



INNOVATIVE TECHNOLOGIES FOR
ENVIRONMENTAL PROTECTION



ecoserv.com.pl/en

ECOSERV

ECOSERV is a **modern, innovative company** providing solutions in the field of environmental protection, renewable energy sources, and industry energy efficiency.

As one of the few companies in the market, we have our own technologies developed by leading Polish engineers. This allows us to, among others, reduce emissions of harmful compounds produced in the process of combustion in industry, heat engineering, and power generation. The development of the product **ECOSERV IOS**, which has gained wide recognition in Poland and abroad, confirms our success in this field. The best confirmation of our professionalism comes from our satisfied customers. Our reference list includes several hundred entities from Poland and Europe.



We are a proven and reliable technological partner for Polish and foreign companies implementing turnkey investments. We are able to provide a wide range of solutions with the highest quality workmanship. Depending on the project, we work on our own or deliver documentation.

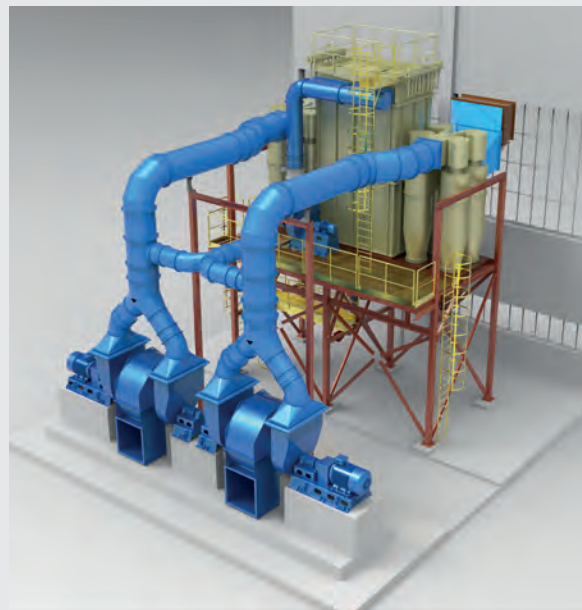
We have our own production facilities, a team of experienced designers, and quality control, confirmed by international certificates. Thanks to this, we are able to oversee projects at every stage of their development.

Design Office

The ECOSERV Design Office combines the potential of experienced designers with more than **30 years of market experience** and young, ambitious engineers with an approach and a capacity for creating innovative solutions. We operate using the latest design tools for 3D modeling.

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We carry out the **most complex and complicated engineering projects**. We are competent in the implementation of detailed designs tailored to the “design and build” formula. We are also able to work on delivered documentation, on the basis of which we prepare detailed design documentation and technologies.



We possess the competence to undertake comprehensive projects in the fields of environmental protection and energy. This involves the preparation of all necessary documentation, followed by the entire production phase, inspections, individual stages of commissioning work, and concludes in handing over the facility for operational use.



Certificates and entitlements

While striving to act in compliance with the highest standards of production processes and attaching great importance to further development, ECOSERV operates following quality systems.

- Certificate of COMPANY PRODUCTION INSPECTION for load-bearing structures in all types of constructions
- WELDING QUALIFICATION CERTIFICATE
- WELDING PROCESS ASSESSMENT CERTIFICATE

ECOSERV has qualified NDT personnel with competencies compliant with the requirements of the respective standards:

- visual testing (VT2),
- penetration testing (PT2),
- magnetic particle testing (MT2),
- ultrasonic testing (UT2).

In addition, we cooperate with Accredited Testing Laboratories in the field of NDT (non-destructive testing) and DT (destructive testing).

ECOSERV has qualified WPQR welding technologies under EN ISO 15614-1 in methods 135 and 141 for many steel.

Employees performing welded joints are certified following the requirements of PN-EN ISO 9606-1. Welding supervision personnel are certified per PN-EN ISO 14731 hold International Welding Engineers' qualifications and a Welding Competence Certificate.

