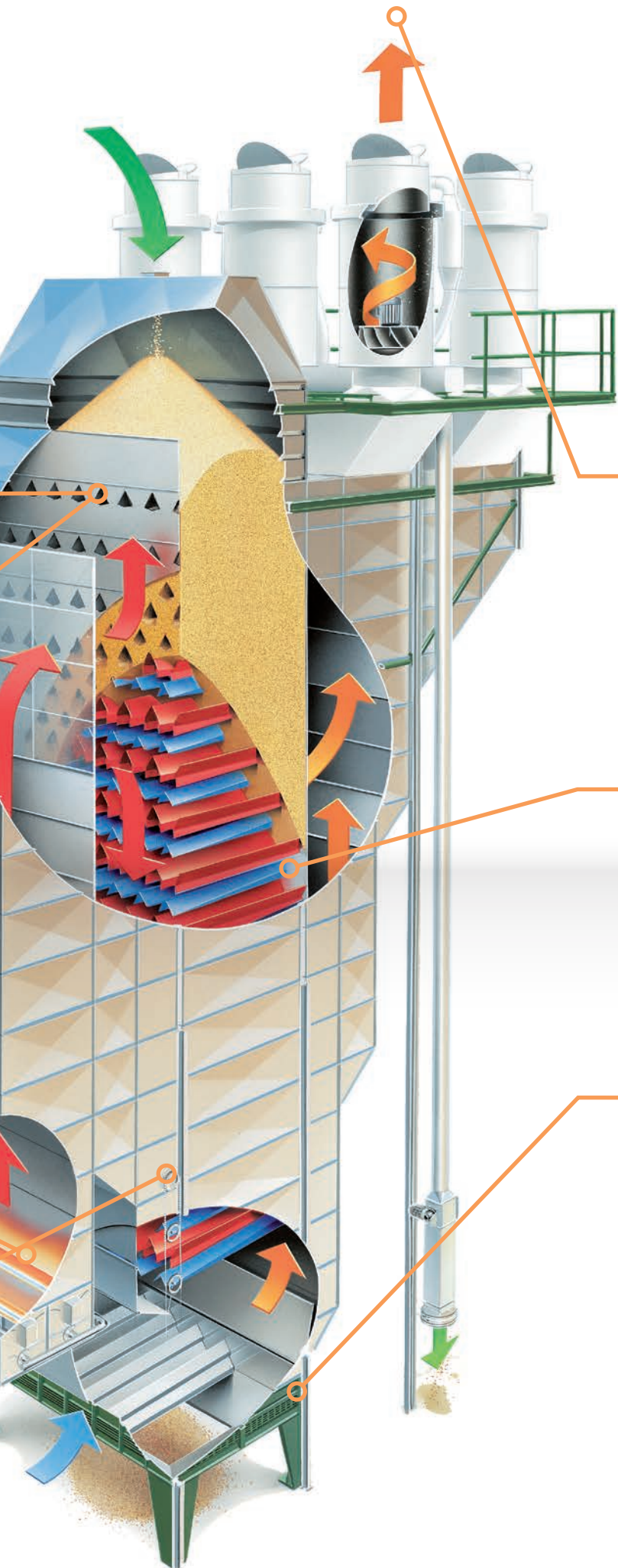
A fully modulating line gas burner adapted to the size of the dryer and equipped with integrated blower fans for combustion air ensures uniform drying air to the grain while maintaining unsurpassed flexibility in the choice of drying air temperature due to the modulation range from 1 to 10. Furthermore changes in ambient temperature are handled without any problems thus providing better utilisation of the dryer and a faster return on investment.



## VARIABLE COOLING ZONE

The variable cooling zone makes it possible to configure the dryer to the exact drying- and working conditions at all times. By utilising air and energy in the best way possible, the costs are reduced and the capacity is optimised.





**TAILOR-MADE SOLUTIONS FOR MOST COMMON DRYING APPLICATIONS**

### ENVIRONMENT

The Cimbia continuous flow dryer design incorporates the negative pressure principle where the complete dryer is aspirated via the exhaust air fans. This principle offers the possibility of adding dust separation using Cimbia cyclofan technology.



### OPTIMISED AIR FLOW

Air foils are placed in the opening of the exhaust channels to minimise turbulence and avoid small grains and light products from being sucked out by the exhaust fans. This makes it possible to use larger air volumes which result in an optimal drying capacity in all crops.



