



EQUIPMENT AND APPLICATIONS FOR SPECIALTY CEREALS, PULSES AND OIL SEED PROCESSING

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GRAIN TECH SERVICES AND EQUIPMENT SUPPLY

Whether your application calls for an individual machine to upgrade an existing process or the installation of a complete processing line we have the solution with advanced equipment design and process technology developed from more than 30 years experience providing state-of-the art equipment, process and solutions to a wide range of cereals, pulse and oil seed process applications. Each installation arrangement is detailed using the latest CAD design software operated by experienced engineers.

This range of equipment is designed to ensure optimum performance according to the type of specialty cereal, pulse and oil seed varieties being processed with the technology having been developed and refined from many installations under a wide variety of operating conditions.

Individual machines and complete processes cater for applications including:

- Individual grain, pulse and oil seed cleaning and multi classifications
- Multipurpose milling for wheat, barley, peas, maize, millet, sorghum, etc.
- Mills for buckwheat processing
- Mills for oat/groat processing
- Maize mill processes
- Manufacture of cereal flakes
- Oil seed processing

To compliment equipment supply Grain Tech services include:

- Design, engineering and planning in detail for individual machines and complete installation arrangements
- Installation and commissioning
- MCC and electrical integrated control systems
- Remodel and reconstruction of existing installations and processes
- Maintenance, guarantee and post warranty service



1 – GRAIN CLEANING AND PREPARATION

Pneumatic Separators

Pneumatic separators are designed for grain cleaning from impurities which differ in their aerodynamic qualities. They can be used within the intake system for grain elevators, mills, feed mills, malt houses, breweries and oats mills, etc.

1.1 Pneumatic Separator-Closed Circuit



The GTZ range is designed for a closed air circuit arrangement

Advantages:

1. With the closed air cycle there is no need for air ducts and cyclones for cleaning of processed air
2. No emissions of exhaust air into the atmosphere
3. High degree of purification of grain
4. There are coarse and fine adjustment of the air achieved by the graduated settings, allowing for the very best cleaning for all kinds of grain
5. The use of components from the leading European manufacturers

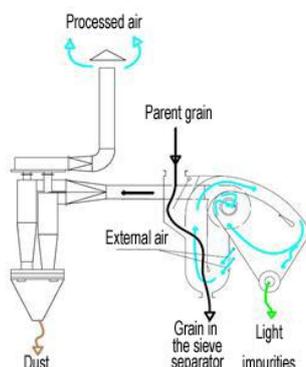
Model	GTZ-60	GTZ-80	GTZ-130
Capacity (t/hr)	40	75	150
Power (kW)	5.1	6.6	8.6
Working channel length	600	800	1300
Overall dimensions			
Length (mm)	1870	1870	1870
Width (mm)	1970	2240	2675
Height (mm)	1590	1590	1590
Weight (kg)	824	900	1050

1.2 Pneumatic Separator-Open Circuit

The GTN range of Pneumatic separators are designed to work with an open-air circuit. Air enters the working area from outside and is exhausted to atmosphere after cleaning. Air separator GTN has a settling chamber where light impurities are separated. To avoid dust emission, the processed air has to be additionally purified. The air separator of this type is simpler in construction but needs an additional cyclone and fan installation.

Description:

The feed material enters the separator's aspiration channel where it is blown by the upward flow of air created by the crossflow fan. The purified product is discharged from the machine by gravity. Light impurities captured by the air are separated in the sediment chamber and removed via a screw conveyor and air is returned to the aspiration channel for later use. Therefore, this type pneumatic separator is structurally very simple but requires additional installation of the cyclone and fan.



Model	GTN-60	GTN-80	GTN-130	GTN-160
Capacity (t/hr)	40	75	150	200
Power (kW)	1.1	1.1	1.1	1.1
Air output (m ³ /hr)	4500	6500	10500	12500
Working channel length	600	800	1300	1600
Overall dimensions				
Length (mm)	1870	1870	1870	1870
Width (mm)	1970	2240	2675	2775
Height (mm)	1590	1590	1590	1590
Weight (kg)	590	670	850	950

1.3 Pneumatic Cascade separator



Pneumatic separator GTO series are manufactured to separate particles, different in their gravitational velocity rate. They are used within grain elevators and grain processing applications to separate grain from light impurities

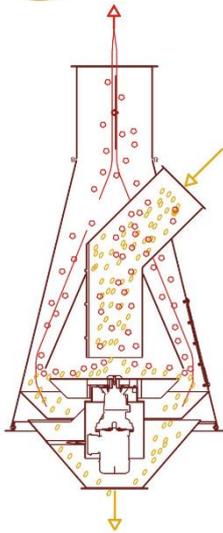
Description:

The product is spread in the machine and is blown by the air which removes light impurities from grain. For best grain cleaning results the air purifier incorporates a system for the product distribution, consisting of flat and rotating assemblies.

The infeed grain falls into the separator cavity and is blown upward by the air flow generated by the external aspiration system. To increase the cleaning separator effectiveness, it is equipped with a feeder, which has a rotating disk.

Advantages:

1. It has a high capacity and high quality grain cleaning
2. Fitted with standard mounting flanges which allows for to installation of the separator anywhere in the production line
3. Low power consumption
4. Wear resistant construction materials



Model	GTO-1
Capacity (t/hr)	150
Power (kW)	0.55
Air output (m ³ /hr)	7200
Overall dimensions	
Width (mm)	1160
Height (mm)	2360
Weight (kg)	294

The grain de stoners are used to effectively separate stones from a continuous flow of grain within processing factories

The grain de stoner OMP operates in the following way: Through the combined action of the sorting surface vibration and the negative airflow, the grain layer is fluidized to reduce the coefficient of internal friction and the grain mass goes into a fluidized state. In the presence of the aerating effects, the fluidized layer of grain, which is influenced through the vibratory motion imparted into the deck, causes the lighter material to flow onto the downside and is discharged to the lower, wider part of the deck. The heavier material particles on the lower layer, which have the tightest bond to the textured separating surface, are transported upward against the deck and removed through the upper narrower section.

