ASPIRATION TECHNOLOGIES

The specialists of the environmental safety department of “SKIF TECHNOLOGY GROUP” have long been engaged in the development and implementation of turnkey dust removal projects for grain processing enterprises.

The manufacturing of aspiration equipment is carried out at the modern production facilities of the Elevator Equipment Plant, using high-quality imported metal and components from leading global manufacturers such as Siemens, Phoenix Contact, Festo, Camozzi, Moro, and others, ensuring the durability and high quality of the products.

A distinctive feature of the department's approach is the focus on eliminating the causes of dust formation, rather than just its consequences. Solving the tasks of guaranteed environmental safety using five levels of protection allows for:

- Increasing the dust suppression efficiency from 60% to 97.9%;
- Reducing energy costs by 1.5 to 2.9 times;
- Eliminating dust accumulation in air ducts.

The company has a large number of completed projects that ensure safe and comfortable working conditions for employees of grain processing enterprises while also taking care of the country's environment.

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WHAT CAN THE LACK OF AN ASPIRATION SYSTEM LEAD TO?

- Harmful and hazardous working conditions for personnel in the work area.
- Dust reduces the service life of technological equipment.
- High risk of explosion and fire.
- Dust emissions are sources of environmental pollution.



EUROPEAN STANDARDS

Environmental

Dust concentration in the room up to 10 mg/m³ over an 8-hour period;
Dust emission concentration up to 50 mg/m³, no more than 35 times per calendar year.

Energy

0.004 to 0.006 kWh/t

Durability

at least 10 years of operation

Characteristics	Classic system	Filter-based system	Other systems (Curtain systems)	“SKIF TECHNOLOGY GROUP”
Power consumption, kW	3,55	2,2	0,39	1,5
Environmental, mg/m³	>4	<4	node < 4 route > 4	<4
Environmental pollution, mg/m³	>50	<50	node < 50 route > 50	<50
Reliability, start/inspection	20	50	30	50
Costs per 1 ton, EUR/t	1,35	1,3	2,34	0,45

Classic dust control systems
based on inertial dust collectors, such as TsOL and BBC type cyclones

Dust control systems
based on filters using dust collectors with filtering material

Other dust removal systems
include grain oil spraying systems

“SKIF TECHNOLOGY GROUP” dust removal systems
Dust absorber system method

DUST ABSORBER SYSTEM METHOD FOR ASPIRATION INSTALLATIONS

1 **Combating Dust Formation Causes**
Reduction of the dust-forming ability of the grain flow.

2 **Sealing the Dust Source**
Reducing the gaps between the enclosure and the atmosphere.

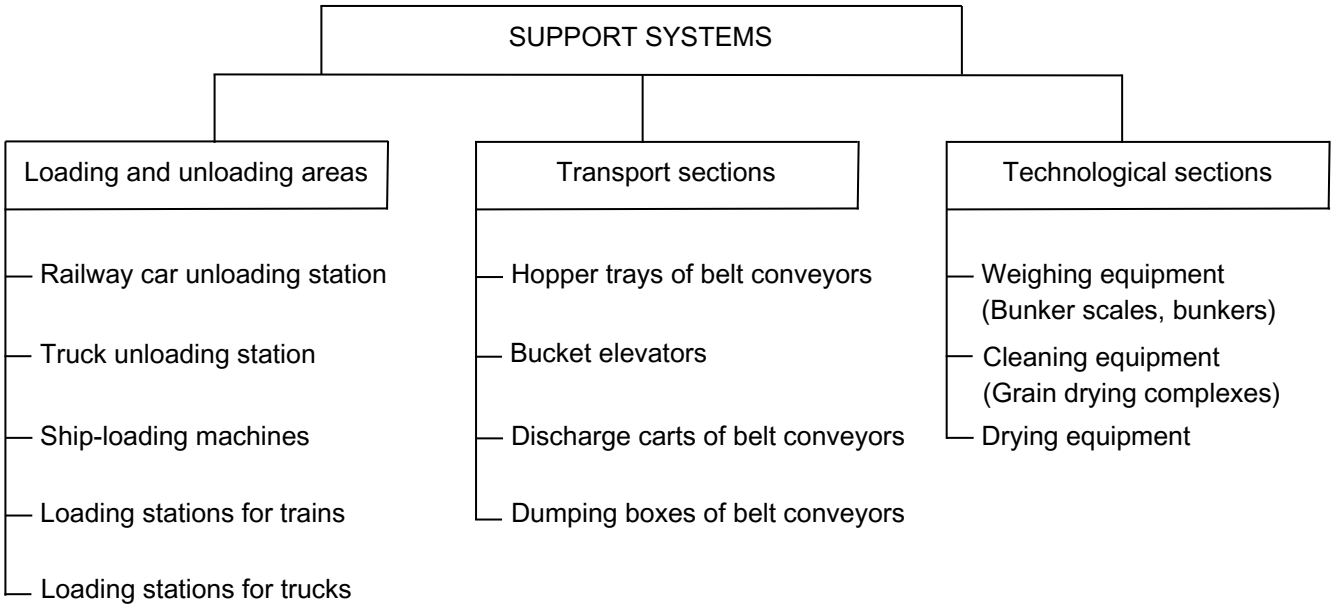
3 **Creating an Air Damper – an Air Lock**
In this process, excess air containing suspended dust is extracted from the dusting node, creating a vacuum in the node.

