

CENTRICOATER

SEED PROCESSING 





EFFECTIVE APPLICATION OF SEED TREATMENT MATERIAL



MODERN COATING TECHNOLOGY FOR INCREASED GROWTH ABILITY

The Centricoater optimises the consumption of chemical agents and the impact on the environment is subsequently a reduction in raw material use. The results are homogenous coated seeds which all have improved growth ability and meet the international standards for certified seeds.

The system provides improved seed coverage and a most uniform distribution of treatment materials on the seed as compared to traditional continuous operating drum (screw) type treaters.

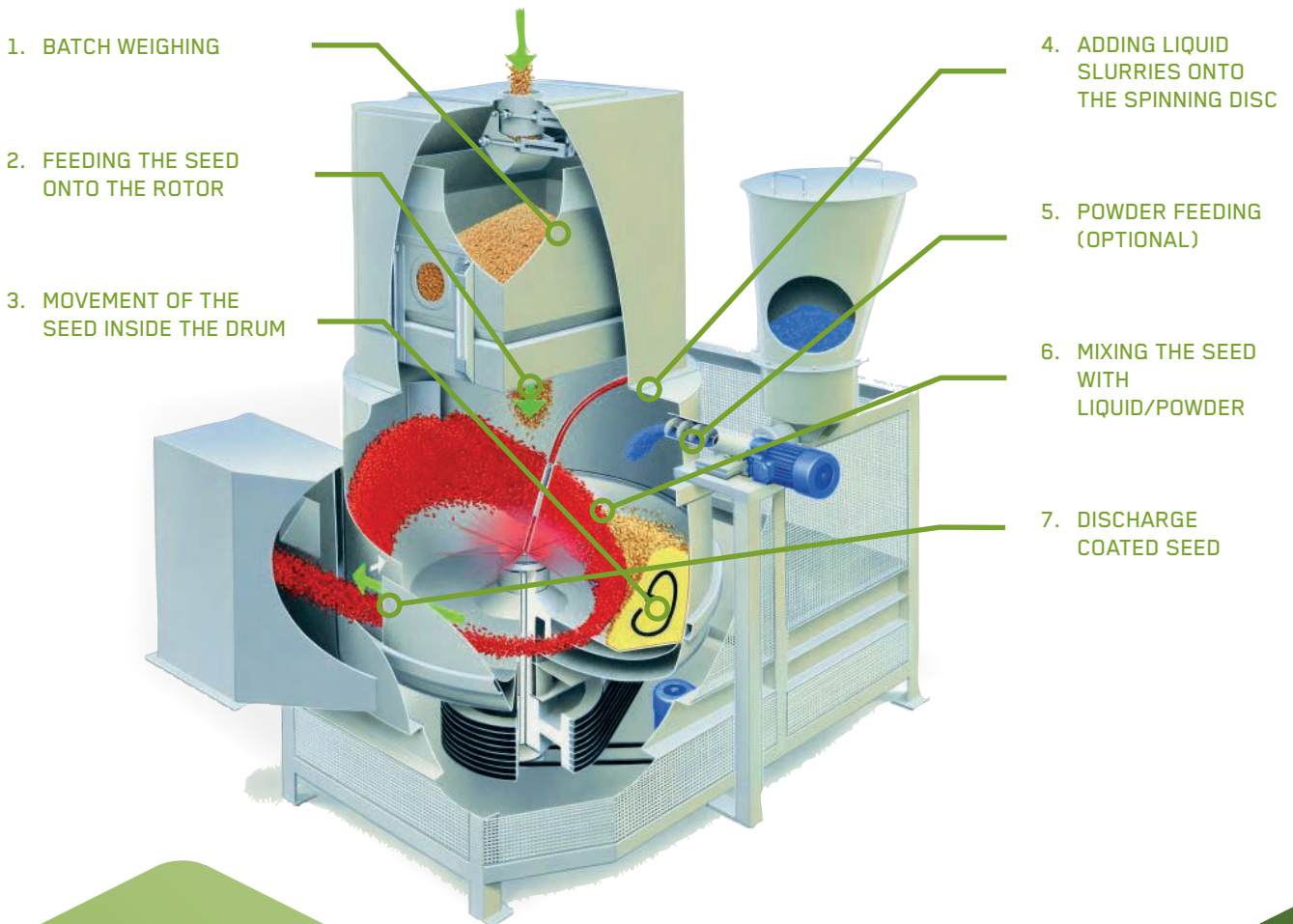
Main attention is also paid to economical use of the expensive coating slurries, thus simply saving money for our valued customers. This results in a very short pay-off period for Cimbria Centricoaters.