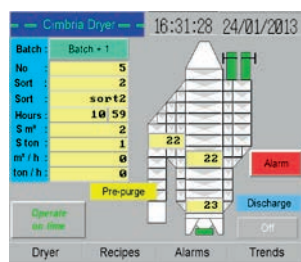
### VOLUMETRIC DISCHARGE SECTION

Cimbia volumetric discharge section is designed with a series of sector valves. This discharge system gives a homogenous grainflow and helps reduce clogging by straw and foreign material. As the discharge volume is fixed, this system offer a simple and reliable indication of throughput directly on the Cimbia control panel.



### CONTROL PANEL

The drying process is controlled and monitored through a PLC controlled panel using an 8" touch screen with user-friendly menu selection which gives detailed overview of the drying process as well as logging of main drying parameters. The control panel is supplied with all necessary interlocking and is normally supplied as a stand-alone unit.





# HEAT GENERATION

## DIRECT OR INDIRECT HEATING? – CIMBRIA PROVIDES AN INTEGRATED SOLUTION

Direct heating typically is typically used for high capacity drying of feed grain where flue gases are allowed to enter into contact with the grain.

Indirect heating are used for drying of products intended for human use which therefore requires heating with “clean air”- Cimbria has the proper equipment for all applications.



### DIRECT HEATING WITH GAS



The direct heating with gas is widely recognized as the most flexible solution, especially where many different crops requires a wide span in drying air temperature is necessary. Cimbria uses standardized solutions from leading European suppliers enabling us to offer fully modulating burners with a turn-down ratio of 1:10. The line gas burners are mounted directly in the hot air channel and provide a very uniform hot air distribution.

### INDIRECT HEATING



For certain drying applications within e.g. food processing is it mandatory to treat the product with extra care just as legislation may require indirect heat treatment, i.e. no flue gases must come into contact with the product but has to be discharged separately via chimney. Cimbria offers a range of energy-efficient indirect furnaces, all with booster-fans and recirculating air channel to ensure correct air volume to the dryer. As standard are the indirect furnaces designed for a  $\Delta T = 75^{\circ}\text{C}$  but higher temperature output are available on request.

### DIRECT HEATING WITH OIL



Cimbria offer two types of direct furnaces depending on the size of the dryer: The VD-furnace which is a free-standing unit typically used on smaller dryers in the B-range whereas the VDI furnace is designed for integration in the hot air channel and is used on the larger models in the A-range.

Both types are designed with temperature resistant steel in the fire box and are equipped with mounting plate for easy fitting of the oil burner.

### INDIRECT HEATING WITH WATER OR STEAM



Cimbria can supply heat exchangers specifically designed for use in combination with a Cimbria continuous flow dryer. Our range of heat exchangers are hot dip galvanised both internally and externally and are designed to optimum performance also in dusty conditions. Our steam exchangers comply with the EU pressurized equipment directive and can be used with steam pressure up to 5,5 bar, which makes this solution attractive in plants where excess steam is available.

## ASPIRATION

### COMPLIANCE TO LOCAL CONDITIONS

Minimizing the environmental impact from industrial drying plants is an ongoing challenge affiliated with the drying process, and Cimbria have for years used dedicated resources on research and development to keep up with constantly increasing legislative demands. The Cimbria cyclofan technology is still considered an efficient solution that can be used wherever local legislation stipulates certain emission values to comply with. As an alternative, all Cimbria flow dryers can still be supplied with a non-dust separating axial fan that fulfils the task of exhausting air from the dryer. We offer a range of noise silencers for direct mounting at the fan outlet as a useful accessory to our complete fan range. This enable Cimbria to provide the correct solution if noise is also an issue to consider at the place of operation.



### CYCLOFAN



The Cimbria Cyclofan is a combination of a ventilator and a high-effective centrifugal separator. It is very easy to install and space saving. Results from »Biotechnological Institute« show that it has a dust separating efficiency of more than 98% in certain types of dust.

Cimbria Cyclofan ensures you a better separation than other dust separating fans with the same energy consumption.

### AIR CONTROL »VARIFAN«



The Cimbria Varifan is installed on all our ventilators and gives the possibility for stepless adjustment of the air volume and proportionally a reduction in the energy consumption. The Varifan gives you an optimal utilisation of the ventilators and ensures you an economic profit while the energy consumption fits to the capacity at all times.

### SUPER CYCLOFAN



Cimbria's Super Cyclofan is specifically designed to further minimize dust emission by offering unusually high separation efficiency of more than 99% in certain dust types and with increased energy efficiency compared to our Cyclofan. With the special developed energy recovery system, the Super Cyclofan provides approx. 20% more air volume compared to a Cyclofan using same size motor.

### AXIAL FANS



The Cimbria Axial fan is a simple exhaust fan with the possibility for regulation of the exhausted air volume with minimal energy consumption. By setting the air volume regulator you obtain an optimal air volume and thereby save energy.



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