

COMPLEX SOLUTIONS FOR GRAIN STORAGE AND HANDLING



AGRICULTURAL HOLDINGS



TRADERS



FARMERS



PORTS



OIL EXTRACTION PLANTS



MIXED FODDER PLANTS



SEED PLANTS



FLOUR MILLERS



BREWERIES



ALCOHOL PRODUCERS

KMZ Industries is a leading provider of complex solutions for grain storage and handling in Ukraine.

- European standards for design, production, installation, and servicing.
- Automation of technological processes.
- Integration of separate grain storage areas (weighing, laboratory, drying, cleaning, storage, shipping) into a single automated control system.

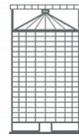
KMZ Industries is the only Ukrainian manufacturer of grain storage and handling equipment with 100% foreign funds. The owner of the company, Dragon Capital investment company, guarantees the company's reliability as a business partner.





ALL GRAIN STORAGE COMPLEX COMPONENTS FROM THE SINGLE MANUFACTURER

KMZ Industries manufactures a new generation of grain storage equipment that fully complies with the EU quality standards.



Silos



Grain dryers



Conveying equipment



Grain cleaners

- Flat bottom and hopper silos with storage capacity up to 21.315 m³ (16.625 t of wheat), with diameter up to 32 m.
- Brice-Baker grain dryers with capacity from 9 to 300 t/h and gas consumption from 0.9 m³/ton-percent.
- DSP grain dryers with a capacity from 25, 50 and 100 t/h.
- Conveying equipment: bucket elevators up to 800 t/h capacity; chain conveyors – up to 500 t/h; auger conveyors – up to 200 t/h; belt conveyors – up to 1.500 t/h.
- KBS grain cleaners with a capacity up to 200 t/h for coarse separation.
- Auxiliary equipment with throughput capacity up to 1.500 t/h (including self-gravity tubes).

Unique solutions for customers of KMZ Industries are developed by the company's own engineering department. The company has an installation department, maintenance department, and grain storage automation department.



Design



Manufacturing



Installation and service



Automation

MANUFACTURE



The facility is equipped with the most advanced high-precision technological equipment in Ukraine — Japanese and American equipment lines by AMADA and BRADBURY, FICEP and SMEC processing machines.

KMZ INDUSTRIES FEATURES ADVANCED TECHNOLOGIES AND INNOVATIONS

Production facilities are located in Karlivka, Region of Poltava (Karlivskyi Machine-Building Plant PJSC).

In 2012 KMZ Industries has acquired the British company Brice-Baker – one of the leading European manufacturer of grain storage equipment. The unique engineering solutions for grain dryers and silos have been purchased. The company's production facilities were modernized and product lines were upgraded.



SILOS

- The first large-scale mass production of steel silos in Ukraine.
- The first silos were installed in 2004 and 2005, and have been in continuous operation ever since.
- Over 7.000.000 m³ of storage have already been commissioned.





THE WIDEST RANGE OF STEEL SILOS IN UKRAINE

- 88 models: storage capacity from 10 to 16.625 t, diameter from 2.7 to 32 m.
- 2 model lines: BBK (English version) and SMVU(A) (Ukrainian design).
- Flat bottom silos, hopper silos, silos for flour storage.
- 1 m diameter step of BBK silos.



VERSATILITY

- For all types of cereal crops, oilseeds, production wastes, various granulated materials and pellets.
- Due to the different angles of bottom inclination (45-55-62-65°), hopper silos are applicable for operational storage of all cereal crops, including primary grain cleaning products.



GRAIN STORAGE QUALITY

- Preservation of grain quality features for up to 12 months.
- Interactive system for temperature measurement and grain level control.
- System of uniform grain distribution (for SMVA 220 and 275 models).
- Wide variety of ventilation systems for hopper silos and flat bottom silos.



SILOS QUALITY

- Minimum operating life of 15 years.
- Made of S350GD high-strength galvanized steel from European manufacturers (zinc coating up to 600 g/m²).
- An innovative metal coating of «zinc + magnesium» for roofs provides long-term protection against wear.
- Withstand high wind and snow loads:
 - snow load — up to 320 kg/m²;
 - wind load — up to 73 kg/m² (148 km/h).
- Design loads comply with DIN, DSTU, DBN, and EUROCODE.



QUICK AND CONVENIENT INSTALLATION

- Perfect geometry of silo parts manufactured at Bradbury automated production line.
- Special markings on panels and reinforcement ribs eliminate selection errors and reduce the time for selecting panels for tiers.
- Height of silo panels (1.200 mm). The higher the panels the smaller number of items which are required for silo installation.
- Systems of catwalks with sturdy decking and railing for quick and safe access for servicing equipment.

FLAT BOTTOM SILOS



2 TYPES OF SILO ROOF FRAMES (see page 10)



3 METHODS FOR JOINING ROOF SECTORS (see page 10)



TWO-LEVEL ACTIVE VENTILATION SYSTEM

- Roof fans are installed on silos with diameter of 11 m or more to remove moisture under the roof.
- For effective ventilation are used the fans which ensure blowing the air through the grain mass of fully loaded silo. Fans capacity is not less than 4 m³/h per ton of grain weight.
- Deflector-type air ducts minimize dust retention at junctions with the roof.
- If necessary, blows insecticides through the stored product.



WIND RINGS

Mounted on high silo bodies and on large diameter silos roofs.

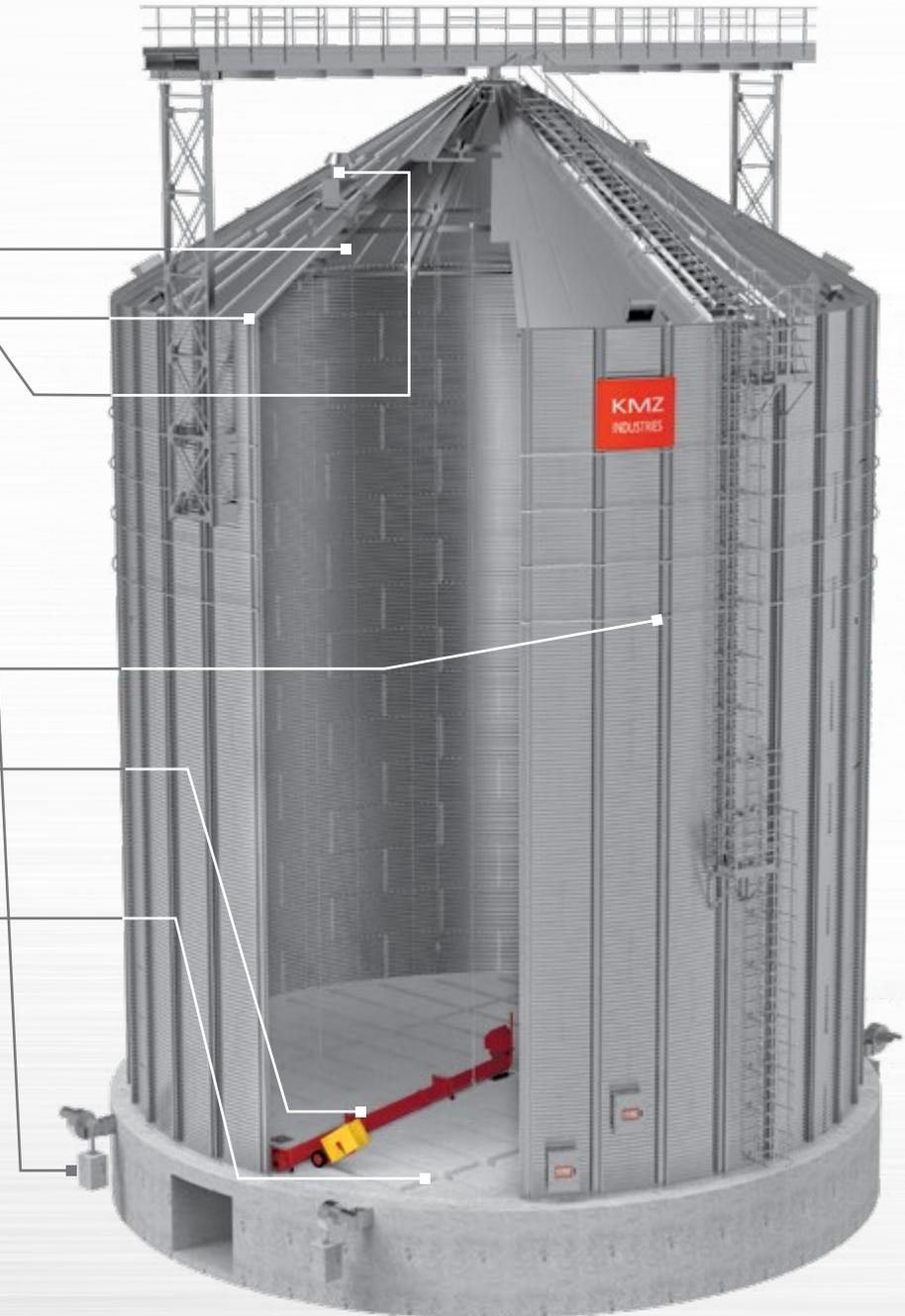


HIGH PERFORMANCE SWEEPING AUGER

- Production capacity of 50 t/h, 120 t/h and more.
- With remote control and travelling mechanism.



AERATION SYSTEM (see page 11)





BB-LOCK SYSTEM

- A special lock created by an automatic line on each panel to ensure a tighter fit of the panels.



STIFFENERS: MINIMUM AND SUFFICIENT

Minimum and sufficient number of stiffeners based on the silo diameter:

- 2 stiffeners per panel — for all hopper silos and flat bottom silos with a diameter up to 16.5 m.
- 3 stiffeners per panel are mounted on flat bottom silos depending on the loads.



DOORS AND STAIRS FOR EASIER OF OPERATION

- Standard configuration of the flat bottom BBK and SMVU silos includes 2 doors (on two lower tiers) for silo access as well as for installation and operation of the cleaning screw mechanism.
- The internal door of the 2nd tier is equipped with a sampling unit.
- The doors of the 2nd tier have internal and external ladders for easy access of maintenance personnel to silo.



ACCURACY AND STRENGTH OF BOLTED JOINTS

Geometric accuracy of bolt holes in panels and ribs. Fastening are used M10 and M12 bolts, strength grade 8.8, complete with nuts, conical washers and gaskets.



INTERACTIVE SYSTEM FOR TEMPERATURE MEASUREMENT AND GRAIN LEVEL CONTROL

- Thermal sensors and multipoint temperature transmitters for layer-by-layer temperature control (with 1.5 m increment).
- Premium configuration includes installation of radar-type sensors for continuous measurement of grain level inside silo.



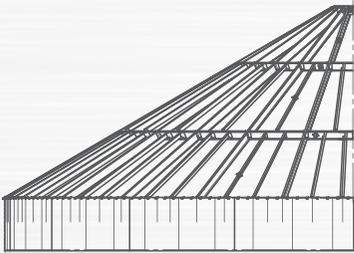
DIFFERENT SYSTEMS OF GRAIN UNLOADING

- Unloading conveyor in the foundation (chain and screw-type). For options without underground gallery.
- Side grain unloading.
- Standard unloading system by the central and lateral funnels.

FLAT BOTTOM SILOS

2 TYPES OF SILO ROOF FRAMES

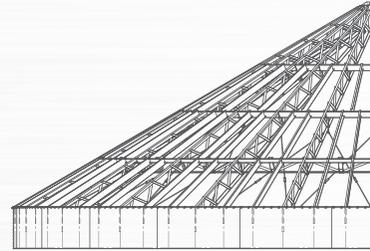
All design loads are based on DBN (BUILDING CODE OF UKRAINE) and EUROCODE requirements.



BEAM TYPE

Brice-Baker and SMVU product line

Lightweight, less metal-intensive. Simple and faster to install.



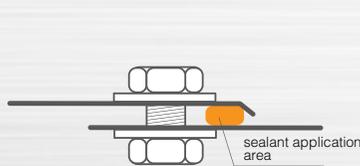
TRUSS TYPE

SMVU product line (silos with diameters of 183, 220 and 275 cm)

Frame to ensure the structural strength.

3 METHODS FOR JOINING ROOF SECTORS

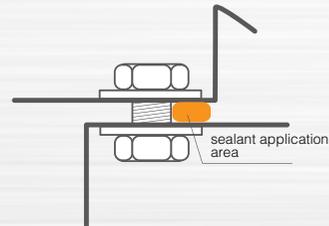
IMPORTANT! Apply sealant (mastic) to the joints so that the water flows outwards.



OVERLAP

SMVU product line

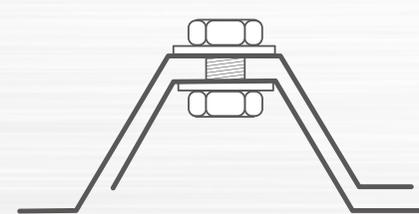
Sealed roof sectors are overlapped.



F-RIB

BBK product line

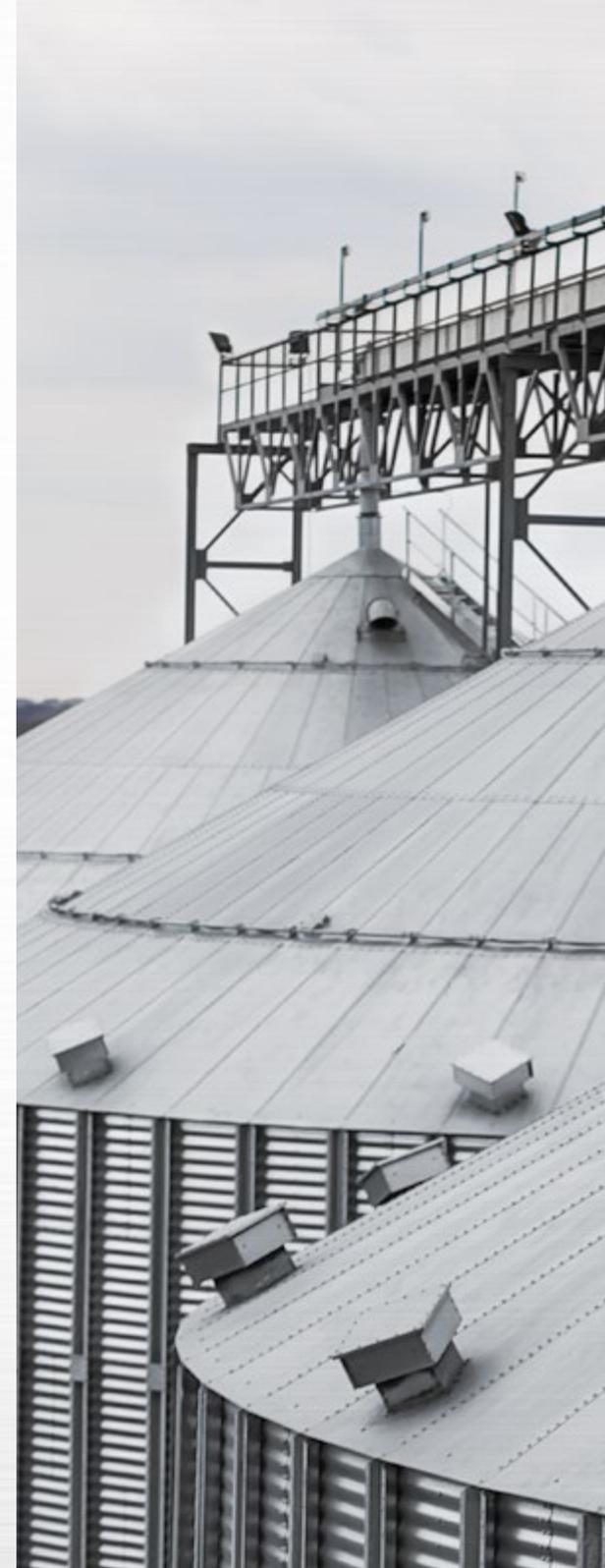
Sealed roof sectors have reinforcement ribs.