Advantages:

1. Improved adjustment of the air
2. Specially designed deck with a high coefficient of friction
3. De stoner is easy to adjust
4. Improved efficiency of the machine
5. Reduced airflow for aspiration is considerably lower in comparison with alternatives
6. Exceptional separation efficiency
7. Separation of no less than 99% of mineral impurities
8. Incorporates components from leading European manufacturers
9. High technical efficiency
10. Reliable design

1.4 Destoner



Model	GTP-3	GTP-6
Capacity (t/hr)	6	12
Power (kW)	0.9	0.9
Cleaning efficiency	99%	99%
Resistance (Pa)	750	750
Air flow rate (m ³ /hr)	2500	4500
Overall dimensions		
Width (mm)	1900	1950
Height (mm)	900	1575
Weight (kg)	1745	1750

1.5 Scalperator



Scalperators are designed for pre cleaning - removing large impurities from the grain. They are used within grain elevators and similar intake systems. Scalperators can be equipped with the open-air circuit separator GTN or closed circuit type GTZ, which is mounted onto the separator assembly

Key advantages:

1. High process efficiency due to the large sieve surface area and possibility to set them independently according to installation work conditions
2. Metal-fabrication for durable design
3. The drum angle adjusting feature widens the scalperator's operating potential
4. Operational safety
5. Use of components from leading European manufacturers
6. Easy replacement of the sieves of standard size without modification

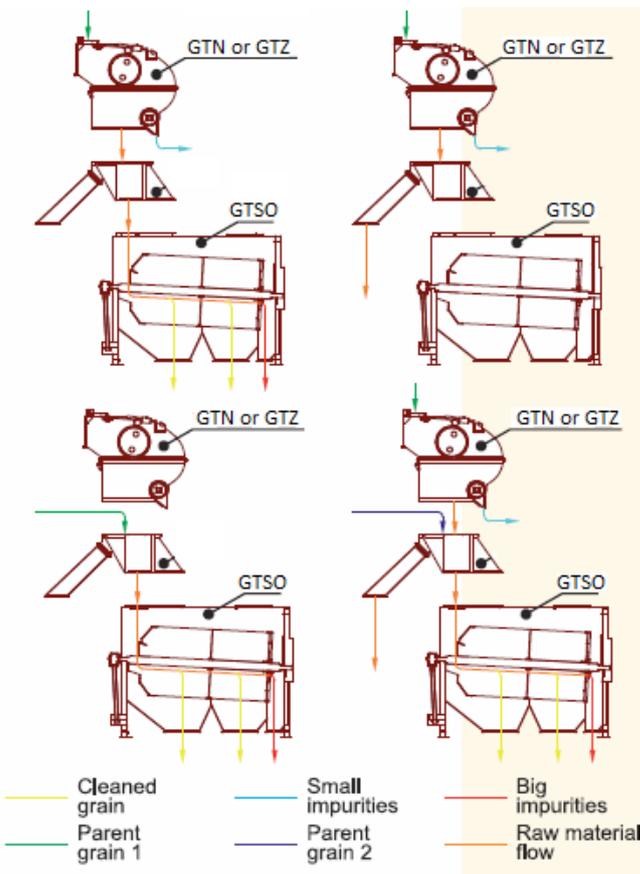


Illustration of working principle



GTSO assembly complete with pneumatic separator

Model	GTSO-100	GTSO-200
Capacity (t/hr)	100	200
Power (kW)	1.5	4
Drum diameter (mm)	900	1260
Number of sections	2	2
Air consumption (m ³ /hr)	4000	5500
Overall dimensions		
Length (mm)	2500	3355
Width (mm)	2355	2685
Height (mm)	3640	4095
Weight (kg)	2050	2400

The wild oat separators (GTCO) are designed for grain cleaning main crop from long wild oat impurity, and the cockle separators (GTCK) - for short cockle impurity separation

Wild oat indented cylinders GTCO are used in grain elevators, mills and oats mills for separating wild oat seeds from grain mixtures; In oat mills – for separating oats from barley and wheat and separating husked and unhusked grain; and also within seed cleaning and grading plants and in plants for maize seed classification for separation of the largest grains from the mixture.

Work description:

The main working part of the wild oat trieur separator is a cylinder with cells where the short fraction (grain) is lifted, but the long fraction (wild oat) larger than the cell size isn't captured by the cells. The cell cylinder is rotated at a design speed lifting and depositing the short fraction to the first tray while the long fraction remains on the indent surface to discharge at the end outlet, in this way the differing size fractions of the mixture is made

Advantages:

1. The machine can be installed as a separate equipment unit and also two separators may be set one above the other, making an indented cylinder arrangement with consecutive and parallel separating features.
2. The working cylinder is automatically put into the setup mode with the angle of 2°, which improves the machine working efficiency and providing an equilibrium of the mixture along the working cylinder;
3. Adjustment of the separation tray is provided in the range of 0-90°, to allow separation of the mixture with maximum efficiency;
4. Components from leading European manufactures are used.

1.6 Indent Cylinder Separator



Model	GTCO-500	GTCO-700
Capacity (kg/hr)	1900	4000
Power (kW)	0.75	1.1
Cleaning efficiency	80%	80%
Air flow rate (m³/hr)	300	600
Resistance (Pa)	400	400
Overall dimensions		
Length (mm)	2800	4000
Width (mm)	1100	1200
Height (mm)	1400	1650
Weight (kg)	600	900

1.7 Sieve Separator



It is designed for grain sorting and cleaning of impurities which differ by geometric dimensions and aerodynamic properties.

Advantages:

1. Solid, heavy duty construction
2. The symmetry of the pipework installation allows for the separator flexibly in installation within existing and new production lines
3. Suited for multi classification applications
4. High efficiency separations and grain cleaning
5. Small installation dimensions
6. Easy replacement of sieve trays and the ball cleaners
7. Provision for Viewing the separation area

Model	GTSO-0.7
Capacity (kg/hr)	2500-3500
Cleaning efficiency % according to:	
Rubbish impurities	60
Coarse impurities	98
Light impurities	70
Small grains output	60
Power (kW)	0.55
Air flow rate (m³/hr)	1200
Overall dimensions	
Length (mm)	1580
Width (mm)	820
Height (mm)	1220
Weight (kg)	425

1.8 Gravity Separator



Model	GTS-500	GTS-700
Capacity (kg/hr)	1.0	305
Power (kW)	0.7	1.1
Oscillation frequency (s ⁻¹ /min)	15.6 (940)	15.6 (940)
Oscillation amplitude (mm)	5-6	5-6
Deck angle Longitudinal and Lateral	0-8	0-8
Separated impurity	75-90%	75-90%
Impurity content	5-15%	5-15%
Air flow (m ³ /min)	110	140
Overall dimensions		
Length (mm)	1840	2149
Width (mm)	1720	1937
Height (mm)	2000	2341
Weight (kg)	400	540

The gravity tables are designed for cleaning of leguminous, grain, oil seed and groat crops from difficult to separate impurities, which differ in shape, surface properties, and specific gravity from the main grain. The gravity table can also remove stones and similar heavy impurities.