4 **Intellectual Control System**
Manages the following parameters:

- Fan performance based on the type of grain, production line capacity, and grain material contamination, with the aim of reducing the power consumption of the aspiration unit fan.
- Compressor performance based on the pressure differential between the clean and dirty air chambers, with the aim of reducing compressor operating time.

5 **Intellectual Diagnostic System**
Implements:

- Displaying the operational parameters of the aspiration units (power consumption, operating hours);
- Signaling aspiration unit malfunctions (elevated currents, filter "packing," the need for maintenance);
- Managing the aspiration units (starting/stopping the unit, semi-automatic/automatic operation of the sleeve regeneration system).



TYPICAL OPERATING CONDITIONS:

1 **Loading and unloading areas:**

- Large volume of dust-air mixture.
- Absence or insufficient sealing of the node.

2 **Transport sections:**

- High speed of grain flow.
- Insufficient sealing of the node.

3 **Technological sections:**

- Large volume of dust-air mixture.
- Different characteristics of dust (particle size distribution, moisture).

ADVANTAGES OF THE DUST ABSORBER SYSTEM METHOD FOR DUST SUPPRESSION

Dust Absorber System, implemented in dust control systems by “SKIF TECHNOLOGY GROUP”, unlike traditional dust control units, allows to provide a constant and uniform dust suppression effect in the formation zone.

Reducing energy consumption:

- Specific power consumption for dust control is 60% less than that of traditional aspiration units.
- The use of "rigid" aerodynamic characteristics of fans increases energy efficiency by 20%.
- The use of equipment enclosures reduces total pressure losses by 40%.

Reducing the volume of cleaned air moved:

- Decrease in air flow through leaks by 40-50%.

High dust suppression effectiveness:

- Dust suppression coefficient at emission sources is 99.9%.
- Dust concentration in the workspace does not exceed MPC (4 mg/m³).

Improve reliability and quality of aspiration equipment:

- The design of the filtration equipment and reduced fabric load prevent clogging and dust buildup in aspiration equipment and ducts.
- Reduce the load on the fan and dust collector by 1.5-2 times.

Reduce material intensity:

- Reduce the material intensity of technological devices and metal structures.

Ensure a high level of explosion safety:

- Thanks to a comprehensive approach, the concentration of dust and air reduces consumption, leading to improved explosion protection performance.
- Dust Absorber System ensures 90% suppression of dust generation sources, thereby enhancing explosion safety.