V-RIB

BBK product line

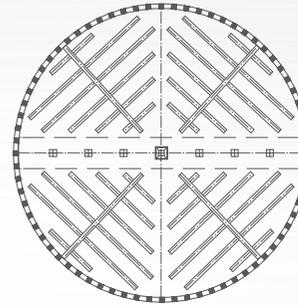
Roof sectors form a double reinforcement rib with 70 mm height.



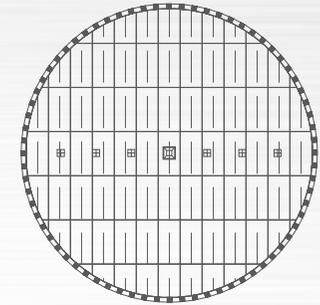


AERATION SYSTEMS FOR DIFFERENT MODELS OF FLAT BOTTOM SILOS

Various options of bottom aeration for uniform and complex air supply.

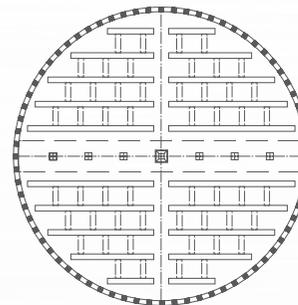


«HERRINGBONE»

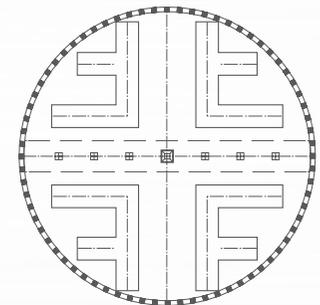


CONTINUOUS

Aeration channel width, m	0.3	Without restrictions
Silo floor area occupied by ducts	15%	100%



LINES



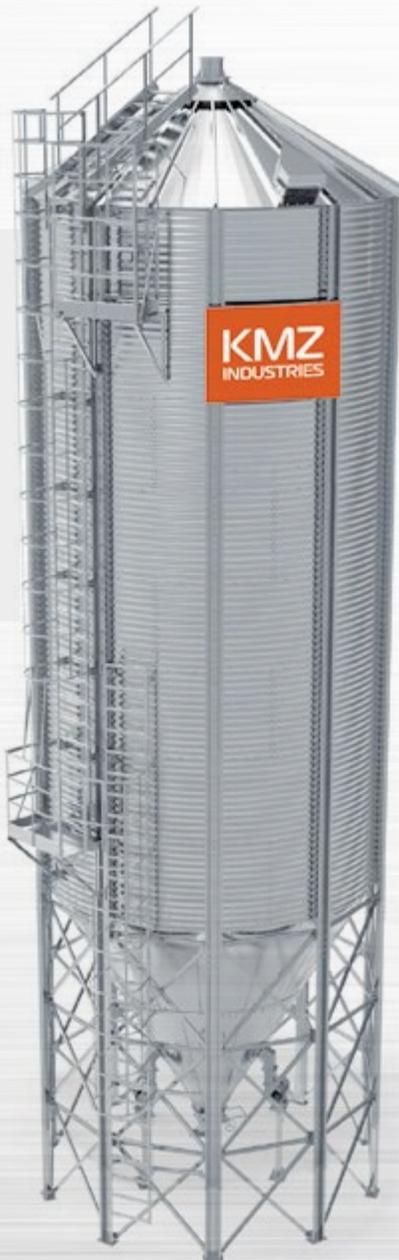
F-SHAPED

Aeration channel width, m	0.3	1.8
Silo floor area occupied by ducts	13-15%	13-15%

HOPPER SILOS

EQUIPMENT

- Upper grain limit level sensors.
- Inspection and service hatches.
- Ergonomic scaffolding and ladders with handrails and guardrails for ease of use.



Operational storage of most types of cereal crops and primary cleaning products (husks and extraction cakes).



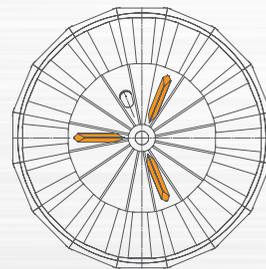
INTERACTIVE SYSTEM FOR TEMPERATURE MEASUREMENT AND GRAIN LEVEL CONTROL

- 24/7 grain temperature control to prevent the product self-heating inside silo.
- Detection of silo filling level.
- Special software sends information to a PC or manual measuring instrument.
- Digital multipoint temperature transmitters with layer temperature control and temperature sensors with of 1.5 m step.

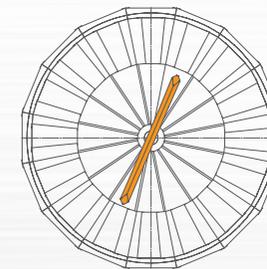


TWO-LEVEL VENTILATION

- Cools the grain after drying to prevent self-heating inside the silo.
- Distributes the internal moisture of the grain after stage 1 of two-stage drying.
- Cools down the grain in the winter to destroy pests.
- Wall air ducts are used for layered ventilation (removal of moisture from lower tiers) (SMVU model line, diameter > 7.3 m).



WALL-MOUNTED AIR DISTRIBUTORS



TRANSVERSE AIR DISTRIBUTOR

2-3 ventilation ducts symmetrically arranged on the conical bottom. Fan with external air inlet system.

Transverse box with external fan.



Welded metal silos for short-term bulk storage of flour, grain and grain processing products at food industry enterprises, grain processing and storage facilities.

Storage volume from 8.5 to 52.9 m³.

SPECIFICATION

- Welded vertical body with service hatches.
- Inspection hatch for conical bottom maintenance.
- Manifold with pipes for breakdown (blowing) of caked product.
- Easy detachable roof.
- Inspection hatch on roof.



SIMPLIFIED SILO INSTALLATION DUE TO ABSENCE OF BODY ASSEMBLING ON SITE



OPTIONAL SCOPE OF DELIVERY INCLUDES

- Support for lifting the bin to a higher level.
- Rotary feeder for bin discharge.
- Pneumatic gate for opening and blocking the movement of flour or grain.

GRAIN DRYERS



- More than 500 grain dryers produced by KMZ Industries are currently in operation in Ukraine.
- First high-capacity Brice-Baker BB.SCN 21/96 grain dryers with a capacity of 294 t/h were installed in 2015 at Voronovyske GCS (Grain-Collecting Station), Alebor Group.
- High-efficient Brice-Baker BB.SCN 7/24 grain dryer with 25 t/h capacity, which runs on alternative fuel (wood chips), was installed in 2017 at Kobzarenko Plant.



SAVINGS OF OPERATING COST

- Specific consumption of natural gas from 0.9 m³/ton-percent.
- Recuperation.
- Operation based on exhaust principle. Uses 40% less energy compared to grain dryers using air pumping.
- Energy efficient direct flame gas burners (Tecflam, Promgazaparat).
- Insulation with non-combustible basalt plates to increase energy efficiency by reducing heat transfer.



AUTOMATION – MINIMIZATION OF ERROR

- Grain dryer with 100% automation. Process control from the operator's workstation.
- Preventive fire alarm. Eliminates overheating and exceeding the operating temperature limits.
- Saving selected drying recipes. Creating and saving custom recipes.
- Temperature monitoring.
- Grain moisture control, fan vibration control (optional).



VERSATILITY

- Drying of all types of cereal crops, oilseeds and legumes.
- Operation on all types of fuel (simultaneous connection of two kinds of fuel is possible).
- High efficiency in wet grain handling.
- Adjustable cooling zone.



SCALABILITY

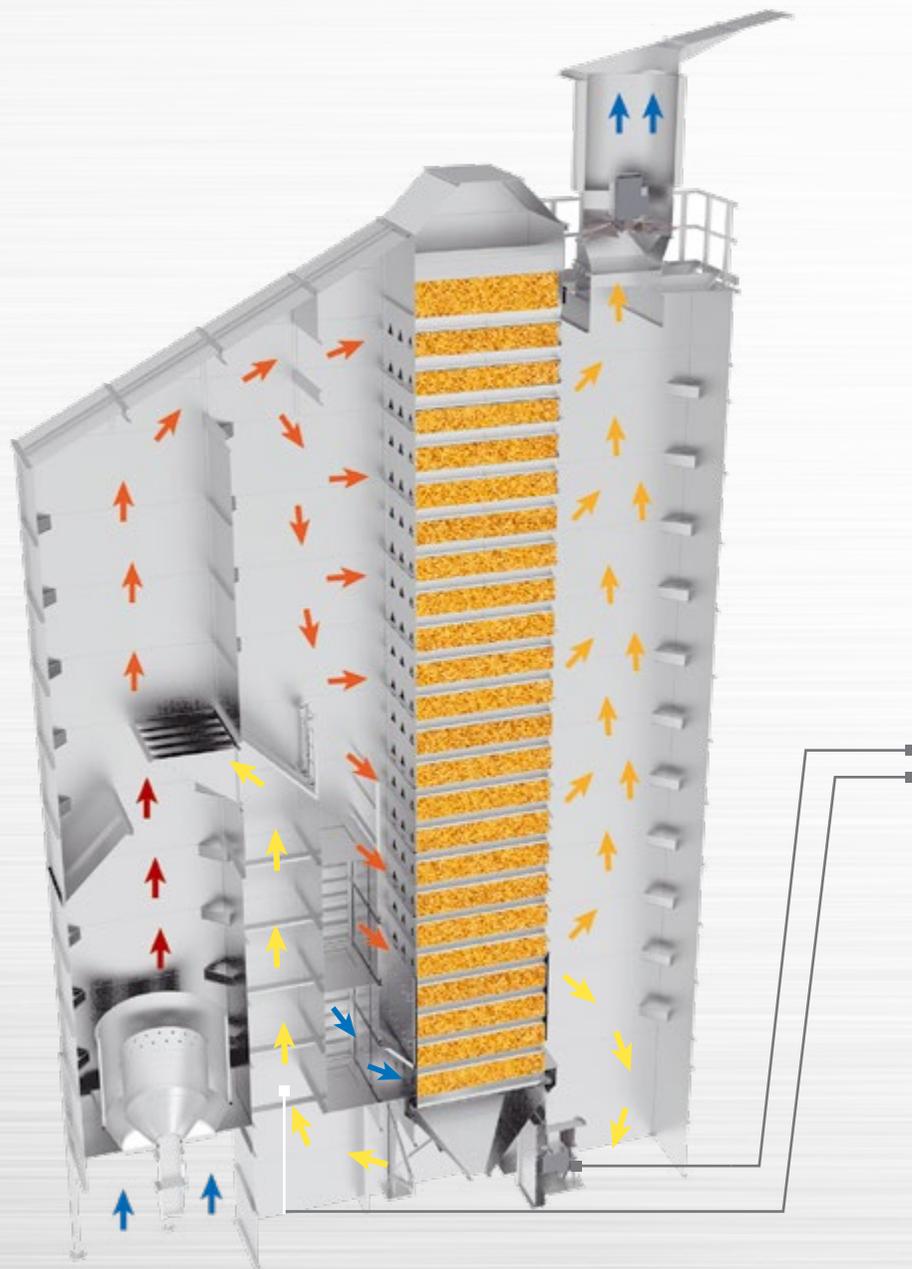
- Wide product range. Production capacity from 9 to 300 t/h.
- Modularity: possibility to expand and increase power by adding sections.



ENVIRONMENTAL SAFETY AND QUALITY

- Aspiration system that captures up to 97.85% of dust.
- Meets the requirements of TUU 28.9-14311169126:2016, DSTU EN 1050:2003, DSTU EN 292-22001 (EN 292-2:1991, IDT), DSTU EN 60204-1:2006 (EN 60204-1:1997, IDT), GOST 12.2.124-90, and GOST 12.2.007.0-75.

BRICE-BAKER GRAIN DRYER



GRAIN TEMPERING ZONE

- Special removable partitions for forming a tempering zone in the drying shaft before cooling (optional).
- Tempering zone protects the crop from sudden temperature changes that cause grain cracking.

HEAT RECUPERATION

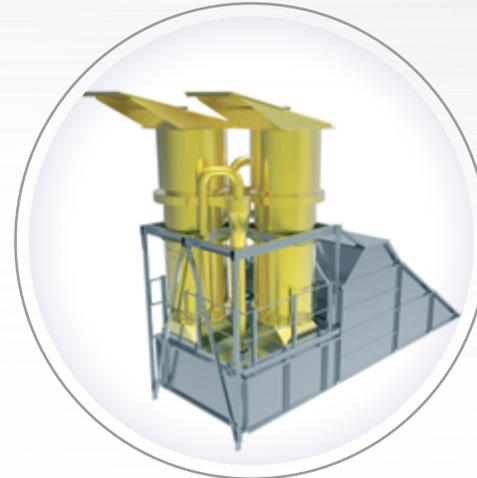
- Part of the hot exhaust air with the lowest moisture content and the air after cooling are fed through the fan into the hot air chamber for reuse.
- Up to 30% lower fuel consumption compared to grain dryers without recuperation.
- Air is fed into the hot air chamber bypassing the gas burner. This ensures fire safety.