By using this machine within the flow arrangement the separation of stones and other impurities that differ from the grain in shape, specific gravity and surface properties is successfully made. The grain material should be cleaned on an air-screen separator or grain separator beforehand, and have the necessary moisture content. The use of the gravity separator-sorting table is advisable in grain cleaning production lines and in grain processing plants.

Process description:

The product enters the machine through the suction inlet, and due to a special valve it is distributed evenly on the deck. The valve eliminates the possibility of suction of air entering through the suction inlet into the working area of the machine. The body of the gravity separator sorting table is fitted with a special metal mesh which performs the longitudinal oscillatory motion.

Due to the vibratory motion of the working surface, and the air flow through the deck to the throttle valve regulated exhaust and the longitudinal and lateral inclination, effective product sorting is provided. All heavy impurities remain on the mesh and go through the discharge outlet under the longitudinal motion. The light particles, under the action of air are directed to the sides of the deck for discharge through the outlet chutes.

Heavy impurities are directed in the opposite direction - to the horizontal valve deck. This valve allows the creation of a countercurrent circulation adjustable speed air flow. With this circulation grains can be separated from the stones that fall to the container bottom. Air transferred in the stratifying process which may contain the lighter product fractions or dust is then subjected to a thorough cleaning in the filter or cyclone

1.9 Grain Separator

Grain separators are designed to clean agricultural harvested grain from large, middle and light impurities within grain and cereal processing plants, grain elevators and related grain processing applications.

The Separator performs the following operations: preliminary purification, primary purification, secondary purification (sorting, calibration).

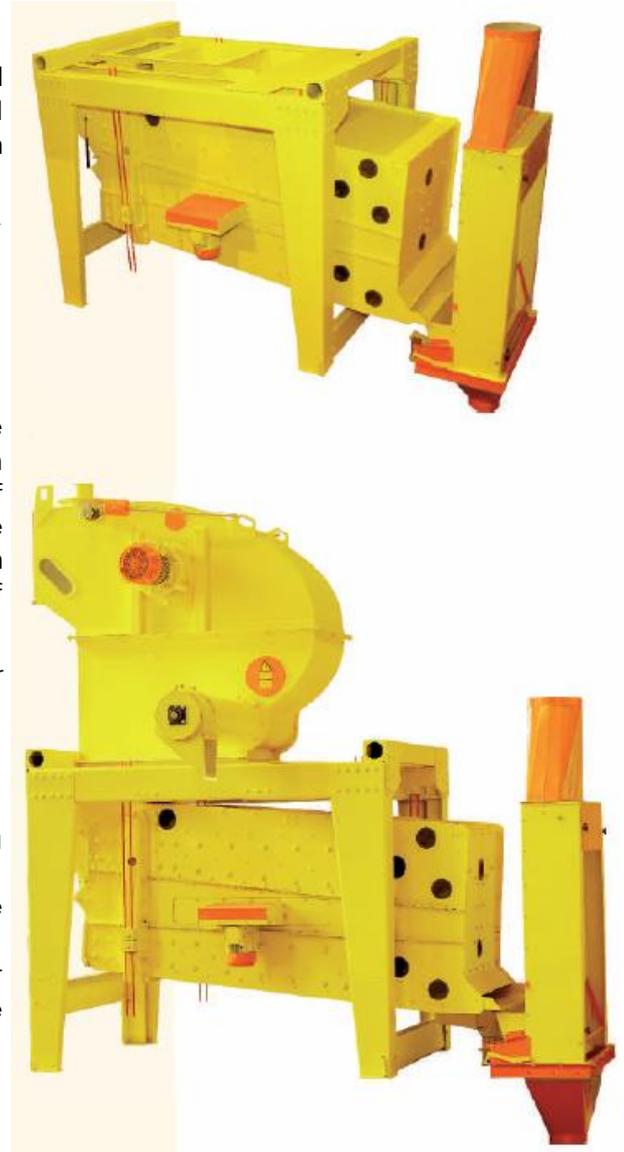
The machines consists of a flat screen deck separator and aspiration column.

Operating principle: Feed grain enters the machine through the suction inlet and falls into the sieves, where it is cleaned from impurities, which differ in size. The separated fractions of cleaned grain and impurities are removed separately from the machine through outlet pipes. Grain then enters the aspiration column where it is blown by counter flow air, for the removal of lightweight impurities.

Grain separators may be equipped with air separators either with a closed air circuit GTZ or open air circuit GTN

Key advantages

- High performance with small footprint
- Effective grain cleaning due to large screen working area
- Reliable and robust design
- Incorporates easy changed, reliable and highly effective screen arrangement with screen cleaning balls.
- Possibility of arranging a double air separation of grain (at the entrance to the sieve machine and on exit from the discharge) providing for optimal aspiration efficiency.
- Low power consumption



Model	GTK-8	GTK-16
Capacity-Pre clean (t/hr)	100	150
Capacity-Final clean (t/hr)	30	50
Screen area (m ²)	8	16
Power (kW)	1.5	2.2
Resistance (Pa)	400	400
Air flow (m ³ /hr)	13500	13500
Overall dimensions		
Length (mm)	3385	3190
Width (mm)	1685	1685
Height (mm)	2150	2770
Weight (kg)	2610	3620
Overall dimensions are specified together with the aspiration column but without air separator		

2 – GRAIN PREPARATION EQUIPMENT

2.1 Deawner/Delinter



The Deawner is designed to remove barley and oats awns and is used for processing oats in the preparatory flow of oat mills as well as for removing awn from grass seeds such as rye grass in seed cleaning systems. The machine operates in the following manner: having entered the working chamber raw materials are abraded vigorously by the working assemblies. As a result, intergranular friction and grain sieve shell friction occurs and the grain separates from the awns. The removed awns are sieved through the screen frame apertures and the processed grains are discharged from the outlet chute. Additionally, the machine may be equipped with an aspiration channel to remove the awns and light impurities.

