



# EAR CORN PROCESSING.



An expert  
at your side.



# **Our Experience. Your vision.**

Cimbria is more than the equipment we produce. We are professionals who thrive on building creative solutions to bring your vision to life. We've been doing it since 1947. We combine the right technology with the right team to bring it all together. Our purpose is your success. You can feel confident because you have an expert at your side – helping you grow into the future.



# Complete Ear Corn Processing.

Cimbria is one of the world's leading manufacturers of processing solutions. Based on in-house technology and experience, we have the capability to carry out the full design and supply of turnkey projects. You can count on our experts throughout the entire process. When designing process plants and solutions, we use our knowhow to ensure that all parts of a plant work together seamlessly and that daily operations and subsequent maintenance run as smoothly as possible. Robust project management provides the assurance that lies in our products and project execution are in safe hands. From the placement of your order to the end of your warranty and beyond, you have an experienced and dedicated project team at your side.







# Gentle Handling at Every Step.

Gentle handling is the key to meet your expectations for quality to hit your operational goals. Cimbria's equipment is specifically designed to respect your harvest and increase your production efficiency, with the ultimate goal to prepare your product for better storage.





## Intake.

The ear corn is tipped directly into the intake pit, equipped with a walking floor for gentle and even transfer of the ear corn into the belt conveying system where it is then conveyed into the husking and sorting area.



## Husking and Sorting.

A distribution conveyor fills the pre cells above the huskers, from where the ear corn is conveyed to the husking process by means of a shaker feeder and a belt conveyor. Side by side husking rolls remove husk and silk from the ear. The waste product is collected and conveyed to a dump area where it can be collected or chopped alternatively. After the husking process, the husked ears are visually controlled and inspected at a sorting table. Un-husked ears will be re-run to the husking machine. Bad and low germination ear corn are removed and discharged into a waste belt conveyor.



## Shelling.

Cimbria's sheller gently separates kernels from the cob to minimize damage. It operates using a corn on corn shelling action and is equipped with a sturdy steel housing with a forged rotor. The shelled cobs are conveyed to a dump area or to a cob bin for truck load out.



## Pre cleaning.

Cimbria combines well-balanced oscillation with a highly effective pre-suction and after-suction system to remove light impurities from the material for efficient and accurate screen cleaning.



# Drying Ear Corn: Key Factors for Optimal Storage

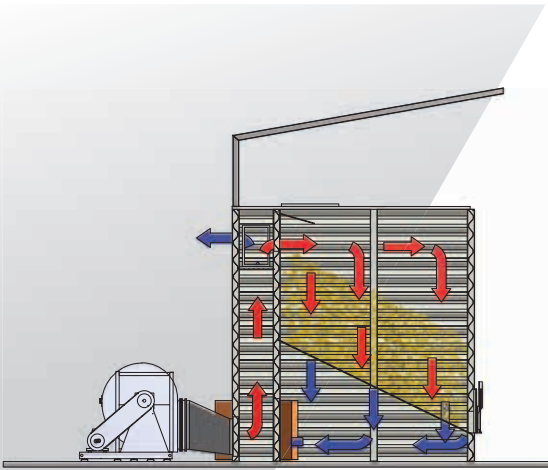
Gentle and accurate drying is crucial to prevent kernel cracks and maintain the highest germination rate. Important factors for the drying process include precise control of temperature, relative humidity, air flow and distribution and initial and final moisture requirements. Ear Corn usually has a moisture content of 30% to 40% and it subsequently needs to be dried down to 12-13% for further processing.





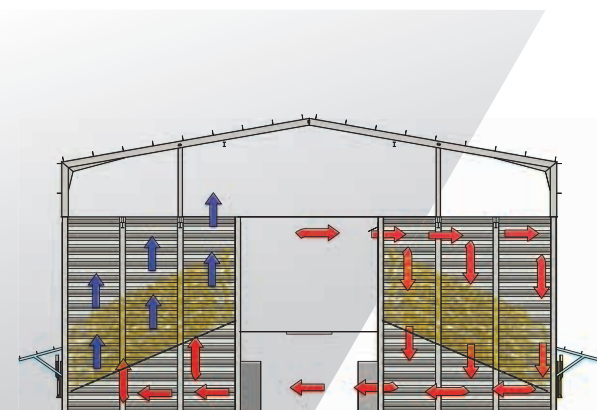
# Efficient drying.

