

GRAIN STORAGE

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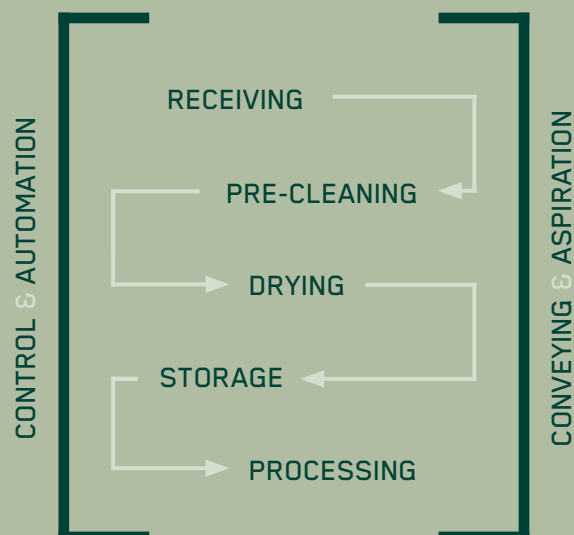


OPTIMUM GRAIN STORAGE FOR BETTER UTILIZATION OF NATURE'S RESOURCES

Cimbria is one of the world's leading manufacturers of equipment and plants for grain storage. Based on in-house technology and experience, we have the capability to carry out full design and supply of grain storage projects of any size.

Solid project management supports the assurance of safety that lies in our products and project execution. From the placement of your order all the way through to the expiry of the warranty, the responsibility for your project lies in the hands of an experienced and dedicated senior project team focused on solving your specific requirements.

Serving customers is a fundamental aspect of Cimbria's efficacy and business sense. This goes for the design and implementation of plants of any size as well as the guarantee of a smooth-running plant. Cimbria's service staff is highly experienced in localising and handling all system errors and this experience is placed at the immediate disposal of our customers.



INTAKE AND PRE-CLEANING

INTAKE

Cimbria intake systems are designed and manufactured to fit the specific requirements of each individual product and plant. For environmental reasons, the intake building can be provided with an intake dust separation filter system which efficiently collects the dust that escapes when unloading trucks.

By removing waste material in the grain received directly from the field, whether wet or dry, the risk of generating hot spots during pre-storage will be reduced. Furthermore, the drying process will be more efficient thus reducing energy consumption during the drying process.



INTAKE

The intake drive over grids is a heavy-duty design and manufactured to withstand an axle pressure of 16 tonnes. The reinforced steel intake hopper has an outlet for direct connection to the selected chain conveyor side inlet systems.

PRE-CLEANING

During the pre-cleaning process, foreign materials such as large impurities, sand, thin grains and weeds will be separated. Pre-cleaning differs from rough cleaning rough cleaning, as the



PRE-STORAGE

Prior to further drying or processing of the grain, temporary storage in hopper bins means that the plant operator can separate different grain sorts and separate grain with different moisture content. Hopper bins typically have an automatic aeration system combined with a Unitest Temperature Monitoring System. This provides the operator with a full picture of the condition of grain before further drying or processing.

former is also able to separate products smaller than the main crop. Overall focus in terms of pre-cleaning is always on ensuring a product that can subsequently be optimally handled and stored.



DRUM SCALPER

Scalping of grain after intake is an efficient way of separating large foreign bodies from the grain, also in very wet products. The Cimbria scalper is a high-capacity unit whose primary function is to remove larger impurities such as non-grain foreign materials, as well as sand. In addition to this, the Scalper has an efficient dust aspiration system which collects and removes light dust.



DELTA PRE-CLEANER

In both wet and dry conditions the efficient and accurate screen cleaning effect is ensured by a well-balanced oscillating movement complemented by Cimbria's highly effective pre-suction and after-suction system, extracting light impurities from the material at both the machine inlet and outlet

DRYING

EFFICIENT AND SUSTAINABLE DRYING SOLUTIONS

A Cimbria dryer is your insurance for a versatile storage plant, as it is built to handle all free-flowing crops with only a few adjustments to the setup when changing product. We offer consultation and design of drying installations based on the results of many years of practical experience. Our extensive knowledge of drying, combined with a heartfelt commitment to the environment, product care and customer

satisfaction, ensures a fully controlled homogeneous and economical drying process. This, in turn, guarantees quality and capacity, thus ensuring fast payback on your investment with the lowest possible impact on the surrounding environment and the world's energy resources.

