

PRESENTATION





INNOVATOR Spółka z o.o

Zakład Działalności Innowacyjnej INNOVATOR Sp. z o.o. was founded in 1997. It is a state-owned company belonging to the Institute of Non-Ferrous Metals in Gliwice.

Since the day it was founded, the Company has been transferring the technologies developed by the Institute of Non-Ferrous Metals to industry and introducing production and services based on those technologies as its own activity.

Using the continuous direct cooperation with the Institute of Non-Ferrous metals, from the onset of its activity INNOVATOR Sp. z o.o. has been conducting research, designing, manufacturing, providing services and trading in the non-ferrous metals industry.

In 2005, in line with its mission, Innovator Sp. z o.o. took up the organization of production and sales of IF type flotation machines. Their modern design is the work of research teams of the Institute of Non-Ferrous Metals. The Company also offers other devices and equipment for non-ferrous metal ore and coal enrichment plants, as well as other industrial equipment, mainly related to environmental protection.

As regards the supply of machinery, INNOVATOR works in close cooperation with Polish non-ferrous metal ore and coal enrichment plants, and in recent years has been also successfully exporting the machines to China, Serbia and Kazakhstan.

Experienced staff, mostly recruited from among the employees of the Institute of Non-Ferrous Metals, is the unquestioned value of the Company. The scientific and research potential of the Institute of Non-Ferrous Metals combined with the vast experience of the staff, who have excellent knowledge of the industry and its connections, enables the Company to provide comprehensive technical and commercial offers to Customers.

OFFER

ENRICHMENT OF MINERALS

Innovator Spółka z o.o., working in close cooperation with the Institute of **Non-Ferrous Metals in Gliwice**, specializes in technologies related to the enrichment of minerals, in particular non-ferrous metals and hard coal. We coordinate all research, engineering and logistics activities connected with the selection of technology, manufacturing and sales of the equipment necessary for those technologies.

Our offer includes among others:



- burdening technologies for metallurgical processes;
- specialized hydrometallurgical processes;
- loose material storage and handling systems;
- utilization of waste acids;
- utilization of the product of semi-dry flue gas desulphurization;
- lead refining;
- vaporization and crystallization technologies;
- complete biodiesel production systems;
- asphalt storage and distribution systems.

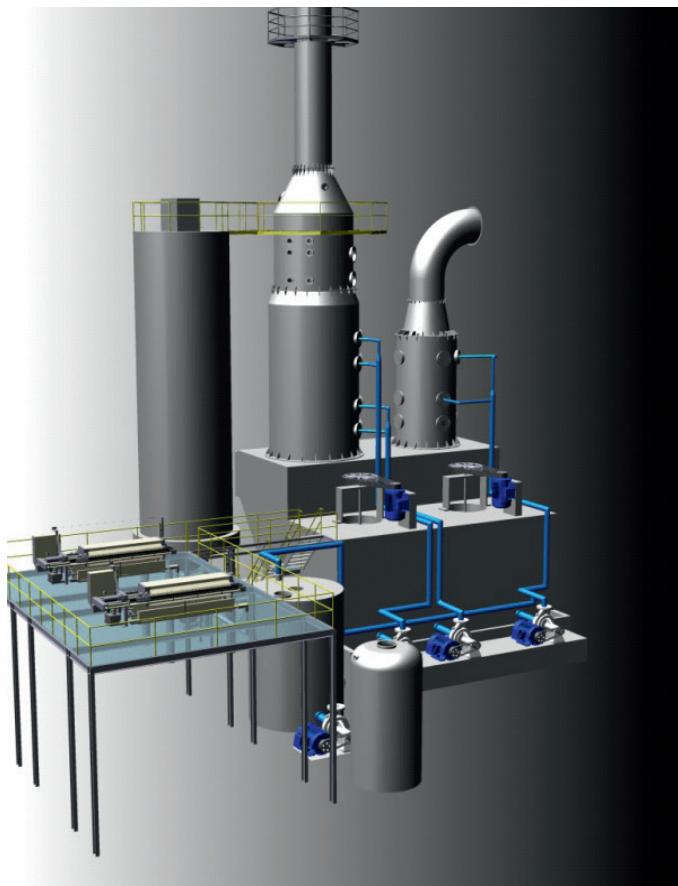


ENVIRONMENTAL PROTECTION

We develop and implement specialist industrial processes aimed both at manufacturing and environmental protection. Depending on the needs and requirements of the Customers, we provide the following services:

- specifying the program and conducting the necessary tests in a laboratory and semi-technical scale in cooperation with research entities;
- developing a process design;
- implementing a technical concept and feasibility study;
- compilation of the process equipment in cooperation with the manufacturers of specialist equipment;
- developing multi-disciplinary plans and specifications, as well as formal and legal documentation;
- acting as the engineering, procurement and construction contractor.

Our offer includes among others:



- **burdening technologies for metallurgical processes;**
- **specialized hydrometallurgical processes;**
- **loose material storage and handling systems;**
- **utilization of waste acids;**
- **utilization of the product of semi-dry flue gas desulphurization;**
- **lead refining;**
- **vaporization and crystallization technologies;**
- **complete biodiesel production systems;**
- **asphalt storage and distribution systems.**

GAS PURIFICATION SYSTEMS

Industrial gas cooling and purification systems



We offer individually designed industrial gas purification systems removing both gas (SO_2 , SO_3 , H, HCl, As_2O_3 , NO_x) and dust pollutants. Depending on the requirements, these systems apply various known methods and processes.

Reference projects include among others purification of flue gases from the lead-bearing raw material furnaces, several configurations of gas purification in copper production, condensation and recovery of Zinc oxide, numerous systems of dust extraction, mostly using pulse filters.

Flue gas desulphurization wet limestone flue gas desulphurization

The wet limestone flue gas desulphurization method, due to its high efficiency, simplicity and reliability, is the most widely used in desulphurization of flue gases of power plants.

We offer systems based on this process based on the license agreement with the Institute of Non-Ferrous Metals and the Institute of Chemical Engineering of the Polish Academy of Sciences.

Semi-dry flue gas desulphurization systems "DRY SCRUBBING"

The DRY SCRUBBING method ensures a moderate investment cost and relatively low maintenance costs, hence, in many applications it is the optimum desulphurization technology for medium-sized power plants.

Our references include the application of this process to the removal of acidic pollutants from both power plant flue gases and other polluted industrial gases.

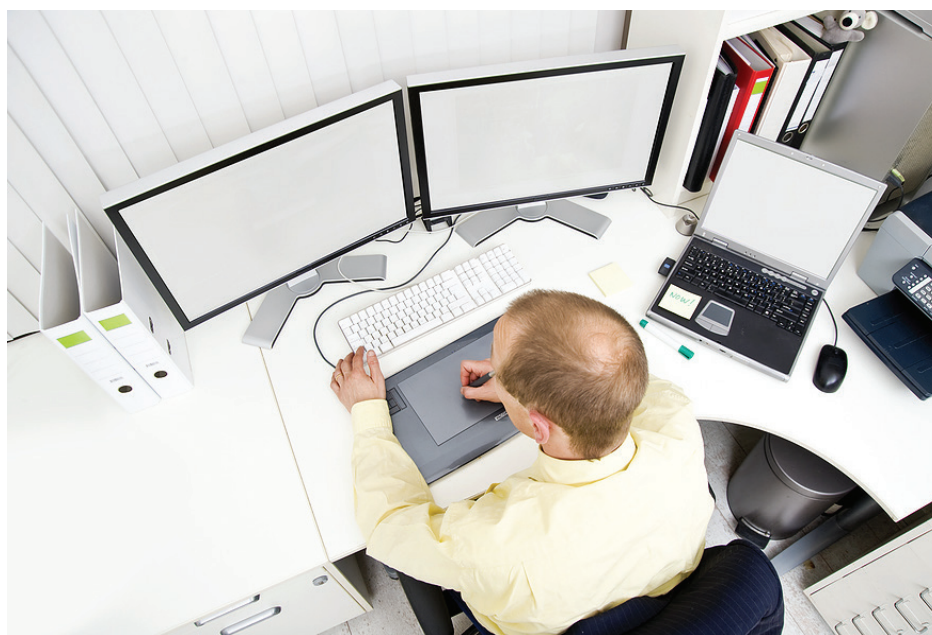
Dry flue gas desulphurization systems

Flue gas desulphurization systems using the method of injection of dry lime or sodium sorbent are a cheaper alternative to the more efficient wet and semi-dry methods in applications, where the efficiency of purification is not a critical parameter.