Cimbria dryers feature a modular chamber system complete with trapez-shaped steel profile walls and an inclined bottom of perforated sheet steel to optimise airflow. The filling doors, air dampers, and shell out doors can be supplied with either pneumatic or electric actuator control. The design and supply of steel construction, roof construction, and access can be customized to meet on your specific requirements.



## Single Pass Dryers.

Two rows of drying bins are arranged opposite of each other. Each bin has its own independent heating source and drying ventilator located at the air plenum outside of the bin. The ventilators blow hot air into the plenum, first upward through the bed of ear corn and then downward, before being released into the atmosphere. The advantage brings flexibility, as each bin can be individually controlled with its own ventilator and temperature level, making them suitable for drying different hybrids with varying temperature requirements.



## Double Pass Dryers.

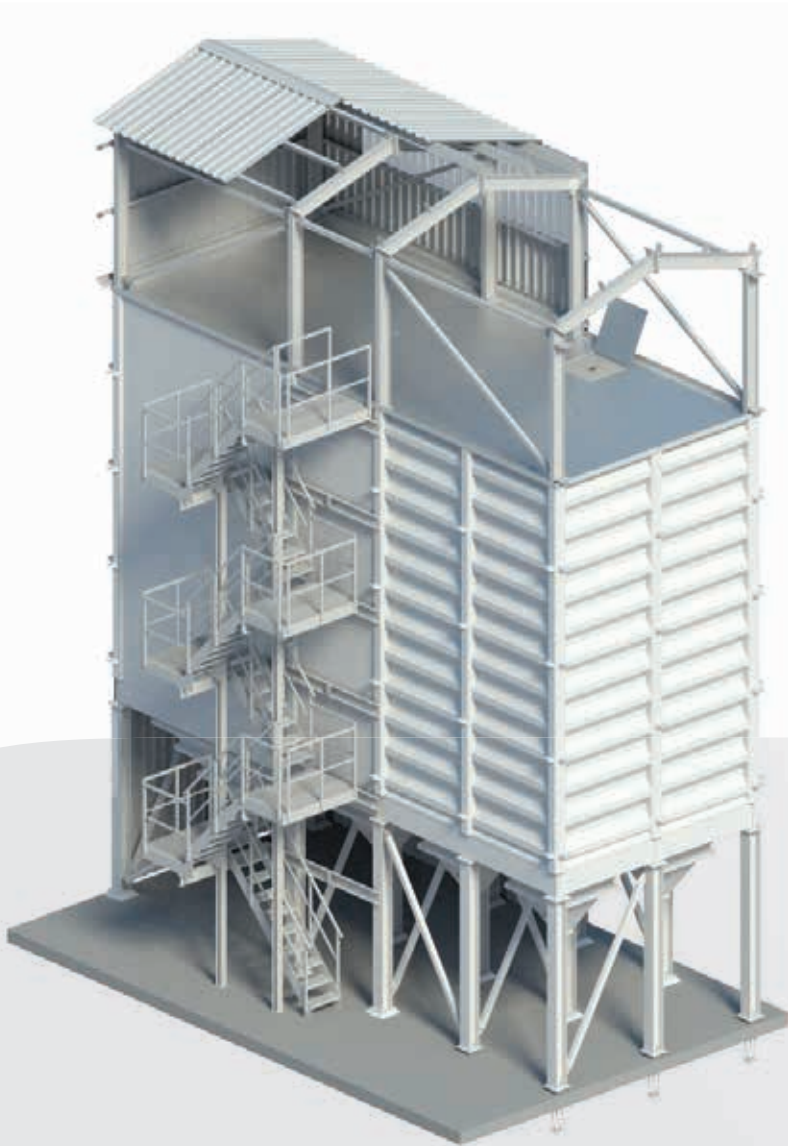
Two rows of drying bins are arranged opposite of each other, with a common heating source and drying ventilators (two or four ventilators and heating sources, depending on the size). The ventilators blow heated air through the bins containing the driest ear corn. That air then travels into the lower plenums and then upwards through the high moisture bins where it will then be released to atmosphere. The advantage are lower power consumption and lower capital cost compared to alternative drying methods.