By choosing Cimbria as your partner to solve your grain drying requirements, you will receive professional assistance throughout the entire process all the way from concept to commissioning.

Reduced energy consumption; ECO-Master continuous flow dryers optimize modern technology, improving the already widely acknowledged high standard of Cimbria mixed-flow dryers.



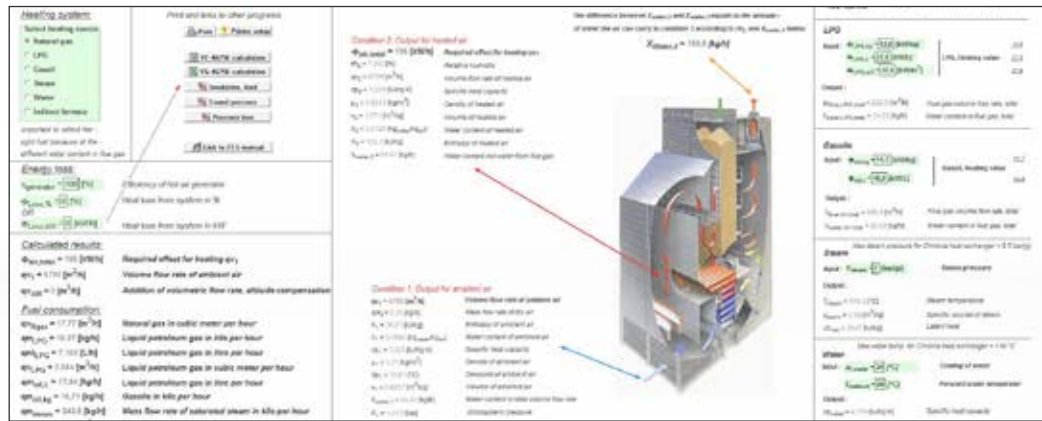
CONTROL OF DRYING PROCESS

The ECO-Master® dryer range is supplied as standard with a highly sophisticated yet user-friendly control system which provides complete dryer status information, including a quick overview of key dryer data such as drying air temperature, grain temperatures, fan status and overall performance of the dryer. With just a few clicks on the screen, the operator can find all the relevant data on the ECO-Master® dryer.

DRYING GRAIN FOR SAFE STORAGE

The main reason for drying grain is to ensure problem-free long-term storage. Cimbria continuous flow dryers are based on more than 60 years of experience with regard to optimal, gentle, efficient and economical drying. Drying grain is essentially a simple process based on air's ability to convey water vapour. Heated air with a correspondingly low relative humidity removes water from anything that can release moisture until the air is "saturated".

There is, however, a complicating factor - the diffusion time, i.e. the time it takes for the water to reach the surface of the kernels, from where evaporation takes place. Therefore the temperature of the air, its rate of flow through the product and the time during which the product is in the dryer are all of crucial importance in terms of the efficiency and economy of the dryer.



HEATING OF AIR

Cimbria dryers are based on a modular construction in sections, where the distance between the inlet and exhaust ducts - i.e. the product layer - is carefully matched to the volumes of air used in each section. Cimbria dryers can be supplied with a wide selection of different heating sources depending on drying application and available energy on site. The most common source is direct heating with natural gas, LPG gas or diesel oil. But gas or diesel can also be used with an indirectly fired system. Moreover, heat exchangers can be used for either hot water or steam. Finally, a combination of heat exchangers and direct or indirect heating can be used if a periodical supply of hot water or steam is available from other heating sources.

SIMULATION PROGRAM FOR AN OPTIMUM DRYING PROCESS

Based on our worldwide experience gained through the sale of several thousand dryers and research done in recent decades, Cimbria has developed a unique simulation program compiling both theoretical and practical knowledge into a handy tool which our engineers and sales staff can use in order to determine the right Cimbria dryer solution for your needs. This ensures the most accurate drying of the grain at the lowest energy consumption



STORAGE

SAFE STORAGE

Optimum storage of grain is crucial when it comes to the quantity and quality of the final output. It is not only a matter of avoiding product losses but careful storage is also vital in order to prevent damaged and infected grain.