PRINCIPLES AND APPLICATIONS

Cimbria Centricoaters are continuous operated batch treaters. A precise electronic scale prepares the needed amount of seed (batch) for the next cycle. After the scale has fed the prepared batch to the mixing drum, the rotating bottom of the drum accelerates the seed to force it to climb up the drum wall, and to be folded back to the drum middle by means of the built-in deflectors. According to a preset recipe, including amounts and timing, all selected slurries and powders are now added to the mixing drum. Slurries are added onto a spinning disc in the middle, atomising the slurries and spraying uniformly onto the moving seed. Powder

is added directly on top of the moving seed. This provides an intensive and highly uniform application of seed treatment materials on each kernel of seed. Stringing all single batches together allows a continuous operation of the Centricoater in an automated seed line. Amounts of product and chemicals as well as time settings can be easily changed within the PLC control to achieve optimal results. Due to this very flexible setup the Centricoater can be used for a wide range of applications, for film coating as well as for incrustation and pelleting.



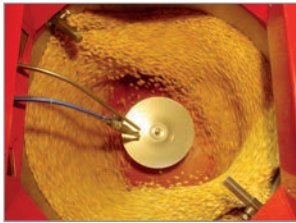
COATING TECHNOLOGY

HIGH END CONTROL UNIT

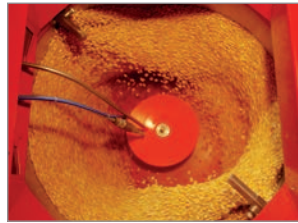
A fully automated PLC controls and monitors the operation of the CentriCoater. The generous touchscreen visualises the complete coating process, thus granting an excellent overview for the operator into all current operations and settings of the machine (scale, mixing chamber, dosing lines). All necessary settings, both for the intake product as well as for the coating process itself, can easily and logically be entered by the operator. Recipes can be stored in a clearly arranged database. All data in the control unit is always shown in the operator's language, switchable to English on demand. A high level alarm and troubleshooting management system as well as the integrated remote main-tenance feature significantly reduces downtimes as well as risk of malfunction.



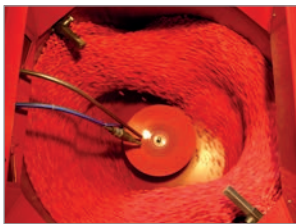
MECHANICAL COATING TECHNOLOGY



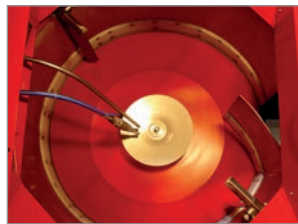
Filling of the mixing chamber



Dosing of coating agent



Mixing phase



Discharging of coated material

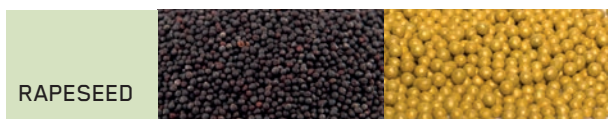
The pictures show the fast and efficient coverage of the seed inside the mixing chamber, starting with the filling of the mixing chamber, continued by the dosing of the agents, the mixing phase and at last the complete discharging of the coated seed.