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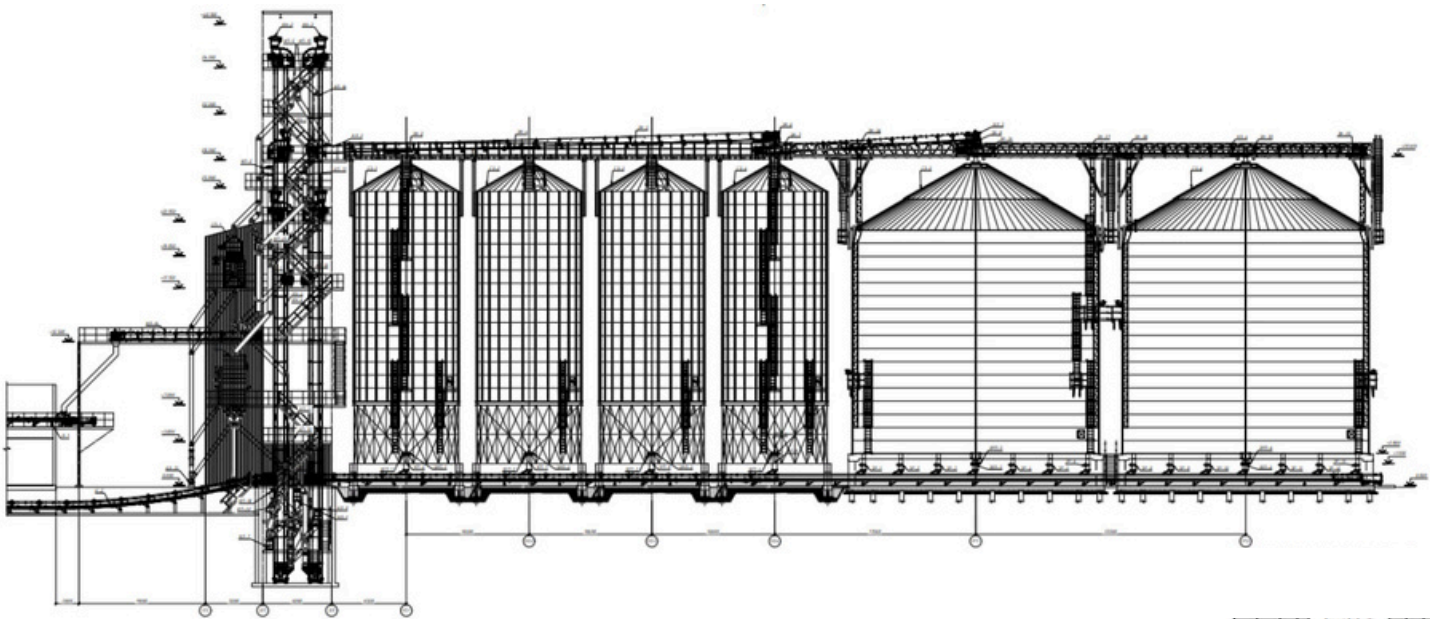
TURNKEY ASPIRATION SYSTEMS BY “SKIF TECHNOLOGY GROUP”

We perform the entire range of work: from analyzing the current state of the facility and the project to commissioning and servicing. Such a comprehensive approach enables us to achieve high implementation speed and guarantee the parameters of the aspiration systems, thanks to conducting turnkey projects.

1. Audit of the company's aspiration systems
2. Design
3. Equipment manufacturing
4. Installation work
5. Supervisory installation work
6. Commissioning work
7. Service maintenance



AUDIT OF ASPIRATION SYSTEMS

Specialists from “SKIF TECHNOLOGY GROUP” will conduct an assessment of the correct implementation of aspiration system projects, identify root causes of unsatisfactory performance and equipment failures, and develop organizational and technical measures to address them.

Tasks:

- Identifying "bottlenecks" in the operation of aspiration systems at the elevator.
- Developing solutions to eliminate dust issues at the facility.
- Developing a set of organizational and technical measures for elevator modernization.

The audit allows for:

- Justifying the need for measures to reduce the energy consumption of existing aspiration units by 15-20%.
- Providing ways to improve the operating modes of dust control systems (increasing the reliability of aspiration equipment up to 2 times).
- Developing technical solutions to enhance dust control efficiency while minimizing reconstruction costs.