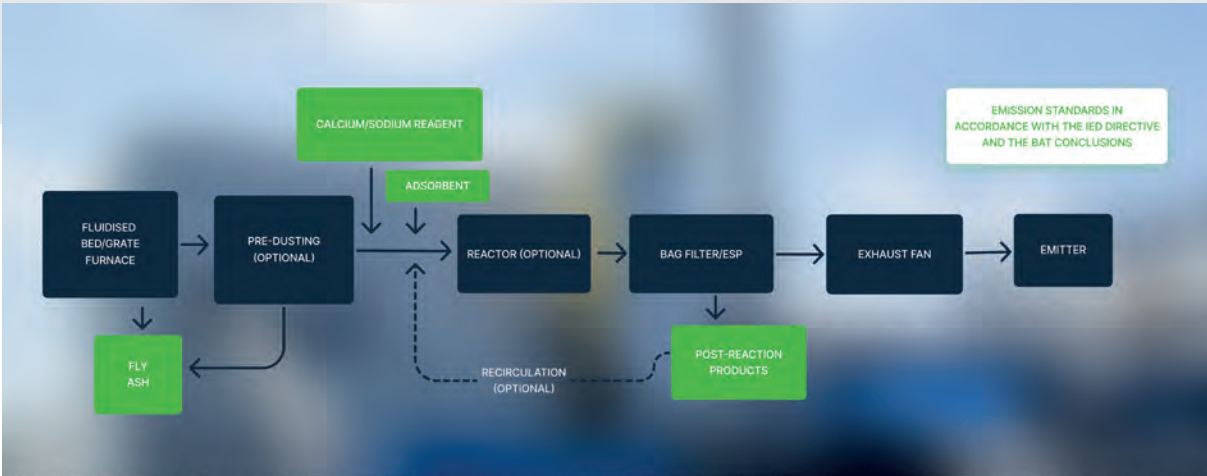


Flue gas and other gas treatment systems - ECOSERV IOS

Our company's engineering team has developed technological solutions that help minimize investment costs, all while ensuring compliance with emission standards based on the latest BAT conclusions outlined in MCP, LCP, and IED directives.

ECOSERV IOS is an **innovative system for flue gas treatment**, particularly for removing chlorine and sulphur compounds based on the dry method for medium-sized grate boilers from 1 to 50 MW. The system is designed to operate with ready-to-use dry sorbent dosed pneumatically from a big bag or silo emptying station directly into the flue gas duct.

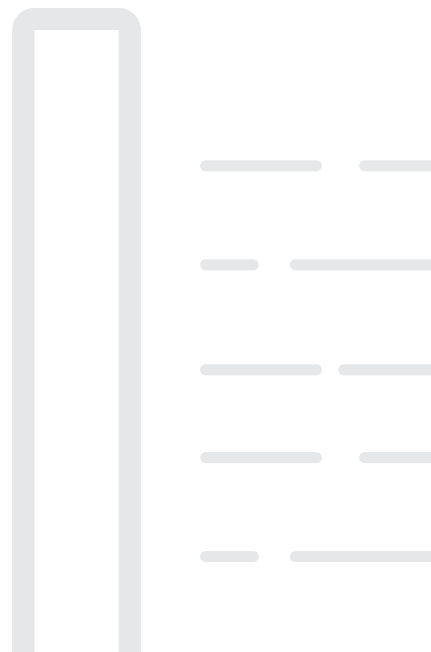
The dry sorbent is dosed into the flue gas duct at a point just downstream of the pre-dusting equipment (multi-cyclone), and the reaction product is caught in the bag filter. The correct length of the flue gas duct, the correct distribution of the sorbent in the flue gas duct, and the time of sorbent presence on the surface of the filter bags enable the sorbent to react correctly and comply with emission standards.





Based on the DSI technology (Dry Sorbent Injection), we have introduced in-house product and process innovations that enabled the following:

- reduction of capital expenditure to the necessary minimum as well as operational costs,
- minimisation of investment process duration,
- optimisation of system operating costs,
- minimisation of interference with the currently operating process system,
- full customisation of the implemented solution, by adjusting it to the character of a given generating unit. This includes the chemical composition and structure of acid-forming substances in the flue gas stream,
- scalability of solutions, in other words, the possibility to implement a functionally extended system for multi-annual operation, but also a portable system with an operating horizon of several years,
- possibility of simultaneous reduction of SO_x and NO_x without the need to implement non-catalytic SNCR or catalytic SCR methods requiring intensive investment,
- reduction to the required levels of the following harmful compounds (among others): SO_x, NO_x, HCl, HF, Hg, and heavy metals.