Cimbria has extensive knowledge about designing the appropriate storage solution and has considerable experience of

storage plants utilizing either flat stores, square or steel silos. The total installed base accounts for millions and millions of tonnes of grain storage capacity.

Aeration and cooling systems, supported by Cimbria's temperature monitoring system, eliminate the risk of losses and damage to the grain during storage.



STORAGE IN ROUND STEEL SILOS

With the silos supplied by Cimbria, the grain material sustains its quality and value, which secures the basis of a sound economy in your production. Intelligent filling systems with gentle let-down ladders can preserve the grain quantity during filling.



STORAGE IN SQUARE SILOS

As an alternative to round silos, square silos manufactured by Cimbria are often used when storage of many different smaller quantities of grain products or sorts is required.



TEMPERATURE AND MANAGEMENT SYSTEMS

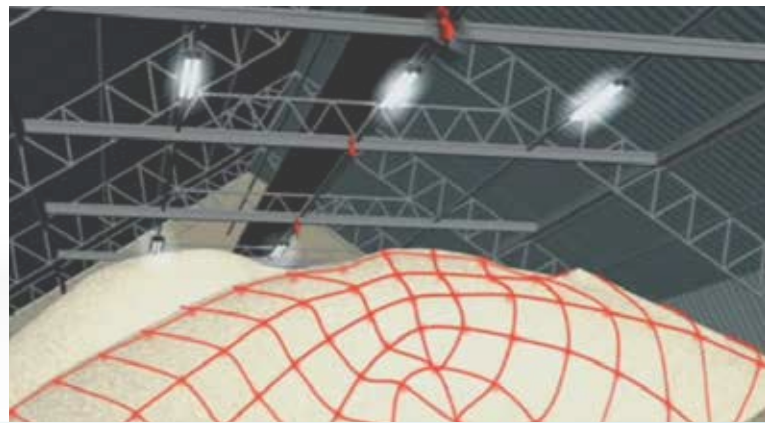
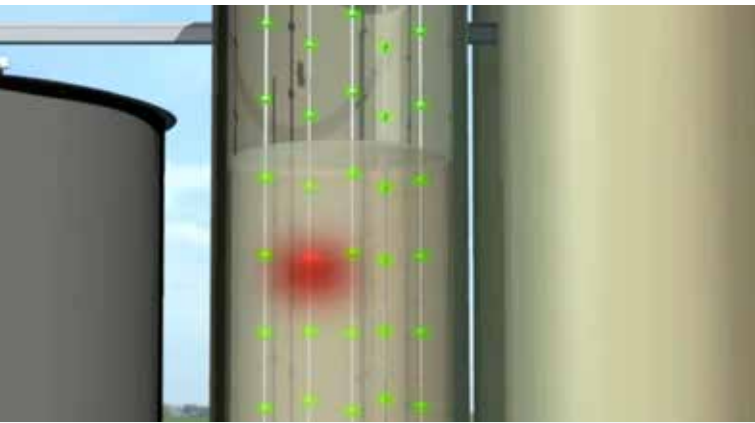
TEMPERATURE AND MANAGEMENT SYSTEMS

The Cimbria Temperature Monitoring system, Cimbria Unittest, is an important tool to safeguard the products during storage in silos. Based on the experience from thousands of installations all over the world, the system monitors storage conditions.

The Cimbria Unittest system has been developed with focus on avoiding unnecessary ventilation. This ensures that savings are achieved in terms of electricity consumption.

The Cimbria Inventory system can be integrated into each silo for indicating stock level. Each system is custom-designed according to the client's requirements and particular plant specifications.

The software update also enables better access to statistics, hard copies/extracts from the database, the option of email reporting, as well as easy implementation with existing systems, e.g. SCADA.



TEMPERATURE MONITORING SYSTEMS

The temperature is constantly monitored by means of a number of sensors which are fitted in carrying cables specially designed for the installation in question.

