



Grain Processing Technology





Cimbria Unigrain

From single machines or processing lines to turnkey projects comprising the world's largest grain processing plants

Our mission

Cimbria Unigrain delivers efficient and controlled technology processes, equipment and plants for handling and storing crops while focusing on increasing quality and energy efficiency and improving cost effectiveness.

Our grain processing competence

We design, develop, manufacture and install custom-built solutions whether these are single machines, complete processing lines or large turnkey projects with highly advanced automation and management information systems.

We master all disciplines and expertise within research and development, crop knowledge, engineering, and manufac-

turing, as well as in professional project management, consulting services, training, site supervision and construction.

Part of the Cimbria Group – world-leader in grain processing technology

Cimbria Unigrain is part of the Cimbria Group which has its origin and head office in Denmark. Cimbria was founded in 1947, operates all over the world and has a global network of distributors and service organisations.

Our thousands of complex grain and seed processing installations around the world, operating under widely different conditions with a broad variety of products, are based on our own research and development during more than sixty years. This, together with our strong focus on a healthy working environment, wide-ranging flexibility and return-on-investment, has provided Cimbria with today's world-leading position.



Total project competence

Cimbria's total project competence provides our customers with a high level of safety, comfort and attentiveness to their project, ensuring qualified performance in every aspect and complete integration and coordination of functions and components. We are a one-stop-company, and our client has only one contact who is responsible for the entire project.

Cimbria grain processing

Cimbria grain processing systems cover the handling of all types of grain, seed, granules and other bulk materials as well as vegetable oil, and comprise: cleaning and grading, drying, seed processing, conveying and outloading, storage, vegetable oil processing, control-automation, aspiration and filtration.





Cimbria develops and manufactures its own solutions

Cimbria develops and manufactures the machines, equipment and components for its grain processing plants. Cimbria has 10 production plants in 7 countries: Denmark, Germany, Austria, Poland, the Czech Republic, Malaysia and Kenya.

Our innovation makes us the best in the world

The Cimbria Academy is a research, testing and training centre for the Cimbria Group. Here a complete seed cleaning, drying and storage plant provides the framework for full-scale testing of new developments, and here we train our customers in how to operate the Cimbria grain processing equipment and installations.



Sunflower silo plant, Mironovsky Hleboprodukt, Ukraine. Silo capacity of 60,000 tonnes.



Cargill Grain Drying Plant, Ukraine. 2xAED37 Sunflower dryers. Capacity of 40 tonnes per hour. Steam heated.



Drying plant for maize for snack-food, Nebraska, USA. Capacity of 250 tonnes per hour (6 x AEG38).



Kemira GrowHow, Lithuania. Seed processing plant including, drying and storage. Capacity of 12 tonnes per hour.



Conveying and storage



*RM18 Chain conveyor.
Vattenfall Power
Station, Copenhagen,
Denmark. Capacity of
1000 tonnes per hour.*

Our expertise in high capacity conveying and storage solutions

Cimbria holds an expertise in top efficient high capacity conveying and storage systems handling up to 2,000 tonnes per hour.

Conveying

Cimbria aims to achieve intelligent simple conveying solutions with minimised routing and complexity to improve energy efficiency and reduce crop waste during the conveying process. The specifications of the conveyed materials, the distances, the climatic conditions, etc., are some of the main parameters in our requirements for both horizontal and vertical conveying solutions.

Intake and outloading

Cimbria's intake and outloading solutions minimise waste and dust emissions which reduce the impact on the environment. A large number of efficient Cimbria intake and outloading facilities have been successfully installed worldwide for grain processing, but also cement, lime, fly ash, plastic granules, coal, grain, flour, sugar and many other processing lines benefit from the advanced Cimbria technology.

Silo plants

Cimbria develops storage solutions with a capacity from 100 to 500,000 tons. You will find Cimbria silo plants all over the world for the storage of various types of grain, seed, foodstuffs, flour products, etc. Each silo plant is individually and precisely designed to meet the customer's specific demands.

No silo project is too complicated or too simple for Cimbria - whether large or small, square or round, trapezoidal or smooth surface, etc.

Port terminals

In port terminals, high inloading and outloading capacity and high equipment reliability are preconditions for obtaining quick handling and short pier-time. Cimbria's many years of experience in this field and our references provide us with a competitive edge as a provider of port terminal solutions.