SKIF TECHNOLOGY GROUP

DESIGN SERVICES

Development of aspiration system projects in the areas of:

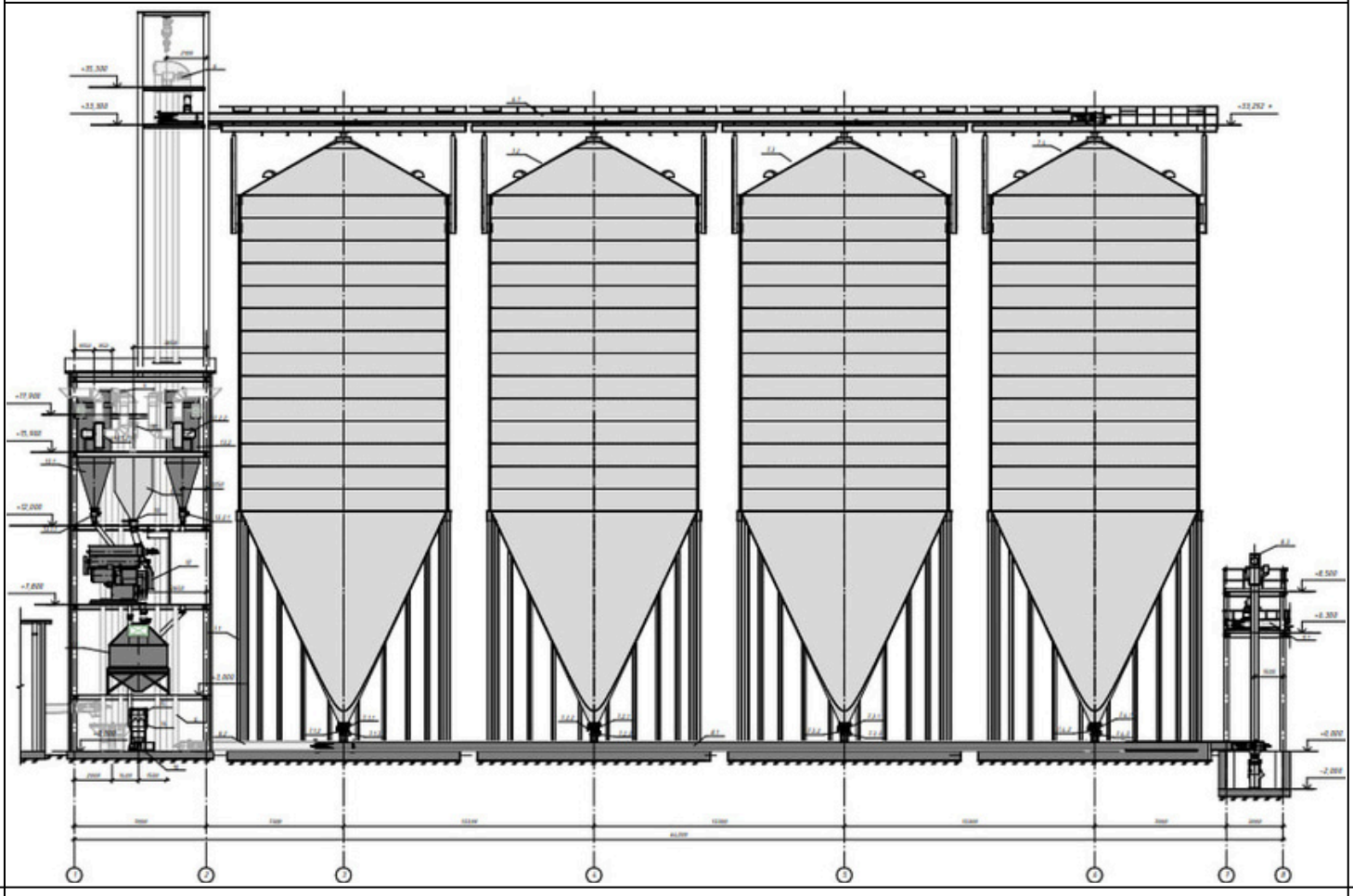
1. Grain processing
2. Cement
3. Wood processing industries
4. Pneumatic conveying
5. Ventilation of various premises

Tasks:

- Addressing issues such as improper equipment selection, material overconsumption, and conflicting intersections of various utilities.
- Solidifying adopted engineering solutions ("what", "where", "how" will be implemented).
- Quantitative and qualitative assessment of required equipment and materials.
- Cost estimation for the implementation of the planned project.