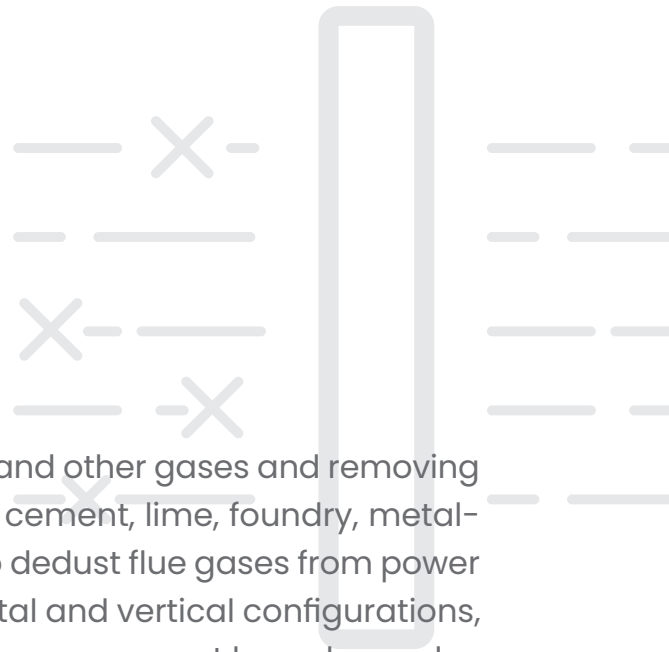
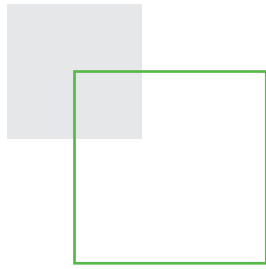


Dedusting systems

Industrial plants in various sectors face the problem of dust generated during ongoing production processes.



This dust is generated both during the combustion of fuels in heating plants and combined heat and power plants, during material processing, and during the transfer of bulk products being transported. In today's world, safeguarding the natural environment and ensuring safety and comfortable working conditions are crucial aspects. Filtering and dust extraction devices play a key role in achieving this. They capture harmful dust generated during manufacturing processes, preventing it from entering the atmosphere. ECOSERV has several process solutions and filtering equipment, i.e., vertical and horizontal bag filters, cyclone and multi-cyclone dedusters, which are selected and configured individually for the respective process.



Bag filters

Bag filters are designed for dedusting air, flue, and other gases and removing dry and non-sticky dust. They are used in the cement, lime, foundry, metallurgy, glass, and heat engineering industries to dedust flue gases from power boilers. We manufacture filters in both horizontal and vertical configurations, and our engineering team selects the optimal arrangement based on a detailed analysis of the investment conditions.





**Our power comes from
outstanding experts
who make the production
of top-quality products
possible.**

Filters with vertical bags

Bag filters with vertical filter bags in the filtration chamber. The gas enters the filtration chamber, where the fine dust fractions are captured and remain on the surface of the filter fabric. Pulsed regeneration of the filter with



compressed air occurs cyclically (the time between compressed air pulses is set) or automatically (when the differential pressure exceeds the set value in the filter controller).

The design of the bag filter ensures good bag regeneration and cleaning of the bags from dust, and it eliminates the accumulation of dust on the filter bags and thus their clogging as much as possible. This can have a significant impact on their service life.

Filters with horizontal bags

Bag filters with horizontal bags are installed horizontally in the filtration chamber. The bag filter's regeneration with compressed air occurs cyclically or automatically. Dedusted flue gases from the filter are extracted by a draft fan to the emitter. Horizontal bag filters are designed to dedust flue gases from power station boilers and other contaminated gases.



They are characterised by high compaction of the filter surface in a relatively small space, which allows them to have a compact size.

In ECOSERV solution the filter bags in the horizontal filters have a convenient “snap-ring” fastening implemented, which ensures tightness and ease of assembly.

Cyclone

Cyclone batteries are used for cleaning gases from solid particles (dust). They are made standard from 3 – 4.5 mm thick steel sheets. The inlet head section may have a wear-resistant steel insert to extend its life. Cyclone batteries can also be used as pre-dusters, e.g., for bag filters.