**For the drying process, we provide heating systems by liquid or natural gas, oil, steam and hot water.**





# Storage.



Cimbria silos are manufactured to store many different smaller quantities of grain products, with capacities of 20,000 m<sup>3</sup> or even higher. Built with heavy, trapezoidal, or face-plated steel plate, with cell sizes up to 4m x 4m. They can be delivered in several combinations and each silo is individually and precisely designed to meet the customer's specific demands. The silos design is optimized for corn and other types of seed, to handle them very gently and preserve their germination ability.

Silos are integrated into the plant flow for storing of

- **Shelled corn**
- **Pre-cleaned corn**
- **Treated corn**
- **Cob waste**





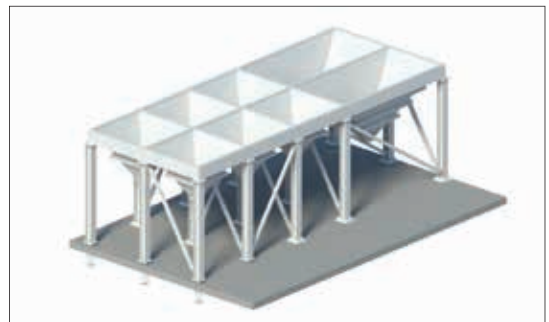
# Gentle Efficient Conveying.



Corn is delivered to the silo cells by means of a belt conveyor. Belt conveyors are equipped with manually or electronically positioned discharge cars. The bins are filled through inlet pipes which are redesigned and connected to the filling chutes of the cells for very gentle product handling.



The silo hoppers are designed to be completely self emptying. The outlets can be equipped with pneumatic or motor controlled shutters for capacity control.





# Clean, Grade and Sort Choose the Best.

It is crucial that seed is thoroughly cleaned. The fine cleaning process is carried out with high precision to ensure the best quality of seeds by removing dust and foreign impurities, as well as kernels with low germination capacity.

Grading into many different fractions is sophisticated work. For the final sorting process, Cimbria has developed a unique technique for sorting according to length, thickness, width, weight, shape and colour. During the grading process, seeds can be separated in size by as little as 0.05 mm differences. Cimbria's vast selection of over 900 screen sizes ensures you have the greatest selection to choose from.





## Fine cleaning.

The Cimbria range of Delta machines are able to perform the best possible separations thanks to a vibrating feeding system that distributes material uniformly across the screens. Moreover, the highest % of open area on the market ensure maximum utilization of each square metre of the screen. Delta Super cleaning lines are equipped with an air lifting system which enables light kernels, which typically cannot germinate, to be lifted out into the waste product.



## Flat Screen Grading.

When using a Cimbria Delta flat screen grader, width and thickness grading will be carried out by combining the optimum open area screen along with the screen slope with the length and frequency of the stroke. The product will be separated into the different fractions required. In terms of grading, Cimbria's unique multiple flow diagrams in our Delta graders are widely recognized as the best systems on the market.





# Special Care is All You Need.

Ear corn has special processing demands, for separating leaves and cobs, removing husk and shelling. In addition, ear corn requires special equipment, gentle treatment and efficient processes to avoid product losses and ensure that the corn maintains its quality and germination capacity.





## Cylindrical Grading.

Incoming material is sorted according to width (round perforation) and thickness (slotted perforation), kernels thinner than the screen fall through, while thicker kernels remain and are transported to the end-outlet. Each kernel comes in contact with the screen due to continuous circulation and centrifugal force. The result is a high degree of accuracy.