Advantages:

1. High efficiency and reliability
2. Increases the paddy machines and sifting machines efficiency
3. Small size and energy consumption
4. Ability to be fitted with different types of working screens and agitators able to be replaced easily

Model	GTBO-1.5
Capacity (ton/hr)	2.0
Power (kW)	5.6
Air consumption (m ³ /hr)	300
Overall dimensions	
Length (mm)	1480
Width (mm)	520
Height (mm)	1590
Weight (kg)	430

These machines are designed to moisten grain (wheat, rye, maize, buckwheat, etc.) in mills before allowing to temper prior to processing. This intensive dampening unit consists of a casing assembly and heavy duty main shaft having blades with a trapezium-shape. Initial grain entering the machine through the receiving inlet is sprayed with water, then agitated by the blades for intensive mixing. The blades are set at a certain angle, which helps the movement of the product along the shaft and housing. The angle of the blades can be adjusted for changing the feed rate and the degree of moistening.

Advantages:

1. No vibration or dynamic loading on structures
2. Simple and solid construction ensures reliability
3. Bearing Units, drives and electrical components from European manufacturers
4. The body is made of stainless steel, which increases the life of the product
5. The unit can be equipped with an automatic controller for setting the value of the moisture addition at the output of the machine. Production of the main elements of the rotor blades are a standard pattern to ensure ease of replacing them when worn, and the ability to change the throughput speed by setting these adjustable mixing blades at different angles on the shaft

Model	Grain Moisturizer
Capacity (kg/hr)	9000
Moisture increase for one travel	2-5%
Power (kW)	7.5
Overall dimensions	
Length (mm)	3000
Water consumption	250L/hr
Angle of inclination	25°
Weight (kg)	394
Screw diameter	320mm

2.2 Intensive Dampner



2.3 Scourer

These machines are designed for cleaning the surface of grains of mineral impurities, partial removal of awn and hair and to abrade the surface of the embryo. They are used in grain-cleaning sections for the preparation of grain prior to milling

Description: The hulling machine consists of a frame, drive and chassis which has a rotor fitted with special heavy duty beaters. A screen sieve is fitted with clamping rings. The rotor may also be provided with abrasive discs. The screen assemblies are interchangeable, allowing selection for treating varying grain varieties. Grain enters the machine through the feed intake and processes as a result of interaction of the abrasive beaters or discs and the perforated screen due to friction between them. The abraded grains discharge from the machine through the exhaust pipe, and the waste is removed through the bottom of the funnel for dust.

Advantages:

1. Carbon steel heavy duty construction
2. High efficiency and reliability (working parts coated with wear-resistant coating)
3. Low specific power consumption
4. Small dimensions
5. Easy to operate and maintain
6. Possible to install a rotor with beaters and a sieve frame (GTBO -3/6) or a rotor with abrasive discs and a sieve frame (GTAO -3/6)
7. Rapid change of the rotors, as they are easily interchangeable
8. Components from leading European manufacturers
9. Main bearings protected from dust for extended operating life



Model	GTBO-3	GTBO-6	GTAO-3	GTAO-6
Capacity (ton/hr)	3	6	3	6
Power (kW)	3	11	5.5	11
Air consumption (m ³ /hr)	100	300	100	300
Lowers ash content of grain (%)	0.02-0.03	0.02-0.03	0.03-0.05	0.03-0.05
Overall dimensions				
Length (mm)	1100	1400	1100	1400
Width (mm)	400	510	400	510
Height (mm)	1300	1620	1300	1620
Weight (kg)	275	630	315	670

2.4 Grain Steamer



The steamer is intended for hydrothermal processing of cereal grains to change the technological properties and to improve the properties of the finished product. The model GTPB steamer is used in the flour-and-cereals industry for grain steaming, and also for the production of flakes and grains which do not require cooking, in the food-concentrates industry and feed industry.

The model GTPC steamer is arranged for product to enter through the feed inlet to fall by gravity into the work zone of the steaming machine, where it is mixing and interacts with the steam vapor. The heated grain is discharged via gravity.



Model	GTPB-A9	GTPC-0
Capacity (kg/hr)	2800	3000
Steam consumption per ton of grain	150-200 kg/hr	150-200 kg/hr
Power (kW)	2.2	2.2
Overall dimensions		
Length (mm)	1620	730
Width (mm)	1184	700
Height (mm)	2810	1200
Weight (kg)	990	170

2.5 Grain Heater

Designed for heating grain in cold climates and for specialty milling requirements and particularly suitable for high-quality wheat flour production.

The heater consists of a receiving hopper, one or more heating sections and exhaust fitting. The heating section is a multi-discharge hopper type with rectangular cross-section 1000mm x 1000mm with a height of 2000mm. The heating elements are made of straight segments of pipe connected to the coil assembly with welded joints which are located outside the main assembly. The body section is provided with manholes for access into the internal area and covers are installed over the joints for the heating pipes. A venting device is included and the design of the discharge is arranged to ensure even heating without stagnant zones. A secondary discharge is fitted to the outlet. All external heating elements are insulated. The heating medium may be either hot water or thermal oil which may be heated in a suitable boiler of any type and reticulated through the heating elements in a closed circuit. The heating section is designed for productivity of 1500 kg / h. If necessary, increased productivity may be achieved through additional sections installed vertically with flanged connections.

Grain, subject to heat, is fed into a hopper via gravity to pass through the heating section where contact is made with the tube heating elements. As a result of contact with the hot surface the grain is heated. Discharge of grain from the hopper section is completed through the lower hopper. Dwell time is automatically adjusted through control via level sensors operating in association with the control unit of the discharge airlock feeder. Temperature control is maintained through temperature sensors fitted within the main body assembly

Advantages:

1. Increase in total flour yield by 3-5%
2. Increase in high-grade flour yield by 10-15%
3. Increase in flour whiteness by 5-6 units
4. Large area heating elements
5. Possibility of increasing the efficiency of thermal power
6. Effective thermal insulation minimizes heat loss to the atmosphere