- ➡ Environmental air
- ➡ Air heated by a burner
- ➡ Air heated by a burner, mixed with regeneration air
- ➡ Exhausted, steam-saturated air
- ➡ Recuperation air for reuse



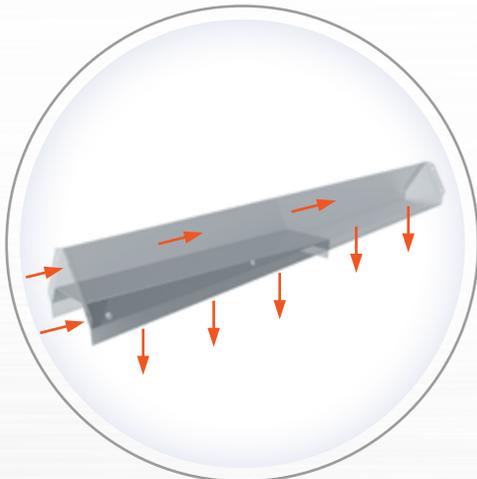
GRAIN DRYER INSULATION

- The drying chamber and the hot air chamber are covered with basalt non-combustible plates (thickness of 50 mm, density of at least 100 kg/m³).
- In addition to reducing the heat dissipation, they provide sound insulation.



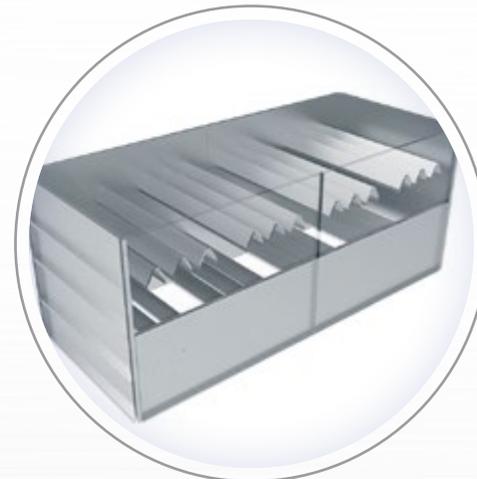
HIGH EFFICIENCY DUST REMOVAL (ASPIRATION)

- Dust separation by European-made cyclofans.
- Mounted on the exhaust air chamber, equipped with weatherproof covers that can be closed by the operator from the ground.
- Dust removal efficiency using this solution is at least 97.85% (based on the test report).
- Equipped with noise silencers. The noise index from the used drying agent side is <53 dBA.



DRYING SHAFT WITHOUT STAGNANT ZONES AND LOCAL CURRENTS

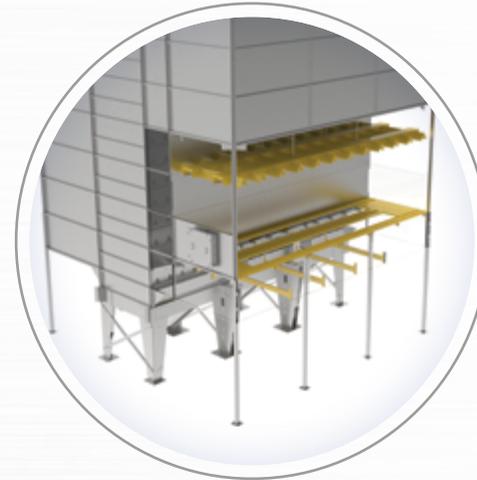
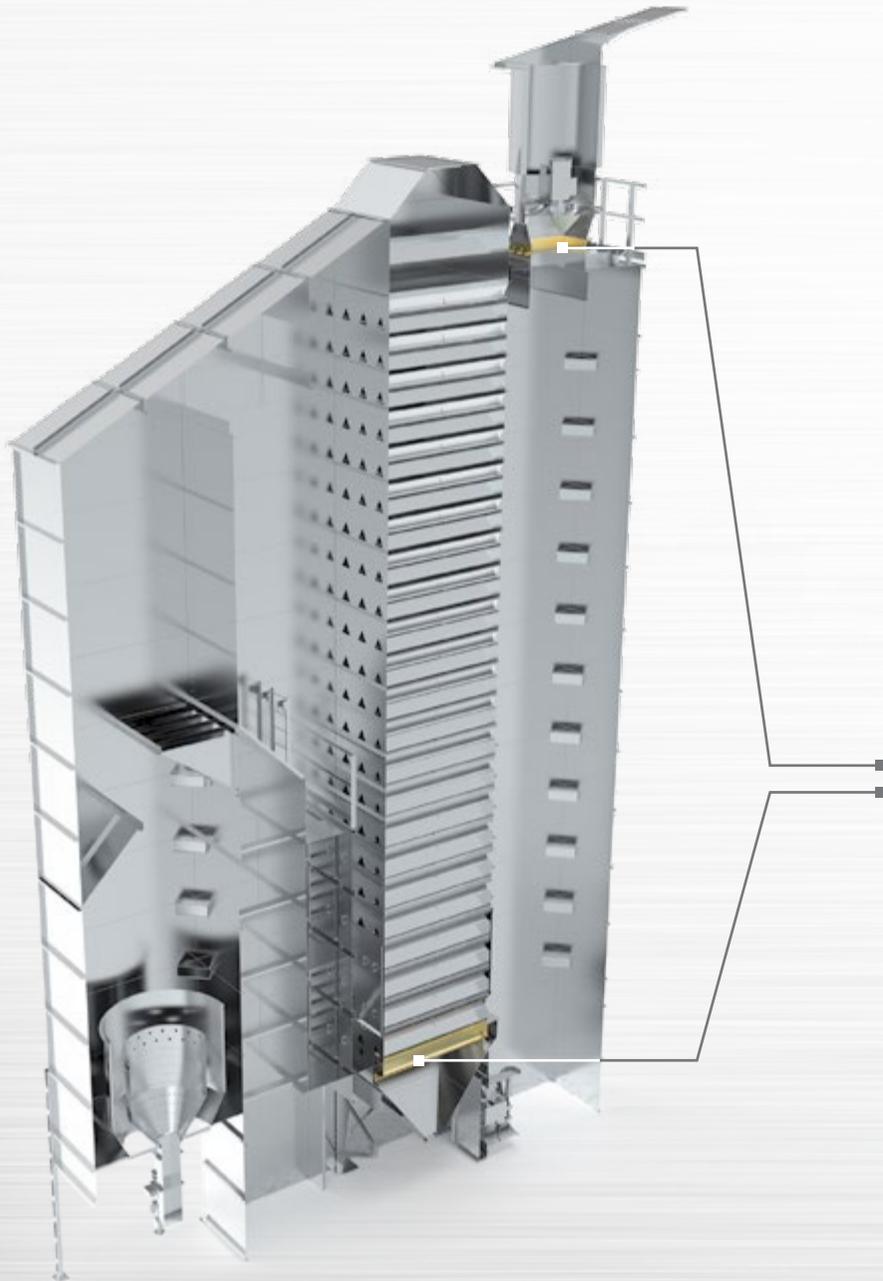
- Made from S350GD high-strength galvanized steel from European manufacturers with thickness of 2 mm (zinc coating up to 600 g/m²).
- Uniform heating of the grain mass due to the drying agent distribution and special section boxes with a technological partition.
- Uniform grain feeding and unloading is due to the checkerboard arrangement of inlet and outlet boxes. Contributes to better mixing of grain in the shaft and its free passage.



STORAGE BIN

- Pre-drying bin (storage sections) for continuous supply of grain to the drying shaft takes up to 10% of the dryer volume.
- Depending on the grain dryer width, it is equipped with level sensors that control product loading into the storage bin.

BRICE-BAKER GRAIN DRYER



ENERGY-EFFICIENT BURNERS

- Tecflam minimum torch linear burners minimize the risk of fire.
- Modulated block burners.
- The burners are located at the base of the body, protected from environmental influences, and have easy access for inspection and maintenance.

DUST SUPPRESSION SYSTEM

Dust does not flow outside the drying shaft when unloading grain.

- The maximum dusting of the exhaust air chamber occurs during unloading when grain moves quickly through the drying shaft.
- To prevent dust emissions during unloading, dampers installed under the fans are closed while the unloader is opened.
- After unloading, the dampers under the fans are opened, and the drying process resumes.

IMPORTANT! In order to prevent dust ignition, the grain dryer with dust suppression needs to be cleaned more often than a grain dryer with aspiration system.



ADJUSTABLE COOLING ZONE

- Adjustable cooling zone allows the operator to change the number of cooling sections depending on the outlet grain temperature.
- Hand movable partitions to adjust the number of cooling sections. 1 to 5 cooling sections (with increment of 500 mm).
- Possibility of increasing the time of grain stay in the drying zone when working with high wet grain.



GATES FOR ADJUSTMENT THE SPEED OF AIR FLOW

The ventilation system is equipped with gates to regulate the degree of air rarefaction. The presence of such gates is especially important when working with lightweight crops, which are blown out of the dryer by powerful ventilation. Belimo (Switzerland) actuators are located on wall panels of Brice-Baker grain dryers for easy operation and maintenance.



INTERNAL SERVICE AREAS

- Each dryer, regardless it is equipped with aspiration system or dust suppression system, must be cleaned of dust with is accumulated inside the shaft.
- Brice-Baker grain dryers can be equipped with internal service platforms that consist of ladders and platforms. The platform width is 1.0 m, which ensures easy and comfortable cleaning of the grain dryer.
- Optional internal service platforms can be installed on any Brice-Baker grain dryer.



UNLOADING DEVICE WITH PNEUMATIC DRIVE

- Reliable automatic unloading control. The pendulum unloading mechanism ensures uniform movement across the entire width of the shaft and eliminates grain damage.
- Wide openings prevents clogging. Eliminates accidental loss of grain.

CONVEYING EQUIPMENT



- The total length of chain conveyors produced in 2018 is more than 4.000 m.
- Belt conveyor has been in continuous operation for more than 10 years at the Elevator Agro grain storage complex. It is used for servicing temporary storage silos.

CONVEYING SOLUTIONS



Wide product range

- Bucket elevators (capacity up to 800 t/h).
- Chain conveyors (up to 500 t/h).
- Screw conveyors (up to 200 t/h).
- Belt conveyors (up to 1.500 t/h).



For small farms
Capacity up to 150 t/h



For linear grain storage complexes
Capacity from 150 to 800 t/h



For port terminal grain storages
Capacity up to 1.500 t/h

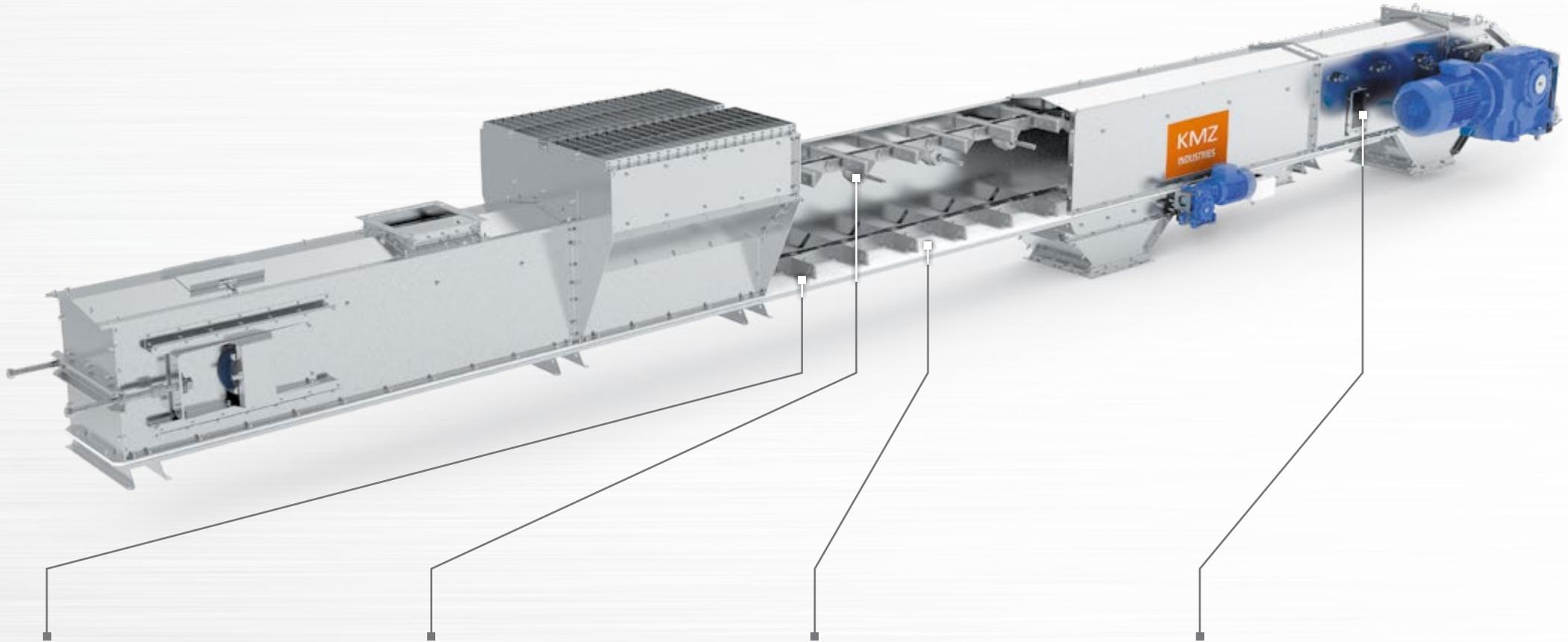
STRUCTURAL RELIABILITY

- The conveyor is equipped with supports (optional).
- All rotating elements are enclosed.
- Bolted joints of all body elements minimizes installation errors and ensures easy replacement of parts.

SENSORS

- Breakage and speed sensors for safe operation.
- “Pockets” with heavy hatches turn off the conveyor when the power supply is cut off in case the transported product accumulates at the drive station.

CHAIN CONVEYORS



POLYURETHANE SCRAPER PADS, CLEANING BUCKETS

Polyurethane pads minimize grain damage and reduce noise level. Cleaning buckets protect the drive station from grain entrainment by the moving chain. They are used in chain conveyors with intermediate unloading along the product transportation path.

ROLLER SUPPORTS

Support the idle chain branch. They are arranged at intervals of 0.5 m or more: closer pitch reduces the load on the roller supports and bearings, and their service life increases accordingly. Polymer rollers reduce noise level. Ball bearings reduce resistance to chain movement.