MAIZE



SUGAR BEET



RAPESEED



WHEAT

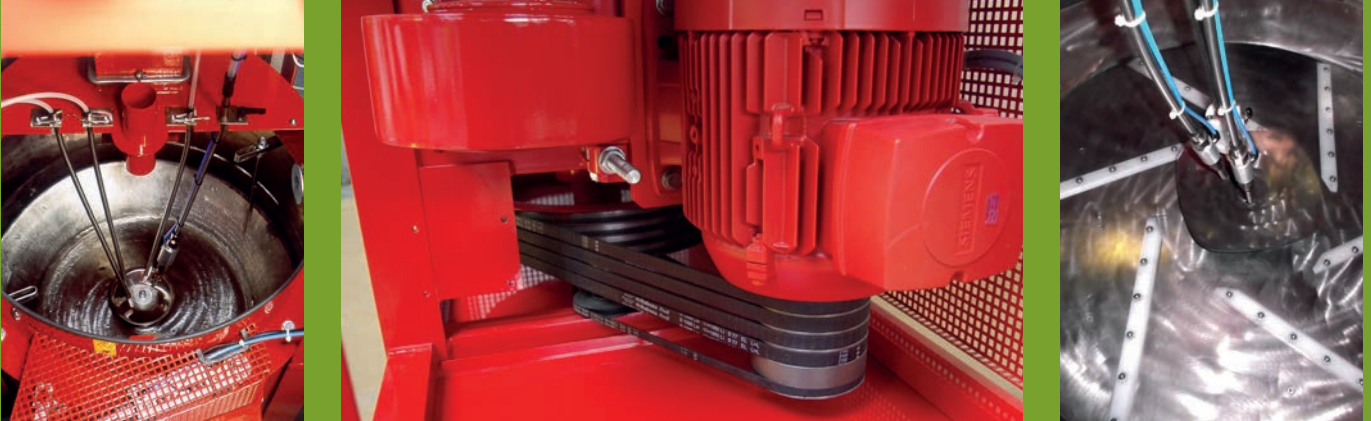


SOYA BEANS



GRASS SEED

COATING TECHNOLOGY



FILM COATING

Seed is covered with a thin slurry film layer. Shape and general size of the raw seed are not influenced or changed. The used chemical ingredients normally contain pesticides (fungicides, insecticides protecting the seed during storage and further in the first weeks growing on the field), micronutrients and bacteria (supporting seed health and growth in the field), polymers (for keeping the ingredients safely on the seed surface as long as planted), further identifying colorants and dyes. Powder can be added, mostly for supporting the drying of the liquid ingredients on the seed surface.

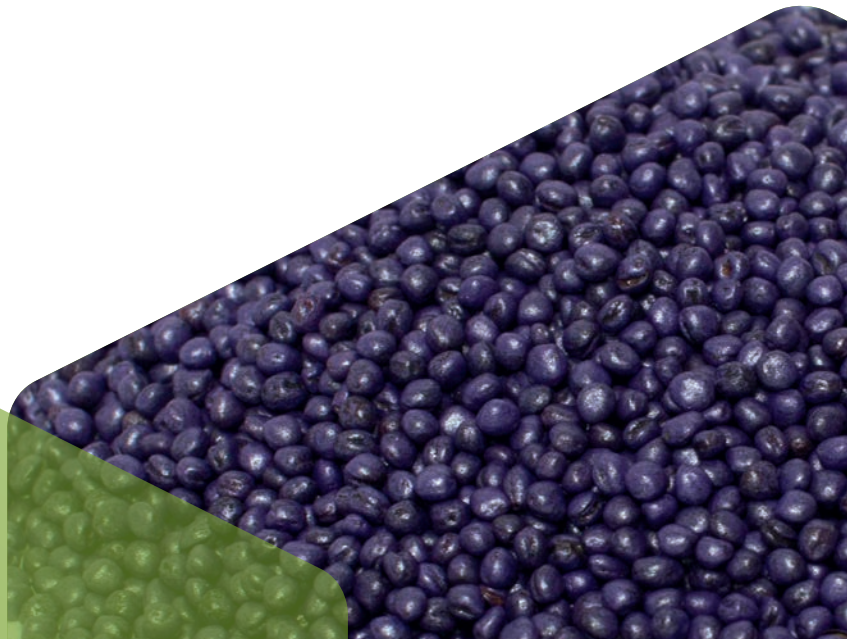
INCRUSTATION

In addition to the above described film coating, a significant amount of powder will be added during film coating to seal and close the whole seed surface. Shape and general size of the raw seed are slightly influenced and changed.