Fig.1 Heater grain

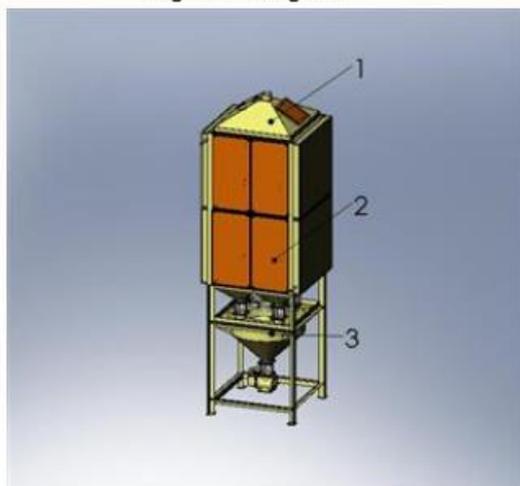
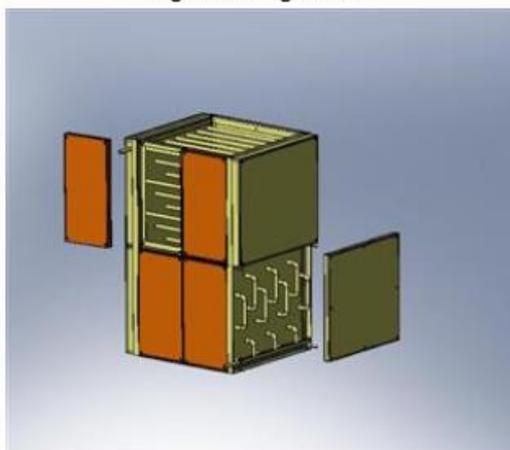


Fig.2 Heating section



Model	GTPZ-1.5	GTPZ-3.0	GTPZ-4.5	GTPZ-6.0
Capacity (ton/hr) when heated to 15°C	1-1.8	2-3.5	4.5	6.0
Power of discharge device (kW)	1.1	1.1	1.1	1.1
Power of electric heating unit (KW)	12	24	36	48
Overall dimensions				
Length (mm)	1250	1250	1250	1250
Width (mm)	1150	1150	1150	1150
Height (mm)	3650	5650	7650	9650
Weight (kg)	1520	1772	1924	2126

2.6 Vertical dryer/kiln

The dryer/kiln is designed for drying or treating grain cereals for hydrothermal treatment in the formulation of processed cereals.

Source product passes successively through heated drying sections consisting of pipes heated by hot steam. The grain then goes to the cooling section, where it is cooled by blowing ambient air and then discharged through a special graduation mechanism

Advantages:

1. Drying sections equipped with an arrangement for connection to forced ventilation to intensify the drying process
2. Cooling section equipped with a device of cooling air distribution and control, that facilitates uniform cooling of the product;
3. Design of the discharge mechanism ensures uniformity of the product discharge with a set productivity, as well as operating in automatic mode
4. Increased number of tubes in the drying sections provides high level of the product drying
5. Precise and smooth adjustment and cooling uniformity due to the presence of separate chokes in the cooling section
6. Outlet section design provides the optimal product discharge and ensures high quality processing of the product
7. Components from leading European manufacturers
8. Meets high hygienic requirements due to stainless food grade steel used

Model	GTPU-3	GTPU-4	GTPU-5	GTPU-6	GTPU-7	GTPU-8
Number of heating sections	3	4	5	6	7	8
Heating area (m ²)	40.5	54.0	67.5	81.0	94.5	108.0
Capacity (ton/hr)	1-1.3	1.5-1.7	2-2.2	2.4-2.6	2.9-3.1	3.3-3.4
Vapour pressure (KPa)	400	400	400	400	400	400
Power (kW)	1.5	1.5	1.5	1.5	1.5	1.5
Steam consumption per ton (kg/hr)	280-360	280-360	280-360	280-360	280-360	280-360
Air consumption per ton (m ³ /hr)	6000	6000	6000	6000	6000	6000
Weight (kg)	3040	3750	4460	5170	5960	6690



3 – GRAIN AND PULSE HULLING EQUIPMENT

3.1 Hulling/Abrading



The machine is designed for intensive processing of grain surface before milling/grinding. It is usually installed within the grain-cleaning section of the mill. Processing of the product in the abrading section is carried out through intensive removal through frictional action in the abrading stones while the hull/bran material is removed from the working chamber meal via an aspiration system. The machine is equipped with a built-in magnetic separator and aspiration column. Controls are fitted for adjusting the abrading performance and degree of treatment provided. The machine can be equipped with a feeder and operates automatically.

Advantages

1. High quality processing of grain surface (decrease in ash content by 0.2-0.3%)
2. Increase in total flour yield by 2-3%
3. Increase in high-grade flour yield by 5-7%
4. Increase in flour whiteness by 5-6 units
5. Low specific power consumption
6. Simple design makes it easy to operate and maintain and ensures high reliability

Model	Cascade-0.4	Cascade-0.6	Cascade-1.6	Cascade-3.0
Capacity (ton/hr)	0.4-0.45	0.65-0.75	1.2-1.6	2-2.5
Power (kW)	7.5	11	22	37
Air consumption (m ³ /hr)	500	650	800	1200
Overall dimensions				
Length (mm)	880	880	1020	1850
Width (mm)	590	590	720	740
Height (mm)	1070	1115	1270	1280
Weight (kg)	270	320	480	855

3.2 Hulling machine-roller type

The hulling machines GTDM and GTDS are designed for buckwheat/millet grain hulling, for incorporation into processed cereal products. The hulled product is suitable for further processing into flakes or incorporated into extrusion formulations.

The raw grain enters the working area of the machine via a vibratory feeder and hulling is performed within the working gap between the rotating roller and the fixed abrasive grinding plate. The interaction with the abrasive working surfaces on both the roller and grinding plate leads to the grain hulling. The hulled product and hull discharges from the machine by gravity through the lower outlet. Hull material is removed from the groat within a following aspirator.

Advantages:

1. The high degree of grains hulling on any fraction, provided by the advanced design of the machine's feeder and the system of the settings for adjustment of the working gap
2. Improved reliability of the machine and effective system of aspiration
3. Ease of installation and maintenance of the machine in a production environment
4. The possibility of operating with the highest level of process control



Model	GTDM-200		GTDS-400		GTDS-600	
	Buckwheat	Millet	Buckwheat	Millet	Buckwheat	Millet
Capacity (ton/hr)	1	0.7	2.2	1.3	3.6	2.0
Power (kW)	2.2	5.5	5.68	5.75	7.68	11.25
Length of roll (mm)	200		400		600	
Diameter of roll	400		600		600	
Speed of roll (rpm)	400		400		400	
Aspiration air flow (m ³ /hr)	250		500		750	
Resistance (Pa)	150		150		150	
Length (mm)	934		1200		1200	
Width (mm)	417		685		885	
Height (mm)	1030		1470		1470	
Weight (kg)	1030		1470		1470	

3.3 Centrifugal Impact Hullers



The centrifugal huller model GTCH is designed principally for oat hulling. It is used in oat mills and compound feed production mills.