*UAB Piviskiu Grudai
silo plant, Lithuania.
Capacity of
20,000 tonnes.*



*Nibulon Port Terminal, Ukraine.
Capacity of 100,000 tonnes.
Transport capacity of 700 tonnes per hour.*

*Denofa Port Terminal, Norway.
Loading capacity of 300 tonnes per hour.*



*Omskii Regionalnyi Elevator, Russia.
Capacity of 30,000 tonnes.
Drying capacity of 50 tonnes per hour.*

*EHCSS Silo Plant, El-Fayoum, Egypt.
Capacity of 60,000 tonnes.
Transport capacity
of 200 tonnes per hour.*



Pre-cleaning, grading and drying



His Royal Highness Prince Joachim of Denmark visiting the Cimbria installation at Mironovsky Hleboprodukt Drying Plant, Ukraine.

Cleaning

Cimbria is a leading developer and producer of a wide range of high-capacity pre-cleaning equipment with a capacity of up to 400 tonnes per hour. The cleaning process must be efficiently integrated and should never become a bottleneck in a grain processing line.

The pre-cleaning removes with high precision undesired elements, dust and impurities. Also, wilted, broken and diseased grains are removed with high precision to ensure the best quality of the treated grain.

Typically 3-15% of the volume is undesired contents removed during the pre-cleaning process.

Cimbria's special air recirculation system

Cimbria has developed a special air system for the pre-cleaning, allowing 80% recirculation of the air, significantly reducing the energy consumption and reducing the air exhaust to about 20% compared to conventional systems.

Grading

Grading according to size is a sophisticated precision work. Cimbria has developed a unique technique for grading according to length, thickness, width, shape and weight. Grain with the same volume may not have the same weight and thus have different properties.

Drying

The drying process must be designed and adjusted to each specific product. Bulk grain with highest possible capacity and seed in the most gentle way to avoid damaging germination. At the same time it must be highly efficient and cope with the capacity of the received quantity.

Cimbria's own developments within this specific area resulting in the market's most flexible modular solutions strongly enhance our world-leading position. The grain slowly zigzags its way through the drying chamber and each grain is dried with air hitting it alternately from above and below. This second-to-none air circulation system ensures a gentle, yet effective drying process.

The Cimbria drying technology is based on an air sucking principle instead of the conventional air pressing principle to eliminate dust emission.

Advanced control of the drying process

The Cimbria technology gives full control over the air volumes, temperatures and rates of passage, as well as the even distribution of the drying air in the drying chambers. High temperatures provide the most efficient drying, but excessive temperatures may also damage the germination ability of the seeds.

Energy supply

Our dryers are developed for various energy supplies, such as electrical power, gas, diesel or steam. Energy sources can be determined in accordance to local environmental and cost-efficiency considerations.



Mironovsky Hleboprodukt Drying Plant, Ukraine. Gas heated.



*Saha farms, Thailand. 2 x AEG34. Oil heated.
Capacity of 60 tonnes per hour.*

*Sunflower silo plant, Sunoil-Bakar Ltd, Russia.
Drying capacity of 50 tonnes per hour.*



*Seed processing plant Kubanskiy Gibrity Kukuruzu,
Krasnodar region, Russia.
Drying capacity of 12,000 tonnes per year (cob).
Seed processing: 15 tonnes per hour.*



Grading plant, Wrightson Seed Co., New Zealand.



Seed processing



Seed and grading processing plant Pioneer Afumati, Romania. Capacity of 15 tonnes per hour (maize).

Leading market position

Cimbria together with its world famous brands Cimbria Heid and Cimbria Delta holds a strong world-leading market position within seed processing plants, where we maintain a strong focus on quality and cost-benefit.

All over the world the seed industry is moving towards an increased level of industrial production with high capacity plants for cleaning and grading the seed. This development increases the demand for Cimbria's high capacity, high quality and cost-effective seed processing solutions.

Range of seed processing equipment

Cimbria develops and manufactures an entire range of seed processing machines and equipment. We deliver complete seed processing lines with a capacity up to 25 tonnes per line per hour. We deliver seed-processing plants for a variety of grain, cereals, oil seeds, grass seeds, rice, legumes, garden seeds and other commercial seeds, capable of working under all kinds of climatic conditions all over the world.

Our wide range of processing machines comprises:

Cleaning and separating:

*De-awner
Fine cleaner
Gravity separator
De-stoner
Maize sheller
Velvet roller*

Grading:

*Indent cylinder
Rotary sizer*

Chemical Treatment:

Centricoater

The Cimbria Centricoater innovation is a fine example of our advanced equipment. The Centricoater reduces the consumption of chemical agents and thereby reduces the impact on the environment. The results are homogenous seeds which all have a fine growth ability and meet the international standards for certified seeds.