PELLETING/WEIGHT GAINING

In addition to the above described film coating, a significant amount of powder is added during coating, now changing the shape and general size of the raw seed into a round pill or pellet. As a huge amount of powder is needed, adding weight to the seed kernel, this process is also called weight gaining. The cycle time is increased up to 5-10 minutes and more, depending on the binder and powder used. Pelleting prepares especially small kernels to be used in an automated sowing machine on the field. Due to the high amount of needed liquid binder (for adding the powder onto the seed surface), a subsequent drying process is necessary, e.g. using Cimbria's jog conveyor dryer.

Especially pelleting requires modifications on the Centricoaters hardware and software, compared to a standard film coating operation. Furthermore, the included training mode enables the operators to develop and optimise their own recipes.



CENTRICOATER CONSTRUCTION

The Cimbría Heid Centricoater is designed for the application of coating value added seeds with costly seed treating materials. The system is a continuous batch operation utilising a highly accurate inlet scale together with a highly accurate chemical

dosing system controlled by a PLC. The system provides improved seed coverage and a more uniform distribution of treatment materials on the seed as compared to traditional continuous operating drum type treaters.

ELECTRONIC SCALE

From the pre-bin or pre-store silo before the Centricoater, the seed is fed into the electronic scale by means of a big and fine flow flap, thus allowing exact dosing of seed with an accuracy of $\pm 0.25\%$. As soon as the electronic load cells of the scale indicate sufficient filling, the bottom flap opens to gently drop the seed batch into the mixing chamber. Residual batch mode starts automatically when the pre-bin is getting empty.



SLIDEABLE SCALE

To grant a generous access to the mixing chamber from the top, a slideable scale (for CC 10, CC 20 and CC 50) or respectively a slideable middle section (for CC 150 and CC 250) is available as an option. This feature significantly eases cleaning and maintenance work inside the mixing chamber. An integrated safety switch prevents any unwanted start of the machine during cleaning and maintenance.



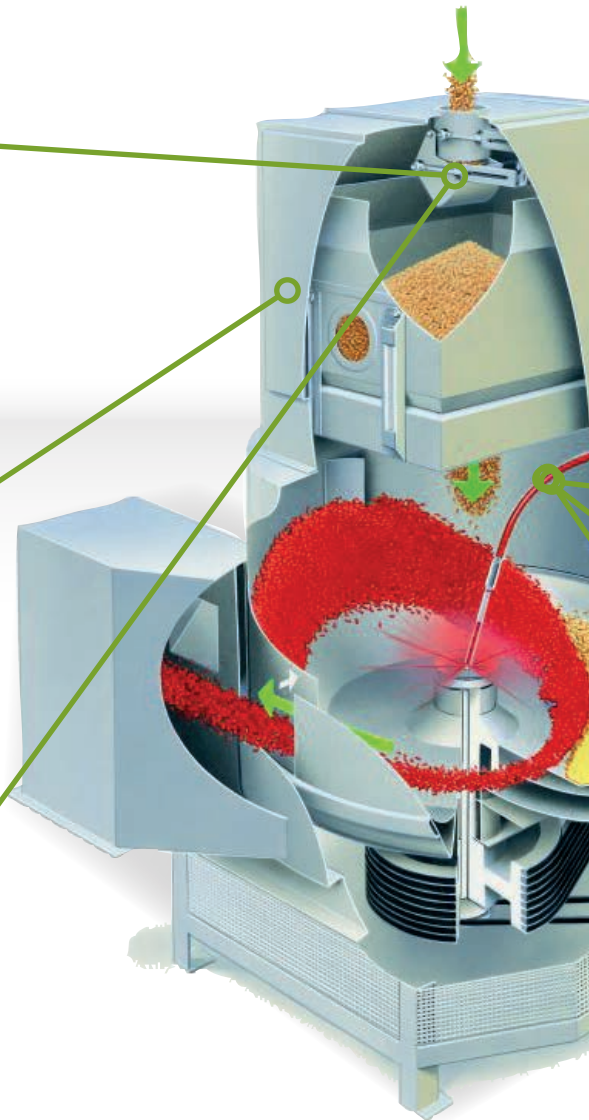
BELT FEEDER

For heavily flowing or bridging products like grass seeds, the big and fine flow flap in the inlet can be replaced by a belt feeder with variable speed. Due to the large open area in the belt feeder's inlet, the danger of bridging is eliminated.

