storage
drying
cleaning
handling
monitoring

GGS
GLOBAL GRAIN SOLUTION

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CONTENTS

Our concept

Since any project of such a magnitude requires personalised follow-up, GGS proposes an offer that is unique on the French market, with support from the inception of your project to its turnkey delivery. We guarantee seamless project flow with the best products, chosen to meet your needs.

PROJECT DEFINITION

The large investment required for a storage, drying or handling installation implies a long "pre-project" reflection phase. This phase may last several months, or even years.

GGS supports you through these planning stages, to evaluate all the parameters to be taken into account: analysis of the land to be built on, research into local building standards, works planning, cost estimation, and so on.

Our goal is to ensure that you have a clear vision of the costs and procedures involved, so that you can make the best decision.

PROJECT DESIGN

GGS knows from experience that many technical innovations begin with a rough sketch.
From the moment we meet, our technical sales staff will lend an attentive ear to help you determine what you need. Our technicians will come up with drafts and costings based on your ideas and aspirations. One or more cost estimates will be required before deciding on your made-to-measure installation.
The accent is always on performance, best value for money, and safety. Over the course of subsequent meetings, and once revisions have been made, your project should perfectly match your expectations.

ENGINEERING

An installation's competitiveness depends to a large degree on the know-how and experience of the engineering department.
All those involved at GGS and, consequently, in your future installation are specialists in their fields.

We offer the guarantee of an optimum investment cost per stored tonne thanks to Premium products, and innovative above-ground solutions that are easy to assemble.

OUR WARRANTY

GGS offers ten-year insurance for your peace of mind, since we guarantee the assembly of your installation for 10 years.

PROJECT EXECUTION

Once your order is confirmed, all our teams are mobilised to guarantee that we meet our commitments to you, in terms of delivery deadlines and assembly.
To ensure that operations run smoothly, our support can extend to handling, on request, all necessary authorisations, building permits, etc.

TURNKEY ASSEMBLY

As soon as the approvals have been granted, the delivery of your installation will begin.
The installation will then be assembled by our GGS teams, in partnership with your teams, or independently.
Once acceptance-testing of the project is complete, our technicians will get your installation up and running.

AFTER-SALES SERVICE

Need maintenance on your installation? Rest assured that our hotline is available and responsive.
By drawing on local technical teams, equipped with workshop trucks carrying spare parts, we can guarantee rapid maintenance.

Our commitments

Customer satisfaction is our priority and this is why GGS, over time, has acquired the necessary market knowledge to be able to offer the best products and services.

Today, our company offers a unique CONCEPT that is ours and ours alone: unbeatable value for money and turnkey installations.

With this in mind, we commit to several precise points:

- Being your sole point of contact
- Providing quality advice
- Presenting a precise technical and economic study
- Offering a technical choice by way of a wide range of Premium products
- Limiting the civil engineering requirements through our above-ground installations concept
- Maintaining the healthy condition of your grain
- Wiring and automating your installation
- Guaranteeing quality assembly by our teams with project acceptance-testing following a checklist
- Installation commissioning by our trained technicians
- Local after-sales and a 7-day-a-week hotline during the harvest
- Spare parts delivered within 24h
- 10-year guarantee for your installations
- Maintaining a high level of training for our personnel

The technical expertise of our engineering department combined with our sales teams' analysis skills guarantee that the projects we propose are highly relevant.

GGS, far more than just selling grain silos, we offer you support from end to end for your complete project. Our sales staff offer you guidance in choosing your loading, unloading, aeration, and installation systems, and with regard to your environment and its constraints.

From the simplest storage installation to more complex projects, our wide range of premium products offers you the best technical solution, while guaranteeing you get the best cost per stored or dried tonne, according to your constraints.

GGS is far more than just a supplier: we are your partner!

Our history

GGS was founded in France in 1997, introducing in Western Europe innovative state-of-the-art grain storage solutions for farmers.

A strong expertise has therefore been acquired in agricultural sector with post-harvest storage, providing farmers with comprehensive tailor-made solutions from grain reception to cleaning, drying, cooling, storing, including complete handling system.

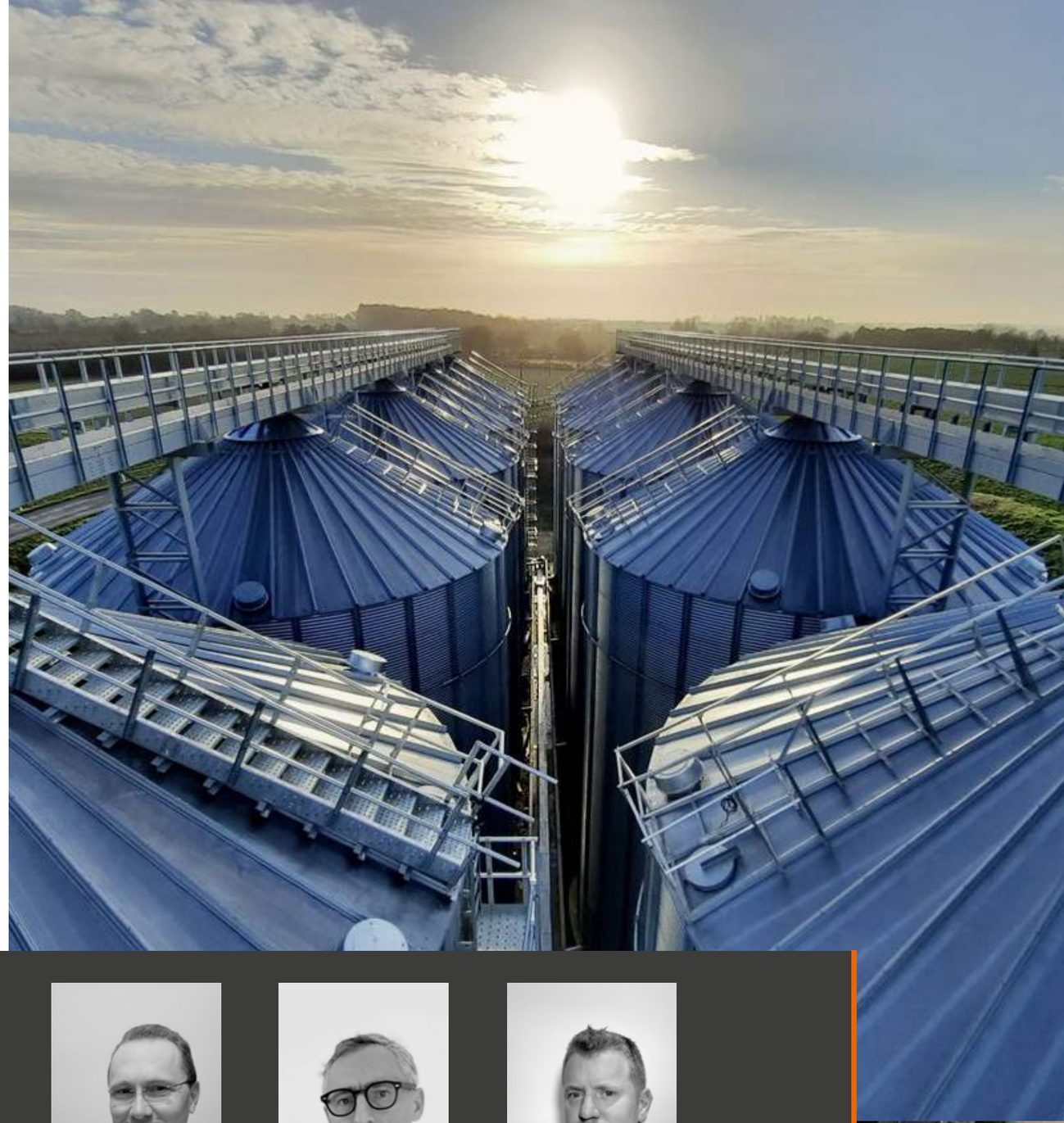
GGS has also developed solutions for industrial storage, from barges or trucks deliveries to mills.

More recently, GGS has successfully diversified into renewable energy sector (biomass) designing and delivering wood pellet storage facilities.

GGS is a French group present in Africa, Eastern Europe and Asia-Pacific.

KEY DATES

- 1997 : company founded in France
- 2015 : company takeover by Jeremie CHOISEAU
- 2019 : opening of Eastern Europe office with GGS in Slovakia
- 2022 : opening of APAC office with GGS Asia Pacific in Malaysia



“For me, investing in GGS made absolute sense, and doing so in cooperation with the management committee that had been in place for practically 10 years only strengthened my drive to develop this fine company. Together with all the staff, we form a team that is passionate about this sector that promises such a bright future.”

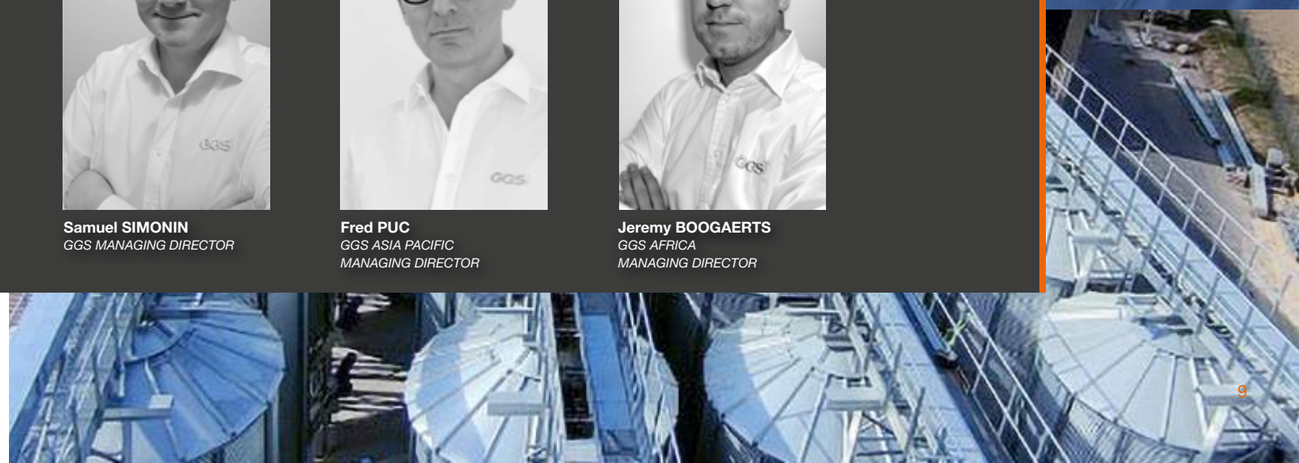
Jeremie CHOISEAU, CEO

Jeremie CHOISEAU
CEO

Samuel SIMONIN
GGS MANAGING DIRECTOR

Fred PUC
GGS ASIA PACIFIC MANAGING DIRECTOR

Jeremy BOOGAERTS
GGS AFRICA MANAGING DIRECTOR



Our locations

GROUP AFFILIATES

GGS GLOBAL GRAIN SOLUTION FRANCE

GGS GLOBAL GRAIN SOLUTION ASIA-PACIFIC

GGS GLOBAL GRAIN SOLUTION SLOVAKIA

GGS GLOBAL GRAIN SOLUTION MIDDLE EAST

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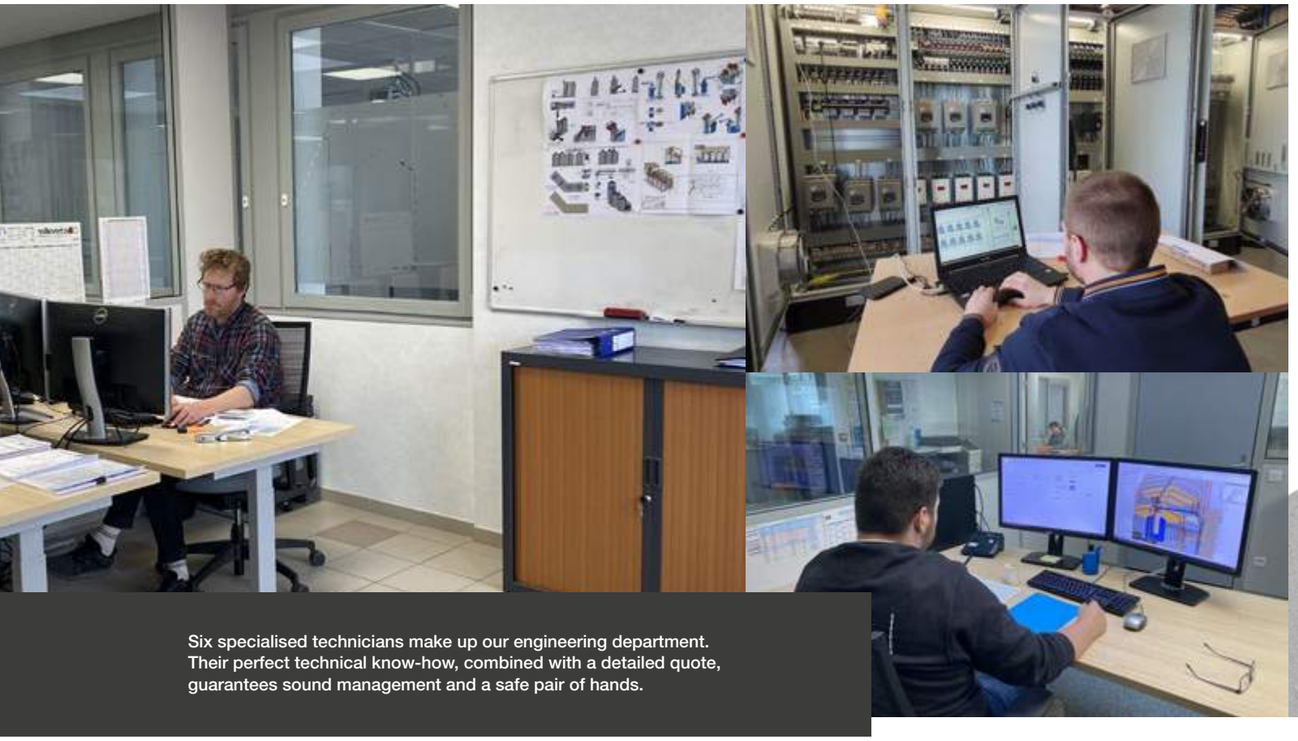
GGS GLOBAL GRAIN SOLUTION

In addition to its 1,600 storage bins and some 600 drying sites (dryers and drying bins) in France, GGS boasts an international dimension that is continually growing.