Purification of the flue gases of waste incineration plants

We offer complete systems removing the acidic pollutants, dusts, dioxins, and heavy metals from the flue gases of household and industrial waste incineration plants. Depending on the requirements, dry, semi-dry, wet technologies, as well as combinations thereof are used.

DESIGNING



Our specialists of the Design Office create new technical solutions and develop the multidisciplinary, comprehensive documentation, plans and specifications of the industrial facilities and environmental protection systems, including:

- **the technological concept;**
- **preliminary design with the environmental impact report;**
- **detailed designs and as-built documentation.**

The documentation we provide meets the highest quality standards and ensures the clients' peace of mind which can only be granted by adhering strictly to the construction law, environmental protection regulations and copyright and intellectual property rights. Continuous training and the designers' close contact, both with the newest technologies and the implementation practice, ensure the high quality of the documentation provided.

Upon the transfer to the ordering party the documentation is safely stored in electronic form, on a CD and in hard copy.



ENGINEERING, PROCUREMENT AND CONSTRUCTION CONTRACTOR

Under the engineering, procurement and construction contracting, **we provide full documentation stage, supply of the key elements of the systems, supervision of the construction, installation and start-up, finishing with the final hand-over of the facility.**

INNOVATOR SP. z o.o. provides the engineering, procurement and construction contracting of complete designs based on proprietary technological solutions and processes supplied by third parties.

Our engineering staff work with continuous commitment to all the executive processes on all stages of implementation. In practice it means that:

- each project is preceded with a discussion with the Customer regarding their needs and expectations;
- all the solutions contained in our documentation and in third-party one provided by our team, are subject to thorough technical and economic analysis;
- the site engineer benefits from broad consultations of our team of engineers.

Project management is supported by the newest computer software which enables scheduling of the investment in close relation to its budgeting and settlements.

The validity of this concept was proved on many occasions in the course of project implementation, which finished with the complete success of the investor and our Company.

CONTRACT ENGINEER SERVICES

Upon request we undertake the function of the contract engineer in investment projects.



The scope of such services includes verification of plans and specifications, professional supervision of the investment process, designing and verification of schedules, co-ordinations and settlements with contractors, representing the investor in front of administrative authorities, etc.

Our project management is supported by specialist software; which generates investment status reports periodically or on Customer's request.

In such activities we use our knowledge and expertise gained in the course of implementation of our contracts, in which we played the role of the engineering, procurement and construction contractor.

PROCESS CONTROL

We offer complete control systems for industrial facilities and technological processes, and the refurbishment of the existing systems, including:

- **controlling single devices to extensive systems;**
- **supplying controllers and operator stations;**
- **software applications;**
- **supplying measurement systems;**
- **visualization of technological processes, data acquisition systems;**
- **controller software,**
- **selection, supply and start-up of control and measurement instrumentation;**
- **electrical designs;**
- **BMS automation.**



The systems we design and supply are based on the equipment of renowned manufacturers and use the most advanced technical solutions.

The purpose of the systems we provide is always to lower the maintenance costs and ensure safety and comfort of the system users.

SELECTED EQUIPMENT

Flotation machines



Flotation machines are basic machines used for recovery of usable minerals from non-ferrous metal ores and other raw materials by flotation.

Between 1963 and 1976 the Institute of Non-ferrous Metals in Gliwice developed a range of pneumo-mechanical machines, which were marked by letters IZ. They were multi-cell, sluce-type machines of the individual cell volume ranging between 1 and 30 m³. They were widely used in the copper, zinc-lead and coal mining industries.

The IZ-12 still remains the basic coal flotation machine used in Poland. They were also widely exported, among others to China and Brazil.

Towards the end of 1990s the Institute of Non-Ferrous Metals developed a new generation of flotation machines marked by the letters IF.

The design philosophy of flotation machines has been changed - instead of a range of machines, we design and manufacture flotation machines according to the specific requirements of individual Customers.