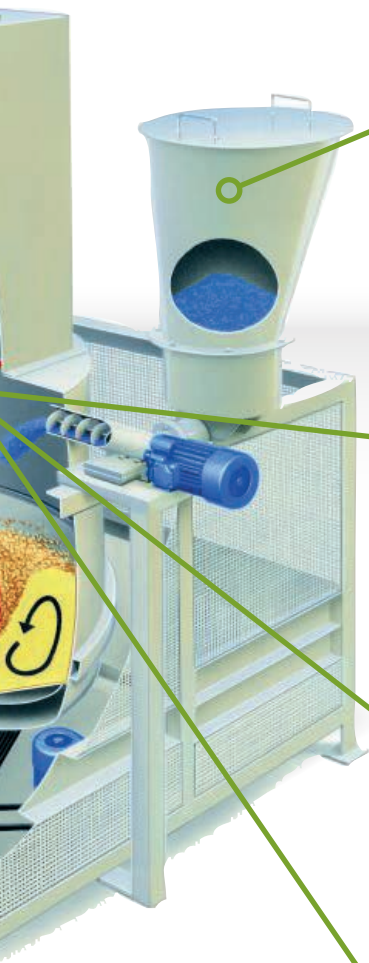


LAN MODEM

Remote maintenance as well as data exchange to the customer's network are enabled by this system, allowing data transfer to databases, connected mixing systems as well as the plant's master PLC. The customer can monitor the coating process from each PC in his network, naturally requiring passwords for entry and permission to disable any unwanted access or interference.



IMPROVED UNIFORM COVERAGE AND APPEARANCE FROM KERNEL TO KERNEL



POWDER FEEDER DOSING SYSTEM

The powder feeder consist of a conical hopper with generous free cross-section and steep walls, as well as an internal stirrer and an eccentrically mounted discharge- screw to handle all kinds of powders available on the market, without any risk of bridging or clumping. Dosing of powder can either operate volumetrically or gravimetrically by means of optional electronic loadcells.



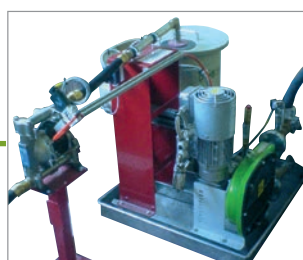
GLASS CYLINDER DOSING SYSTEM

The glass cylinder grants optical control of the liquid dosing process to the operator, using minimum, maximum and safety level electrodes to regulate the filling and discharging of the liquid. Changing of liquid amounts is done by simply shifting the electrodes manually. The filling of the glass cylinder can either be operated by vacuum, or by a pump.



FLOW METER AND MASS FLOW METER DOSING SYSTEM

Further to direct dosing lines, flow meters can be used as a high end dosing solution. Depending on the liquids in use, the amount of liquid will either be measured volumetrically or gravimetrically, the latter even permanently controlling the density of liquid to prevent risks of sedimentation or decomposition of the liquids. Process recording of the Centricoater for constant reporting and quality control (ISO 9002) is supported by the flow meters, giving optimum reproducibility and traceability for each and every batch being treated.



LOSS IN WEIGHT DOSING SYSTEM

Alternatively to mass flow meter systems, Cimbria also offers loss in weight dosing lines. A tank mounted on load cells is connected to the dosing pump, which extracts the necessary amount of liquid for each batch automatically.

ADDITIONAL:

Features for dosing lines:

- Over- and under-pressure sensors
- Broken hose sensors
- Squeeze valves

MACHINE RANGE

The Centricoaters are available in several different sizes and configurations. The mixing drum sizes range from 2 kg up to 250 kg (based on wheat).

STANDARD - AUTOMATIC SERIES

The “compact” Centricoater series, starting with CC10 up to CC250DUO, is designed for an easy installation on the customer’s site. Each Centricoater is pre-wired in the factory, and delivered pre-tested. After connecting the grain pipes (for filling and discharging), the main electric power supply, compressed air, the dosing line piping and the prepared cables for each item (plug and play), the coater is ready for operation.