CAT

Services

Engineering department



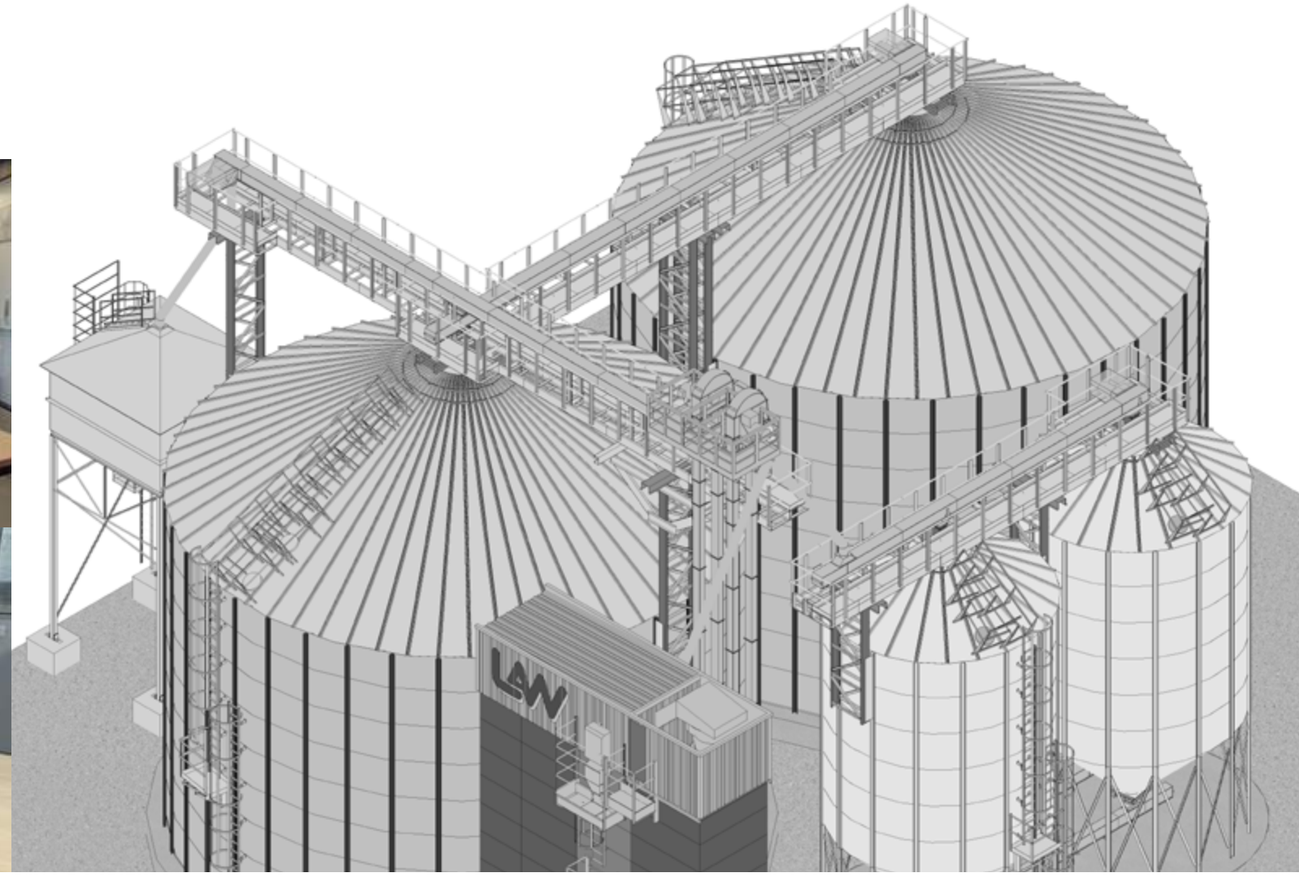
Six specialised technicians make up our engineering department. Their perfect technical know-how, combined with a detailed quote, guarantees sound management and a safe pair of hands.

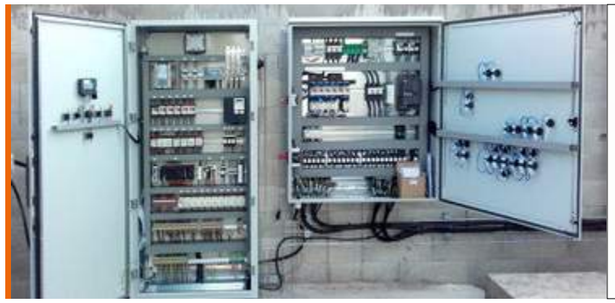
In close collaboration with their technical sales colleague, the technician responsible for your project guarantees continuity through these steps:

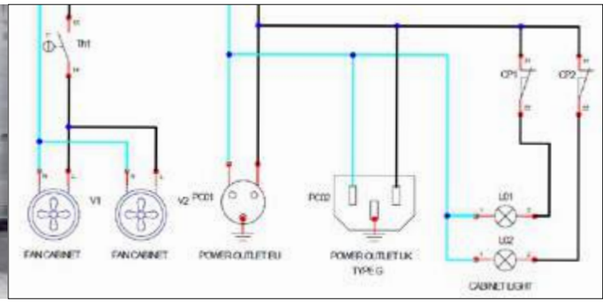
- Pre-project plan
- Costing with detailed quote
- Project plan
- Civil engineering guide plan
- Assembly plan
- Plan for manufacturing made-to-measure parts

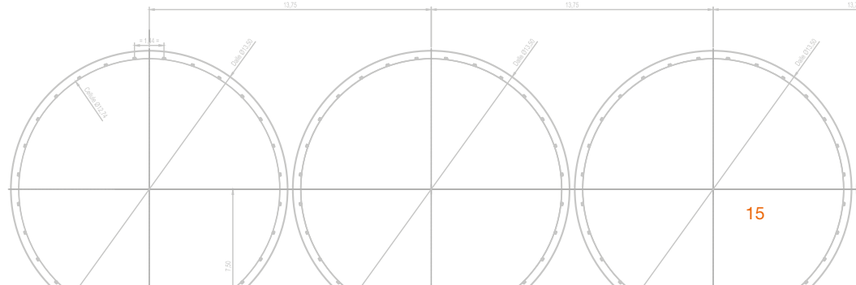
To this end, the GGS engineering department is equipped with high-performance software:

- Solidworks 3D
- Drying simulation software (dryer and drying cell)
- Aeration simulation software
- ERP PACKPMI – CEGID
- Plotters









Electricity by GGS

Keen to provide turnkey services from A to Z, GGS has developed its electricity offering so that you can have a single contact for your project from start to finish.

Our electricity service involves a personalised study conducted by our own engineering department, specialised in electrical engineering and automation, with a detailed quote and an electrics file comprising :

- Cabinet wiring plan
- Terminals plan
- Electricity balance

To facilitate installation, we have standardised the equipment we use, all supplied by a market leader, Schneider Electric.

In terms of electricity services, our after-sales technicians are deployed to wire your installation and for its on-site commissioning.

We can provide solutions for both new installations and existing ones.

CABINETS

Depending on the project and the customer's technical brief, GGS is able to propose three different cabinet models.
All are developed with the same factors in mind, i.e.:

- Study dedicated to each project.
- IP66 for outdoor installation.
- Use of components with spring-loaded terminals in order to avoid re-tightening campaigns.
- Use of speed variator to facilitate throughput adjustment.
- Star/triangle starter systems for all motors above 9.2kW.
- Wiring of cabinets with identification of components and cables.
- Standardisation with the use of Schneider Electric products.

Basic cabinet:

Designed for the simplest installations, this model has been developed with pushbutton controls and relays.
For ease of use, the control elements (buttons, lights, switches, ammeters, etc.) are situated on the front of the cabinet, on a synoptic panel representing the site. This means that users can visualise at a glance the operating status of their installation.

Cabinet with PLC and touchscreen:

As GGS's goal is always to simplify and optimise operations, it proposes cabinets managed via PLC.
This technology replaces the servo-controls otherwise effected by wiring multiple relays which, as well as making the cabinet more complex (large number of components), significantly limits the upgrade capacities over time, since it is far easier to modify a program than to rewire an entire cabinet, particularly when a program enhancement can be made by remote maintenance, or by the integration of an SD card.
Furthermore, the PLC is combined with a touchscreen where the operator can enter commands on a dynamic synoptic diagram.
Thanks to this technology you can preprogram operating cycles, obtain information on use (number of hours, number of start-ups, etc.), and also conduct troubleshooting self-diagnostics.

PLC cabinet with supervision:

As well as the many other advantages of a PLC cabinet with touchscreen, supervision makes it easier to manage the installation, while making for a less stressful work environment.
This remotely-controlled system offers a number of possibilities:

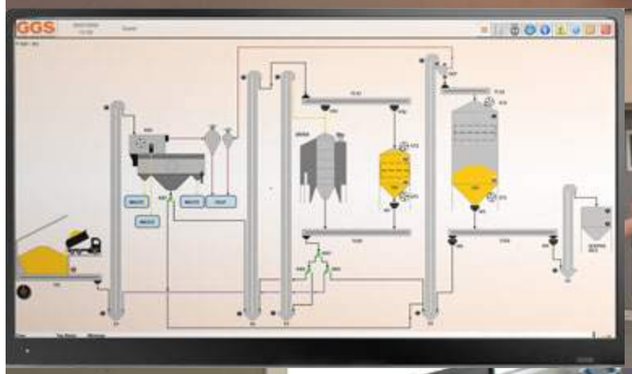
- Multiple control consoles.
- Multiple screens.
- Remote display.
- Remote maintenance.
- Etc.

CABLE KIT

GGS does the calculations to ensure that you get the necessary cables and accessories (cable trays, consoles, etc.) for the proper wiring of your installation.

Benefits

- A single contact from A to Z.
- Quality materials (SCHNEIDER).
- With or without supervision.
- An offering suited to both new and existing installations.
- Different types of cabinet (pushbuttons, touchscreen PLC, supervision PLC).



Assembly

Since we value the quality of assembly as highly as the quality of the equipment, we place particular importance on the continuous training of our assemblers and lead assemblers.

Each pair of GGS employees has a fully-equipped workshop vehicle, and takes care to abide by all requirements.

Our desire is to be a real partner for you, so we provide support up to and through the commissioning of your installation.

Our well-informed personnel works in complete safety, wearing personal protection and harnesses, and using appropriate lifting tools. Our goal is to keep risk to a minimum.

For assembly where the client provides the labour, the lead assembler delegates each individual's tasks. Furthermore, GGS makes available the tools required by the entire team to ensure the project runs smoothly.

The hoisting frames and hoisting gear can be lent out in the case of client assembly, to help you put in place your silo.

Our hoisting gear is certified and inspected.