HIGH STRENGTH CHAIN

With a 6-fold tensile strength reserve. Low chain speed (~ 0.6 m/s) minimizes grain damage. Screw chain tensioning is applied. Chain stabilization is provided by disc springs.

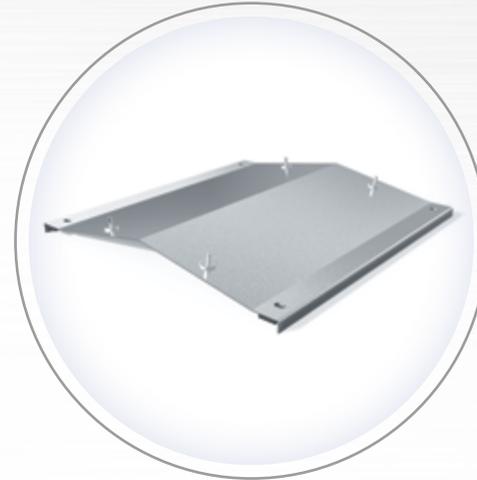
SIGHT WINDOWS AND HATCHES

2 inspection hatches, at the drive and tension stations. Inspection windows are made of organic glass, hatches completed with protective grids. Provide safe visual control of internal moving parts (drive sprocket, tension roller, chain) and product level in the conveyor.



BEARING UNITS

Exterior placement of bearings simplifies maintenance and protects the grain mass from ignition when unlubricated bearings are heated. Flanged bearing units by SKF (Sweden) or SNR (France) are used.



DOUBLE-PITCH ROOF

Prevents stagnation of water on the conveyor roof. Seals the conveyor tightly, prevents moisture and pests from getting inside, and grain dust outside.

Roof thickness: 1.5 mm; wall thickness: 3 to 4 mm; bottom thickness: 2 to 4 mm.



UNLOADING SECTION AND SLIDING GATE

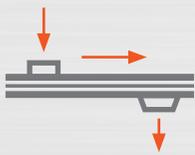
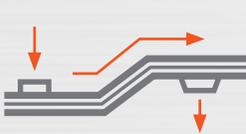
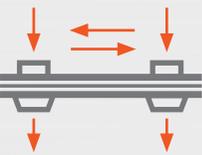
Unloading hopper and baffle plate prevent the product from contacting the drive sprocket. Intermediate longitudinal sliding gate with a special design eliminates grain penetration and uneven wear of the scrapers.



GEARED MOTOR

Geared motors with motor protection class not less than IP54 ensure stable performance. Start-up is possible when the conveyor is fully loaded with grain. Geared motors are mounted on the hollow shaft of the drive station.

SCRAPER CHAIN CONVEYORS

	STRAIGHT	Z-SHAPED	SLOPPING	REVERSIBLE
				
Designation	Conveying of grain in one direction between same-height sections	<ul style="list-style-type: none"> ■ Universal transition between sections of different heights ■ Reduced number of bucket elevators and steel structures 		Alternate grain conveying in two directions
Possibility of several unloading points on the route	€			
Grain elevation angle, °	Up to 5	Up to 30	5, 10 and 15	Up to 5
Capacity, t/h	From 20 to 500	From 50 to 350	From 20 to 350	From 20 to 500
Maximum length, m	60	30	60	60



PROTECTION LINING

We offer chain conveyors:

- with lining;
- without lining.

Chain conveyors are lined to increase their service life by eliminating the wearing of their structures. The protected parts typically include the bottom and, if necessary, side walls to the conveyed product level. The lining sheet material is bolted.

We select the optimal lining material taking into account the features of the conveyed product.

HARDOX® 450 (SWEDEN)

High abrasion resistance steel. Conveyors for sunflower, soybeans, extraction cake, and other abrasive products.

It is used for lining the bottom and walls, material thickness is 4 mm.

POLYETHYLENE PE-500 AND PE-1000

High-molecular and supermolecular polyethylene. High wear resistance, prevent sticking of wet products thanks to the slippery surface. Suitable for working with all cereal crops in storages with a small number of loading and unloading cycles. Polyethylene lining is **a low-cost protection option**, which is often used by small farm and linear grain storages.

POLYURETHANE PU-95

Synthetic polymer with high wear resistance, elastic, lightweight. Suitable **for intensive conveying** of corn, barley, rye, wheat, rice, and millet.

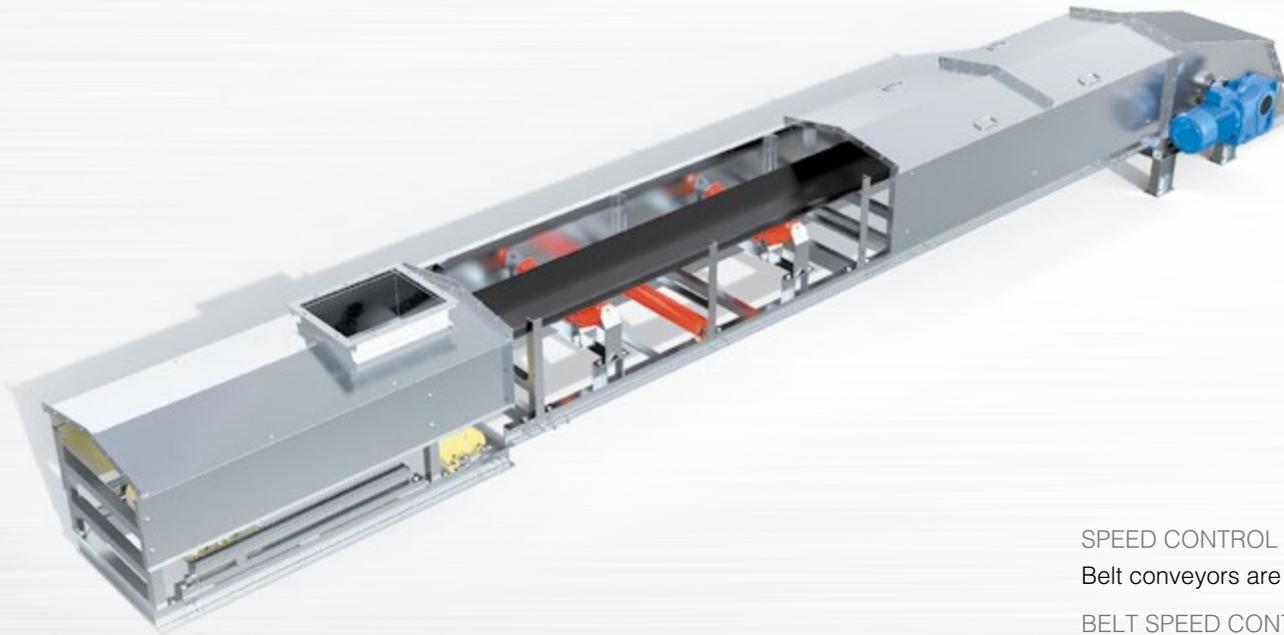
POLYAMIDE

High strength, wear-resistant material with low friction coefficient. **Often used instead of steel** and is 6-7 times lighter than steel. Polyamide reduces product wear caused by friction in two times, increasing the service life of parts 1.5 times.

BELT CONVEYOR



Basic conveying equipment at product unloading areas in marine and related types of transport.



- Safely conveys the product over long distances and with greater production capacity compared to chain conveyors (horizontal or inclined, up to 15°).
- Easy to use and install, reliable.
- It is mainly used under silos for unloading or connecting bucket elevators with chain conveyors (for sections from 70 m long).
- Does not damage grain, has a low noise level, is easily aspirated.
- The most economical conveyor in operation: consumes less electricity with the same performance indicators.
- Operates at temperatures from -20 °C to +40 °C.
- Belt speed: 2-3.5 m/s.

TENSION STATION

Provides tensioning of the belt. Tension is created by a screw or load device.

BELT ROLLERS

Support the belt along the entire conveyor path and shape it as a gutter. The upper roller consists of 3 parts, which together with the belt form a conveying chute with a roller lateral inclination angle of 15°, 30° or 45°.

SPEED CONTROL SENSOR

Belt conveyors are equipped with speed sensors.

BELT SPEED CONTROL SYSTEM

Automatically shuts off the conveyor drive and turns on the alarm:

- when the belt stops due to opening or breakage of belt;
- when there is a significant decrease in belt speed due to conveyor overload.

DRIVE STATION

Transmits pulling force to the belt and sets it in motion.

The power of the electric motor depends on the conveyor performance and length.

2 drive options:

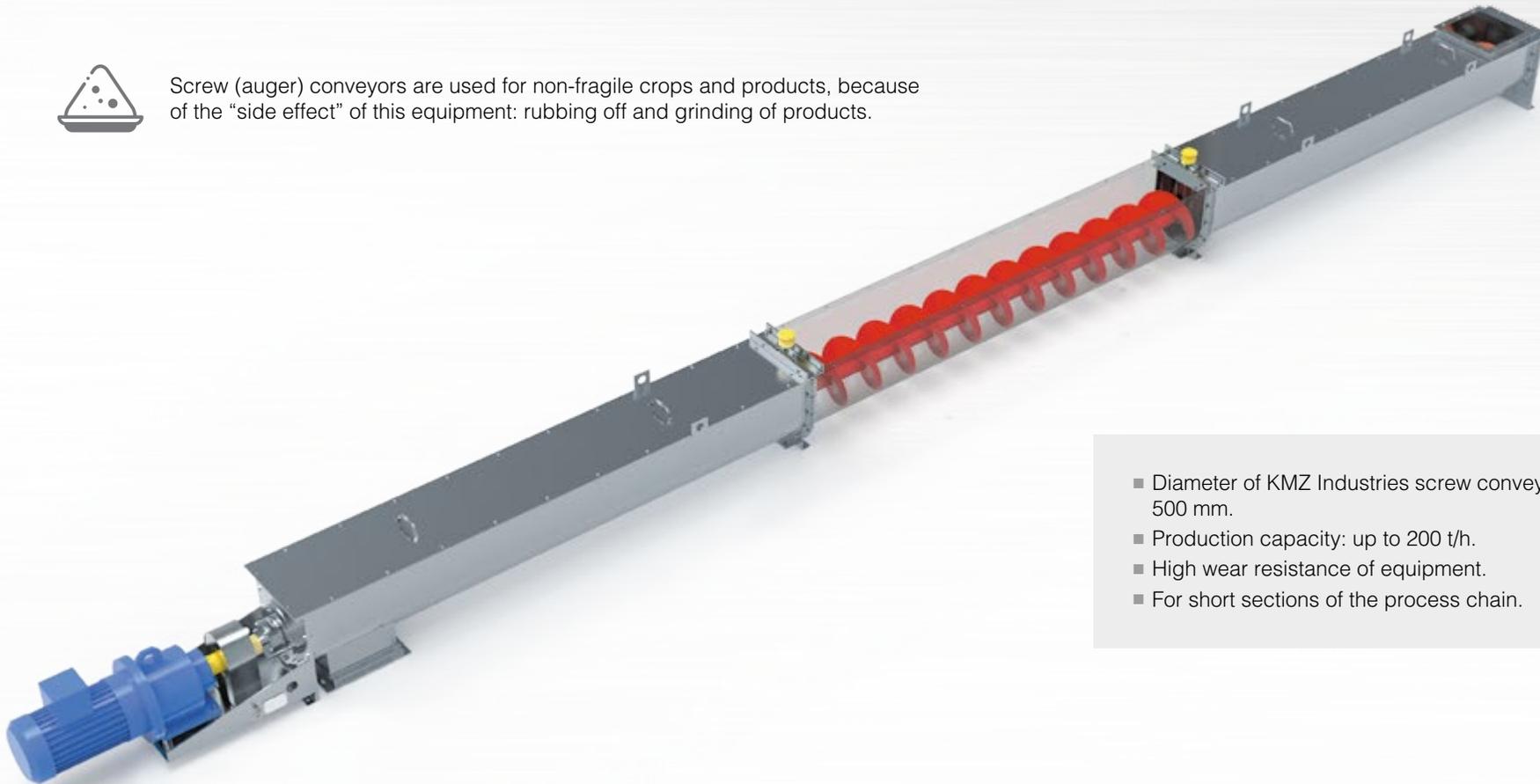
- electric motor — gearbox — drive shaft;
- gear motor — drive shaft.

SCREW CONVEYOR

No.1 MANUFACTURER OF GRAIN STORAGE EQUIPMENT IN UKRAINE



Screw (auger) conveyors are used for non-fragile crops and products, because of the “side effect” of this equipment: rubbing off and grinding of products.



- Diameter of KMZ Industries screw conveyors: 200, 300, 400 and 500 mm.
- Production capacity: up to 200 t/h.
- High wear resistance of equipment.
- For short sections of the process chain.



SMALL SIZE

May be placed at an angle of up to 60°, which saves production space. Reversible product feed.



CLOSED ROUTE

The product is transported without dust and odour due to the complete sealing of the box. No loss of transported materials.



OPERATION AND REPAIR SAFETY

Ability to transport products with a higher density due to the roller angular bearings. Quick replacement of friction parts without dismantling the entire conveyor. Transportation of loads with temperatures up to +90 °C due to temperature compensation of the auger.

BUCKET ELEVATORS



KMZ Industries manufactures 2 types of bucket elevators:

1. Bucket elevators installed inside the structure. Maximum height: 60 m. Production capacity: up to 800 t/h.
2. Bucket elevators with service platforms installed next to the structure. Maximum height: 35 m. Production capacity: up to 200 t/h. Reinforced bucket elevator with design in compliance with European safety standards (equipped with ladders with a pitch of 6 m and rest areas). Differs by reduced steel consumption since no supporting external structures are needed.

WE RECOMMEND COMPLETING THE BUCKET ELEVATORS WITH THE FOLLOWING EQUIPMENT:

- Frequency drive or torque transmission hydraulic clutch.
- Temperature control of bearings, gearbox.
- Gearbox oil cooling system.
- Explosion protection system.

ASPIRATION NOZZLE

Installed on the bucket elevator pipes for dust removal of internal surfaces (optional).

SEALING

Parts joints are sealed to prevent grain dust emission outside the bucket elevator.

BELT

Wide range of belts: oil-resistant, wear-resistant, antistatic, with protection against ignition and hot oil, etc. The belt joint is realised with overlap, stitching through buckets.