Seed processing plant, Buchachagrohlibprom, Ukraine. Capacity of 10 tonnes per hour (wheat).



*Seed processing plant Jensen Seed, Denmark.
Capacity of 3 tonnes per hour (spinach).*

*Seed processing plant Baywa, Germany.
Capacity of 15 tonnes per hour (wheat).*



*Seed processing plant, Advanta, India.
6 tonnes per hour (paddy rice).*

*Seed processing plant, Sady, Ukraine.
4 tonnes per hour (sunflower).*



Square silos

High flexibility with Cimbria square silo solutions

The design of the Cimbria square silos allows easy expanding. The silos are produced with either flat or profiled walls. The square silo solution is very flexible and the cells can be separated into different sizes for storing different products, such as grain, seed, coffee, etc.

The Cimbria square silos are modularly built with cell sizes from 1m x 1m to 4m x 4m, and the design is adaptable to local physical conditions and requirements.

*Monsanto silo, Romania.
Storage capacity of 10,000 tonnes.*



*Zoloty Seed Company, Voronezh, Russia.
Storage capacity of 5,000 tonnes (maize).*



*Square silo, Buinsk, Tatarstan, Russia.
Storage capacity of 10,000 tonnes (wheat).*

*Heydi, Norway. Silo for cement.
Storage capacity of 530 m³.*

Unitest®

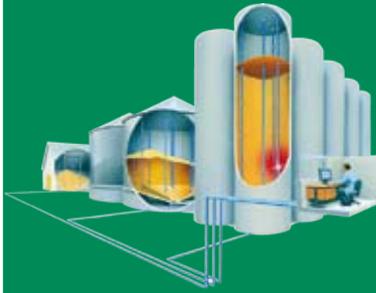
Unitest® Temperature monitoring system

An essential factor for the grain quality during storage is the balance between water content, ambient conditions and duration of storage. If these parameters are not in balance, a reduction of the grain quality could easily occur and may result in huge losses.

A Temperature Monitoring System is therefore essential in grain storage facilities. With the Unitest® system, the operator can get a pre-warning and action can be taken to prevent potential negative developments in due time. Cimbria's Temperature Monitoring System can be integrated with an aeration system and give a signal to automatically start the ventilation, provided that the ambient conditions allow aeration to be used. Moreover, indicative level measurement in each silo can be integrated.

Cimbria has installed more than 6,000 temperature-monitoring systems in more than 80 countries.

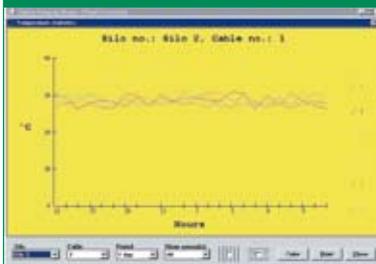
The latest generation of monitoring system provides the customer with the possibility of integrating it with the new Cimbria Inventory management system. The Inventory management system gives a high degree of transparency of storage status and a unique possibility to cash up any surplus stock on daily basis.



Temperature monitoring systems for any type of storage facilities.



Display of level measurement in a SCADA system.



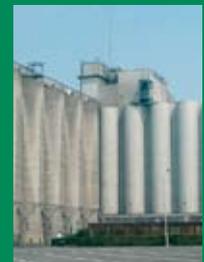
Statistics and temperature trends processed with Cimbria standard software in the temperature monitoring system.



Layout of Cimbria's standard system for temperature monitoring.



VBK South Africa, plant with Unitest installation. Capacity of 100,000 tonnes.



Unitest installation at Euro Silo in Gent, Belgium, which operates storage facilities with a capacity of in total 650,000 tonnes.

Oil seed processing and biodiesel technology

Our experience and know-how

Cimbria develops, manufactures and installs individual machines, equipment and turnkey oilseed processing plants for the extraction of vegetable oil – from raw seed to ready-to-use biodiesel or oil products for human consumption.

The more than a thousand Cimbria Sket plants operating around the world are a distinct result of Cimbria's extensive experience in research and development in oil seed technology.