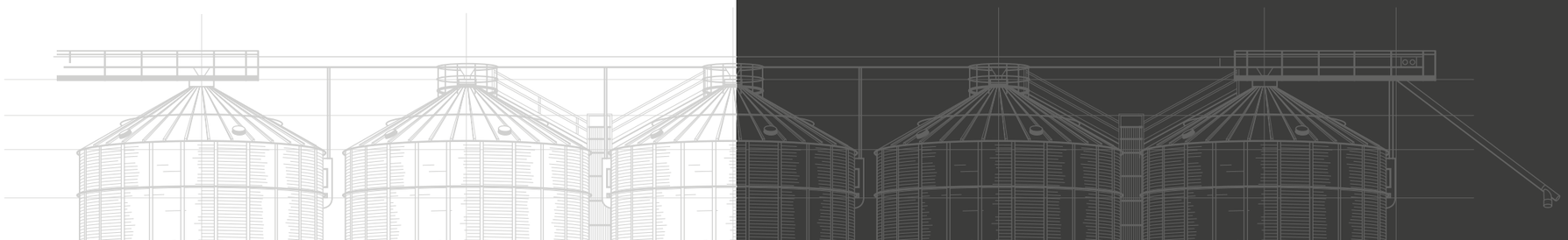
At each stage of your installation, we are at your service: rental of equipment such as cranes, nacelles, etc.
Our lead assemblers provide the follow-up.

STANDARD ORGANISATION OF A WORKSITE PROJECT:

- Before arriving on site, the lead assembler studies the assembly installation plans with the engineering department.
- On the site, the lead assembler, guided by the "project launch" file, will present how the operations are to proceed (timetables, safety instructions, definition of needs, etc.).
- Every week, a project progress report indicating the hours worked is signed with the client.
- During the project, the lead assembler validates the work carried out using a checklist.
- Once assembly is complete, project acceptance testing is organised with the assembly manager, who also conducts an inspection using a checklist.
- Close relations are established with the prime contractor for optimum works coordination (crane operation, nacelle, concurrent work, etc.).

Additional information

- GGS salaried staff.
- On-the-job training (CACES Nacelle, CACES telehandlers, first aid, etc.).
- Regional teams near you.



After-sales

GGS after-sales is a team of men and women dedicated to customer service.

Strategically positioned throughout France, their job is to wire installations, conduct commissioning, provide services relating to preventive maintenance contracts and, of course, carry out troubleshooting for all types of fault.

Yet, in the first instance, the initial customer contact takes place via the GGS hotline.
A specific phone number allows customers to get directly in touch with an experienced technician.
And all this 7 days a week !

The proximity of our technicians in charge of a truck full of spare parts rapid response possible.

Computer archiving of all problems provides a unique database and, using this information, maintenance plans can be formulated, along with technical improvements and team training.

To further ensure rapid troubleshooting, GGS has a large stock of original spare parts. This, combined with efficient logistics, ensures that dispatches are guaranteed on-site in under 24 hours.

Our technicians are at your service and remain at your side for the time it takes to detect and repair the defective part.

As part of our industrial approach, GGS proposes maintenance contracts for carrying out preventive work in the quiet season.

Our contract includes intervention of a technician in charge of the process who will inspect the key points of your installation against a checklist. Based on our experience, we also propose systematic parts replacements.

Signing a maintenance contract gives you rights to benefits (e.g., reduced prices for parts), but above all priority should curative maintenance be necessary.

This preventive work is often a valuable opportunity for discussion between the user and the technician, since the advice provided helps boost performance and by the same token save money on operating overheads.

Storage

Flat-bottom bins

Placing your crop in a high-quality storage facility after harvesting has a positive effect on its added value.

Whether on account of the distance to the collection point, the desire to allot the harvest, or the wish to maintain marketing freedom over your grain, there are a variety of reasons that lead our customers (storage agencies, cooperatives looking for extra storage capacity, farmers seeking greater autonomy) to consider the possibilities of a storage solution.
For these reasons, and on the strength of our experience working alongside our storage customers, at GGS we have defined particular specifications to meet the demands and needs of the French market.

To ensure strict compliance with these data and while taking into account all applicable standards, GGS has developed a range of bins perfectly suited for use on farms as well as in cooperatives or storage agencies.
Our silos are manufactured in a CE-certified plant with ISO 9001 certification that complies with the EN1090 standards.

GGS guarantees long life for your installation through robust design and innovative materials.

By controlling your storage you will be able to control the resale of your harvest, in a context where market rates are increasingly volatile, so that you can benefit from peaking prices to get the best value from your production.

With diameters ranging from 3 m to 32 m, we can supply "made-to-measure" solutions according to your needs, and make adaptations for add-ons to your installation.

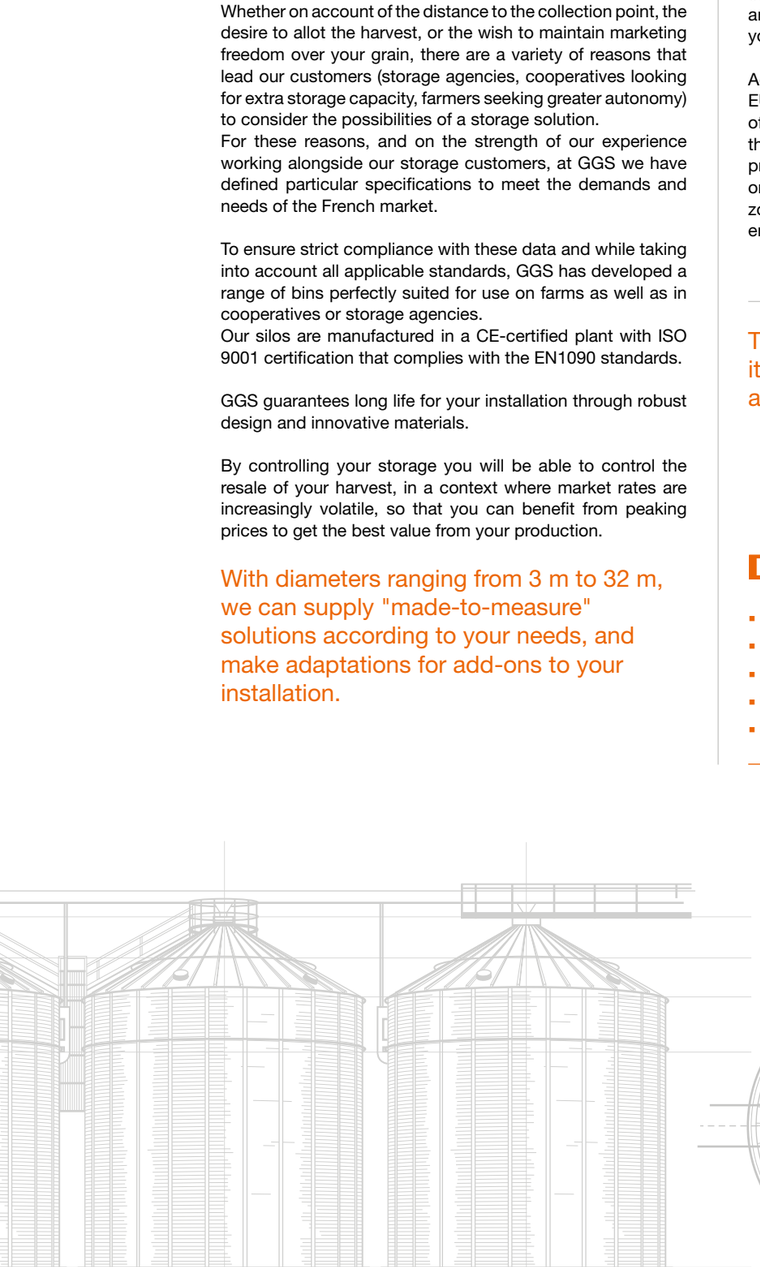
Thanks to our wide range of accessories (roof ladder, wall ladder, small or large door, aeration controller, temperature sensor, humidity gauge, unloading via scraper auger or conveyor) you maintain control over your project. We can offer you a comprehensive range of off-the-shelf solutions, and help you define the installation that is perfectly suited to your needs.

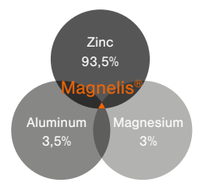
According to the market, we can adapt to ANSI-ASAE, DIN, EUROCODE or other standards. Depending on the location of the installation, new basic data can be incorporated in the structural calculations: internal factors such as stored product loads (angle of repose, density, internal friction) or specific weight, and external factors such as seismic zone, wind, snow, or if the silo is to be situated in a harsh environment (by the sea, for example).

The grain bins are extremely robust, making it possible to install fixed handling systems and catwalks on their roof caps.

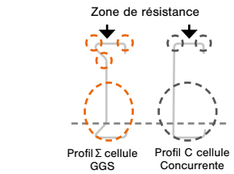
Benefits

- Capacity from 34 to 34,000 m³.
- Galvanisation: 600g/m².
- Fast assembly
- Diameters from 3 to 32 m
- High-quality aeration
- Cylinder height up to 34.25 m
- Fast unloading
- Standard foundation bracket
- Magnelis roof
- Simplified civil engineering





With a 30° sloping Magnelis roof that has a retractable roof cap and pre-drilled panels for the fans, the quality requirements are fulfilled. The Magnelis roof is exceptionally corrosion resistant, has self-repairing cut-edge protection and boasts a more ecological finishing.



The roof corrugation has a structural profile with a specific shape that increases resistance.
The roof as a whole guarantees a perfectly watertight seal and the foam corrugation plugs prevent snow or birds from getting in. In silos with a timber roof (silos larger than 12.23 m), the beam profiles are in Σ (2.5 to 3 mm thick): more robust than C.

Diameter (m)	3	3.5	4.6	3.55	6.1	6.87	7.64	8.4	9.2	9.93
Rings	4-15	4-17	4-23	4-26	4-30	4-30	4-30	4-30	4-30	4-30
Capacity (m3)	34-122	47-190	81-442	110-674	146-1,013	187-1,284	233-1,594	288-1,931	349-2,339	414-2,792
Total height (m)	5.3-17.84	5.4-20.22	5.87-27.53	6.90-31.17	6.3-35.94	6.53-36.17	6.74-36.39	6.97-36.61	7.2-36.84	7.41-37.06

Diameter (m)	10.7	11.45	12.23	12.98	13.75	14.51	15.28	16.8	17.57	18.34
Rings	4-30	4-30	4-30	4-30	4-30	4-30	4-30	4-30	4-30	4-29
Capacity (m3)	486-3,145	562-3,623	651-4,134	755-4,678	843-5,239	951-5,842	1,065-6,499	1,315-7,891	1,457-8,652	1,605-9,130
Total height (m)	7.64-37.28	7.86-37.5	8.08-37.72	8.31-37.95	8.51-38.15	8.59-38.38	8.96-38.6	9.4-39.04	9.71-39.35	9.91-38.41

Diameter (m)	19.86	21.39	22.15	22.92	23.68	24.44	25.98	27.5	32.08
Rings	4-29	4-28	4-28	4-28	4-28	4-27	4-27	4-27	4-25
Capacity (m3)	1,926-10,752	2,280-12,117	2,174-13,012	2,670-13,961	2,887-14,935	3,110-15,397	3,585-17,488	4,097-19,669	6,027-25,380
Total height (m)	10.38-38.88	10.82-38.18	11.04-38.40	11.26-38.62	11.48-38.84	11.7-37.92	12.14-38.36	12.26-38.48	13.57-37.51

Silo aeration

Aeration is a must to ensure storage quality. The three concepts, perforated floor, channel and perforated cone, guarantee optimum aeration for different constraints.

PERFORATED FLOORS

A perforated floor is the most efficient way to aerate and preserve your grain. With aeration across 100% of the lower surface, aeration times are optimised, which reduces energy costs. Furthermore, as there is no contact with the ground, the health and safety of your grain are guaranteed.

Other benefits include easy cleaning of your silo, and fast and easy unloading, thanks to the installation's easy dismantling. The installation of the floors on a flat slab makes for simplified engineering.

With their unique design, our perforated floors are specially engineered to resist heavy loads. The galvanised steel slats guarantee long product life and, because they're pre-cut to the diameter of the silo, assembly is quick and easy.

Depending on the type of grain stored, two perforation models are available: Ø 1.27 mm or Ø 2.38 mm.

For easier installation of the transfer system between floor and concrete slab, two support heights
are available: 310 and 430 mm.

Benefits

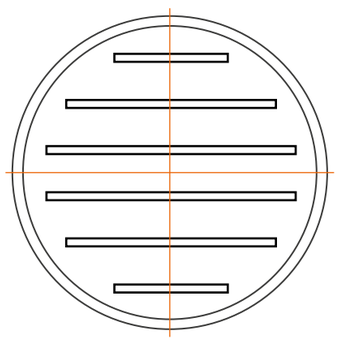
- Simplified civil engineering.
- Optimised aeration.
- Healthy grain conditions guaranteed (no contact between grain and floor).
- Different-sized perforations.
- Reduced aeration energy costs.
- Adaptable to all types of silo (regardless of diameter or height)

CHANNELS

Aeration using channels, a concept generally used in large-diameter silos, simplifies engineering with delivery of non-reusable formworks. Around 12% of the silo area will be equipped with channels.