BUCKETS

Wide range of buckets:

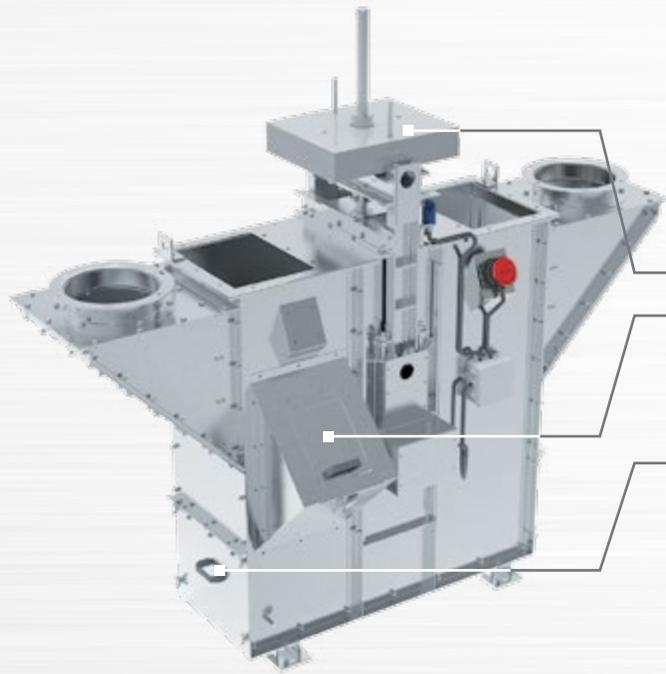
- metal;
- polymer.



MATERIAL	METAL		PLASTIC		
	STEEL	STAINLESS STEEL	POLYETHYLENE HDPE	NYLON PA6	POLYURETHANE PU
Service life	***	*****	***	****	*****
Sticky materials	*	***	**	***	****
Operating temperature, °C	180 -20	250 -20	70 -20	100 -10	70 0
Maximum peak temperature, °C	200	400	80	120	80
Cost	*	*****	*	***	****

* - minimum value, ***** - maximum value

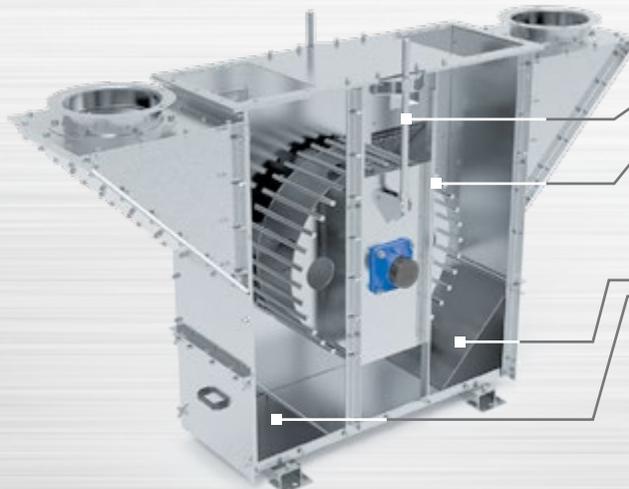
BUCKET ELEVATORS



- BELT TENSIONING WITH A LOAD
- MAINTENANCE HATCH
They are equipped with a “pocket” with an inspection hatch for manual loading of the product into the bucket elevator.
- REMOVABLE CASES WITH HANDLES for ease of maintenance.



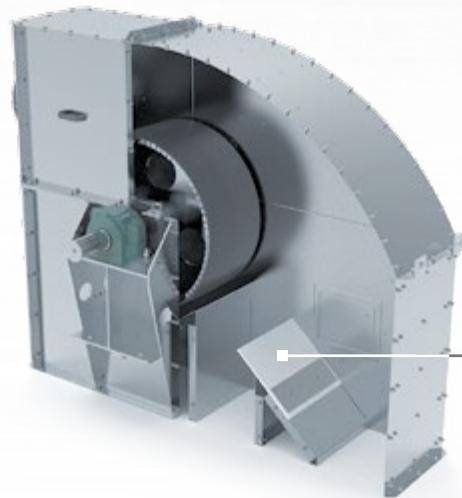
Bucket elevator head with hollow shaft drive



- BELT TENSIONING WITH A SCREW
- THE SQUIRREL WHEEL TYPE TENSION DRUM
Mounted on support bearings. The ribbed “squirrel wheel” drum of the BUCKET elevator shoe ensures gentle grain intake.
- DEAD ZONE PREVENTION PLATE
Two plates in the bucket elevator shoe that reduce product stagnation.



Bucket elevator head with flexible pin drive coupling



BUMPER PLATE
Prevents the conveyed product from spilling back.



OVERRUNNING CLUTCH

The overrunning clutch (back stop) is mounted on the bucket elevator head shaft opposite to the drive. It prevents the reverse movement of the bucket elevator belt if the elevator suddenly stops. Possible reasons for stopping: power failure, actuation of belt runaway sensors, shoe overflow, belt breakage, activation of bucket elevator overload protection. After eliminating the causes for stopping, the bucket elevator can be started immediately without additional cleaning of the bucket elevator shoe, which is necessary if the overrunning clutch is not used.

BUCKET UNLOADING CONTROL

2 inspection windows to control bucket unloading.

DRIVE UNIT

The motor enclosure protection degree is at least IP54. The bucket elevators can be equipped with elastic pin bush drive couplings that reduce shock loads when starting electric motors.

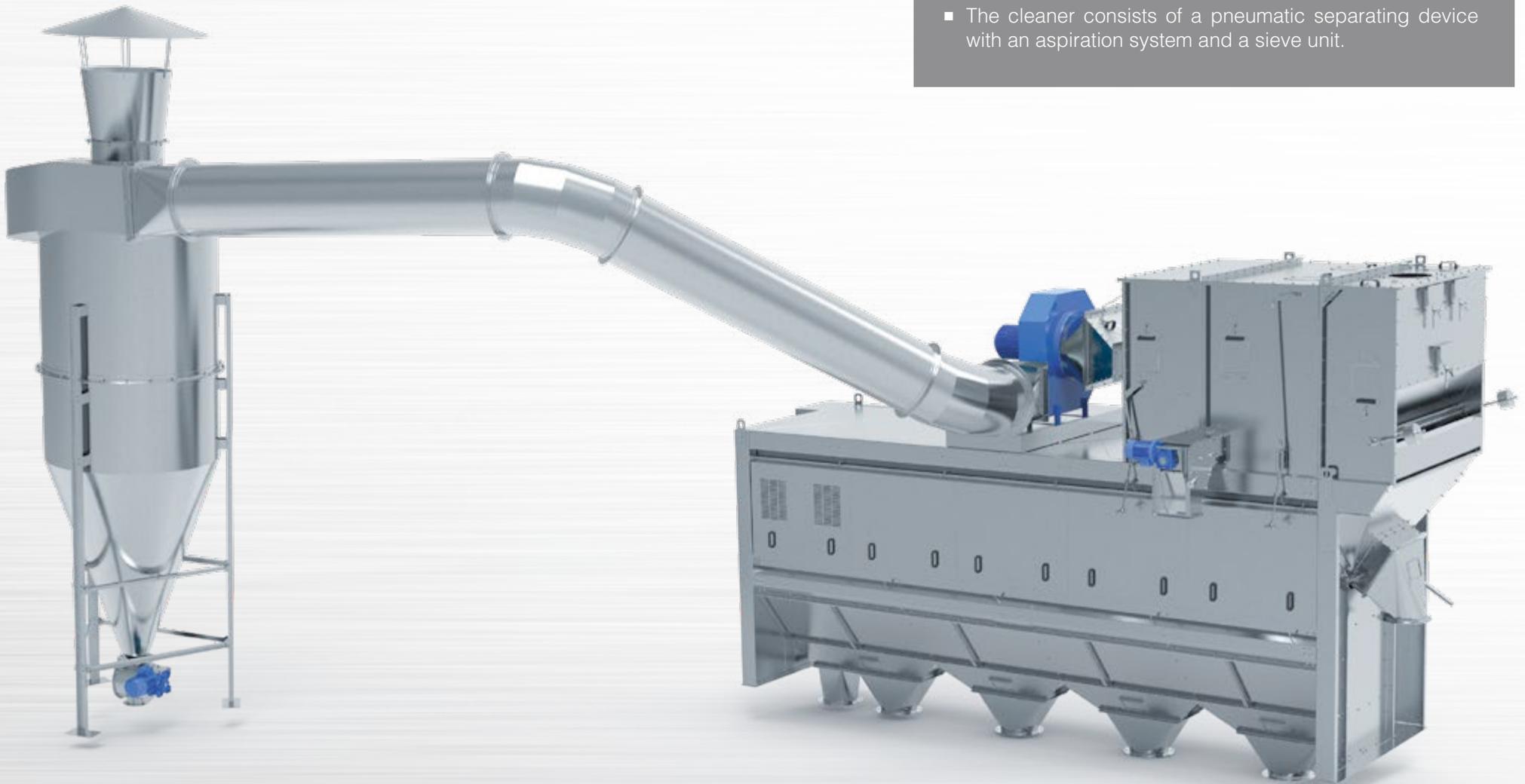
EQUIPMENT PROTECTION LINING

- A wide range of materials for lining the bucket elevator head: from polyethylene of different densities (500, 1000) to polyamide, high-density polyurethane and wear-resistant steel.
- Lining of driving drums with rubber for a better friction between the belt and the drum.

SECURITY

- Aligning roller preventing the idle branch of the belt with buckets from swinging in motion (installed on bucket elevators with height above 26 m).
- Belt speed and withdrawal sensors, limit switch and brake device (protects the belt from reverse motion).

GRAIN CLEANER



- KBS grain cleaner removes light, small and large impurities, which are separated by air and punching sieves, from the grain mass.
- Grain-cleaning machine, insensitive to moisture of the incoming material, with a large area of sieves and a powerful aspiration system.
- The cleaner consists of a pneumatic separating device with an aspiration system and a sieve unit.



EFFICIENCY

- Large sieve area (up to 20 m²).
- Production capacity: up to 200 t/h for pre-cleaning and up to 150 t/h for primary cleaning.
- To increase the productivity and cleaning efficiency of the separator, we recommend using sieves with activators.
- Powerful aspiration system for removing light impurities by air flow (air supply of 10.000 m³/h). Reduced amount of light impurities.



VERSATILITY

- Cleans all types of cereals, legumes, oilseeds, industrial crops, corn. Efficient wet grain handling.
- The possibility of using different technological schemes.
- Reducing the types of cleaning equipment used.
- Combining the functions of:
 - scalperator (grain pre-cleaning);
 - separator (primary and secondary cleaning);
 - calibrator (separation into fractions according to the mesh size).



EASE OF USE

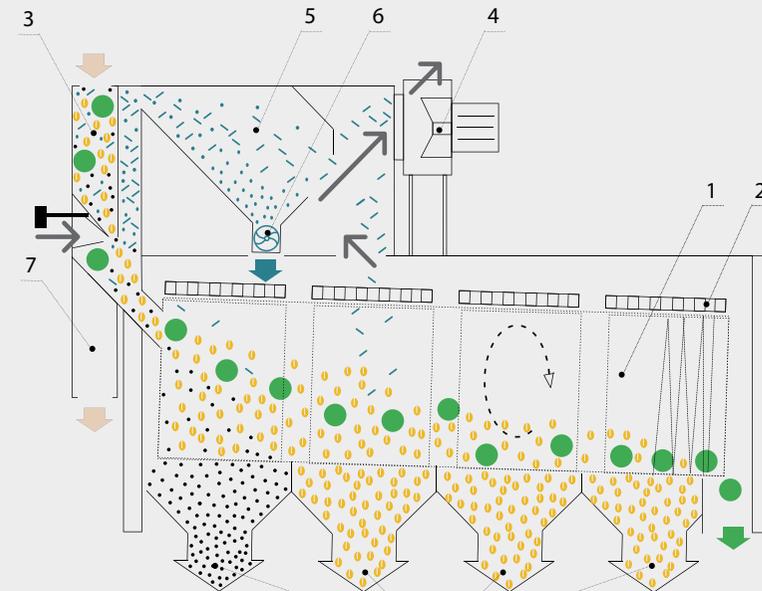
- Quick and easy sieve replacement.
- No dynamic loads and dust.
- Large-diameter drum (1.270 mm) with an efficient sieve cleaning system.

3 KBS SEPARATOR MODELS

NUMBER OF SIEVES	AREA OF SIEVES, M ²	MAXIMUM OUTPUT, T/H		
		PRELIMINARY	PRIMARY	SECONDARY
3	12	75	50	10
4	16	150	100	20
5	20	200	150	30

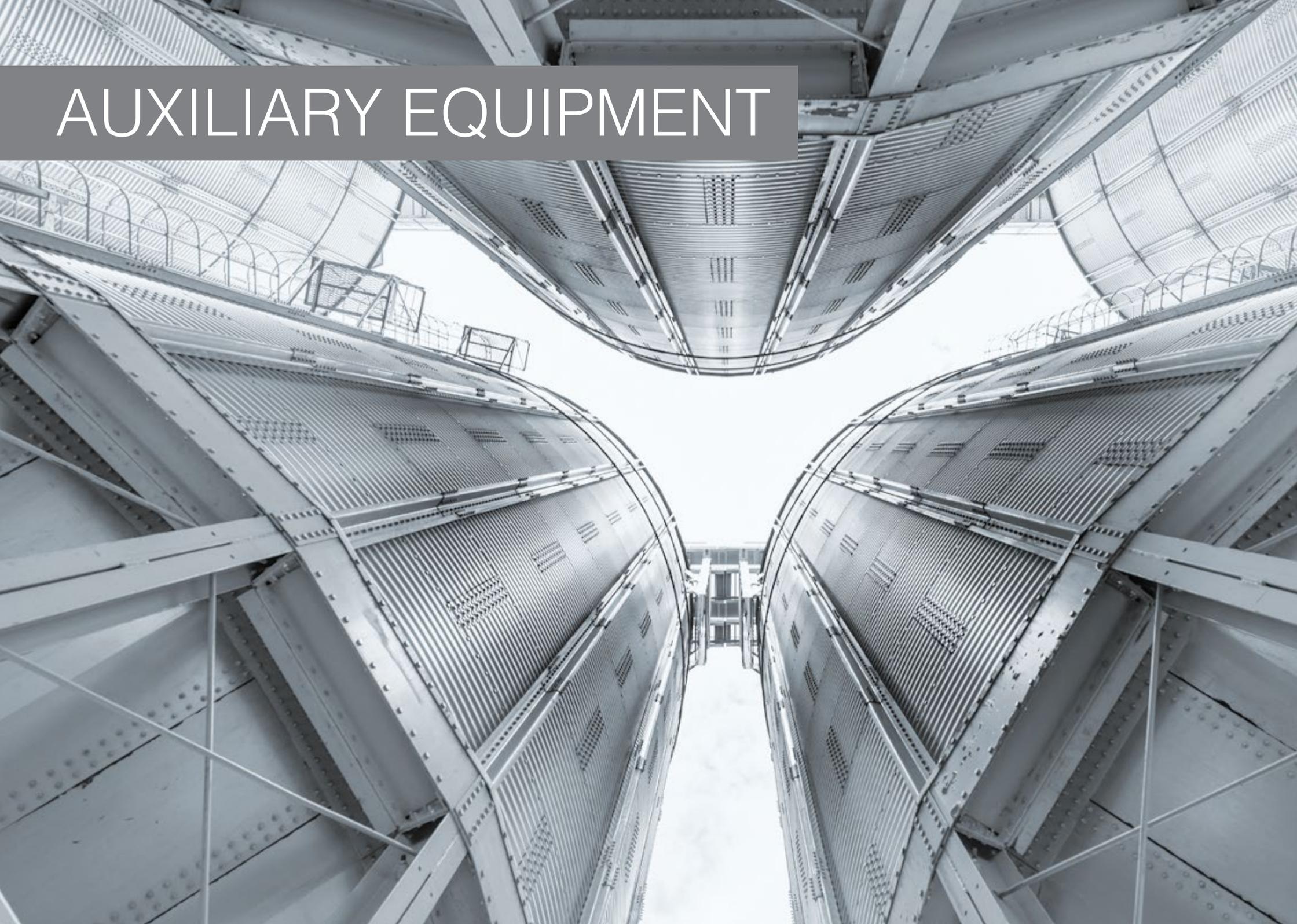
* Pre-cleaning is the cleaning of grain from light and large impurities. Primary cleaning is the cleaning of grain from light, small, and large impurities. Secondary cleaning (sorting, calibration) is the separation of light impurities from grain and its separation into fractions.