The project has the following advantages:

- Conducting design work internally (without subcontracting).
- Design engineers have higher education, undergo additional training, and apply advanced design technologies.
- Significant experience in implementing projects on real sites.
- Projects developed by our company comply with existing regulations and requirements.
- Developed projects ensure high equipment efficiency with optimal electricity costs.
- Equipment selection is based on optimal price-to-quality ratio.
- Ensuring flexibility and technological feasibility in project implementation.



ASPIRATION EQUIPMENT MANUFACTURING

Aspiration equipment is manufactured using modern material and technical base with components from global manufacturers, ensuring reliable operation, assembly precision, and high quality of products. The enterprise has implemented and operates under the ISO 9001:2008 quality system.
The equipment production involves the following equipment and workshops:

INSTALLATION WORKS

Advantages of performing installation works by a project organization:

- All stages of installation of equipment are carried out by one company;
- Warranty for all provided installation works;
- Availability of highly qualified specialists in the installation of aspiration, ventilation, and pneumatic transport systems;
- Availability of necessary tools and equipment for the work;
- Use of high-quality sealing materials;
- Provision of service and post-warranty maintenance;
- Responsibility for the quality of work performed.

Stages of work:

Preparatory work → Installation of pneumatic conveying → Installation of main equipment

Electrical installation → Ductwork installation

SUPERVISORY INSTALLATION WORKS

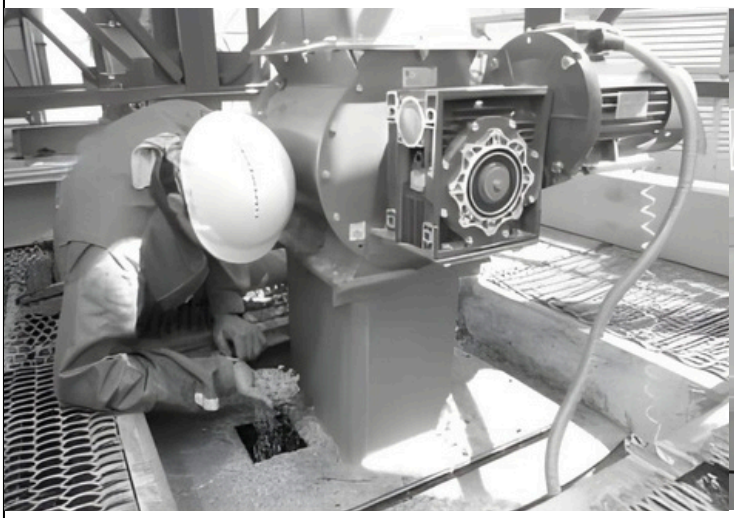
Supervisory installation is the key to the correct, reliable, and long-lasting operation of aspiration, ventilation, active ventilation, and pneumatic transport systems.

Tasks:

- Minimize the risk of errors during installation and commissioning;
- Increase equipment reliability;
- Eliminate equipment downtime;
- Eliminate organizational and technical problems (which arise when installing new, unfamiliar equipment for the staff).

Supervisory installation allows:

- Perform comprehensive supervisory installation works by one company;
- Optimally select components (price/quality ratio);
- Provide service and post-warranty maintenance;
- Guarantee the quality of the work performed.



COMMISSIONING WORKS

The commissioning specialists are highly qualified engineers in dust control systems, conditioning, ventilation, automation, and system dispatching, with extensive experience in operating, adjusting, and repairing engineering equipment of any complexity.

Tasks:

- Ensuring proper documentation handling (including passports during handover, inspection checks, licensing, etc.).
- Conducting commissioning tests and system adjustments.
- Verifying that the operational parameters of installed dust control systems meet project and regulatory standards.
- Guaranteeing the reliable and efficient operation of dust control installations.