The sluce-type machines have been replaced by one-cell flotation machines which can be linked to form a multi-cell flotation machine. They can also operate as individual flotation cells.

Flash flotation machines were designed for the flotation of pulp with high concentration of solids, up to 800 g/dm³, with a high thick grain fraction and for conducting the flotation process in a short period of time. These flotation machines are mostly used in the grinding cycle. Their usefulness can be mainly observed in the flotation of ores, which besides the basic mineral also contain noble metals, such as gold and silver. The flotation machines are used as single-cells, equipped with all the components for automatic stabilization of the parameters of the flotation process.

For the flotation of non-ferrous metal ores the design of flotation machines was developed which can be used for pulp flotation process with a broad range of solid parts concentration, as well as for enriching minerals of high specific gravity. The design of IF floating machines allows for the construction of

a multi-cell flotation machine, where individual cells are arranged in line or can be set in a broken line arrangement. A multi-cell flotation machine consists of a series of flotation sections. Individual sections are located at different levels.

The essence of the IF flotation machines is the introduction of a new type of aerators into their design, which allow for operation in a wide range of pulp aeration options at low peripheral speeds of the rotor. Consequently, an increased content of the useful component can be obtained in the concentration, electric power consumption can be reduced, and the aerator's life can be extended.

All the IF flotation machines are equipped with stabilization and regulation systems of the air stream directed to flotation and pulp level in the flotation machine cell. The systems are adapted for local control and cooperation with master control systems of the flotation process. We also offer systems for stabilization of parameters of the material fed, in particular for flotation in the grinding cycle.

The flotation process parameter stabilization systems used comprise flow stabilization and control system of air supplied to the individual aerators, as well as to the control, stabilization and pulp level system in a single cell or cascade of a multi-cell flotation machine. The stabilization and control system of flotation machine parameters is equipped with an ETHERNET modem for communication with a master system.

Pulse filters

The pulse filters we design and supply have been successfully used in many industries for almost twenty years. With the advances in design, technology and materials, these devices undergo continuous modernization. Each new design uses the maintenance experience gained on the basis of operation of the previously supplied devices to its full extent.

The new generation of our pulse filters comprises:

- **PFM, PFS and PFD bag filters optimized for different flow capacity ranges;**
- **Cyclone and bag PFC filters;**
- **PFZ compact dust separators for dust extraction in silos;**
- **PFN cartridge filters;**
- **PFP horizontal bag filters;**
- **PFK cassette filters;**

Each filter, of any range can be provided in an ex-rated version. Unique technical solutions protected by the law have been used in our filters.

Thanks to those solutions the filters can be used in the most demanding applications, ensuring the highest efficiency coupled with moderate maintenance costs.



These solutions are protected by the following patents:

- cylindrical bag filter No. 166026;
- bag filter No. 166700;
- preliminary gas dedusting chamber in pulse filter No. 56709;
- regenerating assembly of the bag filter No. 58049;
- filtration bag lower position retaining assembly No. 57892.

The main areas of application of our filters are cement and lime industry, non-ferrous metals industry and metallurgy.

Industrial gas coolers

Our offer comprises coolers designed for lowering the temperature of industrial gases. These devices are designed for heavy-duty conditions, for hot gases with high dust concentration.

When necessary, they are equipped with a system of mechanical purification system of the heat exchange surfaces.

Many years of experience in designing industrial gas purification systems enabled us to develop a range of industrial gas coolers. It includes the following devices:

CR type coolers

Pipe coolers with process gas flowing inside the pipes, designed for cooling gases with a moderate level of contamination with non-sticky dusts;



CC type coolers

Flat pipe coolers with process gas flowing outside the pipes and a mechanical system of heat exchange surface purification, designed for the cooling of gases with a high level of dustiness with the possible presence of sticky dusts;

CP type coolers

Plate coolers used among others in the cooling/heating of the heat in the DRY SCRUBBING method of flue gas desulphurization.

Spray driers

We offer driers equipped with spray heads, used in the processes applying spray drying and in environmental protection systems for acidic gas pollutant absorption.

These devices are equipped with modern control systems and can be supplied in self-contained versions or as part of complete systems.



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