SEMI-AUTOMATIC - SERIES

The “semiautomatic” series of Centricoaters allow an easy entrance to the batch coating technology. Available with two drum sizes (10 kg and 25 kg, wheat based) this type is equipped with a PLC operated electric panel with touch display. As no automated scale is part of the hardware, the investment costs can be reduced. All other hardware (mixing drum, dosing lines) are fully automated, enabling the automated coating of single batches.



LAB - SERIES

The standard lab-coaters CC-Lab and CC10-Lab are designed for the manual coating of small quantities of seeds in laboratories or breeding stations. All products and their quantities are prepared manually by the operator before filling into the lab-coater. The operator’s timing, filling and discharging the mixing drum is all done manually.



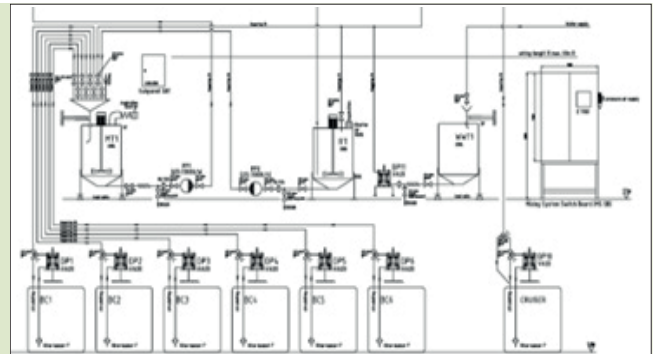
TYPE	BATCH SIZE [KG]			CYCLES [MAX.] / H	CAPACITY [T/H]			OPERATION
	WHEAT	MAIZE	PADDY RICE		WHEAT	MAIZE	PADDY RICE	
CC Lab	2	1.8		Manual	---	---	---	Manual
CC 10 Lab	10	9	5	Manual	---	---	---	Manual
CC 10 semi	10	9	5	Manual	---	---	---	PLC
CC 20 semi	25	22.5	13	Manual	---	---	---	PLC
CC 10	10	9	5	120 – 180	1.2 – 1.8	0.9 – 1.3	0.5 – 0.7	PLC
CC 20	25	22.5	13	120 – 180	3.0 – 4.5	2.3 – 3.2	1.3 – 1.9	PLC
CC 50	50	45	30	120 – 180	6.0 – 9.0	4.5 – 6.5	3.0 – 4.3	PLC
CC 150	150	135	80	90 – 120	13.5 – 18.0	10.8 – 18.0	6.4 – 9.6	PLC
CC 250	250	225	130	80 – 100	20.0 – 25.0	16.2 – 22.5	9.4 – 13.0	PLC
CC 250 Duo	2x 250	2x 225	2x 130	80 – 100	40.0 – 50.0	32.4 – 50.0	18.8 – 26.0	PLC

All above mentioned values are guiding values and can vary depending on product (sort, bulk density, etc.) and the amount and characteristics of the used liquid agents and powders.