The dimensions of the channels are defined by our engineering department, depending on the type of bin, the product stored, the renewal rate and the permissible air speeds.

Their design offers high load resistance. Designed to be able to be used for on-floor storage, they can support the weight of industrial vehicles.
The aeration grilles are extremely easy to dismantle, which facilitates cleaning.



AERATION CONE

With the only aeration cone on the market suited to the tallest grain bins, for diameters from 4.6 m to 12.23 m and up to 14 rings, GGS has the product best suited to the widest range of silos.

Available with two slope angles (30° or 45°) and adaptable under-cone heights, the aeration cone is designed to perfectly meet your needs depending on the type of grain stored.

Integration of the unloading system is facilitated by easy access under the bin, and mechanisation is kept to a minimum as there is no scraper auger.

FANS

With mobile fans ranging from 1.5 to 18.5 kW or fixed fans of all power ranges, all specifically developed for grain aeration, we can guarantee high-performance aeration.

Furthermore, depending on the needs calculated by our engineering department, you can rest assured of high electrical performance for kW/m3/h.

Hopper bins

This innovative and versatile concept can have various applications. It can be used for storage, as a bulk loading bin, as a transit unit or as a green silo for products awaiting drying.

The hopper bins can be equipped with aeration, temperature control, a vibrator, etc.

With total gravity unloading, the main advantage of the hopper bin is to reduce considerably the mechanics of low- or high-rate grain transfer.

Any fluid material can be stored in this type of bin: grains, pellets, woodchips, plastic balls, etc. GGS has experience in every industrial domain.

With its 100%-hot-dip galvanised structure, this standing frame design prevents any risk of water infiltrating between the compression ring and the support frame.

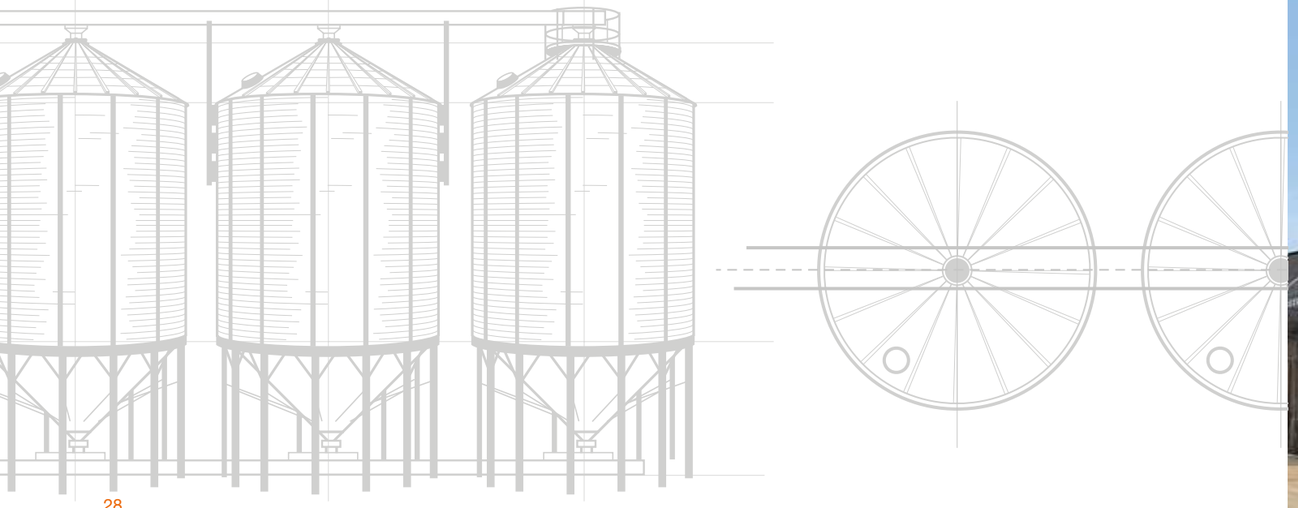
The hoppers, according to their height and volume, are fitted with a continuous welded compression ring, inside and out, giving them superior structural quality and simplifying assembly.

Depending on the seismic zone of the installation, specific calculations are made to determine the correct dimensions of the support frame and bracings.

The suspended cone is made of structural steel (S350 GD – Z600). It is joined to the silo body by means of mushroom-head bolts.

Benefits

- Capacity from 14 to 3,449 m³
- Galvanisation: 600g/m²
- 45°, 60° and 66° cone.
- Diameters from 3 to 12.23 m
- Gravity unloading
- Easily accessible under-cone system
- Above-ground system
- Adjustable under-cone height (raising possible)



	45°	60°	66°
Diameter (m)	3.00 - 12.23	4.60 - 6.10	3.00 - 3.50
Capacity (m3)	14 - 3,449	65 - 266	18 - 99
Total height (m)	4.24 - 29.88	8 - 14.34	5.66 - 14.19

Storage in indoor silos

GGS remains your partner for indoor storage, whether in hopper bins or flat-bottom bins.

If you have an existing building that you wish to use for its storage capacity, our sales team will come out to you to analyse the constraints and offer you the solution best suited to your needs.

Our wide range of handling machines (augers, sweep conveyors, elevators, etc.) allows us to propose a global project.

This silo can be used inside a photovoltaic building to optimise investment thanks to the lowest-possible price per stored tonne.

Indoor flat-bottom bin specifications

- Z600 galvanisation (600g/m²)
- Fast assembly
- High-quality aeration
- Standard foundation bracket
- Magnelis roof
- Many options
- Simplified civil engineering

On-floor storage

Do you have a building that you would like to refurbish or make more multi-purpose?

GGS will advise you as to the best possible layout with column, half-moon or channel aeration, and a wide choice of handling possibilities for loading operations (mobile auger, chain conveyor, belt conveyor, etc.).

Temporary storage

Constant changes in storage constraints and fluctuations in the volumes to be managed force professionals to demonstrate increasing flexibility in terms of storage capacity, while optimising the cost of the stored tonne.

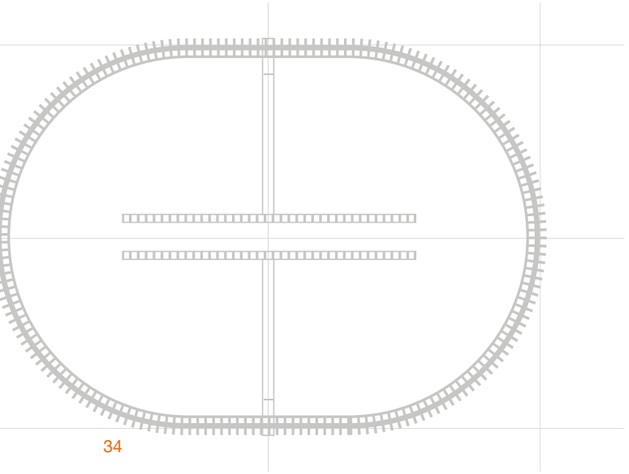
This temporary storage system is a supply chain tool that will increase storage capacities at little cost, while preserving the quality of the grain.

Simple and quick to install, and easily transportable as needed, it can be used as a storage unit in its own right or as an extra storage option.

It is also used extensively in North America for buffer storage. With tarp protection and grain aeration by means of a polypropylene tubing system, this process can preserve the grain's quality for storage periods of over one year (humidity <15%).
Thanks to the multiple configurations possible (round or oval) and its 3.05 m long modular panel sections, with heights varying from 1.2 to 2.7 m, this storage adapts perfectly to the outdoor space you have available to optimise storage.

Benefits

- 5,000 to 100,000 tonnes
- Only requires concrete/compacted flooring
- Simple to assemble/disassemble
- Variable wall height: 1.2-1.8 and 2.7 m
- Galvanised steel panels
- Reinforced polyethylene tarp
- Ø6mm polypropylene aeration network



CHOICE OF FOUNDATION:

The ground on which the system rests can be simply compacted sand/gravel or a concrete slab.
Compacted ground is an economic alternative, but it involves a loss of grain for a height of several centimetres from the ground across the entire surface (so as to keep foreign bodies out of the grain).

The foundation that GGS advises in Europe is a concrete surface that enables transfer of practically all the grain and extends the system's service life.

Loading is done by a mobile auger, belt conveyor or high-throughput fixed handling (270 to 320 T/H). Unloading transfer is done by a front loader or fixed handling.

AERATION, STANDARD:

The dimensions of the fans that we supply for temporary storage are designed for an average air passage of 5m3/h per m3 of grain (or 6.25m3/h per tonne – wheat SW 0.75).

Should your needs differ, we can calculate the power required for your project.

Air intake is through perforated central ducts, and the wall panels, which are also perforated, allow air to pass through the walls, and then through the grain and the central ducts, to be expelled by the fan.
Only the ducts in the centre of the pile are perforated, so that the air taken in through the panel perforations penetrates right to the heart of the pile, and aeration is optimal.
This aeration is one of the system's keys, ensuring storage conditions equivalent to bin storage and far superior to on-floor storage.

To avoid any possible hotspots, it is possible to insert temperature control cables to verify the pile.

Bulk loading bins

Adding a bulk loading bin to your storage installation makes your supply chain all the more efficient.
A bulk loading bin allows you to optimise the rapid loading of trucks to less than five minutes. This way, as well as optimising your worktime, you can claim a "fast loading" bonus, depending on your buyer.

The square-round option lets you use your bulk loading bin for green buffer storage, with no grain retention.

Two ranges of bulk loading bin are available:
- galvanised as standard
- painted "to measure", according to the customer's specific request

As standard, the bulk loading bins have a hopper with four 45°-slope panels in galvanised steel plate. Unloading is done by means of a 300 x 300 mm penstock with manual control on the ground via nut wheel and chain.

The framework is galvanised, and has anchoring crosses and a belt in the top section of the posts.

Benefits

- From 31 to 137 m3
- Under-cone height: 4.50 m
- 30° roof
- 45° hopper

Options

- Ladder and roof access.
- Galvanised observation platform.
- Circuit disable switch, or with horn.
- Two or four-sensor weighing system.
- Side hatch.
- Square-round hopper.
- Automatic valve.



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Drying

Column dryers

To expand its range and consolidate its leadership position, in 2013 GGS entered into an exclusive partnership with CFCAI, the company that manufactures LAW dryers, and maker of world-renowned products for more than a century.

Thanks to the efficiency of the LAW dryer, GGS is able to guarantee the specifications and energy consumption of your future dryer.

By means of the various ranges of dryers proposed, we aim to reduce farmers' overheads.

By recycling the air in insulated chambers, drying can be done with low energy consumption.

Furthermore, it is possible to use different types of fuel (fuel oil, gas, steam, biomass, etc.), and the power rating as installed is designed to be as low as possible. The drying homogeneity guaranteed by the LAW dryers and the ease of machine maintenance are also factors to be taken into account.

As well as reducing costs, LAW is currently the most reliable and safest dryer on the market.

Thanks to its automatic monitoring equipment, with the air temperatures measured after drying via the dryer's integrated PLC, the dryer can be safely used for all kinds of produce, including difficult produce such as oilseeds and seed for sowing.

The LAW dryer today benefits from patented extraction mechanisms that keep the risks of soiling to a minimum, thanks to its self-cleaning action.

The use of pre-coated, galvanised sheet metal prevents any risk of internal corrosion and provides real protection against inclement weather.

The modularity of the range, through the use of standard components, means you can expand your installation at a later date.

OPERATING PRINCIPLE

In the column, the grain moves vertically.

It fills the chambers as it descends by the force of gravity each time the extractor is opened, allowing a predetermined quantity to pass into the lower collection hopper.

At the base of the column, "multi-purpose" chambers serve either for deferred slow cooling or for cooling before the grain is transferred to storage. The chambers are adapted by opening or closing hatches.

Hot air is produced by hot air generators installed at the base of the hot air chamber. The drying air circuit is horizontal. The hot air used for drying is applied along one entire side of the drying column, with the layout of the ducts allowing the air to exit the other side after it has absorbed humidity.

The air is circulated in the dryer by a fan unit situated in the upper part of the chamber that extracts and contains the saturated humid air.

Benefits

- Reduced running costs.
- Totally safe usage.
- Protecting the environment.
- Control of installations.
- 50 to 1000 T/24h.
- MAGIZINC column.
- GEOMET500 fasteners.
- 45° hopper at all angles.
- Can be cladded.
- System of pulleys/belts on fan.