General view and scheme of the technological process of the KBS complex drum separator



- 1 — drum
- 2 — sieve cleaner
- 3 — pneumatic separating channel
- 4 — fan
- 5 — dust chamber
- 6 — light impurities unloading device
- 7 — outlet nozzle
- 8 — receivers for separated products

AUXILIARY EQUIPMENT



We produce a wide range of auxiliary equipment for grain logistics at the elevator complex.



GRAVITY FLOW EQUIPMENT
For moving the product.



RACK AND PINION GATES
For controlling the grain flow.



PNEUMATICALLY OPERATED GATE VALVES
For interrupting the grain flow.



REVERSING VALVES
For changing the direction of product movement.

- Equipment throughput: up to 1.500 t/h.
- Lined with wear-resistant materials.



MECHANIZED GRAIN FLOW DISTRIBUTOR
For changing the direction of product movement.



VERSATILITY AND WEAR RESISTANCE

Versatility and design features of the elements allow for a quick and reliable installation and replacement of parts that are subject to wear during operation.

AUTOMATION

We make processes at the elevator complex as transparent and controlled as possible. We introduce the tool for enterprise profit management.

The software includes 4 blocks:

- Conveying equipment.
- Repair and maintenance.
- Temperature control.
- Silo board.



FULL RANGE OF AUTOMATION SERVICES

- Own production of power supply and control cabinets. Hardware from the world's leading brands (Siemens, Schneider, Eaton).
- Installation of custom software. The software solution is implemented on the PLCnext Technology platform by German electrical giant Phoenix Contact.
- Installation and commissioning.



The database works on the client server



Cloud storage of data



Integration into any accounting system



Unlimited number of work places



Open source code



24/7 service



Remote configuration option



Access to the object from anywhere in the world

MODULARITY

- Common software platform with the ability to gradually or selectively connect control modules at the customer's request.
- Each subsequent connection of new equipment will not require a separate control workplace — everything is controlled via the same program.

EASE OF USE

The intuitive software interface is user-friendly even to staff without special training.

VERSATILITY

- The ready-made software package adapts to the requirements of a particular elevator complex.
- Combining all stages of the elevator complex operation in one software program: weighing complex, sampling and laboratory, cleaning and drying of grain, transportation to silos, storage control and shipment.
- Need for multiple software programs for each section of the elevator complex eliminated.

SCALABILITY

No hidden costs for licenses for the number of work places.

INSTALLATION AND SERVICE



Correct installation is the key to quality and trouble-free operation of the equipment throughout the entire period of operation.

IMPORTANT! Most problems due to poor installation occur when the silo is fully loaded rather than during commissioning. Undedicated third-party teams lack knowledge and skills in assembling grain storage equipment, as opposed to the KMZ Industries installation teams.



- We carry out works on installation of the elevator complex equipment, automation, equipment setup and commissioning.
- We carry out professional inspection, diagnostics and repair of equipment.
- We train elevator complex personnel.

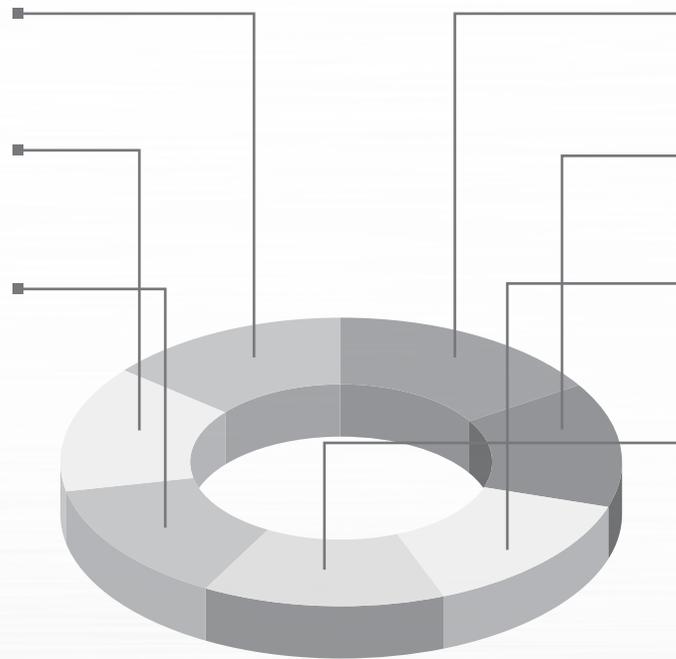
- We install both our own elevator complex equipment and equipment from other manufacturers.
- The company's capabilities allow for simultaneous installation of several objects.
- The customers who order the equipment installation from KMZ Industries receive an extended warranty on our equipment.

WHAT MAKES INSTALLATION FROM KMZ INDUSTRIES PROFITABLE?

We adhere to the assembly technology

High qualification of our installation teams is ensured by training and practical experience

Warranty on installation works from the equipment manufacturer



We ensure ease and quality of installation

The customer bears minimum installation administration costs

We optimize the arrangement of works on the construction site

Professional equipment and tools for installing silos of any design

KMZ INDUSTRIES FIGURES



Silos with serial No.1 and No.2 were installed in 2005 and are still in operation



Over 40 new products and equipment upgrades are developed and implemented annually



Over 500 grain dryers produced by KMZ Industries are operated in Ukraine



About 60% of grain dryers of Ukrainian production are produced by our plant annually



15 years of continuous innovation in conveying equipment



KMZ Industries silos with a total volume of more than 8.000.000 m³ are in operation

EXPERTISE PROVED BY TIME

The advantage of KMZ Industries is tens of years of successful operation of our production equipment at elevator complexes in various industries: from farms to national-scale grain storages, from seed plants to mixed fodder manufacturers.

Over the years, the company has implemented more than 5,000 projects in various areas: from small receiving complexes to port terminals in Ukraine and abroad.

-  Ukraine
-  Poland
-  Romania
-  Hungary
-  Belarus
-  Bulgaria
-  Iran
-  Kazakhstan
-  Moldova
-  Estonia



APPENDIX 1. OVERALL DIMENSIONS AND CAPACITY OF SILOS

BBK FLAT BOTTOM SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
BBK.11.16.B12	11.00	16	1 908	1 526	22.483
BBK.11.15.B12	11.00	15	1 794	1 435	21.283
BBK.11.14.B12	11.00	14	1 680	1 344	20.083
BBK.11.13.B12	11.00	13	1 566	1 253	18.883
BBK.11.12.B12	11.00	12	1 452	1 162	17.683
BBK.11.11.B12	11.00	11	1 338	1 070	16.483
BBK.11.10.B12	11.00	10	1 224	979	15.283
BBK.11.9.B12	11.00	9	1 110	888	14.083
BBK.11.8.B12	11.00	8	996	797	12.883
BBK.16.16.B12	16.00	16	4 117	3 294	23.926
BBK.16.15.B12	16.00	15	3 875	3 100	22.726
BBK.16.14.B12	16.00	14	3 634	2 907	21.526
BBK.16.13.B12	16.00	13	3 393	2 714	20.326
BBK.16.12.B12	16.00	12	3 152	2 522	19.126
BBK.16.11.B12	16.00	11	2 910	2 328	17.926
BBK.16.10.B12	16.00	10	2 669	2 135	16.726
BBK.18.16.B12	18.00	16	5 249	4 199	24.51
BBK.18.15.B12	18.00	15	4 944	3 955	23.31
BBK.18.14.B12	18.00	14	4 639	3 711	22.11
BBK.18.13.B12	18.00	13	4 333	3 466	20.91
BBK.18.12.B12	18.00	12	4 028	3 222	19.71
BBK.18.11.B12	18.00	11	3 722	2 978	18.51
BBK.20.23.B12	20.00	23	9 168	7 334	33.487
BBK.20.22.B12	20.00	22	8 791	7 033	32.287
BBK.20.21.B12	20.00	21	8 414	6 731	31.087
BBK.20.20.B12	20.00	20	8 037	6 430	29.887
BBK.20.19.B12	20.00	19	7 660	6 128	28.687
BBK.20.18.B12	20.00	18	7 283	5 826	27.487
BBK.20.17.B12	20.00	17	6 906	5 525	26.287
BBK.20.16.B12	20.00	16	6 529	5 223	25.087
BBK.20.15.B12	20.00	15	6 152	4 922	23.887
BBK.20.14.B12	20.00	14	5 775	4 620	22.687
BBK.20.13.B12	20.00	13	5 398	4 318	21.487
BBK.20.12.B12	20.00	12	5 021	4 017	20.287
BBK.20.11.B12	20.00	11	4 644	3 715	19.087
BBK.20.10.B12	20.00	10	4 267	3 414	17.887
BBK.20.9.B12	20.00	9	3 890	3 112	16.687
BBK.20.8.B12	20.00	8	3 513	2 810	15.487
BBK.22.22.B12	22.00	22	10 696	8 557	32.782
BBK.22.21.B12	22.00	21	10 240	8 192	31.582
BBK.22.20.B12	22.00	20	9 784	7 827	30.382
BBK.22.19.B12	22.00	19	9 328	7 462	29.182
BBK.22.18.B12	22.00	18	8 872	7 098	27.982
BBK.22.17.B12	22.00	17	8 415	6 732	26.782
BBK.22.16.B12	22.00	16	7 960	6 368	25.582
BBK.22.15.B12	22.00	15	7 503	6 002	24.38
BBK.22.14.B12	22.00	14	7 047	5 638	23.18
BBK.22.13.B12	22.00	13	6 591	5 273	21.98
BBK.22.12.B12	22.00	12	6 135	4 908	20.78
BBK.28.18.B12	28.00	18	14 658	11 726	29.71
BBK.28.17.B12	28.00	17	13 919	11 135	28.51
BBK.28.16.B12	28.00	16	13 180	10 544	27.31
BBK.28.15.B12	28.00	15	12 441	9 953	26.11
BBK.28.14.B12	28.00	14	11 702	9 362	24.91

BBK.28.13.B12	28.00	13	10 963	8 770	23.71
BBK.28.12.B12	28.00	12	10 225	8 180	22.51
BBK.32.20.B12	32.00	20	21 315	16 625	34 752
BBK.32.19.B12	32.00	19	20 350	15 875	33 552
BBK.32.18.B12	32.00	18	19 385	15 120	32 352
BBK.32.17.B12	32.00	17	18 415	14 365	31 152
BBK.32.16.B12	32.00	16	17 450	13 610	29 952
BBK.32.15.B12	32.00	15	16 485	12 860	28 752
BBK.32.14.B12	32.00	14	15 520	12 105	27 552
BBK.32.13.B12	32.00	13	14 555	11 350	26 352
BBK.32.12.B12	32.00	12	13 590	10 600	25 152
BBK.32.11.B12	32.00	11	12 625	9 845	23 952

Note:

To determine the weight of the product stored in the silo, multiply the silo volume (in m³) by the bulk density of the product.