## Gravity Separator.

The product processed by the Gravity Separator is separated into layers with different specific weights according to the "fluid bed" principle. The deck is fluidised by a completely uniform pressurised air system stratifying the light material to the top of the product bed and allowing the heavy material to come into contact with the deck surface. The deck is inclined from side to side and inlet end to discharge end and the stratified layers are then separated by conveyance on the deck.



# Optical Sorting.

The SEA colour sorter range features Full colour RGB cameras together with SWIR and UV technology and LED lighting system to meet the needs of modern seed processing. SEA Optical Sorters have the ability to detect and reject seeds having either non-conforming colours or shapes with extreme precision and sorting speed.





A large industrial optical sorting machine, likely a CIMBRIA model, is shown in a factory setting. The machine is green and white, with a complex structure of metal frames and conveyor belts. It is used for sorting products with high precision. The background shows a large industrial building with a high ceiling and various pipes and structural elements.

# Sort Your Products with the Highest Precision.

Optical sorting uses the most advanced technology to sort micro-sized foreign bodies and defects which cannot be distinguished by human eye. The different set of cameras applied in our range of optical sorters are conceived to accomplish various kind of sorting, with extreme accuracy and speed for your highest quality.





# Protect Seeds with Coating.



## Centricoaters.

Prior to being sown, seeds have to be protected against attack by fungi and pests.

Cimbria seed treaters are suitable for all types of liquid or powder treatment. Each seed comes in contact with the atomized treating agent in the mixing drum for uniform coating of the entire seed surface. A closed vacuum system ensures zero pollution with no aerosol leakage.



## Jog Conveyor Drying.

Jog Conveyor Dryers are mainly used after the coating process to prevent wet kernels from “caking”. The wet product is transported by means of an eccentric drive through the drying sections, where warm air is blown through the product layer from underneath.

Moist air is aspirated from the top and led to a dust collection system. There is an option of installing a screening section at the end of the machine to screen out undersized and oversized material, thus improving the environmental protection aspect during sowing, for both farmers and bees.