The advantages of both the continuous flow and batch dryer ranges:

- The twin-cone dihedral column made of MAGIZINC, a material eight times more resistant than Z350 galvanisation.
- Grain chambers insulated on the hot side by 5 cm of rockwool offering 99% energy efficiency.
- Galvanised (Z350) and coated dryer for optimum longevity.
- Pneumatic rotary extractor = fast closing (less than 1 second) (advantageous for high levels of humidity).
- Pulsed air, gas-phase burner.
- Possible integration of precleaner.
- Rotary membrane wet grain detector on dry grain.
- Safety redundancy (all sensors are duplicated).
- Low-power fan motors offering energy savings.
- Control cabinet managed via Schneider touchscreen.
- ABB motor drive.

Column dryers

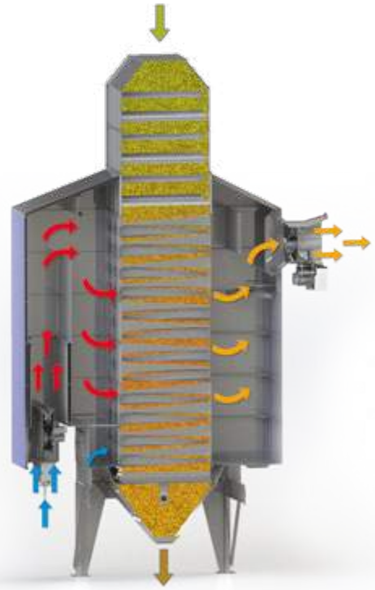
BATCH DRYERS

The batch dryer enables batch-by-batch management.

Each cycle is broken down into filling, drying with recycling, cooling with recycling, and emptying times.
The PLC and its sensors let you either automatically concatenate cycles or run just a single cycle.
This principle keeps handling to a minimum, since a single elevator is all it takes to fill, recirculate or empty the dryer. Conversely, the daily drying capacities are limited on account of the filling and emptying times.

Additionally, batch dryers, unlike continuous dryers, cannot be equipped with energy-saving mechanisms.

In short, this concept is extremely well-suited to phased harvesting, multiple batches or different batches.



CONTINUOUS DRYERS

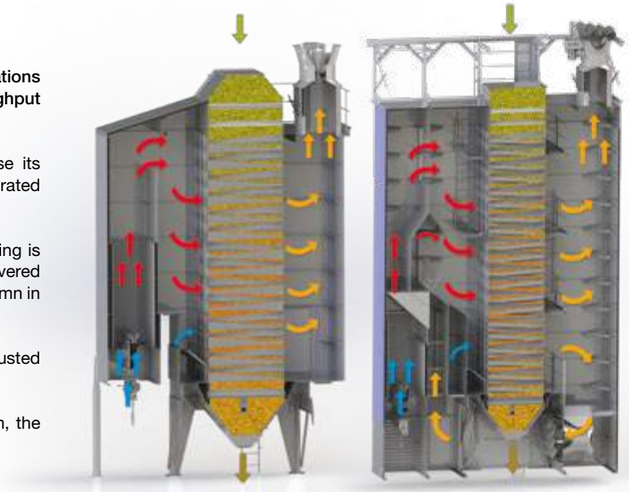
The continuous dryer is designed for installations requiring high performance in daily throughput and energy savings.

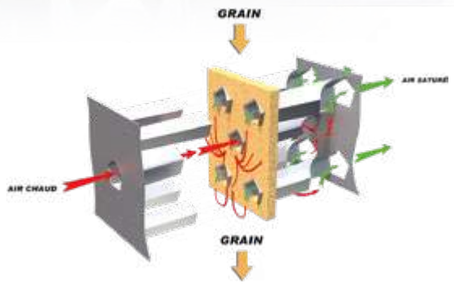
Depending on your needs, GGS can propose its standard, simplified economiser or integrated economiser model.

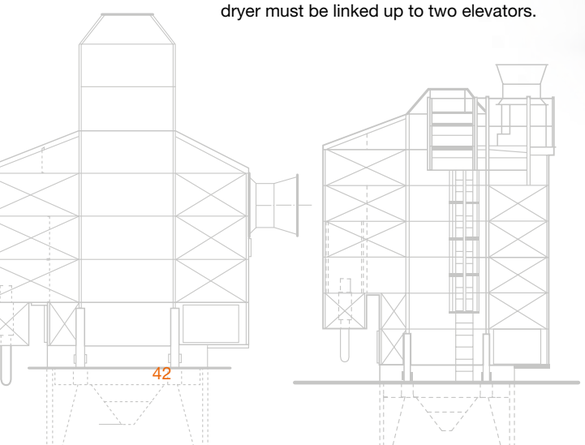
In the latter case, 40% of the air used for drying is re-treated to reintegrate the heat energy recovered from cooling and at the base of the drying column in the production of hot air.

Furthermore, the temperature can be adjusted according to the height of the column.

In order to guarantee its continuous operation, the dryer must be linked up to two elevators.







Drying bin

A fourth-generation American concept, the drying bin combines a system of mechanical stirring and low-temperature hot air (approximately 55°C) circulated beneath the perforated floor. The low temperature preserves the nutritive quality of the grain (PROMATEST).

Easy to use, with the possibility of loading via mobile auger, this system is reliable, autonomous and involves low maintenance costs. It facilitates harvest management, whatever the weather conditions.

The general design of the bin is such that the corrugated metal walls prevent residue build-up upon emptying; they are pre-drilled in the factory to attach to the stirring system and the perforated floor. The vertical stiffening struts, of variable thickness to resist the dropping loads, are placed every 1.4 m (two per wall panel).

GGS know-how has helped improve certain technical points and make the concept that much more reliable. The drying bin that we propose is perfectly suited to CE-certification standards.

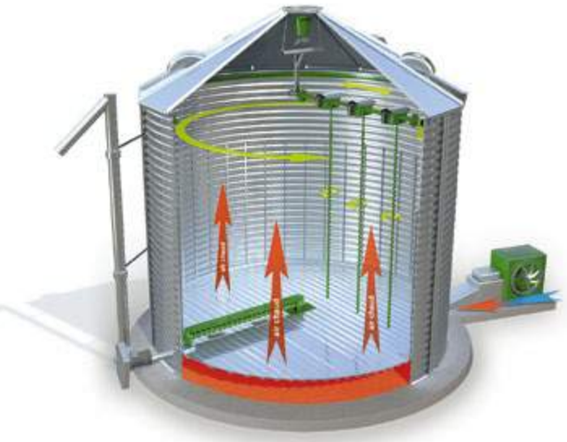
All components come from the same factory and everything is therefore perfectly designed to be assembled together, with the guarantee of the necessary spare parts.

All accessories (vents, inspection hatch) are installed on purpose-designed metal sheeting, with the laser cutting and recessing done in the factory.

Besides its drying function, the bin can also be used as a storage silo in its own right.

With some 400 drying bins (including many benchmark models for high-humidity maize), GGS is the uncontested leader for this concept.

This concept can also be integrated as a complementary supply chain tool, for increasing harvesting capacity in the summer: with a drying bin you can start harvesting earlier in the morning and finish later in the evening.



STIRRING

Its FASTIR+ (patented) mechanical stirring system optimises drying performance while homogenising the stored grain.

SPREADER

The centrifugal disperser with variable speed drive evens out a flat pile, thus favouring air flow from the perforated floor.

HOT AIR GENERATOR

To generate hot air, a high-yield fan combined with a natural gas or liquefied propane burner, or a biomass-fuelled boiler, blows hot air under the floor (at 55° C). CE-certified.

CONTROL CABINET

The temperature is controlled by a PLC. This PLC regulates the gas flow by means of a motorised valve according to the temperature programmed by the user, but also according to the actual underfloor temperature as measured by a sensor.
The user can see the programmed temperature and the actual temperature on a digital display.
The general control panel facilitates the actuation of all of the drying bin's electrical components and offers a synoptic display of their operating status (on, off, faults, safety, etc.).
It is prewired and the safeties are adjusted ex-works. As an option, it can be managed by means of a touchscreen PLC.

Benefits

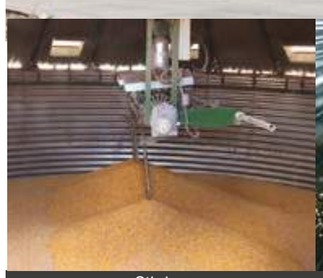
- Low-temperature drying.
- Autonomous system (minimum surveillance).
- Easy-to-use.
- Versatile (all types of cereals).
- Reduced energy consumption.
- Can be used for last-cycle storage.
- Organising harvest operations (large area in one day).

Characteristics

- 84 to 595 tonnes.
- 5.48 to 14.64 m diameter.
- 15 to 2 x 30 hp.
- 7.29 to 10.14 m high.
- Cycle duration: 1.6 to 5.8 days.

Accessories

- Aerated roof cap.
- Vigidry.
- Cleaning hatch.
- Various unloading systems.



- Stirring -

- Spreader -

- Hot air generator -

- Control cabinet -

Biomass heater

Considering the purchase price of different sources of energy, by choosing to invest in a biomass boiler you can save 60% on your fuel purchases, for heat production equivalent to 1 tonne of gas and 4 tonnes of woodchip.

The performance of the hot air generator, with biomass-fuelled air/air exchanger, is the result of extensive engineering experience. Its one-piece design, combined with its versatility, makes it extremely adaptable.

The wide range of hot air generators makes it possible to get the best equipment to fit needs and be as efficient as possible. Depending on the configuration, air recycling may be possible (for livestock, greenhouses) to optimise generator efficiency.

CONTROL CABINET

Each generator is delivered with a control and power cabinet as standard features. The PLC controls and regulates the combustion and all the peripherals by means of a touchscreen. A temperature sensor is installed in the drop box between the combustion feed augers for fire detection. All the motors, except for the agitator, can run at variable speeds, programmable from the touchscreen.

Furthermore, an anti-clogging system is included by automatic reversal of the auger rotation direction.

The hot air flow coming out of the generator can be easily regulated by the variable speed drive of the main fan.

ROTARY EXTRACTOR

Placed in the reserve silo, the 6.5 m extractor is driven by a 1.5 or 2.2 kW geared motor with chain coupling, and equipped with a clogging sensor. It can be tilted up to 30°.

The adjustable length, articulated slats are connected to a semi-open, asymmetric auger duct.

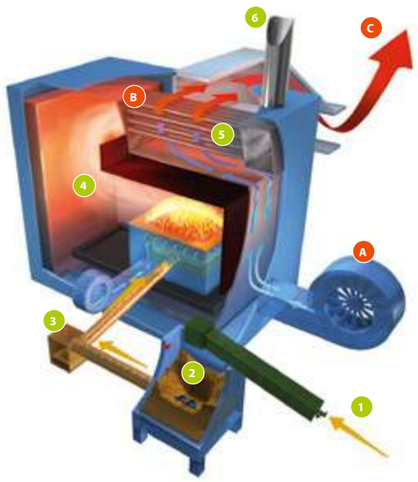
OPERATION

For optimum heat energy production the most commonly-used fuels in this range are G30 forestry woodchip or pellets. This fuel is extracted from the reserve silo to feed the boiler by means of a 5.5 m-diameter silo extractor (1) which fills an approximately 1m3 buffer reservoir, equipped with a bridge-breaker agitator (2).

The combustion chamber is fed by double-auger for flawless safety: the conveyance via two augers rotating at different speeds, combined with an interspersed drop box, prevents any flashback (3).

The combustion chamber (4), designed to accept a maximum temperature delta of 95°C, has a stainless steel top lining. To optimise the boiler yield, the horizontal tubes exchanger process (5) captures the heat energy from the smoke before the cooled smoke is extracted via the stainless steel chimney (6).

Equipped with fan with high-performance for flow rate and pressure (A), the exchanger intakes cold air. This air is then heated in the horizontal tubes exchanger: combining the heat exchanges around the combustion chamber and inside the exchanger guarantee 85% yield (B). The hot air is blown through the exit transit (C).



Characteristics

- 581 to 1,400kW
- Different maximum temperature deltas: 65°C and 95°C
- Various applications: drying bin, continuous dryer, greenhouses, livestock, etc.
- 1.5 or 2.2kW extractor
- Control cabinet ships as standard with PLC and touchscreen
- 85% yield
- Air/air exchanger

Handling

Fixed handling

In partnering with the European leader in fixed handling systems, SKANDIA ELEVATOR, GGS can provide a wide range of products entirely in line with its ideal of limiting infrastructure requirements, in particular the engineering work required, while maintaining throughputs and functionalities.

The quality, performance and ease of assembly are the result of entirely automated and robotised, ISO 9001-certified, high-precision manufacturing facilities. The quality requirements at all stages (from production to shipping) guarantee total reliability.

Each range represents a complete system of top conveyors, elevators and bottom conveyors.

All machines comply with the European ATEX 94/9EC directive. They are all designed to occupy a specific place in the installation for obtaining maximum throughput. Furthermore, innovative self-regulation solutions guarantee clogging-free operation.