Density of major grain crops:

1. Wheat: 0.8 t/m³.
2. Barley: 0.61 t/m³.
3. Corn: 0.72 t/m³.
4. Soybean, oilseed rape: 0.6 t/m³.

SMVU(A) FLAT BOTTOM SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
SMVU.165.22.B12.A	16.5	22	5 906	4 725	31.458
SMVU.165.21.B12.A	16.5	21	5 650	4 520	30.258
SMVU.165.20.B12.A	16.5	20	5 393	4 314	29.058
SMVU.165.19.B12.A	16.5	19	5 193	4 109	27.858
SMVU.165.18.B12.A	16.5	18	4 880	3 904	26.658
SMVU.165.17.B12.A	16.5	17	4 623	3 598	25.458
SMVU.165.16.B12.A	16.5	16	4 366	3 493	24.258
SMVU.165.15.B12.A	16.5	15	4 110	3 288	23.058
SMVU.165.14.B12.A	16.5	14	3 853	3 083	21.858
SMVU.165.13.B12.A	16.5	13	3 596	2 877	20.658
SMVU.165.12.B12.A	16.5	12	3 340	2 672	19.458
SMVU.165.11.B12.A	16.5	11	3 083	2 467	18.258
SMVU.165.10.B12.A	16.5	10	2 827	2 261	17.058
SMVU.165.09.B12.A	16.5	9	2 570	2 056	15.858
SMVU.165.08.B12.A	16.5	8	2 313	1 851	14.658
SMVU.165.07.B12.A	16.5	7	2 057	1 645	13.458
SMVU.165.06.B12.A	16.5	6	1 800	1 440	12.258
SMVU.183.22.B12.A	18.3	22	7 329	5 864	32.044

SMVU FLAT BOTTOM SILOS

SMVU.183.21.B12.A	18.3	21	7 013	5 610	30.844
SMVU.183.20.B12.A	18.3	20	6 696	5 357	29.644
SMVU.183.19.B12.A	18.3	19	6 379	5 103	28.444
SMVU.183.18.B12.A	18.3	18	6 062	4 850	27.244
SMVU.183.17.B12.A	18.3	17	5 745	4 596	26.044
SMVU.183.16.B12.A	18.3	16	5 428	4 343	24.844
SMVU.183.15.B12.A	18.3	15	5 112	4 089	23.644
SMVU.183.14.B12.A	18.3	14	4 795	3 836	22.444
SMVU.183.13.B12.A	18.3	13	4 478	3 582	21.244
SMVU.183.12.B12.A	18.3	12	4 161	3 329	20.044
SMVU.183.11.B12.A	18.3	11	3 844	3 075	18.844
SMVU.183.10.B12.A	18.3	10	3 527	2 822	17.644
SMVU.183.09.B12.A	18.3	9	3 211	2 568	16.444
SMVU.183.08.B12.A	18.3	8	2 894	2 315	15.244
SMVU.220.22.B12.A	22.0	22	10 623	8 498	33.214
SMVU.220.21.B12.A	22.0	21	10 166	8 134	32.014
SMVU.220.20.B12.A	22.0	20	9 710	7 768	30.814
SMVU.220.19.B12.A	22.0	19	9 254	7 404	29.614
SMVU.220.18.B12.A	22.0	18	8 798	7 039	28.414
SMVU.220.17.B12.A	22.0	17	8 342	6 674	27.214
SMVU.220.16.B12.A	22.0	16	7 886	6 309	26.014
SMVU.220.15.B12.A	22.0	15	7 430	5 944	24.814
SMVU.220.14.B12.A	22.0	14	6 974	5 579	23.614
SMVU.220.13.B12.A	22.0	13	6 518	5 214	22.414
SMVU.220.12.B12.A	22.0	12	6 062	4 849	21.214
SMVU.220.11.B12.A	22.0	11	5 605	4 484	20.014
SMVU.220.10.B12.A	22.0	10	5 149	4 119	18.814
SMVU.220.09.B12.A	22.0	9	4 693	3 754	17.614
SMVU.220.08.B12.A	22.0	8	4 236	3 390	16.414
SMVU.275.22.B12.A	27.5	22	16 911	13 529	34.800
SMVU.275.21.B12.A	27.5	21	16 199	12 959	33.600
SMVU.275.20.B12.A	27.5	20	15 486	12 389	32.400
SMVU.275.19.B12.A	27.5	19	14 773	11 818	31.200
SMVU.275.18.B12.A	27.5	18	14 060	11 248	30.000
SMVU.275.17.B12.A	27.5	17	13 348	10 678	28.800
SMVU.275.16.B12.A	27.5	16	12 635	10 108	27.600
SMVU.275.15.B12.A	27.5	15	11 922	9 538	26.400
SMVU.275.14.B12.A	27.5	14	11 209	8 967	25.200
SMVU.275.13.B12.A	27.5	13	10 497	8 397	24.000
SMVU.275.12.B12.A	27.5	12	9 784	7 827	22.800
SMVU.275.11.B12.A	27.5	11	9 071	7 257	21.600
SMVU.275.10.B12.A	27.5	10	8 358	6 687	20.400
SMVU.275.09.B12.A	27.5	9	7 646	6 116	19.200
SMVU.275.08.B12.A	27.5	8	6 933	5 546	18.000

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
SMVU.110.18.B12	11.00	18	2 062	1 650	24.274
SMVU.110.17.B12	11.00	17	1 952	1 562	23.122
SMVU.110.16.B12	11.00	16	1 843	1 474	21.97
SMVU.110.15.B12	11.00	15	1 733	1 387	20.818
SMVU.110.14.B12	11.00	14	1 624	1 299	19.666
SMVU.110.13.B12	11.00	13	1 514	1 211	18.514
SMVU.110.12.B12	11.00	12	1 405	1 124	17.362
SMVU.110.11.B12	11.00	11	1 295	1 036	16.21
SMVU.110.10.B12	11.00	10	1 186	949	15.058
SMVU.110.09.B12	11.00	9	1 076	861	13.906
SMVU.110.08.B12	11.00	8	967	773	12.754
SMVU.110.07.B12	11.00	7	857	686	11.602
SMVU.110.06.B12	11.00	6	748	598	10.45
SMVU.147.20.B12	14.70	20	4 103	3 282	27.636
SMVU.147.19.B12	14.70	19	3 908	3 127	26.484
SMVU.147.18.B12	14.70	18	3 713	2 971	25.332
SMVU.147.17.B12	14.70	17	3 519	2 815	24.18
SMVU.147.16.B12	14.70	16	3 324	2 659	23.028
SMVU.147.15.B12	14.70	15	3 129	2 504	21.876
SMVU.147.14.B12	14.70	14	2 935	2 348	20.724
SMVU.147.13.B12	14.70	13	2 740	2 192	19.572
SMVU.147.12.B12	14.70	12	2 545	2 036	18.42
SMVU.147.11.B12	14.70	11	2 351	1 881	17.268
SMVU.147.10.B12	14.70	10	2 156	1 725	16.116
SMVU.147.09.B12	14.70	9	1 996	1 569	14.964
SMVU.147.08.B12	14.70	8	1 767	1 431	13.812
SMVU.147.07.B12	14.70	7	1 572	1 258	12.66
SMVU.147.06.B12	14.70	6	1 378	1 102	11.508
SMVU.220.22.B12	22.00	22	10 307	8 245	32.399
SMVU.220.21.B12	22.00	21	9 869	7 895	31.247
SMVU.220.20.B12	22.00	20	9 431	7 545	30.095
SMVU.220.19.B12	22.00	19	8 993	7 194	28.943
SMVU.220.18.B12	22.00	18	8 555	6 844	27.791
SMVU.220.17.B12	22.00	17	8 117	6 494	26.639
SMVU.220.16.B12	22.00	16	7 679	6 143	25.487
SMVU.220.15.B12	22.00	15	7 241	5 793	24.335
SMVU.220.14.B12	22.00	14	6 804	5 443	23.183
SMVU.220.13.B12	22.00	13	6 366	5 092	22.031
SMVU.220.12.B12	22.00	12	5 928	4 742	20.879
SMVU.220.11.B12	22.00	11	5 490	4 392	19.727
SMVU.220.10.B12	22.00	10	5 052	4 042	18.575
SMVU.220.09.B12	22.00	9	4 614	3 691	17.423
SMVU.220.08.B12	22.00	8	4 176	3 341	16.271

BBK HOPPER SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
BBK.03.11.K45.B12	3.0	11	99	79	16.640
BBK.03.10.K45.B12	3.0	10	90	72	15.440
BBK.03.09.K45.B12	3.0	9	82	66	14.240
BBK.03.08.K45.B12	3.0	8	73	58	13.040
BBK.03.07.K45.B12	3.0	7	65	52	11.840
BBK.03.06.K45.B12	3.0	6	56	45	10.640
BBK.03.05.K45.B12	3.0	5	48	38	9.440
BBK.03.04.K45.B12	3.0	4	39	31	8.240
BBK.03.03.K45.B12	3.0	3	31	25	7.040
BBK.05.11.K45.B12	5.0	11	284	227	13.200
BBK.05.10.K45.B12	5.0	10	260	208	12.000
BBK.05.09.K45.B12	5.0	9	237	189	10.800
BBK.05.08.K45.B12	5.0	8	213	170	9.600
BBK.05.07.K45.B12	5.0	7	189	151	8.400
BBK.05.06.K45.B12	5.0	6	166	133	7.200
BBK.05.05.K45.B12	5.0	5	142	114	6.000
BBK.05.04.K45.B12	5.0	4	119	95	4.800
BBK.05.03.K45.B12	5.0	3	95	76	3.600
BBK.05.02.K45.B12	5.0	2	72	58	2.400
BBK.06.08.K45.B12	6.0	8	314	251	15.237
BBK.06.07.K45.B12	6.0	7	280	224	14.037
BBK.06.06.K45.B12	6.0	6	246	197	12.837
BBK.06.05.K45.B12	6.0	5	212	170	11.637
BBK.06.04.K45.B12	6.0	4	178	142	10.437
BBK.07.16.K45.B12	7.0	16	806	645	25.640
BBK.07.15.K45.B12	7.0	15	760	608	24.440
BBK.07.14.K45.B12	7.0	14	713	570	23.240
BBK.07.13.K45.B12	7.0	13	667	534	22.040
BBK.07.12.K45.B12	7.0	12	621	497	20.840
BBK.07.11.K45.B12	7.0	11	575	460	19.640
BBK.07.10.K45.B12	7.0	10	529	423	18.440
BBK.07.09.K45.B12	7.0	9	483	386	17.240
BBK.07.08.K45.B12	7.0	8	436	349	16.040
BBK.07.07.K45.B12	7.0	7	390	312	14.840
BBK.07.06.K45.B12	7.0	6	344	275	13.640
BBK.07.05.K45.B12	7.0	5	298	238	12.440
BBK.07.04.K45.B12	7.0	4	252	202	11.240
BBK.09.17.K45.B12	9.0	17	1 440	1 152	28.550
BBK.09.16.K45.B12	9.0	16	1 363	1 090	27.350
BBK.09.15.K45.B12	9.0	15	1 287	1 030	26.150
BBK.09.14.K45.B12	9.0	14	1 211	969	24.950
BBK.09.13.K45.B12	9.0	13	1 134	907	23.750
BBK.09.12.K45.B12	9.0	12	1 058	846	22.550
BBK.09.11.K45.B12	9.0	11	982	786	21.350
BBK.09.10.K45.B12	9.0	10	905	724	20.150
BBK.09.9.K45.B12	9.0	9	829	663	18.950
BBK.09.8.K45.B12	9.0	8	752	602	17.750
BBK.09.7.K45.B12	9.0	7	676	541	16.550
BBK.09.6.K45.B12	9.0	6	600	480	15.350
BBK.09.5.K45.B12	9.0	5	523	418	14.150
BBK.09.4.K45.B12	9.0	4	447	358	12.950
BBK.09.3.K45.B12	9.0	3	371	297	11.750

SMVU HOPPER SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
SMU.27.01.K62.B12	2.750	1	14	11	6.190
SMU.27.02.K62.B12	2.750	2	21	17	7.342
SMU.27.03.K62.B12	2.750	3	27	22	8.494
SMU.27.04.K62.B12	2.750	4	34	27	9.646
SMVU.37.01.K55.B12	3.667	1	25	20	6.152
SMVU.37.02.K55.B12	3.667	2	38	30	7.304
SMVU.37.03.K55.B12	3.667	3	50	40	8.456
SMVU.37.04.K55.B12	3.667	4	62	50	9.608
SMVU.37.05.K55.B12	3.667	5	74	59	10.760
SMVU.37.06.K55.B12	3.667	6	86	69	11.912
SMVU.46.02.K45.B12	4.584	2	58	46	7.249
SMVU.46.03.K45.B12	4.584	3	77	62	8.401
SMVU.46.04.K45.B12	4.584	4	96	77	9.553
SMVU.46.05.K45.B12	4.584	5	115	92	10.705
SMVU.46.06.K45.B12	4.584	6	134	107	11.857
SMVU.46.07.K45.B12	4.584	7	153	122	13.009
SMVU.46.08.K45.B12	4.584	8	172	138	14.161
SMVU.46.02.K62.B12	4.584	2	69	55	9.124
SMVU.46.03.K62.B12	4.584	3	88	71	10.276
SMVU.46.04.K62.B12	4.584	4	107	86	11.428
SMVU.46.05.K62.B12	4.584	5	126	101	12.580
SMVU.46.06.K62.B12	4.584	6	145	116	13.732
SMVU.46.07.K62.B12	4.584	7	164	131	14.884
SMVU.46.08.K62.B12	4.584	8	183	147	16.036
SMVU.55.02.K55.B12	5.500	2	98	78	9.222
SMVU.55.03.K55.B12	5.500	3	126	101	10.374
SMVU.55.04.K55.B12	5.500	4	153	122	11.526
SMVU.55.05.K55.B12	5.500	5	180	144	12.678
SMVU.55.06.K55.B12	5.500	6	208	166	13.830
SMVU.55.07.K55.B12	5.500	7	235	188	14.982
SMVU.55.08.K55.B12	5.500	8	263	210	16.134
SMVU.73.04.K45.B12	7.334	4	282	226	11.798
SMVU.73.05.K45.B12	7.334	5	332	266	12.950
SMVU.73.06.K45.B12	7.334	6	382	306	14.102
SMVU.73.07.K45.B12	7.334	7	432	346	15.254
SMVU.73.08.K45.B12	7.334	8	482	386	16.406
SMVU.73.09.K45.B12	7.334	9	531	425	17.558
SMVU.73.10.K45.B12	7.334	10	581	465	18.710
SMVU.73.11.K45.B12	7.334	11	631	505	19.862
SMVU.73.12.K45.B12	7.334	12	681	545	21.014

