



THE FIRST AND THE BIGGEST LARGE-SCALE MASS PRODUCTION OF STEEL SILOS IN UKRAINE

Grain storage quality



Versatility



Long-term operating life



EU quality standards

IN FIGURES

88 models

Flat bottom and hopper silos with storage capacity up to 21,315 m³ (16,625 t of wheat), with diameter up to 32 m

Made of S350GD high-strength galvanized steel from European manufacturers (zinc coating up to 600 g/m²).

S350GD

over 15 years

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

7,000,000

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5 MAIN ADVANTAGES OF SILOS PODUCED BY KMZ INDUSTRIES



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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.

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VERSATILITY OF OUR SILOS

- 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.





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).
- 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.

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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.

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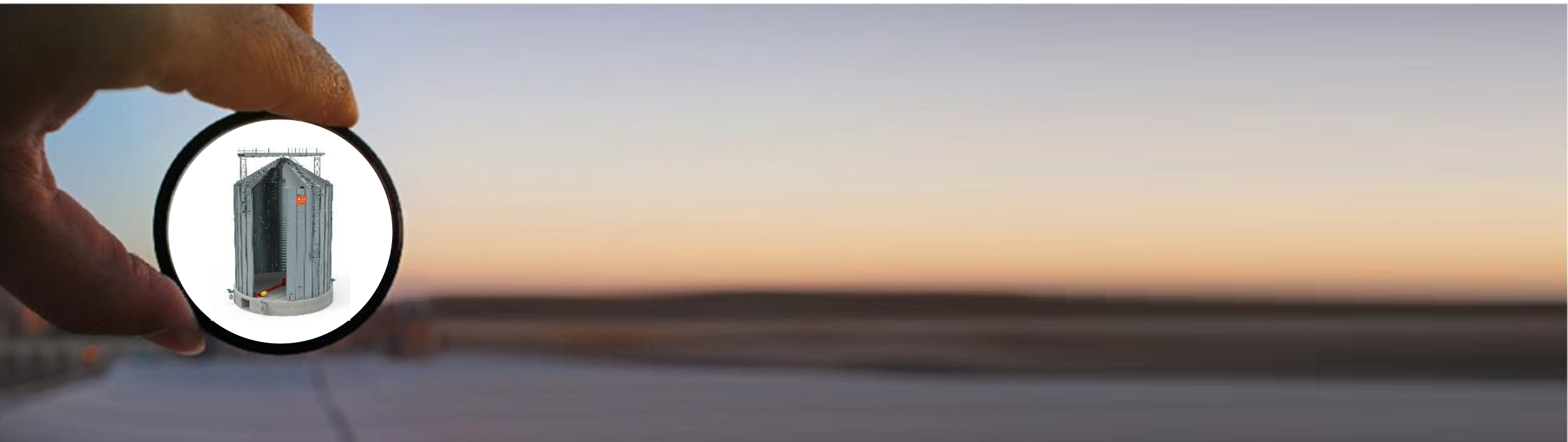


QUICK AND CONVENIENT INSTALLATION

- 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.

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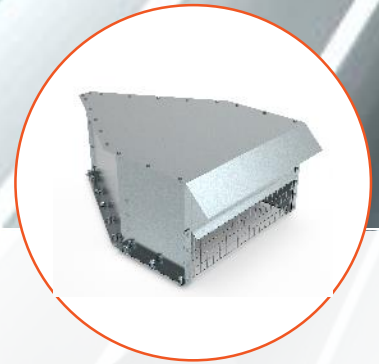
FLAT BOTTOM SILOS. Technical characteristics

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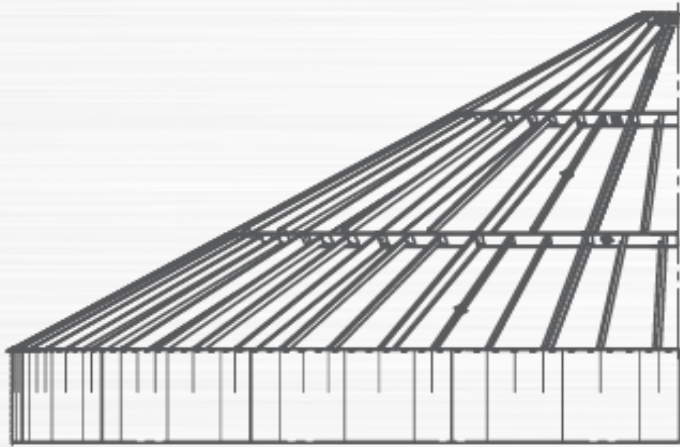


TWO-LEVEL ACTIVE VENTILATION SYSTEM

- 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.