INVENTORY MANAGEMENT SYSTEMS

The Inventory Management System (IMS) is a unique technology which can scan any shape of grain pile in 3D and, based on this 3D view, can generate a very accurate indication of the volume of the stored grain. The system offers more than 99% accuracy and is certified by independent auditors for use both in silos and flat warehouses.



CONVEYING

CONVEYING EQUIPMENT - THE NECESSARY LINK

In grain storage plants, conveying equipment links the various processes into complete production units. Correctly designed and gentle conveying solutions are crucial to the quality of the

final product and therefore unquestionably safeguard value and generate profit on the bottom line.



CHAIN CONVEYOR

Cimbria chain conveyors are built in a modular system ensuring fast installation and maximum operational safety due to carefully calculated chain speeds, the use of worldwide recognized sub-suppliers on e.g. gearboxes and bearings, sturdy design and wear-resistant materials in critical areas of the conveyor.



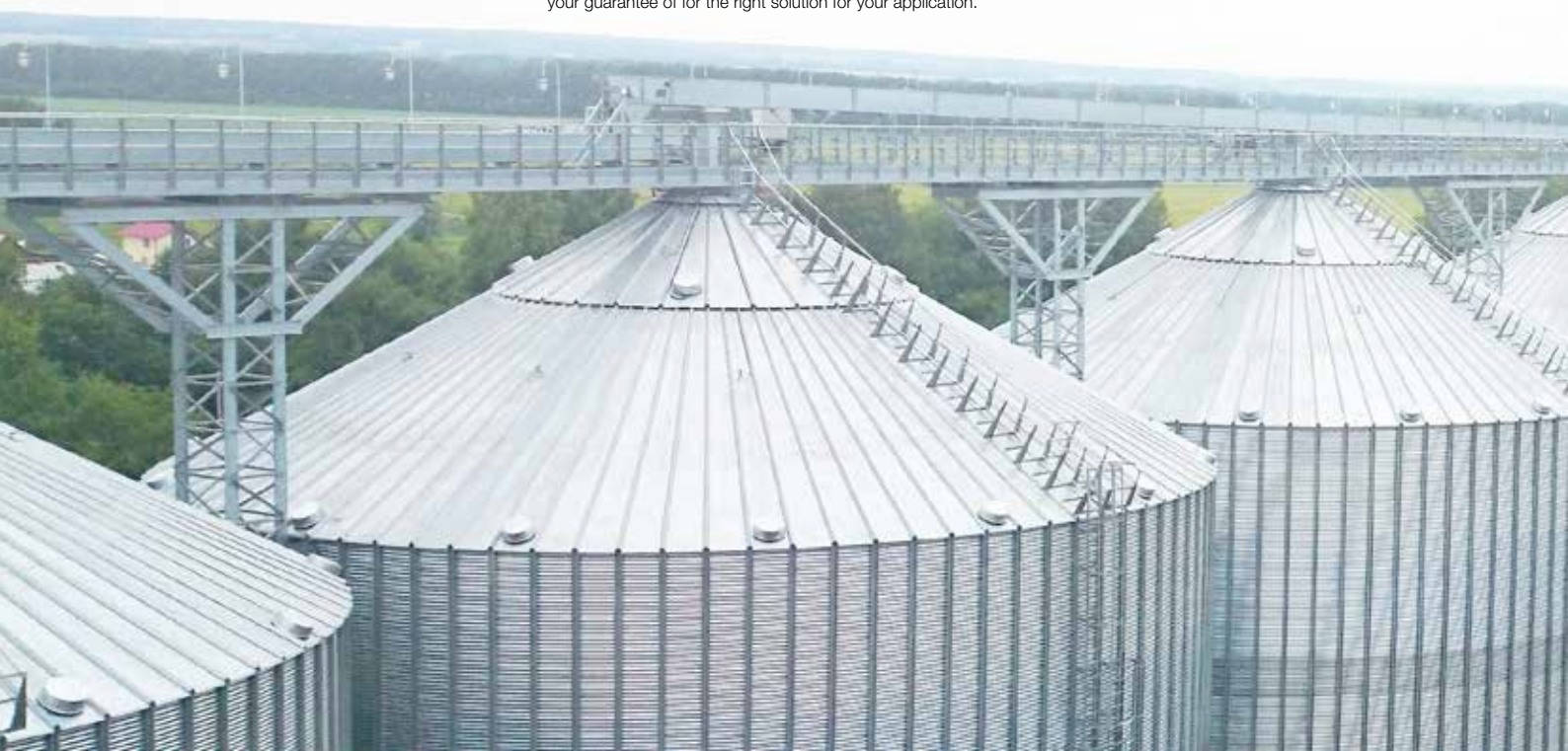
BELT CONVEYOR

Whenever gentle handling, low kW consumption, long conveying distances or high conveying capacity are decisive factors, a Cimbria belt conveyor is the ideal solution. A wide range of belt widths, combined with various diameters of carrying rollers and drive and tension drums as well as the possibility of offering conveyor frames in either pre-galvanized plate or welded and hot-dip galvanized heavy duty execution, is your guarantee of for the right solution for your application.



BUCKET ELEVATOR

Cimbria bucket elevators are designed for gentle and reliable product handling – a wide range of sizes, combined with flexibility in choice of belt speed and type of buckets used in the particular application, ensures long lifetime with only minimal maintenance and wear parts required.