As a result of centrifugal force (caused by the cylindrical chamber), the flue gases flowing through the cyclones cause the dust to be thrown back onto the wall of the cylindrical shell. Here it slows down under the impact of frictional force, and then falls by gravity before being discharged through a chute tightly closed to the gases with a sluice.



Horizontal pass-through multi-cyclone dedusters

Pass-through cyclones (multicyclones) are mainly used in the power industry for grate boilers as the preliminary dedusting stage. They are designed to capture the most erosive fractions, which extends the life of cyclone dedusters or filters.

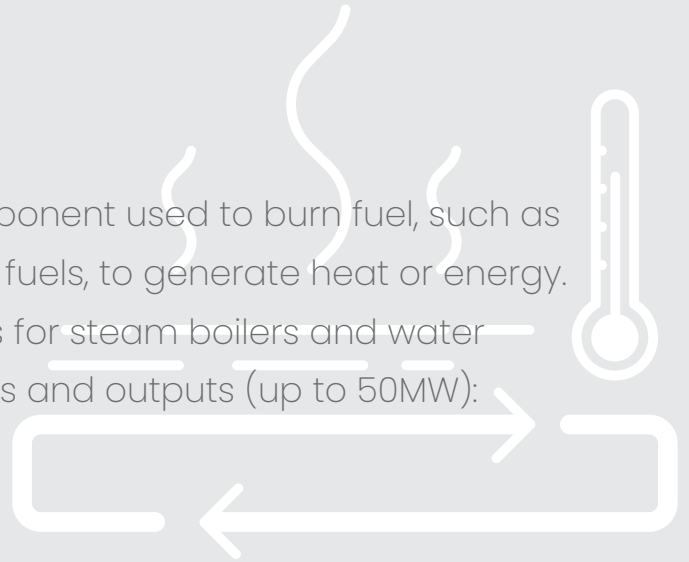
A pass cyclone comprises of cast-iron cyclones (the so-called swirlers), which swirl the flue gases. It is here where the dust is thrown back on the wall of the shell under the impact of centrifugal force, and where it is slowed down under the impact of frictional force, falling into the expansion chamber of the pass-through cyclone. It then falls by gravity to the chute, which is closed with a dust discharge sluice.

The capacity of one pass-through cyclone depends on the number of pass-through cyclones (swirlers) installed and the diameter used.



Mechanical grates

The belt grate is a boiler component used to burn fuel, such as coal, biomass, and alternative fuels, to generate heat or energy. We can list mechanical grates for steam boilers and water boilers with different capacities and outputs (up to 50MW):



Its strength and robust structure allow it to burn the selected fuel type efficiently. There are many options and categories of boiler grates, which differ in design and mode of operation.

For boilers with capacities from 1MW to 5MW, light deck belt grates (of RN, RTS, RTN, RTSR, and RTSN types) are used.



For boilers from 6MW to 50MW, heavy-deck belt grates (of RW, RTW, RTWC, RTWK, RTP, and RŁ types) are used.

The design of the grate box, divided into an appropriate number of zones (to have as little “dead space” without air as possible), allows the primary air to be supplied to each zone, while remaining airtight and not allowing the air to pass from one zone to another. This design ensures the proper course of the combustion process and allows the boiler to operate in a regulated and controlled manner.

ECOSERV is involved in inspections, overhauls, modernizations, and new implementations related to belt grates, introducing several changes to improve the performance of the combustion process.

Step grates for biomass combustion

A step grate is a type of grate used in biomass boilers. It is a particular type of grate designed to enable efficient combustion of organic materials such as wood, sawdust, straw, pellets, wood chips, or other types of biomass.

The step grate consists of several levels of high-chrome fire-bars arranged in a stair-like manner.



The biomass is delivered to the highest level of the grate and then gradually moved to the lower levels using a hydraulic system, in a reciprocating motion during the combustion process. This arrangement allows better control of the combustion process and ensures an even distribution of the biomass on the grate.

ECOSERV performs inspections, overhauls, modernizations, and new implementations related to step grates and biomass feeding systems.

Grates for co-firing

The coal and biomass co-firing grate is a particular type of grate used in boilers that allows the simultaneous combustion of both coal and biomass, such as sawdust, straw, pellets, wood chips, or other types of biomass. Co-firing is a process in which both types of fuel are combusted simultaneously to achieve environmental and economic benefits.