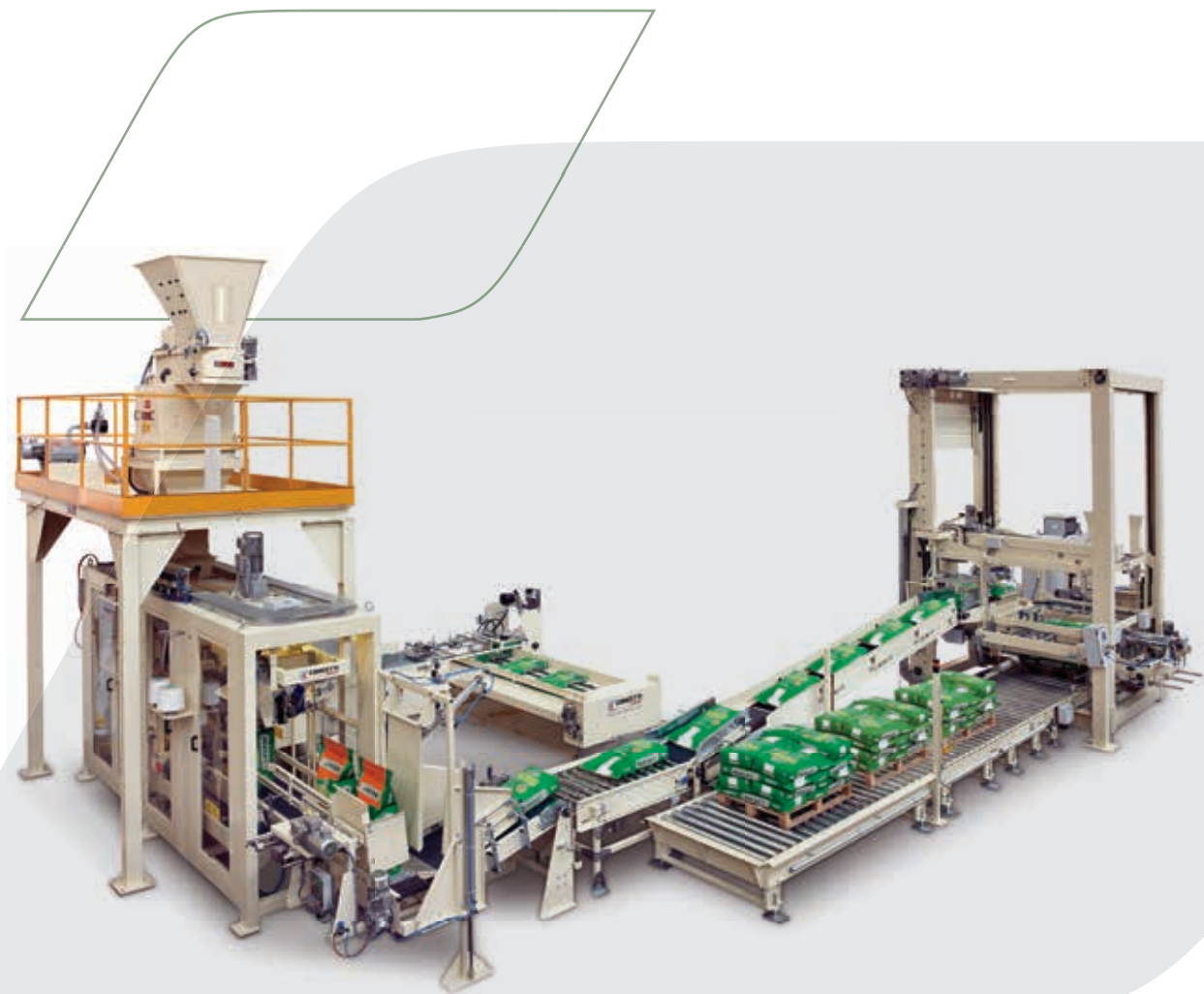


# Bagging and Packing.

Treated seed corn is packed in a variety of bags, depending on the region, tradition, bag size, bag type etc.

The packaging systems are very individual in their lay out in order to fit within the available space.

From a simple netto bag weigher with open mouth bag, manual sewing and stacking of bags on pallets to the more advanced systems including automatic bag placement and flattening, automatic sewing and robot palletizing and wrapping systems.





# Take Full Control Over Your Processing Plant.

Remote monitoring improves safety, reliability and efficiency. Connected with your ERP system, our control solutions are able to collect and distribute information between products, machinery and the system for optimized plant performance.





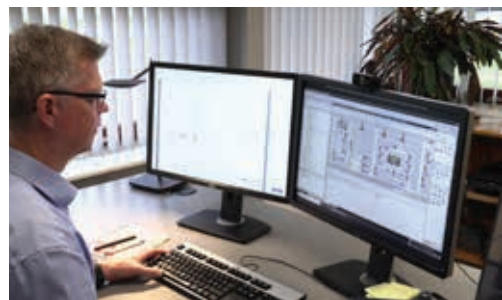
# Management and Control.

The Cimbria control system combines our many years of process experience with the latest technology. This is your guarantee that all installed machines operate at their optimum performance, minimizing downturns and thereby ensuring the best efficiency of the entire system throughout the lifetime of the plant.



## Scada System.

The Scada system is tailor-made for your operation to monitor and provide alerts. It can be controlled by your operator from one or several locations. Our preferred system is WinCC from Siemens - a powerful, userfriendly, high performance PC based Human-Machine Interface (HMI) together with Microsoft Windows.





**CIMBRIA A/S**

Faartoftvej 22  
7700 Thisted  
DENMARK  
Phone: +45 96 17 90 00

**Cimbria Heid GmbH**

Heid-Werkstrasse 4  
A-2000 Stockerau  
AUSTRIA  
Phone: +43 2266 699

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**Cimbria.com**