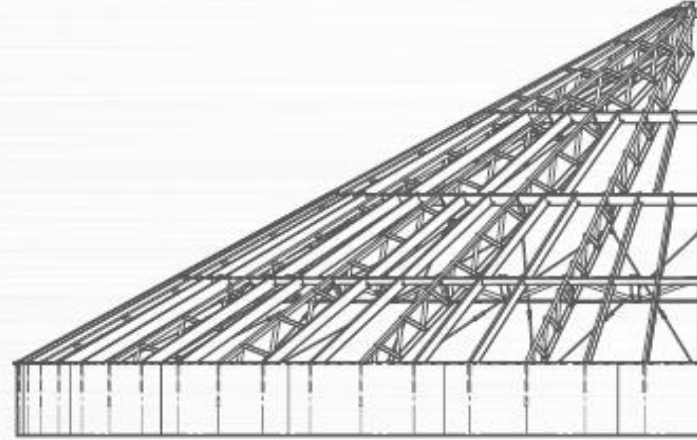


2 TYPES OF SILO ROOF FRAMES



BEAM TYPE

- Brice-Baker and SMVU product line.
- Lightweight, less metal-intensive.
- Simple and faster to install.



TRUSS TYPE

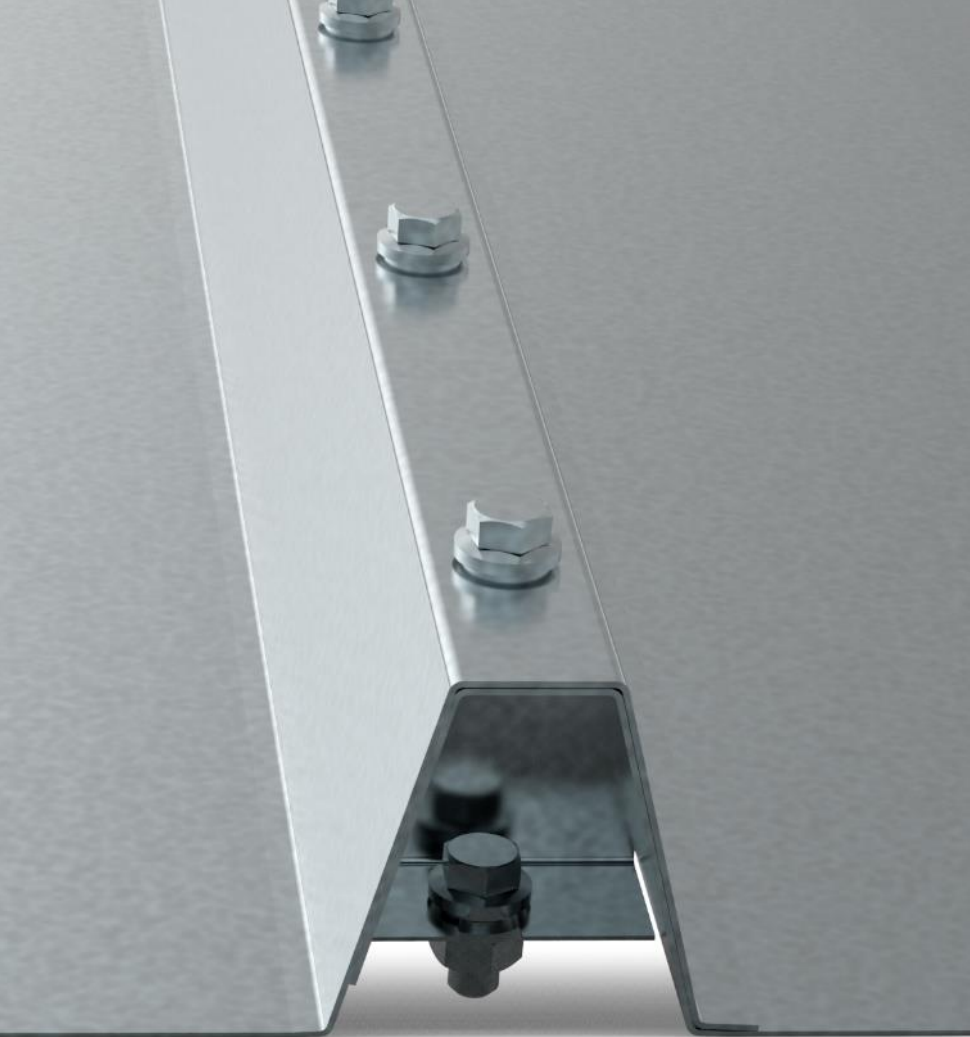
- SMVU product line (silos with diameters of 183, 220 and 275).
- Frame to ensure the structural strength.

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



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V-RIB

- BBK product line
- Roof sectors form a double reinforcement rib with 70 mm height.