Co-firing enables the use of both the energy contained in coal and biomass, resulting in more efficient use of available energy sources and the reduction in harmful emissions.



We deliver a wide range of solutions of the highest quality, individually tailored to the needs of our customers.

Transport systems and conveyors

ECOSERV is a manufacturer of fuel transport systems, such as biomass, coal, and other materials, including slag and bulk materials. In the designed systems, we use devices such as:

Chain conveyors

The modern chain conveyor is a piece of equipment with several key functions for transporting materials. The wear-resistant materials, antistatic plastics, or basalt linings used in it are designed to protect the structure from wear, corrosion, and the transported material from ignition.



The dimensions of the entire structure depend on individual needs and customer preferences, such as the efficiency of the transported material and the transport route.

The properties and purpose of chain conveyors make them suitable for use in, among others, the metallurgy, mining, and broadly defined power generation sectors.

Belt conveyors

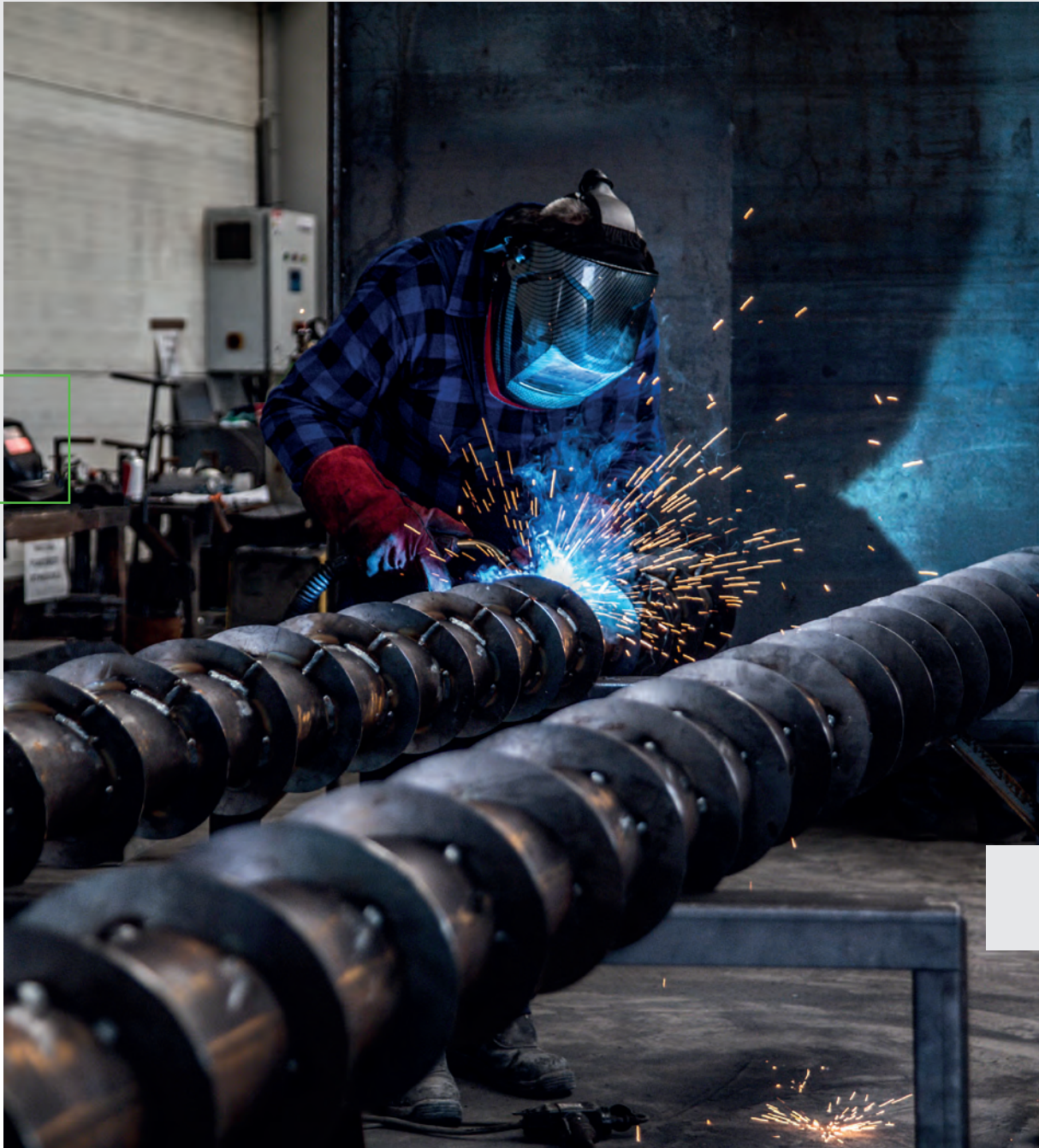
Belt conveyors are devices designed to move material resting on the belt. The transported material is carried by the belt, supported by carrying rollers, while guiding rollers maintain alignment along the route. The belt is set in motion by coupling it with the drive drum. Depending on the material being