The centrifugal huller operates as follows. Grain that is to be processed moves from the operational grain balance hopper in the production line through opening the valves for gravity flow to the working chamber. The grain enters the impact disc where it is processed by the centrifugal force. With the intense impact of grains against the shell ring the grain groat separates from the hulls.

An important advantage of the centrifugal huller is the fact that the shell ring has its own drive, which causes it to move in the opposite direction to the disk movement. This feature improves the effectiveness of the hulling process for increased efficiency, while the service life of the shell ring is extended.

Following the working chamber, grain discharges from an outlet chute, where with the help of aspiration light material transfers to the exhaust system. Following hulling the mixture of groats and hulls together with any un hulled grain passes to a separate aspirator for intensive separation of hull and light weight material before being conveyed either of the pneumatically or mechanically to the following process according to the technological arrangement.

Advantages:

1. The shell ring has its own drive where it moves to the side opposite to the disk movement. In such a way that the effectiveness of the hulling process is increasing, and the service life of the shell ring is extending.
2. Convenient, easy and precise product supply adjustment into the hulling chamber

Model	GTCH-1
Capacity (kg/hr)	3000
Rotor drive Power (kW)	5.5
Ancilliary drive power (Kw)	0.37
Aspiration consumption (m ³ /hr)	1000
Rotor speed (rpm)	1000
Length (mm)	600
Width (mm)	600
Height (mm)	1200
Weight (kg)	150



Centrifugal Huller type GTHO suited for hulling oats. This machine is mainly used in grain mills and compound animal feedstuffs mills. In this procedure, the raw material is first directed into the rotating rotor via the feed inlet where the blades specifically accelerate and throw the grain against the metal insert deck material. The impact on the metal deck causes splitting of hulls with a minimum damage to the kernel. Hulled grain is discharged through the product outlet

Advantages:

1. High efficiency and productivity with small overall dimensions
2. Simple design, reliability, easy to use
3. Smooth and precise adjustment of product supply in the husker
4. Operating components are easy and quick to change

Model	GTHO-0.5
Capacity (kg/hr)	1000
Rotor drive Power (kW)	5.5
Rotor speed (rpm)	1000
Length (mm)	600
Width (mm)	600
Height (mm)	500
Weight (kg)	120

3.4 Peas splitting machine-vertical type



The peas splitting machine is designed to process peas into splits by splitting them into halves.

The machine is used within cereal plants, and in the pea processing mills

Advantages:

1. Simple design
2. Simple wear component spares needed for maintenance
3. Long operating life, due to the wear part replacement possibility
4. High efficiency and performance with low energy consumption

Model	GTKG-0.8
Capacity (ton/hr)	0.8-1
Power (kW)	2.2
Overall dimensions	
Length (mm)	620
Width (mm)	620
Height (mm)	1439
Weight (kg)	90

3.5 Peas splitting machine-Horizontal type

This machine is designed for the processing of peas in cereal plants for the production of halves (splits). The machine consists of a frame, drive and a body assembly in which the rotor is mounted with an impact assembly installed within a sieve fixed with clamping rings. The product is fed into the machine through the inlet chute and processed as a result of interaction with the impact beaters and due to friction between them. The yield of halves (splits) within the total mass of grains up to 85%

Advantages:

1. Metal-intensive sturdy construction
2. Operating components are easy and quick to change
3. Bridge bearings protected from dust and thus greatly increase the overhaul interval of the machine
4. Components from leading European manufacturers



Model	GTRG-1.5
Capacity (ton/hr)	1.5
Power (kW)	7.5
Overall dimensions	
Length (mm)	1144
Width (mm)	403
Height (mm)	1329
Weight (kg)	315

3.6 Column Aspirator



Designed for grain sorting and cleaning from those impurities which differ by aerodynamic properties. Incorporates cascade passage of grain with counter flow air being drawn through each level.

Main applications are within, grain elevators, flour mills, feed mills, oat mills and specialty milling process applications.

Advantages:

1. In-feed grain is distributed evenly across the full width of the aspiration channel
2. The presence of louvers on both sides of the channel promotes an even distribution of the air flow
3. High efficiency
4. A compact design
5. Components from leading European manufacturers are used

Model	GTVC-500
Capacity (kg/hr)	3000
Power (kW)	0.08
Air flow rate (m ³ /hr)	2000
Overall dimensions	
Length (mm)	310
Width (mm)	610
Height (mm)	1490
Weight (kg)	380

3.7 Air aspirator cleaner

The air separator cleaner is designed to separate particles differing in size and velocity. Typically, these are installed within applications when it is necessary to ensure high efficiency and clarity of separation, for example for separation of small particles from flaked cereals, fines and dust removal for control of finished products, husk separation within hulling processes, etc.

The feed product enters into the pneumatic separating feed air separator to be aspirated upward within the flow of air created by an enclosed fan. The purified product is removed from the machine by gravity. Light impurities trapped in the air stream are separated in the sediment chamber and discharged via the rotary valves while the air is recycled back into the pneumatic separating channel for re use

Advantages:

1. High efficiency and accuracy of separation
2. Closed cycle of the air, contributing to a substantial reduction of emissions in the production environment in general, and energy savings for heating in cold areas
3. High reliability and maintainability, ensured through simple design and use of heavy duty components



Model	GTSO-0.5	GTSO-2.5	GTSO-5.0
Capacity (ton/hr)	0.5	2.5	5.0
Power (kW)	1.1	1.47	1.87
Cleaning efficiency (%)	80-90	60-85	60-85
Overall dimensions			
Length (mm)	1100	1200	1200
Width (mm)	305	450	700
Height (mm)	2070	2070	2070
Weight (kg)	150	330	370

3.8 Paddy Separator



The paddy separator is designed to separate the hulled grain from the mixture of hulled and unhulled according to the difference of the physical and mechanical properties, and is widely used to maintain these operations within milling applications. The machine is widely used in groats milling technical processes, and particularly when processing buckwheat, rice and oats. The paddy separator - machine is most efficient for the hulled products separation process, both in de-hulled kernel separation process and the degree of separation that is classifying kernel content as a fraction of the product from the hulling process.