To ensure the long service life of these assemblies, the machines are entirely made through the bending, pressing and bolting of galvanised sheet metal.

For decades, the machines have been developed and refined to attain perfection.

This means that users can concentrate on the harvest period without worrying about the technology.

The engineers of our leading supplier's engineering department focus their innovative research on throughputs, energy optimisation through friction limitation (eliminating movement of the metallic chain on the galvanised steel base), self-regulation, safety, limited maintenance requirements and ease of assembly.

Whatever the type of machine, specific inlets are used to define automatically the correct throughput.

No further manual regulation is required, and you are guaranteed to achieve the throughput you require with no risk of clogging, whatever the density and type of product.

Our objective is always to consider things from the viewpoint of the customer. This is why we not only concentrate on the products but prefer to favour global solutions, developed on the basis of our customers' specific needs. So that you have no difficulties making a choice, we have decided to develop only three product ranges, to satisfy different requirements in terms of capacity, ergonomics and quality.

Whatever the size of your installation, we have a solution for you.

The various products in a product line together constitute a complete system, with each playing its part in producing an ideal workflow. Thanks to this global outlook, we avoid any operational problems. The ranges in their entirety, designed for outdoor use, are made of galvanised steel.

The various product ranges are illustrated opposite.

Benefits :

- 20 to 600 T/H
- Concept limiting residue - easy maintenance
- 100% above-ground concept - simplified civil engineering
- Rotation controller
- 3 ranges to suit your needs
- Anti-clogging switch
- Self-regulated handling
- Restart under load
- Galvanised and bolt-fastened (non-welded)
- NORD geared motor

THE AGRI RANGE

is specially adapted for medium-size farms that need to concentrate their operations over the harvest period.

THE INDUS RANGE

is designed for facilities with intensive activities year-round. This range is suited to medium or large-scale agriculture, up to and including storage agencies.

THE REINFORCED RANGE

is developed for installations with continuous, daily operations. It has been designed to meet the strict requirements of the grain industry. All parts subject to premature wear and tear are protected by a PEHD liner.

	Throughputs										
	30 T/H	40 T/H	60 T/H	80 T/H	100 T/H	120 T/H	150 T/H	200 T/H	250 T/H	300 T/H	400-600 T/H
AGRI RANGE 300H/year	●	●	●	●	●	●	●	●	●	●	●
INDUS RANGE 1000H/year	●	●	●	●	●	●	●	●	●	●	●
REINFORCED RANGE 3000H/year	●	●	●	●	●	●	●	●	●	●	●

Conveyors

To optimise a cost price per stored tonne after civil engineering, GGS undertakes, thanks to its range of conveyors, to find simple, reliable and efficient solutions.

Thanks to its patented elbow-bend conveyor system, our concept keeps the civil engineering to a minimum when creating your future reception pit, since the conveyor can be placed at the same level as the elevator boot.

Our self-regulating machines guarantee you optimum throughput and restarting under load.

The design of our machines ensures preserved grain quality (no breakage and no residue in the machines) as well as easy maintenance, since the assemblies are 100%-bolted with no mechanical welding.

All conveyors are equipped with tracking base plates, limiting the residue in the tensioner tumbler.

With NORD direct-drive geared motors, machine maintenance is simplified and easy.

The system is entirely streamlined and protected.

Specific to our range are the inclined conveyors that we can use to come up with technical solutions involving slopes of up to 45°, while guaranteeing throughput.

We do not adapt a machine to match your installation: we select from our range the machine that is perfect for you.

Benefits

- 100%-bolted.
- 100%-galvanised.
- One machine = one application
- Extensive range of throughput and work intensity
- Easy to assemble
- NORD IE3 geared motor
- SKF bearings

1 conveyor = 1 design for 1 use

- Double-bottom inclined conveyor
- Self-regulated pit conveyor
- Elbow-bend conveyor
- Dual-direction conveyor
- Curved conveyor to avoid roof openings

Many options

- ATEX motor and sensors
- Manual, pneumatic, electric valves
- Brushes
- Recycling buckets
- Rotation control
- 8mm PEHD base liner

Elevators

All elevators are made of galvanised steel and comply with the European machines directive. They are designed for outdoor installation and can be exposed to wind and rain for many years. As well as cereals, they can be used for transporting most dry pellets and powdered materials.

To guarantee reliability and reduce risks, all elevators are equipped as standard with rotation controllers and, optionally, with belt start sensors.

The elevator heads are fitted with wearing plates on the jetty.

Externally-mounted, the NORD direct-drive geared motors are protected from bad weather by casings.

Furthermore, thanks to the male and female leg sections, assembly and levelling are easy, and the watertight seal of your machine is guaranteed.

To facilitate maintenance, elevators are equipped with a safety ladder and maintenance platform so you can work in complete safety.

Created specifically for each elevator, its bolted design avoids any mechanical welding and therefore any risk of corrosion.

The elevators can be equipped with seed boots to make it easy to completely empty and clean the elevator boot, especially in organic farming.

Characteristics

- 100%-bolted
- 100%-galvanised
- Standard-feature rotation sensors
- PEHD on wearing plate
- Oil and temperature-resistant straps

Options

- Seed boot
- ATEX
- Plastic buckets
- Access (ladders, platforms, etc.)
- Various belt models

Belt and shuttle conveyors

BELT CONVEYOR

Suited to the horizontal transport of straw cereals, protein crops, seed products and granules, with a throughput of 10 to 500 T/H.

They can be designed in a variety of shapes and structures depending on the process they are intended for. They are made of E24 sheet metal (stainless steel or hot-dip galvanised).

Their equipment complies with current standards:

- Self-extinguishing, anti-abrasive belts
- Antistatic, PVC
- Rotation controller
- Belt offset controller
- Geared motors to silo standards

Since they are equipped with moving distributors, you can easily fill your grain chambers or bins.

These belt conveyors offer numerous advantages: zero residue, no breakage, reduced electricity consumption, possibility of pouring to right or left and making a continuous pile (thereby guaranteeing greater storage capacity).

SHUTTLE CONVEYOR

Thanks to the shuttle conveyor, you can fill dumper trucks uniformly without moving the truck.

The conveyor belt travelling from front to back above the dumper optimally distributes the grain.

Metalwork

Depending on the installation profile and with a view to serving as your sole point of contact, GGS can propose to produce for you the handling support structures.

Whether for towers, pits, conveyor supports, pipe supports or catwalks, GGS has the references for each type of metalwork you might need.

For each of these concepts, we are able to propose to you grids, pit walls and pit covers.

Characteristics

- Bespoke, depending on your installation
- Developed by our engineering department according to the size of the machinery
- Hot-dip galvanised assemblies
- Bolted for ease of assembly

PITS AND PIT COVERS

GGS's constant goal to optimise its concepts has led it to develop different types of grain pits: drive-through, set-back, modular dimensions, sunken or above ground, with the possibility of adapting pit covers to protect them.

CATWALKS

Secured in place on the tops of the silos by simple or double supports or pylons, catwalks provide access for positioning the top conveyor and facilitate servicing when it is required.

SUPPORTS

We leave nothing to chance and manufacture all the supports to order for the correct installation of your project, with robustness and easy assembly as our watchwords.

Whether for supporting conveyors or any other type of machine, you can be sure that GGS has the technical know-how.

OR ANY OTHER TYPE OF METALWORK

Elevator shaft covers, for example.

Mobile augers

A totally different concept from fixed handling, this versatile system is an excellent logistics tool for an ultra-competitive investment cost.

Filling silos with an auger attaining between 100 and 600 T/H offers considerable time savings in the harvest period, while minimising investment costs in handling tools.

There are two auger ranges: Supercharged augers and Swing Away augers.

The latter have a 180° multi-position arm, to avoid having to manoeuvre the dumper. This also enables the use of the silo unloading auger with sloping head transfer systems.

The extended lengths also make it possible to fill directly high-capacity on-floor storage bins.

Depending on the range of auger used, you will be able to choose between electric drive or PTO.

Since there is no intermediate bearing, the power requirement is therefore reduced and the grain is protected from breakage.

With two cleaning hatches and two maintenance hatches, servicing is facilitated.

SUPERCHARGED RANGE:

- Throughput: 100 T/H at 30°
- Single-feed auger with tight flighting at boot
- Conical tube at boot for optimised filling (85%)
- Mover made of reinforced tube frame
- Manual winch (hydraulic possible)
- PTO or electric drive
- Double sprockets in head, no intermediate bearing
- Oven-cured paint

SWING AWAY RANGE:

- Throughput: 190 to 600 T/H
- Hydraulic scissor-lift undercarriage
- 180° multi-position arm
- Twin-screw hopper with reinforced sides, wheel-mounted (1.8 x 1 m)
- Stainless steel transition screw
- Cleaning hatches in boot
- PTO drive
- No intermediate bearing
- Oven-cured paint
- Hydraulic hopper lifting kit (optional)
- Reversing system (optional)
- Hydraulic hopper displacement motor (optional)

Characteristics

- 100 to 600 T/H
- 18 to 34 m long
- For loading silos from 12 to 23 m total height
- Oven-cured paint
- Many patents
- The most widely-used range in France

	SUPERCHARGED auger	SWING AWAY 10" auger	SWING AWAY 13" auger	SWING AWAY 16" auger
Loading	Auger boot in tray	Multi-position arm	Multi-position arm	Multi-position arm
Lengths	12.80 - 18.89 m	18.28 - 24.38 m	21.33 - 33.52 m	25.9 - 38.10 m
Max. heights	8.5 - 12.57 m	12.8 - 16.07 m	14.8 - 22.25 m	17.25 - 24.68 m
Tube diameter	203 mm	254 mm	330 mm	406 mm
Power requirement	35 to 55 hp	95 to 115 hp	175 to 235 hp	250 to 300 hp
Throughput (T/H)	100 T/H	196 T/H	354 T/H	626 T/H

Mobile belt conveyors

This versatile conveyor, equipped with a rubber belt passing through a tube, can be used for handling grain or other materials over lengths of 4.72 m to 33.52 m.

The machines can be driven by electric motor (including long conveyance lengths), but also by PTO or hydraulics, while maintaining throughputs of 150 to 300 T/H.

This transfer technology offers not only system mobility but also energy consumption efficiency (e.g., only 15 kW for a 25 m conveyor with a throughput of 150 T/H).

Additionally, belt transfer protects the transported products and avoids any residue. The low hoppers facilitate loading from dumper trucks or other source.

Its specific design, with the belt running inside a tube, lets you handle products outdoors without being affected by the environment or bad weather.

Furthermore, this concept keeps maintenance to a minimum, since there are no belt rollers.

Characteristics

- 150 to 300 T/H
- 4 to 34 m long
- Oven-cured paint
- Hydraulic lift

	15' transfer conveyor	15' conveyor	20' transfer conveyor	20' conveyor
Lengths	4.57 m	10.6 - 25.9 m	6.40 m	13.7 - 33.5 m
Max. heights	1.16 m	4.9 - 12.7 m	1.77 m	6.47 - 16.46 m
Tube diameter	381 mm	381 mm	508 mm	508 mm
Throughput (T/H)	163 T/H	163 to 245 T/H	272 to 326 T/H	272 to 326 T/H

Utility - transfer augers

THROUGH-AUGERS

With its wide range of VST through-augers, GGS meets cereal transfer requirements in different applications (elevator, pit, transfer augers, etc.).

Its robust and specific design enables it to work at angles of 0° to 90°.

With throughputs of 21 to 130 T/H, you are sure to find the product suited to your need in this range.

U-TROUGH AUGERS

The different models of VEA U-trough augers are designed for conveying cereals or derivatives.

The modular design allows for easy installation of equipment and accessories, while preserving the quality of the transported materials.

The wide range of models and motors ensures a specific design suited to your needs with throughputs ranging from 9 to 105 T/H.

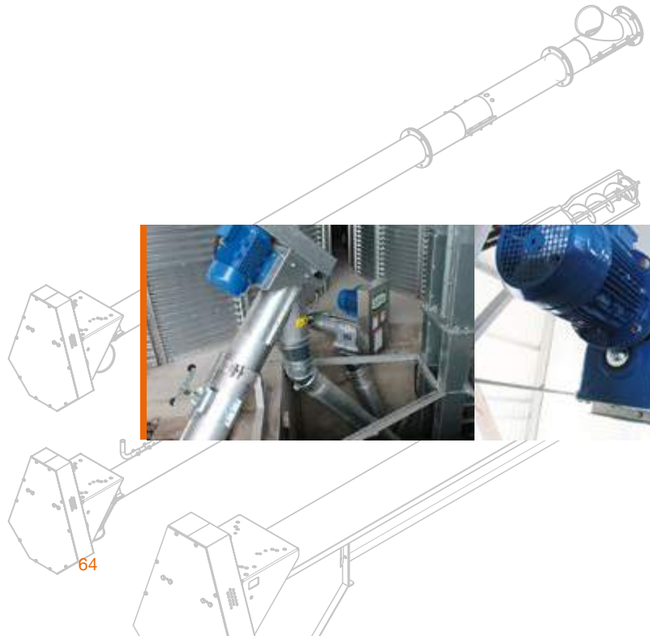
INDUSTRIAL AUGERS

The industrial augers range specifically addresses customer needs.