transported, throughput, or process, our designers select the appropriate type of components such as rollers, belt, or conveyor structure.

Screw conveyors

Screw conveyors are devices used in the transportation of biomass, dust, slag, and other bulk materials. The parameters of screw conveyors are tailored to the specific transport system of the given material.



The main components of screw conveyors include the body, the screw assembly with bearings, and the drive assembly.

Biomass conveyers

The transport of biomass to the boiler is linked to the combustion technique used. When designing the boiler fuel supply equipment, the distance over which biomass with specific properties is to be transported at a given capacity is considered.



When transporting loose biomass (sawdust, pellets, woodchips) over short distances, screw conveyors are used.

Belt conveyors are used if the distance between the boiler and the hopper is greater. Their simple design consists of a long belt mounted on pulleys, which can be additionally loaded. They are designed for fine biomass.

Chain conveyors are installed to transport the fuel in different planes (up to 90 degrees). They are flexible in terms of the particle sizes conveyed, which can be freely distributed along the length of the chain.

Moving Floors

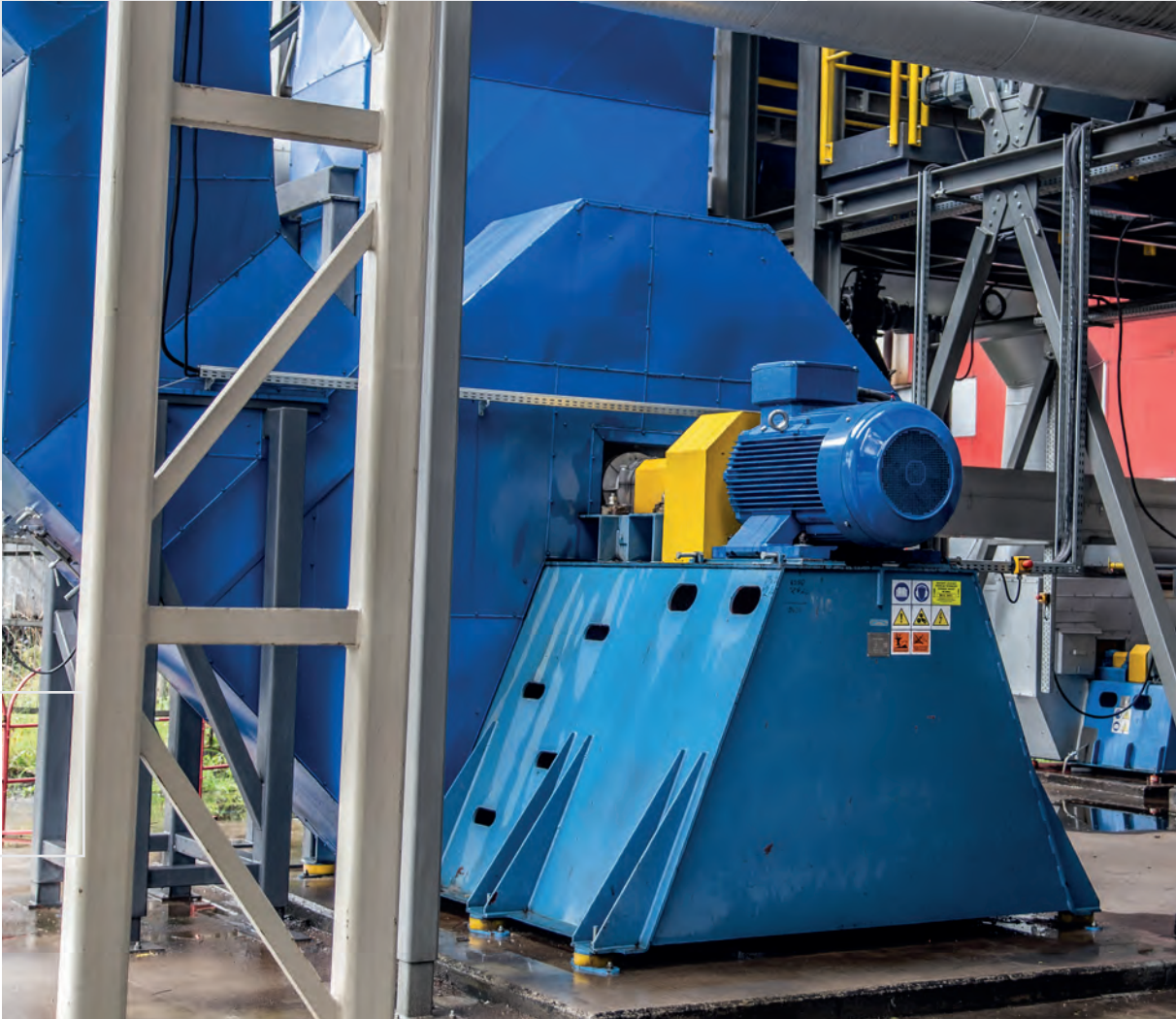
For transporting materials such as sawdust, wood chips, shavings, etc., we employ moving floors with hydraulically controlled push-pull bars that move in both directions along the bunker floor.