Cimbria Sket technological crop handling processes

The total conditioning and refining competence comprises:

- **Preparation:** Cleaning, crushing, flaking and/or dehulling
- **Conditioning:** Stack cooker or horizontal type
- **Pressing:** Pre-, cold-, and full-pressing
- **Refining:** Chemical or physical refining plants with 50 - 1300 tonnes per day
- **Fatty acid plants:** Distillation and splitting
- **Glycerine plants:** Preparation, evaporation and distillation
- **Biodiesel plants:** Transesterification, methanol recovery.



Oil press with capacity of 500 tonnes per day.



Tianjin Longwit Oils & Grains industrial Co. Ltd., China. Plant for refining vegetable oil.



Pressing at RME Magdaburg, Germany. Glycerol distillation capacity of 20 tonnes per day.

Rape seed pressing at RME Magdaburg, Germany. Capacity of 225 tonnes per day.



Air cleaning

Conveying and outloading of bulk materials are always associated with risk of creating waste and dust, as well as the danger of explosion. Cimbria develops and manufactures solutions that allow dust-free storage, handling and outloading of bulk goods.

Cimbria manufactures, supplies and installs a comprehensive range of filter units, fans, air-ducting systems, cyclones, noise reducers and dust explosion relief under the JKF brand name.

Cimbria also manufactures outloading bellows for dust reduction when filling grain or many other bulk materials into trucks, tankers and large scale bulk carriers. This is made by Cimbria Moduflex being the world's largest supplier of outloading bellows.

Cimbria has accumulated a profound experience with air cleaning in bulk handling which constantly benefits customers around the world who invest in bulk outloading equipment.

The comprehensive knowledge and range of Cimbria's in-house production of air cleaning equipment has a huge impact on making a cleaner environment.

*Dustfilter at intake system,
DLG, Aarhus, Denmark.*



*Dust aspiration filter at
woodworking factory in Poland.*



*Dust aspiration system at
feed mill in Sweden.*



*Outloading of bulk products with
Cimbria Moduflex system.*



Plant Automation

Our experience and know-how

The highest capacity of Cimbria Unigrain's equipment is achieved by automation. As a result of many years of experience we can advise the best automation level for controlling the processes.

In this respect, Cimbria Unigrain's obvious strength is that we have gathered our knowledge of processes, systems and automation into one organisation and, by choosing Cimbria Unigrain as an automation partner, our customers get a properly dimensioned system based on modern technology and optimised functionality.

The advantages of being a turnkey partner include design and execution, as well as subsequent servicing when the need arises.

Turnkey partner

Cimbria Unigrain's turnkey contracts include PLC and SCADA for process control and electrical panel installations for machinery and building facilities alike. Our electrical engineers not only have expertise in the complete design and execution of electrical facilities and process control, but also in designing systems and equipping machinery.

Panel installations

Cimbria designs and supplies all types of electrical panel installations for complete systems: distribution panels, power-factor correction panels, circuit-breaker panels and PLC panels.

Process control

A plant's machinery and equipment are controlled by PLC systems adapted to the size and organisation of the system.

A SCADA system is used for operating and monitoring the plant.

A SCADA system makes it possible to program special functions for operating, monitoring and alerting, but also makes it possible to store and present empirical data.

Management Information System

It is currently common for modern production plants in the grain, seed and feed industry to use computer-based controls for managing input, output and flow, e.g. automated storage and production controls, capacity optimisation, quality assurance, logging energy use, etc.

Cimbria is also at the cutting edge in this area by providing computer systems that – in conjunction with weighing machines and SCADA systems – can log, store and process data concerning material transactions to and from storage facilities, as well as additions and partitioning during the production process.

Service

Serving customers is an important aspect of Cimbria Unigrain's image, not least in the area of process control.

Process control provides the first indication of error at a plant and, in the vast majority of instances, this can be used for localising the error; an area in which Cimbria Unigrain's service staff are widely experienced. We place this experience at the immediate disposal of our customers, as all our SCADA systems are Internet-linked and we can be online within a few minutes regardless of where in the world a system is located.



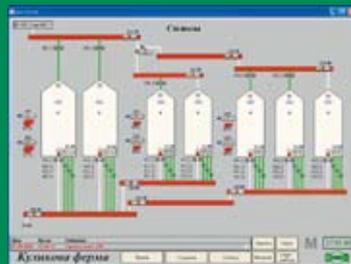
Motor Control Centre.



Feed mill in Italy.



Drying & cleaning plant in Ukraine.



Silo project in Russia.

Cimbria automation systems provide easy overview of plant processing.



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