For each application, the engineering department draws on its experience and renowned expertise to develop the best concept for guaranteeing performance and a long-lasting system. Depending on the environment, ATEX solutions may be proposed. These augers may be used for various applications such as: micro-dispensing of powdered solids, multi-thread transporters, emptying of big bags, etc.

Characteristics

- Hot-dip galvanised
- Bearing at each intermediate section
- Rotation speed = 360 rpm
- Bolted flange joints
- Numerous options (intermediate section, throughput adjustment, 45 or 90° inlet or outlet)



Silo unloading systems

Opting for the GGS outdoor storage concept in flat-bottom bins means that GGS is capable of offering you different unloading systems, always with the objective of keeping civil engineering to a minimum and favouring high throughput.

UNLOADING UNDER PERFORATED FLOOR

This concept can be integrated perfectly in projects where the baseline requirements are simplicity and efficiency. This is because, whether for indoor bins or outdoor bins on a flat slab (simplified civil engineering), GGS can propose different unloading systems (round auger, U-trough auger or chain conveyor) in combination with a perforated floor.

This guarantees optimised assembly, throughput and aeration.

U-trough auger or through auger

This concept offers many advantages, since it includes the transfer auger, the unloading pit and the sweeper auger with its drive system.
These systems are very simple to use: after opening the central shaft, then the intermediate shafts, you simply need to turn on the sweeper auger to finish emptying the residual pile.

Since they are all equipped with a system of scrapers under the auger, hardly any grain remains after unloading.

The sweeper auger is driven by the horizontal auger, avoiding the need to install an independent electric motor, for extra ease-of-use.
Depending on the configurations, three types of outlet are available:

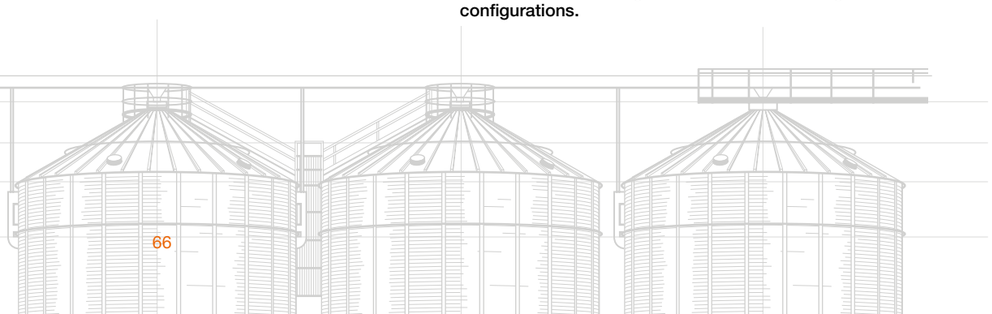
Inclined head
Transfer with mobile auger

Vertical head
Direct loading of dumpers

Horizontal head
Connection to fixed machines

Underfloor conveyors

The fixed underfloor conveyor system is able to traverse one or more silos, and was developed in close collaboration with SKANDIA ELEVATOR.
With this solution we are able to offer a cost-effective system that remains above ground while maintaining different outlet configurations.



Different ranges :

- Emptying under perforated floor
- Silo unloading with conveyor in tunnel
- Silo unloading in channel
- Fixed or mobile sweeper auger
- Sweep conveyor

Silo unloading systems

UNLOADING IN A CHANNEL

In a bin, when aerating via channels, emptying is possible by means of our fixed handling apparatus, installed in one of them.

This solution minimises masonry work and, for large diameter bins, optimises the costs of the aeration system.

To complete the unloading of the residual pile, this needs to be combined with a sweeper auger or conveyor.

UNLOADING IN A TUNNEL

With our systems, you can fashion a tunnel assembly. This offers you unhampered access to all unloading conveyors for maintenance purposes.

This tunnel can also be used as an aeration distribution gallery.

SWEEPER SYSTEMS

Depending on the desired throughputs, the silo diameters and the quality of cleaning at the end of the unloading, different types of systems for scraping the bottom of the silos are available:

MOBILE SWEEPER AUGERS

This modular and mobile system fits in perfectly with economic requirements.

Coupled with an electric motor, which can also be moved around easily, the throughputs can vary from 30 to 65 T/H.

FIXED SWEEPER AUGERS

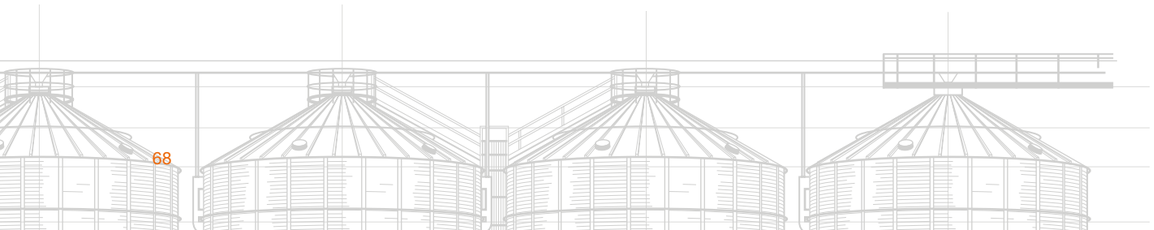
Mainly used for large diameter bins with high throughput, these fixed systems meet intensive usage needs.

SWEEP CONVEYOR

This galvanised sheet metal sweep conveyor has sufficient capacity to unload your silo onto a chain conveyor under the floor, in a channel or in a gallery.

With its different and innovative technology, the sweep conveyor can be adapted to all silo diameters for a throughput of 40 to 70 T/H.

The main advantages of this are practically total sweeping of the residues, low electrical power requirements and an automatically disengaging wheel to limit wear and tear.



Marot cleaners

The experience behind this reliable, efficient technology, combined with our teams' know-how, makes for an impeccable choice of solution.

This system's reputation is mainly due to the originality of its rotary screening system.

With its continuous movement and absence of vibration, each grain or particle passes more easily through the perforations. Thanks to the absence of vibration, there are no dynamic forces and the rotary screening grid can be installed on any existing platform.

For seed sorting and grading, the grid plays a particularly important role, removing small items of waste and broken grains through the small perforations.

The efficiency of the process depends to a large extent on the unclogging efficiency.

On a flat screen, the bottom grid cannot be inspected when running, and the weight of the grain layer on the grid prevents truly efficient unclogging, whether with brushes, balls or other systems.

On a rotary grid, unclogging occurs at the top of the cylinder where no product remains, and the grain falls practically unaided.

Each grid section can be used for removing either large particles or fine particles, according to need.

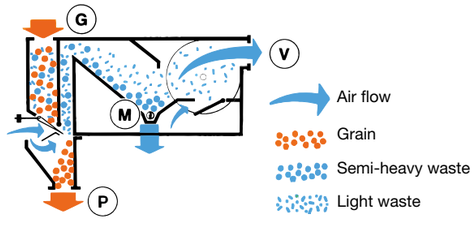
Characteristics

- 60 to 180 T/H for dust removal
- 35 to 150 T/H for precleaning – 1 to 3 grids
- 5 to 110 T/H for cleaning – 3 to 4 grids
- 3 to 20 T/H for grading – 3 to 5 grids

SUCTION PRECLEANERS:

These allow the light waste to be removed from the grain while recovering the heavier waste.

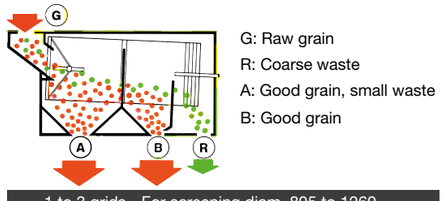
These compact machines can be very easily integrated into the reception circuits without limiting throughput (45 to 200 T/H).



PRECLEANERS WITH SCREENING GRIDS:

These enable the fast and easy elimination of coarse elements contained in the grain. They are vital for the proper operation of dryers, since they prevent clogging and unnecessary energy use.

The large surface of the grids enables throughputs of between 35 and 150 T/H.

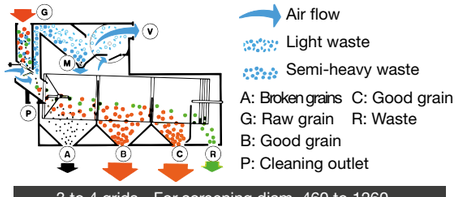


1 to 3 grids - For screening diam. 805 to 1260

CLEANER GRADERS:

These remove the light waste and separate the good grain from the broken grain and coarse waste. These operations are carried out by means of dual-action suction followed by a rotary screening grid.

The successive grids with their different perforations make these devices extremely versatile for use with any type of grain, for throughputs of 5 to 110 T/H.



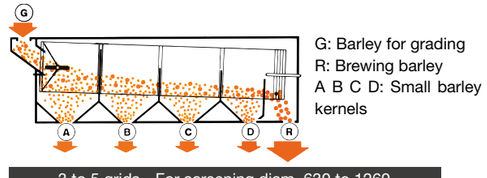
3 to 4 grids - For screening diam. 460 to 1260

GRADERS:

They separate grain according to size.
Precision sorting is possible thanks to a rotary screening drum with adaptable tilt and rotation speed.

The choice of apparatus depends on the number of products and the desired throughput.

The first criterion defines the number of sections (3 to 5), and the second the screening drum diameter (630 to 1260 mm).



3 to 5 grids - For screening diam. 630 to 1260

Precleaner dust management

SKANDIA ELEVATOR PRECLEANING

This system, perfectly adaptable to the elevator heads, is designed to remove dust, husks and the finest grain straw.

The cleaning unit and the suction unit are compact. The grain fed in is spread over a panel with transverse slots (cascade principle), enabling grain cleaning with no risk of loss. Air is sucked in through the panel and across the curtain of grain, drawing with it, in its flow, the light particles.

An airflow regulator in the upper section of the dust removal unit enables it to be used with different types of grain.

The 360°-mobility of the suction unit enables the outlet to be pointed in the desired direction without using elbow sections.

Throughput: 40 to 150 T/H.

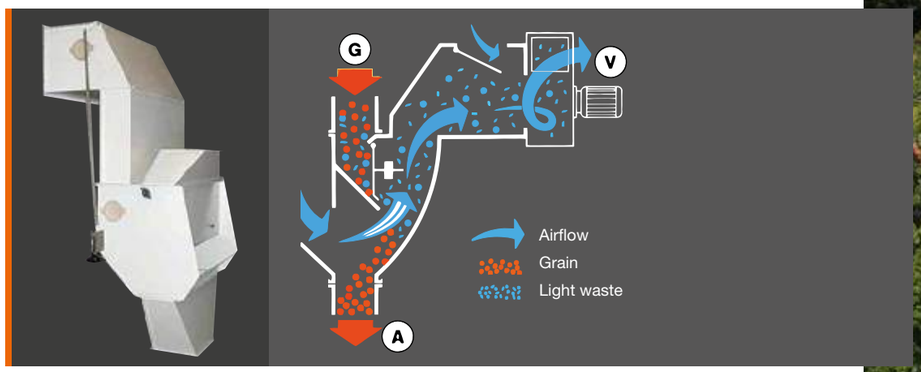
MAROT CIRCUIT DUST REMOVAL

The Marot dust removal units are particularly useful when all you wish to eliminate are light particles.

The grain is spread out in a uniform layer by a hatch with counterweight, then traversed by an air current. The proportion of light waste extracted is adjusted by setting the suction power and by means of the additional air inlet flap on the upper chamber.

Because they are very small, the dust removal units can be very easily incorporated at any point of the handling circuits.

Throughput: 60 to 180 T/H.



Cyclones and filters

CYCLONES

Coupled with the cleaning unit, this cyclone can channel all particles sucked upwards.

All the residues can be transported over a distance of around 25 m via the suction ducts, and discharged in the cyclone.

These can be coupled with dust chambers, bags or other solutions. Optionally, they can be equipped with hopper seal, collar, chimney cap, etc.

FILTERS

The modular dust removal unit is a dust removal filter with pneumatic dust removing pockets made of Aluzinc. It has horizontal pockets for the loaded air inlet in the upper or lower section, depending on the applications.

In all cases, the airflow inside the filter is never rising. This arrangement considerably improves unclogging efficiency, particularly for low-density products.

The chequerboard layout of the pocket support plates and the variable length of the filtering pockets enable optimal use to be made of the available volume.