Commissioning works allow:

- Completion of the entire cycle of works internally.
- Availability of an accredited laboratory.
- Availability of a range of instruments for measuring and adjusting aerodynamic and power characteristics of dust control systems.
- Measurement using instruments certified and accredited by the state.
- Conducting commissioning tests strictly in accordance with GOST (State Standards) and SNiP (Construction Norms and Regulations).
- Providing warranty and post-warranty technical support for the completed works for one year.

SERVICE MAINTENANCE

The structure of “SKIF TECHNOLOGY GROUP” includes a service division, which ensures the uninterrupted operation of your equipment through high-quality and timely maintenance and repairs.

Advantages of the provided service maintenance:

- Conducting technical servicing within the framework of scheduled maintenance (TO, TO1, TO2) by highly qualified factory personnel (as per service contract terms).
- Service department equipped with modern, high-quality, high-tech tools and equipment.
- Full responsibility for the quality of work performed.
- Rapid service for ordering, design, manufacturing, delivery, and, if necessary, installation and commissioning of spare parts (without prepayment, based on the service agreement).
- Availability of transport, qualified installers, and operators from the operational factory producing equipment for elevators.
- In case of equipment breakdowns, emergency assistance (within 24 hours) by factory representatives for diagnostics and troubleshooting is provided.

Tasks:

- Maintaining equipment in operational condition.
- Diagnostic evaluation of technical condition.
- Preventing failures of engineering systems and equipment.

SUMMARY CHARACTERISTICS OF THE SUPPLIED FILTERS:

The filter material is selected individually based on the dust characteristics and the aggressiveness of the environment in each case. The modular design features of the housings allow for the manufacturing of filters that consider the dimensions of the production facilities and enable installation both inside and outside buildings.

The equipment can be used for cleaning contaminated air (gas) removed from technological equipment (silos, hoppers, conveyors, crushers, dryers, screens, separators) as well as for installation at transfer points.
The warranty ranges from 18 to 24 months (depending on the equipment configuration). The company also provides maintenance services, which include the following types of work:

- Customer service and equipment repair
- Equipment maintenance during the warranty period, as well as post-warranty
- Training of personnel operating the equipment
- Prompt qualified technical assistance
- Delivery of spare parts and consumables

Characteristics	Figures
Performance	500 to 60,000 m³/h
Flow temperature	-30°C to +50°C
Dust dispersion	0.1μm to 1000μm
Inlet concentration	nominal value
Outlet concentration	99-99.5% of nominal value
Filter types	sleeve filters, cartridge-sleeve filters, membrane filters, centrifugal filters
Regeneration method	Pulse cleaning
Possible configuration	antistatic, explosion-proof
Application area	food-grade, cement, and wood processing industries

GENERAL RECOMMENDATIONS FOR FILTER SELECTION

The key factors in choosing a specific filter, in addition to its purpose and performance, include the dustiness of the air to be cleaned, its temperature, the characteristics of the dust, and the method of filter element regeneration. The main parameters that help determine the required filter type are presented in the following table:

Parameters		Uni-f	Unload-f	Cas-f	Cyclo-f
Performance m³/h	min	800	5000	4000	1000
	max	9600	12500	60000	50000
Flow Temperature, °C		-30	-30	-30	-30
		60	60	60	60
Regeneration method		pulse purge			
Filter elements		sleeves			
Type of filter	local	+	+	-	-
	centralized	-	-	+	+

DUST SEPARATING EQUIPMENT

For local exhaust ventilation, dust return into the stream

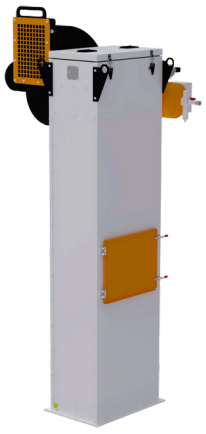
filters with efficiency η ≥ 99.0-99.5%.

For centralized ventilation

filters with efficiency η ≥ 99.0-99.5%.

Unload-f

Uni-f



Cyclo-f

Cas-f