Advantages:

1. High technological efficiency
2. Stable operation for the kernel and hulled products separation and on the ready cereals control
3. Easy servicing and adjusting

Model	Paddy separator
Capacity (ton/hr)	
Buckwheat/rice	3-4.5
Oats	1.5-2
Number of channels	36
Power (kW)	3
Aspiration consumption (m ³ /hr)	640
Resistance (Pa)	50
Length (mm)	2955
Width (mm)	2110
Height (mm)	1615
Weight (kg)	2500

4 – GRAIN MILLING EQUIPMENT

4.1 Hammer mill



Designed for milling grain and grain products and used in small specialty grain, pulse and legume milling installations to produce meals and flours, as well as grinding alternative products, i.e. pepper, spices, groats, etc. This model hammer mill is also widely used within small scale compound feed production applications.

The machine consists of a main body assembly, screen-mesh shell and clamp and a rotor, which has fixed blades of a special design. The grain/grain product or product to be milled is feed into the milling chamber via a gravitation feed spout where the particle size reduction occurs through impact of the product against product particles, product particles against the screen and product impact by the rotating beaters. Varying screen apertures may be fitted according to the final product specification required.

Advantages:

1. Electricity savings of up to 30%
2. Minimum shredding of the product
3. Simplified scheme of grinding
4. High reliability
5. No need to aspirate

Model	GTCM-0.4	GTCM-0.8
Capacity (ton/hr)	0.6	1.2
Power (kW)	3.0	5.5
Overall dimensions		
Length (mm)	500	650
Width (mm)	500	650
Height (mm)	1450	1450
Weight (kg)	90	110

Designed for milling groats and similar granular products and is widely used in specialty grinding operations and for size reduction applications. The mill consists of a main body assembly with a stationary set of impact pins and high speed rotating impact pins driven from a direct coupled motor. The product is feed into the mill via gravitation and particle size reduction is achieved through the impact action produced by the rotating and fixed pins

Advantages:

1. High flour extraction rates
2. Control of milling intensity
3. Minimizing over grinding of the product
4. High reliability
5. Simple grinding arrangement
6. High technological efficiency
7. Versatility
8. Durable design
9. Enables to reduce the use of expensive grinding mills and sifters

4.2 Impact Mill



Model	GISM-1.5
Capacity (kg/hr)	1000-1500
Power (kW)	5.5
Overall dimensions	
Length (mm)	620
Width (mm)	660
Height (mm)	635
Weight (kg)	175

4.3 Plan Sifter



This machine is designed for the classification and grading of milled products from hulling and milling of cereals, pulses, and similar particle size separation applications for intermediate screening and to meet final product quality specifications.

Advantages:

1. Low dynamic loading on the suspension beam arrangement
2. Weight is 2-3 times lower than comparable plansifters
3. The body of the sifter and sieve frames are made of aluminum and stainless steel to meet modern sanitary and epidemiological requirements;
4. Dust free operation not requiring aspiration
5. No by-products
6. Easy and convenient changing of sieves ensures minimal costs when using alternative sieve screen sizes
7. Highly effective sieves cleaning ensures complete use of the entire screening surface
8. Components from leading European manufacturers
9. Use of modern materials significantly extends the service life of the sifter

Model	GTSC-4
Power (kW)	3
Frequency of circular oscillations of the body s^{-1} (count/min)	160
Screen area (m ²)	20
Number of frames in each section	20
Number of sections	4
Overall dimensions	
Length (mm)	1750
Width (mm)	1750
Height (mm)	2300
Weight (kg)	1000

Designed to screen products within hulling and milling processes, as well as for security screening for final quality control. These sifters are also used to control waste and separate coarse and fine fractions from many types of industrial finished products in a wide range of processes.

The machine consists of a body assembly, gear motor drive and rotor with two sieve drums. The product entering the machine through the infeed chute is fed by the screw feed into the sieve drum, which is split into two fractions. The coarse fraction product retains on the second sieve drum while the fine fraction passes through the screen apertures. The separate fractions are discharged separately from the respective hopper outlets. The screens are cleaned by the inert cleaners and brushes.

Advantages:

1. Separation of the product into four fractions
2. The absence of litter
3. Convenience and ease of replacement screens

Model	GTBM-0.8	GTBM-1.2	GTBM-2.0
Capacity (kg/hr)			
On sorting	700-800	1000-1200	1300-1800
On waste emission	300-50	400-700	500-900
Power (kW)	0.55	0.7	0.75
Overall dimensions			
Length (mm)	1520	2000	2922
Width (mm)	840	840	938
Height (mm)	1200	1270	1817
Weight (kg)	1200	1270	1817

4.3 Orbital Sifter



4.4 Bran Finisher



Model	GTBM-0.5	GTBM-1.5
Capacity (kg/hr)	500	1500
Power (kW)	3	5.5
Overall dimensions		
Length (mm)	1144	1600
Width (mm)	403	510
Height (mm)	1329	1600
Weight (kg)	315	400

Designed for recovering flour from bran within the milling process and also for cleaning up hulled groats within oat milling processes. The machine consists of a frame structure, gear drive and a body assembly in which the rotor is mounted with beaters and sieve/screen c/w Clamping rings. The product flows into the machine through the feed intake and is processed as a result of attritional interaction of the rotating beater assembly with the screen surface area.

Advantages:

1. Metal-intensive sturdy construction
2. High efficiency and reliability (working parts coated with wear-resistant coating)
3. Small dimensions and low power consumption make it easy to operate and maintain the machine
4. Possibility of installing various screen types to meet different requirements – screens easily replaced.
5. Automatic control of grain processing degree allows for increase productivity and technological efficiency
6. Components from leading European manufacturers
7. Outrigger bearings protected from dust and thus greatly increase the overhaul interval of the machine

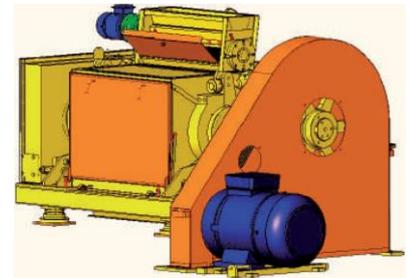
The flaking roller mill is designed for the production of oat flakes, maize flakes, buckwheat, wheat flakes, pea flakes, millet flakes, etc. and is incorporated within oats-mills for the processing of rolled oats, as well as meeting universal flaking requirements within animal feedstuff and the processing of specialty flaked cereal grains such as rye, rice, barley, etc.