Continuous unclogging of the pockets is assured by direct injection of compressed air. The air is stored in a buffer tank and distributed by means of a series of solenoid valves coupled with injection tubes.

The control unit is used to manage the unclogging solenoid valves. The integrated differential pressure switch and compressed air pressure controller regulate and optimise air consumption.

This range proposes filtration areas from 20 to more than 600m².

Grain Control



Temperature control

With the increasingly strict quality requirements at all levels of the industry, there is no room for error for those who store cereals, and they need to be able to prove to their buyers that the grain has been stored in conditions that guarantee quality. Measurements and analyses ensure optimised storage procedures and aeration times.

Thanks to the GGS concept, use of the perforated floor, temperature management and VENTIPERFORMER, you avoid having to use insecticides and can perfectly manage your aeration without any risk of insufficient or excessive aeration.

Depending on the requirements and the configuration of the installation, GGS proposes a comprehensive system: sensors, cable ducts, supports, link cables, interconnection unit, and a read and record module. The installation and commissioning of the facility can, of course, be carried out by GGS's own technicians.

All the systems can be installed on outdoor silos or even in indoor storage spaces (boxes, on-floor, bins, etc.).

GGS SOLUTIONS :

Portable monitors

The inspection monitor offers you an intuitive and user-friendly interface for fast and easy data retrieval. Data can also be stored for one year in the monitor's memory. In this way you can be sure to get the best price for your grain from buyers.

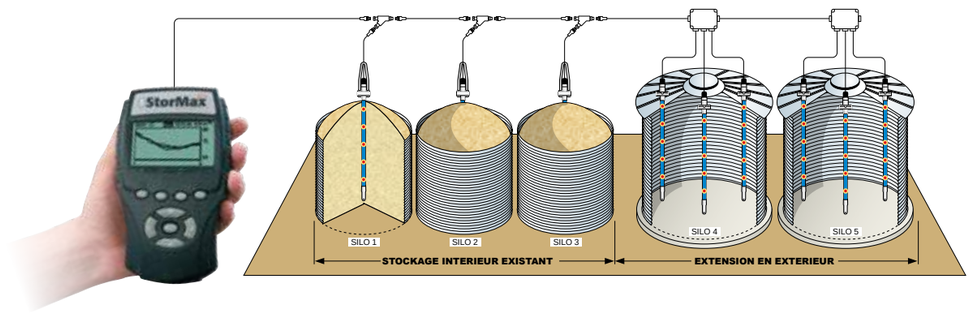
A single read-off point for your installation no matter how many silos.

The recommendations for the number of cables vary (from 1 to 6), depending on the diameters of your silos. The sensor probes are placed every 1.5 m along the entire height of the silo. Each PEHD cable duct reinforced with two steel cables is independent of the multi-probe cable, to facilitate changing them if required.

Centralised supervision

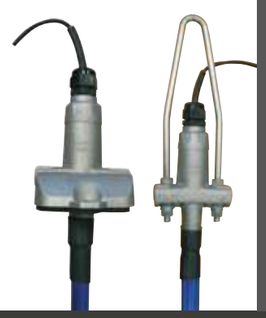
We can also put in place supervision, making it easy to read your sensors from your office PC.

This supervision will help you manage your storage by triggering alarms for temperature thresholds that you set yourself.
What's more, depending on the equipment, it is possible to trigger aeration automatically when there is a rise in the grain temperature, or if the outdoor temperature conditions make it possible to optimise the aeration with respect to the illustrated aeration stages.



Benefits

- Sensor precision to within +/- 0.5°C
- Full history
- Single read-off point
- Scalable system with possibility of adding cables



Two types of fastenings:

- On a pedestal for mounting on an outdoor roof (system adaptable to all roof slopes).
- With suspension hook for indoor storage.

NUMBER OF CABLES DEPENDING ON DIAMETER:

The action zone of a cable covers a diameter of 6 m.

≤ 7.50m 7.5 - 11m 11 - 13m 13 - 15m

For larger diameters, please contact us.

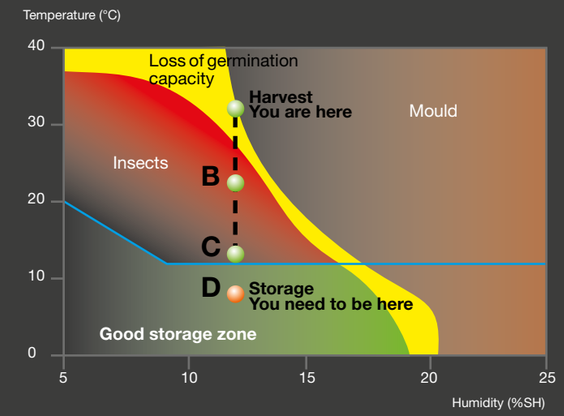
GRAIN COOLING MANAGEMENT PRINCIPLE:

THREE AERATION STAGES

The ideal grain storage temperature is 5 to 7°C. To achieve this objective, three aeration stages are required.

- **1st stage:** Bring the grain temperature down to 18°C, to repel insects and reduce the physiological activity of the grain.
- **2nd stage:** Bring the grain temperature down to 12°C, to continue the insect repellent effect by reducing insect activity, in particular their reproductive functions.
- **3rd stage:** Bring the grain temperature down to 5°C, to kill off any insects.

To achieve these temperatures, the grain mass must be traversed by air that is 7 to 10°C cooler than the temperature of the grain.



Source: Arvalis - Institut du végétal

VIGIDRY

GGS has developed for you a faults notification system via GSM network for drying installations.

VIGIDRY alerts you by phone call when a fault appears in the system or there has been a power outage. This system can take up to four phone numbers, to ensure that the fault is picked up by someone.

So why use VIDIGRY?
For the optimisation and profitability of your drying installation!

A stoppage of the burner can cause the drying grain to cool, and when restarting, the entire volume needs to be completely reheated, involving significant energy consumption.
As well as wasting time, a power outage can cause the mass of the drying batch to increase, leading to specific surveillance requirements and the risk of loss of quality.

VIGIDRY lets you work in complete peace of mind, with no risk of complications and no extra costs.

It can be installed on any type of equipment: drying bin, continuous dryer, batch dryer, etc.

VENTIPERFORMER

VENTIPERFORMER was developed with the goal of helping silo managers manage aeration cycles, and also to guarantee that the operating ranges of the fans are maintained under ideal temperature conditions.

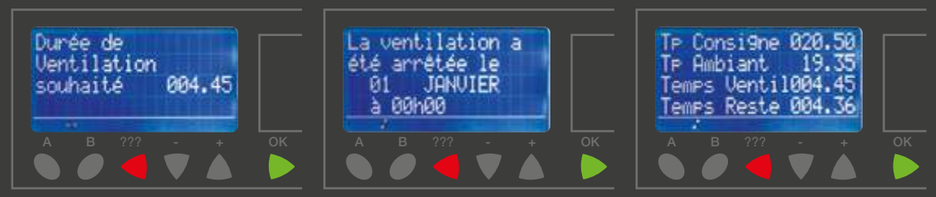
In this way, the energy used to cool the grain is optimised, thereby avoiding unnecessary costs.

The process is easy, a triggering temperature (e.g., 19°) simply needs to be programmed along with an aeration period, then turn the button to AUTO: grain cooling will take place completely autonomously.

As soon as the external temperature drops below 18.5°, VENTIPERFORMER will start up your fan.

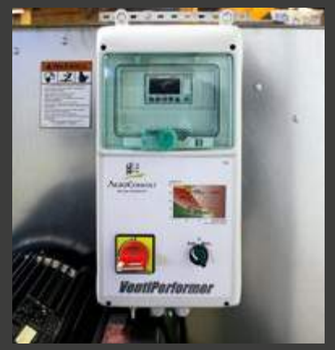
Conversely, if the temperature rises above 19.5°, VENTIPERFORMER will stop the fan for the entire duration of the programmed aeration.

This system, which can be used with both existing and new installations, lets you review the aeration history (date last started, last stoppage, partial time meter, total time meter, etc.).



VENTIPERFORMER provides aeration at the right temperature and for the right length of time, so that you can guarantee the quality of your grain while optimising your aeration costs.

Thanks to these meters, you have access to a range of information such as the aeration start and stop times, or the partial or total aeration duration.




LAV

References

INDOOR STORAGE
Silos X8

STORAGE : CEREALS
Silos X4
Fixed loading
Unloading
Bulk loading bin

STORAGE : CEREALS
DRYING
Silos X4
Drying bin
Auger loading
Unloading

STORAGE : CEREALS
DRYING
Silo
Drying bin
Fixed loading
Unloading

STORAGE : CEREALS
DRYING
Silos X2
Drying bin
Unloading

STORAGE : CEREALS
DRYING
Silos X2
Drying bin
Auger loading
Unloading

STORAGE : CEREALS
Silos X5
Fixed loading
Unloading
Bulk loading bin

STORAGE : CEREALS
DRYING
Silos X4
Drying bin
Fixed loading
Unloading

STORAGE : CEREALS
DRYING
Silo
Dryer
Fixed loading
Cleaner
Bulk loading bin

STORAGE : CEREALS
DRYING
Hopper bin + building
Dryer
Fixed loading
Unloading
Bulk loading bin

STORAGE : CEREALS
Silos X2
Fixed loading
Unloading
Dust extractor

STORAGE : CORN
DRYING
Silo
Dryer
Loading
Electrical cabinet

STORAGE : CEREALS
DRYING
Silo
Drying bin
Fixed loading
Unloading
Bulk loading bin

DRYING
STORAGE
Silos X2
Drying bin
Fixed loading
Unloading
Biomass heater

STORAGE : CEREALS
Silos X4
Drying bin
Mobile auger loading
Unloading

STORAGE : CEREALS
DRYING
Silos X4
Drying bin
Loading and unloading
Dust extractor

COCOA PROCESSING LINE
Ivory Coast
Rotary cleaner x1
Rotary grader
Bagging station
Handling equipments

STORAGE : CORN
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Silos X2
Hopper bin
Loading
Unloading

STORAGE : CEREALS
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On-floor storage – dryer
Fixed loading
Storage aeration
Bulk loading bin

STORAGE : CEREALS
DRYING
Silo
Drying bin
Auger loading
Unloading

STORAGE : CEREALS
Hopper bins X2
Flat-bottom bins X3
Auger loading
Unloading

STORAGE : CEREALS
Silos X3
Auger loading
Unloading

STORAGE : CEREALS
Silos X2+ 1
Fixed loading
Unloading

STORAGE : CEREALS
Silos X2
Loading and unloading
Dust extractor

STORAGE : CEREALS
Hopper silos X2
Flat bottom silos X5
Fixed loading and unloading

STORAGE : CEREALS
Silos X4
Auger loading
Unloading

STORAGE : CEREALS
Slovakia
Silos X2
Auger loading
Unloading

STORAGE : CEREALS
Slovakia
Drying bin
Silos X2
Mobile auger

STORAGE : CEREALS
Silos X9
Grain Loop

STORAGE : CEREALS
Silos X5
Fixed loading
Unloading

STORAGE : FEED MILL
Silos X32
Handling equipments

STORAGE : CEREALS
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Fixed loading
Unloading

STORAGE : PADDY RICE
Senegal
Silos X8
Rotary cleaners X2
Dryers bin X4
Handling equipment

STORAGE : CEREALS
Slovakia
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Unloading

STORAGE : CEREALS
DRYING
Silos X2
Hopper bin
Energy saving Dryer

STORAGE : CEREALS
Silos X3
Fixed loading
Unloading

STORAGE
Silos
Loading and unloading

STORAGE : SOYA MEAL
Hopper bins X3
Fixed loading
Fixed unloading
Declogging assembly

STORAGE : WOOD PELLETS
Hopper bin
Loading
Unloading

STORAGE : CEREALS
Hopper bins X2
Fixed loading
Unloading

STORAGE : CEREALS
Silo
Fixed loading
Unloading

STORAGE : WOOD PELLETS
Silos X2
Handling
Shuttle conveyor
Rotary sieving drum

STORAGE : CEREALS DRYING
Silos X10
Hopper bins X10

STORAGE : PLASTIC BALLS
Hopper bins X6
Pneumatic loading

STORAGE : WHEAT
Guinea
Silos X6
Handling equipments

STORAGE : CEREALS
Bins x7
Fixed loading
Unloading

TEMPSTOR
Temporary storage
Auger loading

STORAGE : CEREALS
Bins x2
Fixed loading
Unloading

STORAGE : CEREALS
Bins X5

STORAGE : CEREALS
Bins x5

STORAGE : CEREALS
Bins X3

INDOOR STORAGE
Hopper bins x15
Handling

STORAGE : CEREALS
DRYING
Germany

Hopper bins X10
Flat bottom bins X10
2 energy saving Dryers

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