CONTINUOUS FLOW DRYER
A RATIONAL AND PROFITABLE WAY OF ARTIFICIAL DRYING

ARTIFICIAL DRYING OF AGRICULTURAL PRODUCTS AT A HIGH LEVEL OF QUALITY

Cimbria has 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 field has resulted in Cimbria having obtained full control over drying parameters such as air volumes, temperatures and rates of passage. We thereby obtain the optimal capacity and economical drying in terms of energy whilst also taking the surrounding environment into account.

Cimbria has supplied plants and equipment for drying and conditioning of numerous products world-wide. This, combined with professional advice, is your guarantee of a well-functioning installation.

CIMBRIA.COM
The Cimbria continuous flow dryer can be tailored to meet specific customer demands by means of our standard components that are all kept in stock. This reduces the delivery time as well as the installation time.

If the drying demand increases in the future, then the modular design of the dryer enables the size of the unit to be increased. Each dryer is carefully calculated by means of our simulation program, which ensures that the dryer meets the requirements concerned.

Environmental care is very important to Cimbria. Both in connection with production, but also with regard to the surrounding environment in which the plant is situated. We endeavour at all times to be at the forefront of environmental demands wherever in the world the plant is to be installed.

Worldwide representation through fully owned subsidiaries or an extensive dealer network ensures local presence and fast reaction during the critical harvest period. This is your guarantee of minimum downtime and maximum operational performance.

At Cimbria, it has never been enough to test ideas in artificial surroundings. We therefore 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 fulfil all requirements in the best possible way.

### EXAMPLES OF PRODUCTS DRIED IN A CONTINUOUS FLOW DRYER

- Maize
- Soya beans
- Sorghum
- Sunflower
- Rice
- Flax
- Barley
- Paddy
- Quinoa
- Rape seed
- Green coffee
- Cocoa beans
The Cimbria continuous flow dryer range comprises 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.

**DRYING/COOLING SECTIONS**
Drying/cooling sections are as standard built in galvanised 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 have 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 determines how effectively and homogeneously 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 gentle treatment and 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.

The continuous flow dryer is designed for industrial use and the drying sections are therefore built in 2 mm galvanized plate to ensure high durability and a design suitable for outdoor installation.
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 the 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 is typically used for high-capacity drying of feed grain where flue gases are allowed to come into contact with the grain.

Indirect heating is used for drying of products intended for human consumption, which thus requires heating with “clean air” - Cimbria has the proper equipment for all applications.

DIRECT HEATING WITH GAS

Direct heating with gas is widely recognized as the most flexible solution, especially where many different crops require a wide span in drying air temperature. 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.

DIRECT HEATING WITH OIL

Cimbria offers two types of direct furnaces depending on the size of the dryer. The VD-furnace 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

For certain drying applications within, for example, food processing it is 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 have to be discharged separately via the 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 the indirect furnaces are designed for a $\Delta T = 75^\circ\text{C}$ although higher temperature output is available on request.

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 is hot-dip galvanised both internally and externally and is designed for optimum performance, even in dusty conditions. Our steam exchangers comply with the EU pressurized equipment directive and can be used with steam pressures up to 5.5 bar, which makes this solution attractive in plants where excess steam is available.
The Cimbria Varifan is installed on all our fans and provides the possibility of stepless adjustment of the air volume and proportional reduction in energy consumption. The Varifan provides optimal utilisation of the fans, thus ensuring economic profit, whilst the energy consumption matches the capacity at all times.

The Cimbria Cyclofan is a combination of a fan and a highly effective centrifugal separator. It is very easy to install and compact. Results from »Biotechnological Institute« show that it has a dust-separating efficiency of more than 98% in certain types of dust. The Cimbria Cyclofan ensures better separation than other dust-separating fans with the same energy consumption.

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 specially developed energy recovery system, the Super Cyclofan provides approx. 20% more air volume compared to a Cyclofan using a motor of the same size.

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

Minimizing the environmental impact from industrial drying plants is an ongoing challenge affiliated with the drying process, and for many years Cimbria has used dedicated resources on research and development to keep pace with constantly ever-stricter legislative demands. 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 fulfills 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 enables Cimbria to provide the correct solution if noise is also an issue to consider at the place of operation.