AUTOMATIC MIXING AND PUMPING SYSTEM

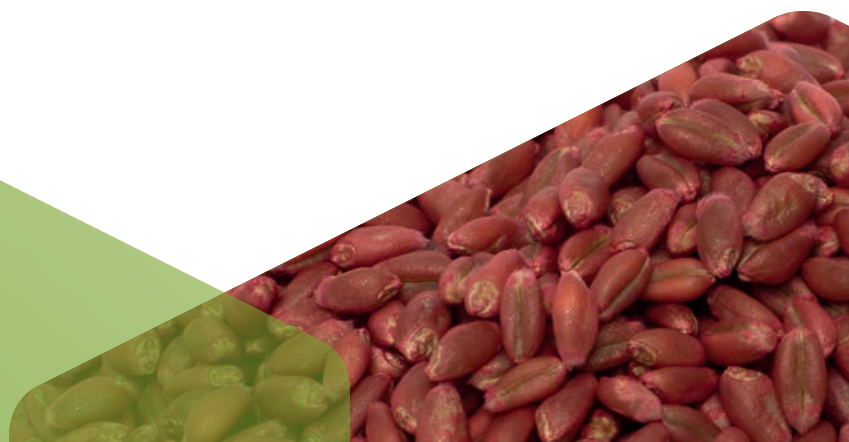
PRINCIPLES AND COMPONENTS

Large hourly capacities and the use of wide varieties of different chemicals require the need for reliable and accurate disposal of required liquids just in time. Cimbria's automatised mixing and pumping systems enable customers to buy and store their chemicals separately and independently from one another, mixing them in the right ratio just before their final use. Therefore, the single ingredients are usually stored in IBC tanks supplied by the chemical companies, adding a mobile stirrer to prevent sedimentation or demixing inside the tanks. Those IBC tanks are stored on electronic load cells, allowing an accurate extraction of the necessary amount by the following pumps by loss in weight technology. Ingredients coming out of the various IBC tanks are pumped to the subsequent mixing tanks in the correct ratio, thus automatically finalising the mixtures necessary for the coating process. Those final mixtures are then pumped to work tanks, where they are made available to the Centricoater's dosing systems. The work tanks are also equipped with sophisticated stirring mechanisms to prevent any sedimentation or demixing prior to use. Wash water systems and all necessary safety devices such as level sensors and safety pans are included in the systems.



AUTOMATIC SWITCHBOARD

The complete mixing and pumping system and related processes are controlled and monitored by a PLC control unit with a generously sized touchscreen. Recipes are entered and stored via the touchscreen, of course also enabling upload and download as well as logging of recipes via LAN or USB. Remote maintenance and full communication with the Centricoater's control unit are logical and vital features



RELATED EQUIPMENT

CONTINUOUS TREATERS KB

Continuous treaters are built for continuous treating of seeds. The product is fed into the hopper. A rotary feeder ensures a continuous feeding into the spraying chamber where the seed is distributed by a dispersal cone. The treating liquid is simultaneously sprayed via a spinning disc onto the product. Afterwards a paddle screw ensures a continued mixing and moves the product to the outlet.



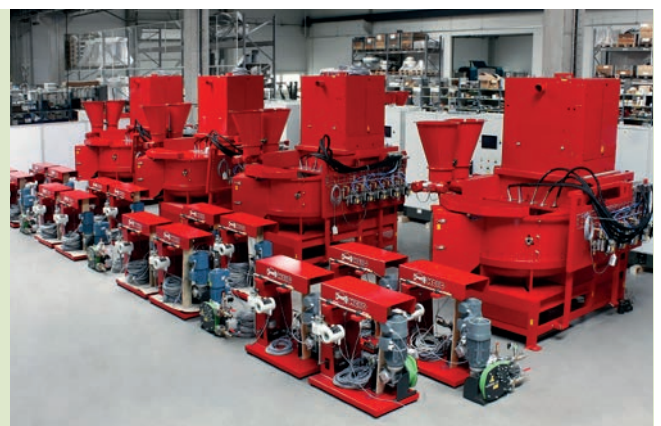
JOG CONVEYOR DRYER JCD

Jog Conveyor Dryers are mainly used after the coating process to prevent wet kernels from clumping together during bagging off. 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. The moist air is aspirated from the top and led to a de-dusting plant. There is a possibility to install a screening section at the end of the machine to screen out under- and oversized material. The JCD is available in two different widths (625 mm and 1,250 mm). The number of drying and screening sections is flexible and depends on the requirements (modular system).