Steam treated grain with the help of the feeder enters the working area of the machine with an operating clearance between the rotating rollers, where the product becomes flattened to the size, which corresponds to roll gap

Advantages:

1. High efficiency by adjusting the thickness of the flakes during the flaking mill's work
2. Simplicity of maintenance due to the technological optimization of the construction
3. Ease of installation, operation, maintenance
4. Components of the known European manufactures are used

4.5 Flaking Mill



Model	GTPM-0.5
Capacity (ton/hr)	1
Power (kW)	45.37
Aspiration (m ³ /hr)	500
Overall dimensions	
Length (mm)	1660
Width (mm)	3323
Height (mm)	1729
Weight (kg)	5549

4.6 Fluid Bed Dryer



The dryer is designed for thermal processing (drying and cooling) of cereal flakes and extruded shapes from flaking and extrusion operations. Feed product is supplied onto the drying (cooling) zone perforated bed and the heat or cooling treatment is carried out by fluidization air, which is passed through the product layer opposite to the gravitational state of the product mass. Each particle of the product is washed by air, so that the drying air is given the maximum external contact to the surface of the product. The product is constantly moving from the point of infeed to the point of discharge, which prevents overheating. The hot air coming through the fan and heaters, directs into the drying zone of screens, and the cold air through the fan is directed into the cooling zone of screens. The dried and cooled product is discharged through a valve

Model	GTXO-50	GTXO-150	GTXO-300	GTXO-500
Capacity (kg/hr)	60-80	180-250	360-500	600-800
Screen area (m ²)	0.5	1.5	3	5
Overall dimensions				
Length (mm)	1890	2900	4220	4420
Width (mm)	480	770	1200	1600
Height (mm)	1800	2300	2850	3150
Weight (kg)	3040	3750	4460	5170

5 – MATERIAL HANDLING AND CONVEYING EQUIPMENT

Screw Conveyors



Designed for moving free-flowing materials in the horizontal and inclined planes up to 35° and supplied in a wide range of sizes and capacities.

Drag Conveyors

Designed for the transportation of grain processing products, feed other free-running materials

Available in a Wide range of sizes



Bucket Elevators

They are designed for vertical transportation of grain and grain products within processing applications.

Included: gearbox/ motors manufactured in Europe, motion sensor and belt alignment sensor.



Cyclones

These are designed for air receiving applications from processes and general exhaust installation to meet dust control requirements

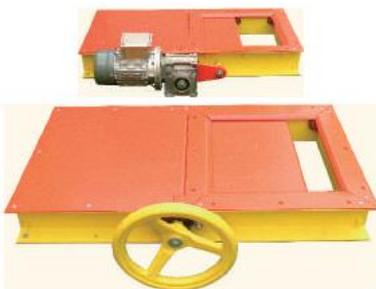


High pressure fans

Incorporated within the systems for pneumatic conveying



Slide Gate Valves



Conveying Ducting and clamps



Two-way diverter valves



6 – LABORATORY EQUIPMENT



Laboratory Mill

Designed for milling of laboratory grain samples and other solid foodstuffs with moisture content not higher than 18% in order to prepare for subsequent determination of grain quality

Transillumination unit

Designed for grain hardness determination according to its optical properties for checking grain vitreous qualities



Laboratory Mill

Designed for refinement of laboratory grain samples of cereals and processed products in order to prepare the samples for subsequent analysis

Drying Oven

Designed for cereal grain and related product drying at pre-determined temperatures. The principle of operation of the drying oven is based on an even drying of the sample within an air stream (air-thermal method)



Universal Grain Divider

Used for the selection of samples of the required weight from the original sample of leguminous, cereal grain, oil-bearing seeds, etc. up to 8 liters' volume by equally dividing the sample as it passes through the transfer chute arrangement. Widely used in testing stations and intake receiving offices

Sheller for rice and switchgrass

Used for mechanization of shelling process when husking grains and separation of husked products particularly switchgrass and rice grains



Laboratory Huller

Used for testing and research & development applications in hulling processes

Grain litre-unit Scale

Designed for grain unit determination (grain weight per liter)





Laboratory Cooler with Weigh Bottle

Designed for cooling of weighting bottles with the product after drying in the drying oven and other testing units during grain moisture content determination within grain elevators, mills and factory laboratories

Laboratory Sifter (three station)

Mainly recommended for use in cereal research laboratories, mills and grain testing stations for: determining grain contamination by insects; weed seeds and grain impurities, grain size and content of small grain; quality of milled cereals and sieving classification analysis contamination by granary pests



Thermo-sensors

Used for temperature measurement of free-flowing materials (grain, mix feed and seeds, etc.), which may be inclined to overheating during storage

Sampling probes

These are designed for grain sampling. They allow convenient taking of samples simultaneously at several levels, with grain depth up to: 1.5 m; 2 m; 3 m



Grain Sample splitters

Used to ensure a homogeneous and representative separation of grain samples

Digital moisture meter

Suited for moist determination of cereal grains and prepared foodstuff with automatic regulation of temperature of the machines dehydration plate



Kneader

The kneader is designed for dough kneading from whole grain meals (wheat & rye) and flours for determining the quantity and quality of gluten

Hand Press

This is designed to provide a sample of oil from sunflower, rapeseed and other oilseeds for further analysis to determine the acid number and extraction quality

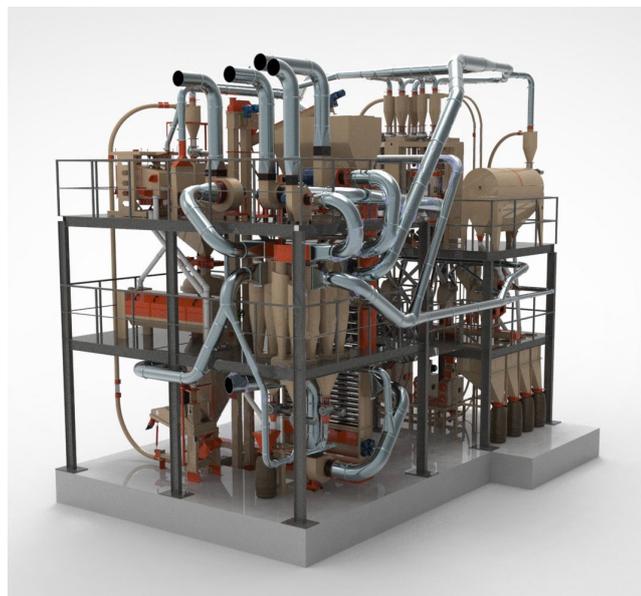




Modular Specialty Cereals Processing Assembly



**High Capacity Grain
Pre-cleaning Installation**



**Modular Milling
Arrangement**