RESEARCH AND KNOWHOW – OUR FOUNDATION – YOUR GUARANTEE

At Cimbria, conveying solutions are developed based on our in-depth knowledge of the particular circumstances of the individual

projects. Focus is applied to diligent and precise calculation of capacity, combined with knowledge of the grain to be conveyed, including distances, usage pattern and climatic conditions.



SCREW CONVEYOR

Cimbria Contec screw conveyors are designed for efficient and reliable conveying of grain. The screw conveyors can be supplied for horizontal or inclined conveying.



PIPING AND VALVES

Cimbria's range of piping, slides and valves covers Q-spouts for the gravity flow of grain which. Q-spouts have the advantage of being square, which means that they have less friction and therefore require lower angles than round ducts, and consequently require a lower built-in height.



OUTLOADING

The outloading of grain can be carried out by Cimbria Modulflex loading chutes. The outloading system can be supplied for tanker trucks, flatbed trucks, open and closed rail wagons and containers, or it can be manufactured in a more sturdy construction for shiploading, depending on customer requirements for heavy duty performance, long term durability and high capacities.

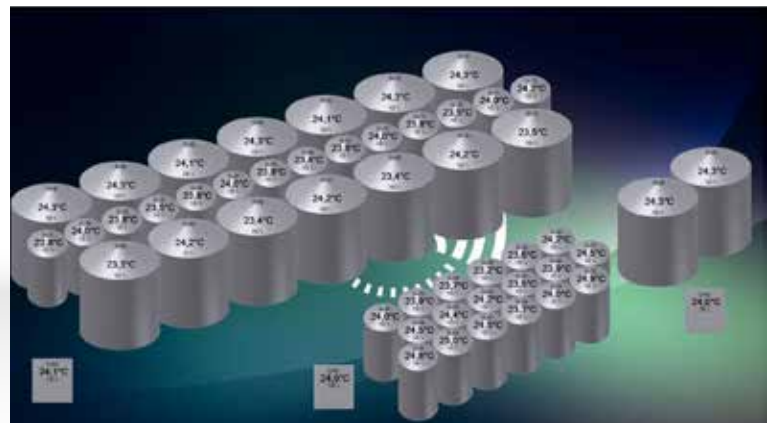
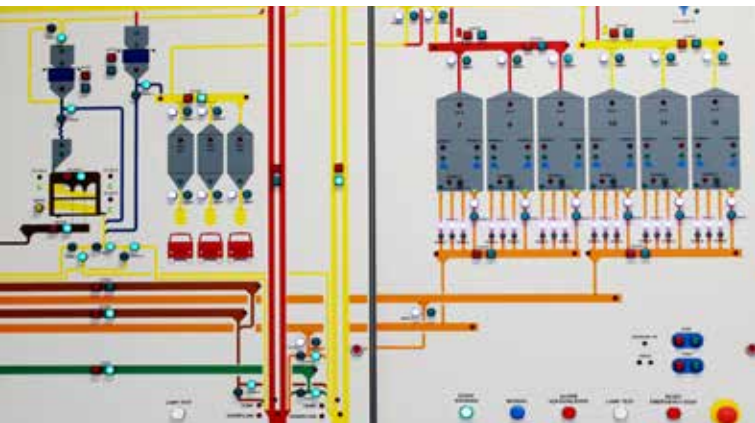


AUTOMATION

HIGH TECHNOLOGY FOR OPTIMUM PERFORMANCE

A modern facility is not utilized in the optimum manner without an effective and reliable control system. A Cimbria control system combines our many years of process experience with the latest automation technology.