3 METHODS FOR JOINING ROOF SECTORS



OVERLAP

SMVU product line

Sealed roof sectors are overlapped.



F-RIB

BBK product line

Sealed roof sectors have reinforcement ribs.

IMPORTANT!

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

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- 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.

DOORS AND STAIRS FOR EASIER OF OPERATION

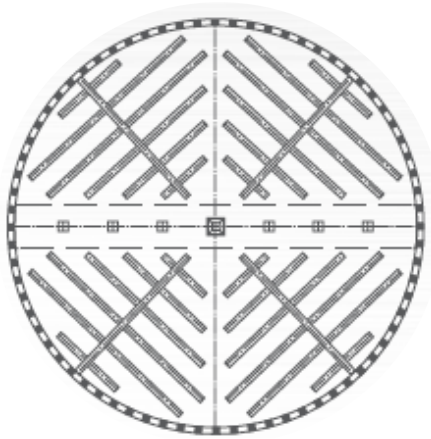


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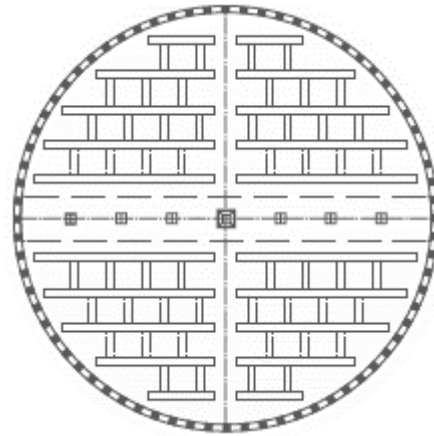
AERATION SYSTEMS FOR DIFFERENT MODELS OF FLAT BOTTOM SILOS

«HERRINGBONE»



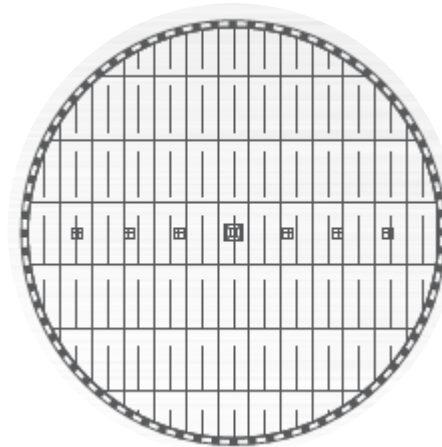
- 15% of the silo floor area occupied by ducts
- The aeration channel width is 0,3 m

«LINES»



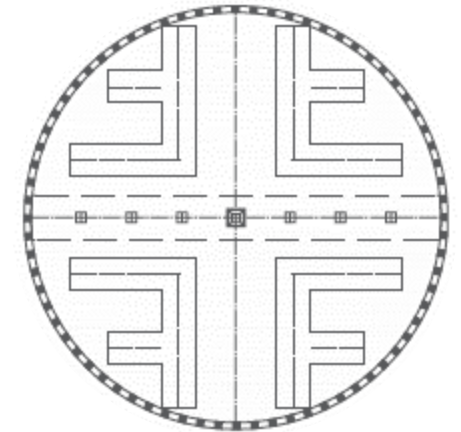
- 13-15% of the silo floor area occupied by ducts
- The aeration channel width is 0,3 m