Transport systems are tailored to the individual needs of the customer – from the concept stage, through the system design, its manufacture, to its assembly and commissioning.



Industrial fans

We offer a comprehensive range of radial fans applicable across all industrial sectors. Our products are manufactured in accordance with the latest design standards, catalogs, and industry norms, using certified materials to deliver a high-quality, reliable, and durable product.



We design user-oriented solutions tailored to the specifics of each application. Industrial radial fans are characterized by the flow direction along the radius of the impeller. The operating principle of radial fans involves the rejection of swirling air mass due to centrifugal force.



The fan housing features an internal spiral contour.

The rotor design is developed to achieve maximum efficiency and suitability for various operating conditions.

We offer our customers a comprehensive fan service, ranging from repairs and inspections, through component replacement and modernisation, to relocation and major overhauls.

We carry out expert assessments of fans with regard to further operation, possible modernisation, as well as reasons for incorrect or uneconomical operation. We work with proven and renowned equipment.

An aerial photograph of a dense, vibrant green forest. A light blue river winds through the trees, forming a large loop. In the center of the loop, there is a small island with a row of six trees. The image is framed by a dark blue background with a green horizontal bar at the top. There are also white and green geometric shapes overlaid on the image: a white square on the left, a green square at the top right, and a large white semi-circle at the bottom right.

**We create specific
solutions aimed
at protecting
the natural
environment.**

Steel structures, silos

Operating on the basis of the latest global technology and in accordance with the highest quality standards, we offer the following types of steel structures (among others):

- supporting structures,
- steel ducts for air, flue gases, and process systems with rectangular and round cross-sections,
- heat exchanger structures,
- reactors, scrubbers, and absorbers,



- supporting structures for process lines and pipelines,
- chain conveyors structures; structures for bulk material handling equipment,
- design of machinery and equipment for various industries,

- construction of quarter-turn staircases, service platforms,
- high-volume structures,
- railings, ladders,
- fittings, reducers, steel compensators,
- silos, chutes, tanks, aeration chutes.

Each proposal we make passes through the hands of our technologists and specialists who carefully select components and process solutions.





In the production process, we benefit from the rich experience gained over many years of activity in this field. This not only enables us to understand the most complex challenges but also, to make full use of the potential of owned equipment and machinery.

We carry out our projects based on precise technical documentation provided by the customer or developed by our design team. This process takes place in full compliance with the relevant industry standards and using advanced IT tools.

Our engineers, designers, and certified welders meticulously supervise every stage of production. We respond to the highest quality requirements, whether in the choice of raw materials, production processes, or advanced technological solutions.









**Flue gas and other gas
treatment systems**



**Industrial
fans**



**Mechanical
grates**



**Dedusting
systems**



**Transport systems
and conveyors**



**Steel structures,
silos**



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