SMVU HOPPER SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
SMVU.73.04.K62.B12	7.334	4	320	256	14.786
SMVU.73.05.K62.B12	7.334	5	369	295	15.938
SMVU.73.06.K62.B12	7.334	6	417	334	17.090
SMVU.73.07.K62.B12	7.334	7	466	373	18.242
SMVU.73.08.K62.B12	7.334	8	515	412	19.394
SMVU.73.09.K62.B12	7.334	9	563	450	20.546
SMVU.73.10.K62.B12	7.334	10	612	490	21.698
SMVU.73.11.K62.B12	7.334	11	661	529	22.850
SMVU.73.12.K62.B12	7.334	12	709	567	24.002
SMVU.73.02.K62.B12W*	7.334	2	165	132	12.292
SMVU.73.03.K62.B12W*	7.334	3	214	171	13.444
SMVU.73.04.K62.B12W*	7.334	4	262	210	14.596
SMVU.73.05.K62.B12W*	7.334	5	311	249	15.748
SMVU.73.06.K62.B12W*	7.334	6	360	288	16.900
SMVU.73.07.K62.B12W*	7.334	7	408	327	18.052
SMVU.73.08.K62.B12W*	7.334	8	457	366	19.204
SMVU.73.09.K62.B12W*	7.334	9	506	405	20.356
SMVU.73.10.K62.B12W*	7.334	10	554	443	21.508
SMVU.73.11.K62.B12W*	7.334	11	603	482	22.660
SMVU.73.12.K62.B12W*	7.334	12	652	521	23.812
SMVU.92.06.K45.B12	9.167	6	611	489	15.090
SMVU.92.07.K45.B12	9.167	7	687	550	16.242
SMVU.92.08.K45.B12	9.167	8	763	610	17.394
SMVU.92.09.K45.B12	9.167	9	839	671	18.546
SMVU.92.10.K45.B12	9.167	10	915	732	19.698
SMVU.92.11.K45.B12	9.167	11	991	793	20.850
SMVU.92.12.K45.B12	9.167	12	1067	854	22.002
SMVU.110.6.K40.B12	11.000	6	894	715	15.909
SMVU.110.7.K40.B12	11.000	7	1 003	802	17.061
SMVU.110.8.K40.B12	11.000	8	1 113	890	18.213
SMVU.110.9.K40.B12	11.000	9	1 222	978	19.365
SMVU.110.10.K40.B12	11.000	10	1 332	1 066	20.517
SMVU.110.11.K40.B12	11.000	11	1 441	1 153	21.669
SMVU.110.12.K40.B12	11.000	12	1 551	1 241	22.821
SMVU.110.13.K40.B12	11.000	13	1 660	1 328	23.973
SMVU.110.14.K40.B12	11.000	14	1 770	1 416	25.125
SMVU.110.06.K45.B12	11.000	6	922	738	16.544
SMVU.110.07.K45.B12	11.000	7	1 031	825	17.696
SMVU.110.08.K45.B12	11.000	8	1 141	913	18.848
SMVU.110.09.K45.B12	11.000	9	1 250	1 000	20.000
SMVU.110.10.K45.B12	11.000	10	1 360	1 088	21.152
SMVU.110.11.K45.B12	11.000	11	1 469	1 175	22.304
SMVU.110.12.K45.B12	11.000	12	1 579	1 263	23.456
SMVU.110.13.K45.B12	11.000	13	1 688	1 351	24.608
SMVU.110.14.K45.B12	11.000	14	1 798	1 438	25.760

SMVU(A) HOPPER SILOS

Silo model	Silo diameter, m	Number of tiers	Silo volume, m ³	Wheat capacity, t (at a density of 0.8 t/m ³)	Total silo height, m
SMU.27.04.K62.B12.A	2.750	4	35	28	9.855
SMU.27.03.K62.B12.A	2.750	3	28	22	8.655
SMU.27.02.K62.B12.A	2.750	2	21	17	7.455
SMU.27.01.K62.B12.A	2.750	1	14	11	6.255
SMVU.55.08.K55.B12.A	5.500	8	270	216	16.195
SMVU.55.07.K55.B12.A	5.500	7	242	193	14.995
SMVU.55.06.K55.B12.A	5.500	6	213	171	13.795
SMVU.55.05.K55.B12.A	5.500	5	185	148	12.595
SMVU.55.04.K55.B12.A	5.500	4	156	125	11.395
SMVU.55.03.K55.B12.A	5.500	3	128	102	10.195
SMVU.55.02.K55.B12.A	5.500	2	99	79	8.995
SMVU.55.10.K45.B12.A	5.500	10	318	254	17.629
SMVU.55.08.K45.B12.A	5.500	8	261	209	15.229
SMVU.55.07.K45.B12.A	5.500	7	232	186	14.029
SMVU.55.06.K45.B12.A	5.500	6	204	163	12.829
SMVU.55.05.K45.B12.A	5.500	5	175	140	11.629
SMVU.55.04.K45.B12.A	5.500	4	147	117	10.429
SMVU.55.03.K45.B12.A	5.500	3	118	95	9.229
SMVU.55.02.K45.B12.A	5.500	2	90	72	8.029
SMVU.73.12.K45.B12.A	7.334	12	685	548	21.155
SMVU.73.11.K45.B12.A	7.334	11	635	508	19.955
SMVU.73.10.K45.B12.A	7.334	10	584	467	18.755
SMVU.73.09.K45.B12.A	7.334	9	533	427	17.555
SMVU.73.08.K45.B12.A	7.334	8	483	386	16.355
SMVU.73.07.K45.B12.A	7.334	7	432	346	15.155
SMVU.73.06.K45.B12.A	7.334	6	381	305	13.955
SMVU.73.05.K45.B12.A	7.334	5	331	265	12.755
SMVU.73.04.K45.B12.A	7.334	4	280	224	11.555
SMVU.92.12.K45.B12.A	9.167	12	1 101	881	22.570
SMVU.92.11.K45.B12.A	9.167	11	1 021	817	21.370
SMVU.92.10.K45.B12.A	9.167	10	942	754	20.170
SMVU.92.09.K45.B12.A	9.167	9	863	690	18.970
SMVU.92.08.K45.B12.A	9.167	8	784	627	17.770
SMVU.92.07.K45.B12.A	9.167	7	705	564	16.570
SMVU.92.06.K45.B12.A	9.167	6	625	500	15.370
SMVU.110.14.K65.B12.A	11.000	14	2 055	1 644	32.402
SMVU.110.13.K65.B12.A	11.000	13	1 941	1 553	31.202
SMVU.110.12.K65.B12.A	11.000	12	1 827	1 462	30.002
SMVU.110.11.K65.B12.A	11.000	11	1 713	1 370	28.802
SMVU.110.10.K65.B12.A	11.000	10	1 599	1 279	27.602
SMVU.110.09.K65.B12.A	11.000	9	1 485	1 188	26.402
SMVU.110.08.K65.B12.A	11.000	8	1 371	1 097	25.202
SMVU.110.07.K65.B12.A	11.000	7	1 257	1 005	24.002
SMVU.110.06.K65.B12.A	11.000	6	1 143	914	22.802
SMVU.110.14.K45.B12.A	11.000	14	1 856	1 485	26.424
SMVU.110.13.K45.B12.A	11.000	13	1 742	1 393	25.224
SMVU.110.12.K45.B12.A	11.000	12	1 628	1 302	24.024
SMVU.110.11.K45.B12.A	11.000	11	1 513	1 211	22.824
SMVU.110.10.K45.B12.A	11.000	10	1 399	1 120	21.624
SMVU.110.09.K45.B12.A	11.000	9	1 285	1 028	20.424
SMVU.110.08.K45.B12.A	11.000	8	1 171	937	19.224
SMVU.110.07.K45.B12.A	11.000	7	1 057	846	18.024
SMVU.110.06.K45.B12.A	11.000	6	943	755	16.824

APPENDIX 2. TECHNICAL SPECIFICATIONS OF GRAIN DRYERS AND CHAIN CONVEYORS

XE SILOS

Silo model	Height, m	Diameter, mm	Geometric volume, m ³	Working volume, m ³	Compressor inlet diameter, mm	Flour inlet diameter, mm	Outlet diameter, mm	Pressure of air supplied to the dome destruction system, MPa	Air consumption for dome destruction, m ³ /min	Weight, kg
XE-160A	12.144	2652	52.9	50.0	40	75	500	0.08 - 0.1	3	3160
XE-160A-01	11.644	2652	50.5	47.3	40	75	500	0.08 - 0.2	3	3037
XE-160A-02	11.144	2652	48.1	44.9	40	75	500	0.08 - 0.3	3	2914
XE-160A-03	10.644	2652	45.7	42.4	40	75	500	0.08 - 0.4	3	2791
XE-160A-04	10.144	2652	43.3	40.0	40	75	500	0.08 - 0.5	3	2667
XE-160A-05	9.644	2652	40.9	37.6	40	75	500	0.08 - 0.6	3	2544
XE-160A-06	9.144	2652	38.5	35.2	40	75	500	0.08 - 0.7	3	2421
XE-160A-07	8.644	2652	36.1	32.8	40	75	500	0.08 - 0.8	3	2297
XE-160A-08	8.144	2652	33.7	30.4	40	75	500	0.08 - 0.9	3	2174
XE-160A-09	7.644	2652	31.3	28.0	40	75	500	0.08 - 0.10	3	2051
XE-160A-10	7.144	2652	28.9	25.6	40	75	500	0.08 - 0.11	3	1927
XE-160A-11	6.644	2652	26.5	23.2	40	75	500	0.08 - 0.12	3	1804
XE-160A-12	6.144	2652	24.1	20.8	40	75	500	0.08 - 0.13	3	1681
XE-160A-13	5.644	2652	21.7	18.4	40	75	500	0.08 - 0.14	3	1558
XE-160A-14	5.144	2652	19.3	16.0	40	75	500	0.08 - 0.15	3	1434
XE-160A-15	4.644	2652	16.9	13.6	40	75	500	0.08 - 0.16	3	1311

TECHNICAL SPECIFICATIONS OF BRICE-BAKER GRAIN DRYERS

The Brice-Baker grain dryer range includes 115 models with a capacity of 9–300 t/h (with a pitch from 3 t/h). Ask for the specifications of the full product range from the company's specialists.

Indicator name	Grain dryer type					
	Brice-Baker SCN-4/48	Brice-Baker SCN-14/24	Brice-Baker SCN-9/48	Brice-Baker SCN-16/48	Brice-Baker SCN-16/72	Brice-Baker SCN-21/96
Production capacity with decreasing moisture content from 20% to 15%, min, t/h*	27	49	62	112	156	292
Gas consumption, max, m ³ /h	180	326	413	745	1 037	1 942
Electricity consumption per 1 hour, max, kW	50	65	275	162	275	463
	Overall dimensions, max, mm					
Length	5 720	7 600	7 610	7 610	7 610	7 610
Width	4 980	2 800	4 980	5 240	7 550	9 780
Height	7 800	19 100	13 100	21 100	21 100	26 100

Note: * When drying wheat with a bulk density of 750–760 kg/m³; temperature of the drying agent not more than 125 °C; outdoor temperature of 20 °C; humidity of 70%.

TECHNICAL SPECIFICATIONS OF MAJOR TSTS CONVEYORS

Conveyor model		TSTs-200			TSTs-320		TSTs-400			TSTs-500			TSTs-600	TSTs-700
Conveyor productivity	Q, t/h, for wheat with bulk density of 0.75 t/m ³	20	30	50	75	100	150	175	200	250	300	350	400	500
	Chain speed, m/s	Up to 0.6			Up to 0.6		Up to 0.6			Up to 0.63			Up to 0.63	Up to 0.63
Maximum transportation length as standard, m							60							
Drive power, kW		4	5.5	9.2	15	18.5	30	30	37	45	55	75	75	90
Cross section of a conveyance ball, mm		200x193			320x259		400x330			500x485			600x485	700x486
Planar chain pitch as per GOST 588, mm		100			125					160				

BELT BUCKET ELEVATORS

Bucket elevator model		U2-UN-5		U2-UN-10		U2-UN-20		U2-UN-30		U2-UN-50		U2-UN-100			
Product	Bulk density, t/m ³	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h
Wheat	0.75	5.0	6.7	10.9	14.6	20.9	27.9	30.0	39.7	50.1	66.8	103.0	137.5	129.0	171.9
Corn	0.72	4.8	6.7	10.5	14.6	20.1	27.9	28.7	39.7	48.1	66.8	99.0	137.5	124.0	171.9
Sunflower	0.40	2.7	6.7	5.8	14.6	11.2	27.9	15.9	39.7	26.7	66.8	55.0	137.5	68.8	171.9
Rice	0.60	4.0	6.7	8.8	14.6	16.7	27.9	23.9	39.7	40.1	66.8	82.5	137.5	103.0	171.9
Soybean	0.50	3.3	6.7	7.3	14.6	13.9	27.9	19.9	39.7	33.4	66.8	68.8	137.5	86.0	171.9
Extraction cake	0.55	3.7	6.7	8.0	14.6	15.3	27.9	21.9	39.7	36.7	66.8	73.6	137.5	94.6	171.9
Oilseed rape	0.65	4.3	6.7	9.5	14.6	18.1	27.9	25.9	39.7	43.4	66.8	89.4	137.5	112.0	171.9
Mixed fodder	0.48	3.2	6.7	7.0	14.6	13.4	27.9	19.1	39.7	32.1	66.8	66.0	137.5	82.5	171.9
Maximum transportation height, m		45		45		45		58		68		65		65	

Bucket elevator model		U2-UN-175						U2-UN-250					
Product	Bulk density, t/m ³	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h
Wheat	0.75	150	204	175.0	232.3	201	268.4	253	338	304	405.7		
Corn	0.72	147	204	167.0	232.3	193	268.4	243	338	292	405.7		
Sunflower	0.40	81.9	204	92.9	232.3	107	268.4	135	338	162	405.7		
Rice	0.60	123	204	139.0	232.3	161	268.4	203	338	243	405.7		
Soybean	0.50	102	204	116.0	232.3	134	268.4	169	338	203	405.7		
Extraction cake	0.55	113	204	128.0	232.3	148	268.4	186	338	223	405.7		
Oilseed rape	0.65	133	204	151.0	232.3	174	268.4	220	338	264	405.7		
Mixed fodder	0.48	98.2	204	115.0	232.3	129	268.4	162	338	194	405.7		
Maximum transportation height, m		67		70		62		64		55			

Bucket elevator model		U2-UN-400															
Product	Bulk density, t/m ³	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h	t/h	m ³ /h		
Wheat	0.75	250	334	302	403.2	352	470	405	540.5	456	608.5	510	679.4	562	749	609	811.5
Corn	0.72	241	334	290	403.2	339	470	389	540.5	438	608.5	489	679.4	539	749	584	811.5
Sunflower	0.40	134	334	162	403.2	188	470	216	540.5	243	608.5	272	679.4	300	749	325	811.5
Rice	0.60	200	334	242	403.2	282	470	324	540.5	365	608.5	408	679.4	449	749	487	811.5
Soybean	0.50	167	334	202	403.2	235	470	270	540.5	304	608.5	340	679.4	375	749	406	811.5
Extraction cake	0.55	184	334	223	403.2	259	470	297	540.5	335	608.5	374	679.4	412	749	446	811.5
Oilseed rape	0.65	217	334	262	403.2	306	470	351	540.5	396	608.5	442	679.4	487	749	527	811.5
Mixed fodder	0.48	161	334	194	403.2	226	470	259	540.5	292	608.5	326	679.4	360	749	390	811.5
Maximum transportation height, m		82		83		72		62		55		50		46		42	



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