FULL FLOOR

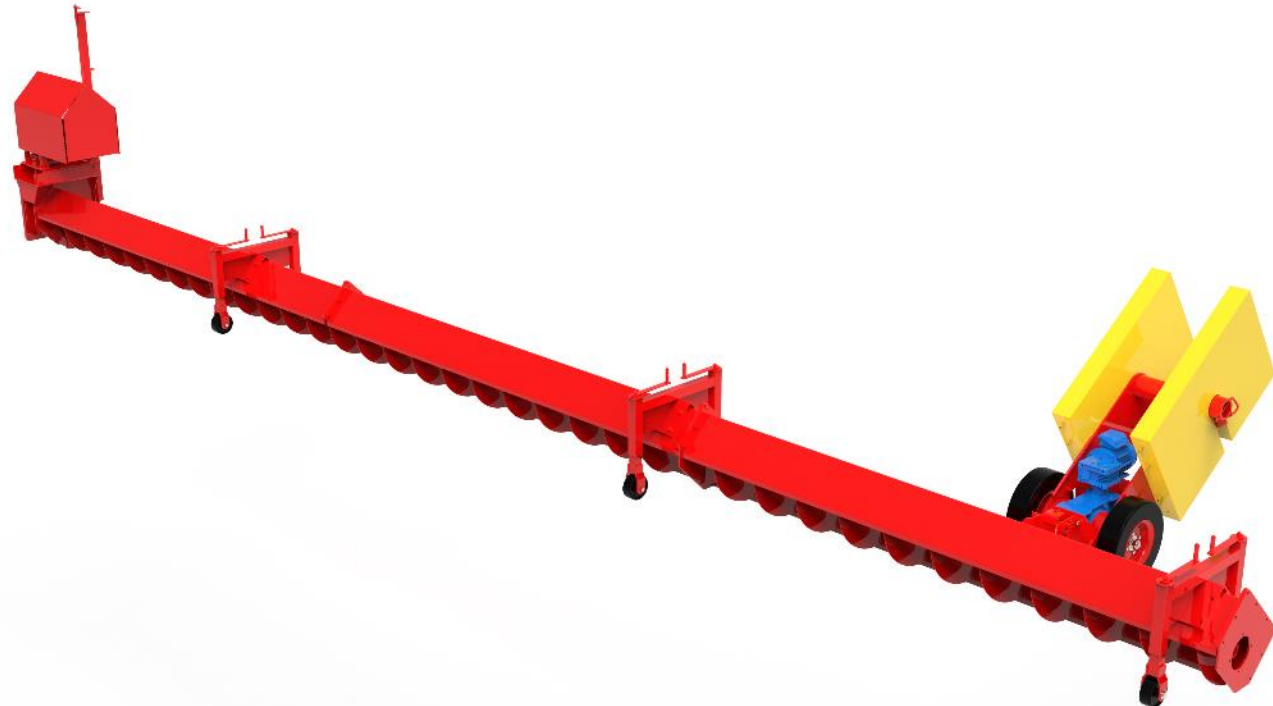


- 100% of the silo floor area occupied by ducts
- Without restrictions

«F-SHAPED»



- 13-15% of the silo floor area occupied by ducts
- The aeration channel width is 1,8 m



HIGH PERFORMANCE SWEEPING AUGER

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

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OTHER INPORTANT FEATURES



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.



BB-LOCK SYSTEM

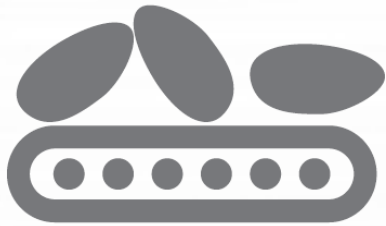
A special lock created by an automatic line on each panel to ensure a tighter fit of the panels.

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unloading grain through a central funnel

ДРУГИЕ ВАЖНЫЕ «МЕЛОЧИ»



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.



STIFFENERS

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.



WIND RINGS

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

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HOPPER & FLOUR SILOS. Technical characteristics

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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.

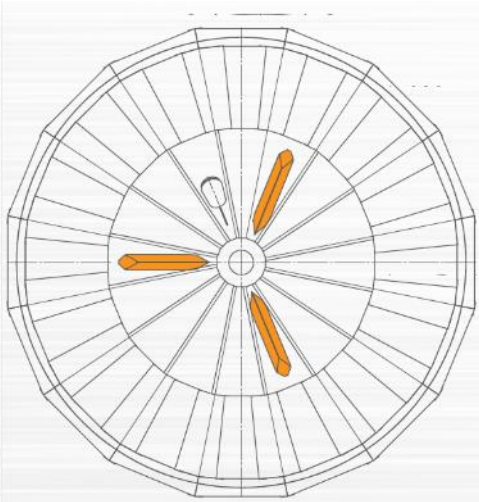
Equipment

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

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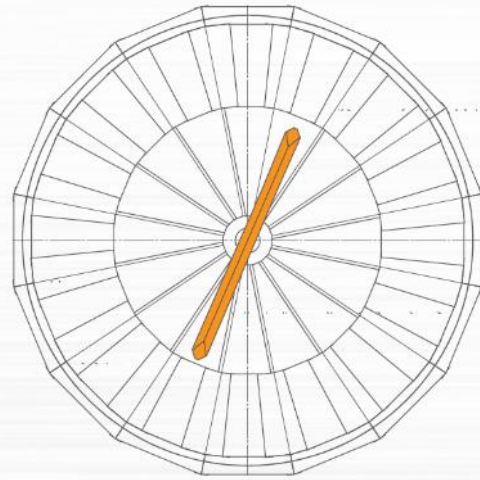


TWO-LEVEL VENTILATION



WALL-MOUNTED AIR DISTRIBUTORS

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



TRANSVERSE AIR DISTRIBUTOR

Transverse box with external fan.

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).



WELDED METAL SILOS FOR SHORT-TERM BULK STORAGE OF FLOUR, GRAIN AND GRAIN PROCESSING PRODUCTS

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.

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SHORT REFERENCE LIST OF SILOS INSTALLED BY KMZ INDUSTRIES

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THANK YOU FOR THE ATTANTION!



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