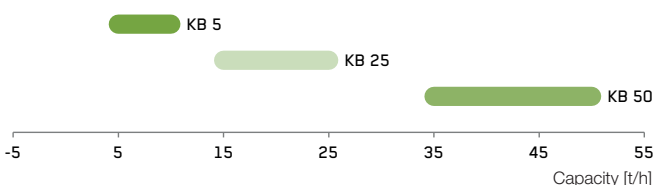


SERIES PRODUCTION

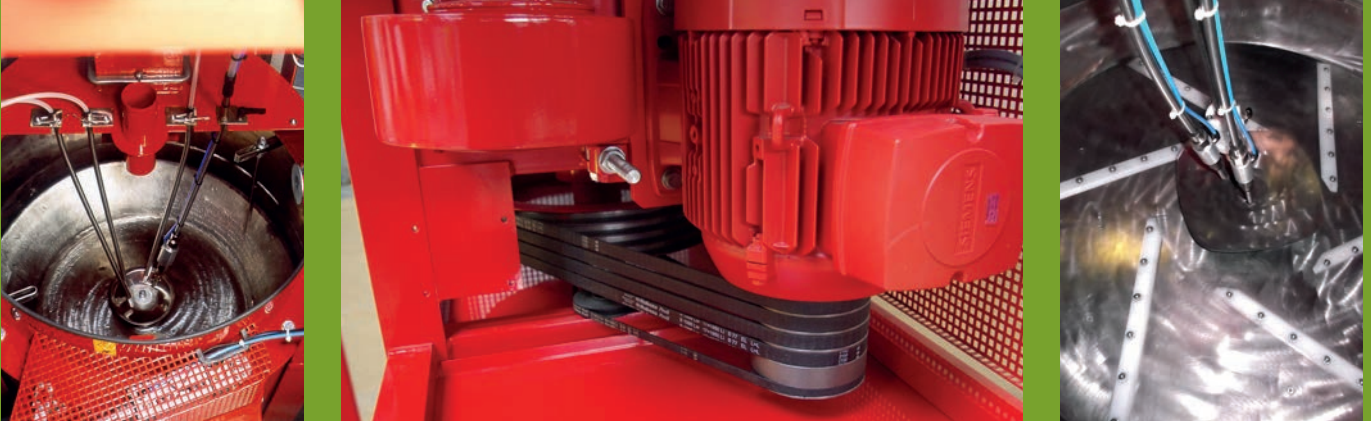
Cimbria builds machines in series production. During the manufacturing process, each machine as well as its components must pass several strict quality controls to meet our customers' requirements at the highest level. Before dispatch, a final quality control process following a sophisticated checklist is carried out, rounded off by a 24-hour test run. We can thus guarantee that each machine is ready to operate at the customer's site very quickly and without any surprises. And should there be any surprises, it will only be the outstanding performance of the Cimbria Centricoater.



CONTINUOUS TREATERS KB



WHY BUY A CENTRICOATER



ADVANTAGES OF A BATCH TYPE COATER COMPARED TO A CONTINUOUS FLOW TREATER:

The batch operation is the base for the most precise coating technology, as coating is done in a closed drum in a reproducible way, adding for each batch always the same amount of seed with related amounts of slurries and powders, keeping the same timing for adding the ingredients and afterwards mixing. Therefore each batch gets the correct amount of chemicals resulting in the most accurate and even distribution on each seed kernel.

The batch operation also allows the flexibility for adding each slurry or powder separately, allowing parallel dosing of ingredients as well as time shifted dosing (resulting in building up different layers on the seed kernel).

As it is a batch operation, there are no losses as a result of starting up or shutting down the Centricoater. Once the recipe is approved and tested, all batches are coated in the same way with the same quality, from the first to the last batch.

The key for accuracy of application and quality of the coated seed is based on using advanced technology, e.g. PLC, HMI touchscreen, electronic scale, VFD drives, flow meter systems.

The Centricoater is fully automatised by means of its PLC control unit. The latter controls and monitors the entire coating process from seed filling to application of all necessary chemicals, at the same time preventing malfunctions and serving reports to comply with quality standards following ISO 9002.

The centrifugal force and also the intensive mixing in the drum allows the application of the coating ingredients onto the seed kernels in the most effective and efficient way, resulting in a homogeneous coverage of the seed.

BENEFITS

- **BEST COATING TECHNOLOGY AVAILABLE ON THE MARKET** > applicable for all types of seeds and slurries
- **BEST HOMOGENEITY** > most efficient application of expensive chemicals
- **UNIFORM DISTRIBUTION** > most uniform and long lasting protection of the seeds on the field after planting
- **MOST UNIFORM FIELD PERFORMANCE** > reduction of costs for further fertilising of the field
- **BEST REPRODUCIBILITY FROM BATCH TO BATCH** > continuing equal quality
- **SAVINGS IN SEED TREATMENT MATERIALS** > reduction of operating costs
- **BETTER VISUAL SEED APPEARANCE** > warranty for excellent seed quality
- **EASY MAINTENANCE AND OPERATION** > reduced labour costs



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