This is your guarantee that all installed machines operate at their optimal performance, thereby ensuring the best economy of the entire system throughout the lifetime of the plant.



SCADA SYSTEM

The SCADA system is tailor-made for operation, monitoring and alerting and it can be controlled and managed by the operator from one or several locations. To secure daily operation, all routes and operations are saved and stored and can be easily accessed.

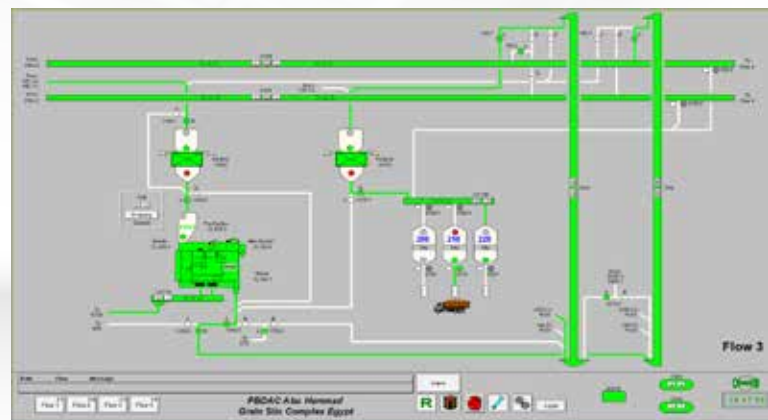
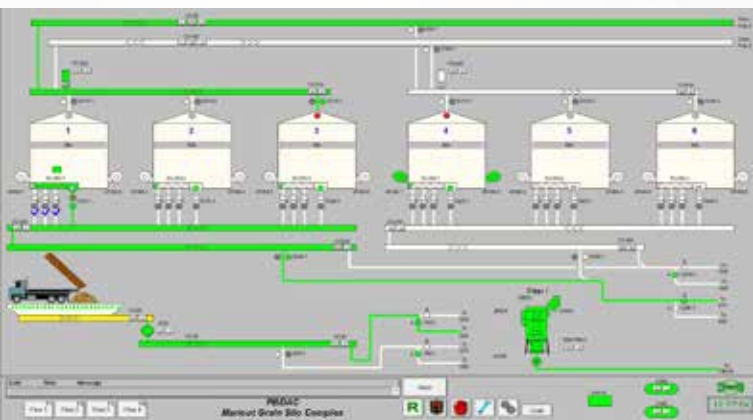
Our preferred system is WinCC from Siemens: a powerful, user-friendly, high performance PC based Human-Machine Interface (HMI) together with Microsoft Windows.

TRACEABILITY

Grain represents great value, and therefore traceability is increasingly important. A very well-tested and stable database system is normally built in Microsoft SQL. Logging is typically done using a barcode system, but other systems such as RFID systems are also available.

SERVICE PROGRAM

To minimize the risk of breakdowns and plant downtime, operating statistics on each machine can be set and monitored enabling scheduled service and preventive maintenance to be carried out in a timely fashion.



ASPIRATION

DUST FILTER SYSTEM

Dust appears in all grain storage plants, especially at the transfer points where the grain is conveyed from one machine to another. Grain dust creates an unpleasant and dangerous environment for the workers, including the risk of dust explosion. Therefore an integrated aspiration system is an absolute must in any modern grain storage plant.

The dust filters are equipped with filter bags which separate the dust before the air is discharged to the atmosphere.

Dust aspiration piping must be properly designed according to air quantity, air velocity and pressure. Fans create the under-pressure that extracts the air from all extraction points. Air-locks discharge the dust to either a bag or to a conveying system leading to a dustbin.





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