

Magnetic Separation Treatment of Industrial Wastewater

**Company Video
Presentation**

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About the Company



ZAVKOM-ENGINEERING LLC — Your Reliable EPC and EPCM Partner in the Implementation of High-Tech Production Facilities for the Petrochemical, Biotechnology, and Food Industries.

We provide a full range of engineering services for the comprehensive implementation of high-tech and energy-efficient industrial plants and equipment. We assume full legal responsibility.

- We are a member of the Chamber of Commerce and Industry of the Russian Federation.
- We are included in the Register of Engineering Companies of the Russian Federation.
- We are a licensor of technologies: naphthalene purification, resin production, evaporation units, PNS production, formalin, and adhesive compositions.
- We operate in the markets of Russia, the CIS countries, and Egypt.
- We have a representative office in China (Shanghai).
- We possess our own scientific, technical, engineering, and production facilities.

Company Departments

Petrochemicals



Биотехнологии



200 +
Team Members

350 +
Successful Projects

70000 m² +
Production Facilities



Today, ZAVKOM-ENGINEERING means integrated projects, decades of experience, energy-efficient technologies, and quality equipment — delivered on time.

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Advantages

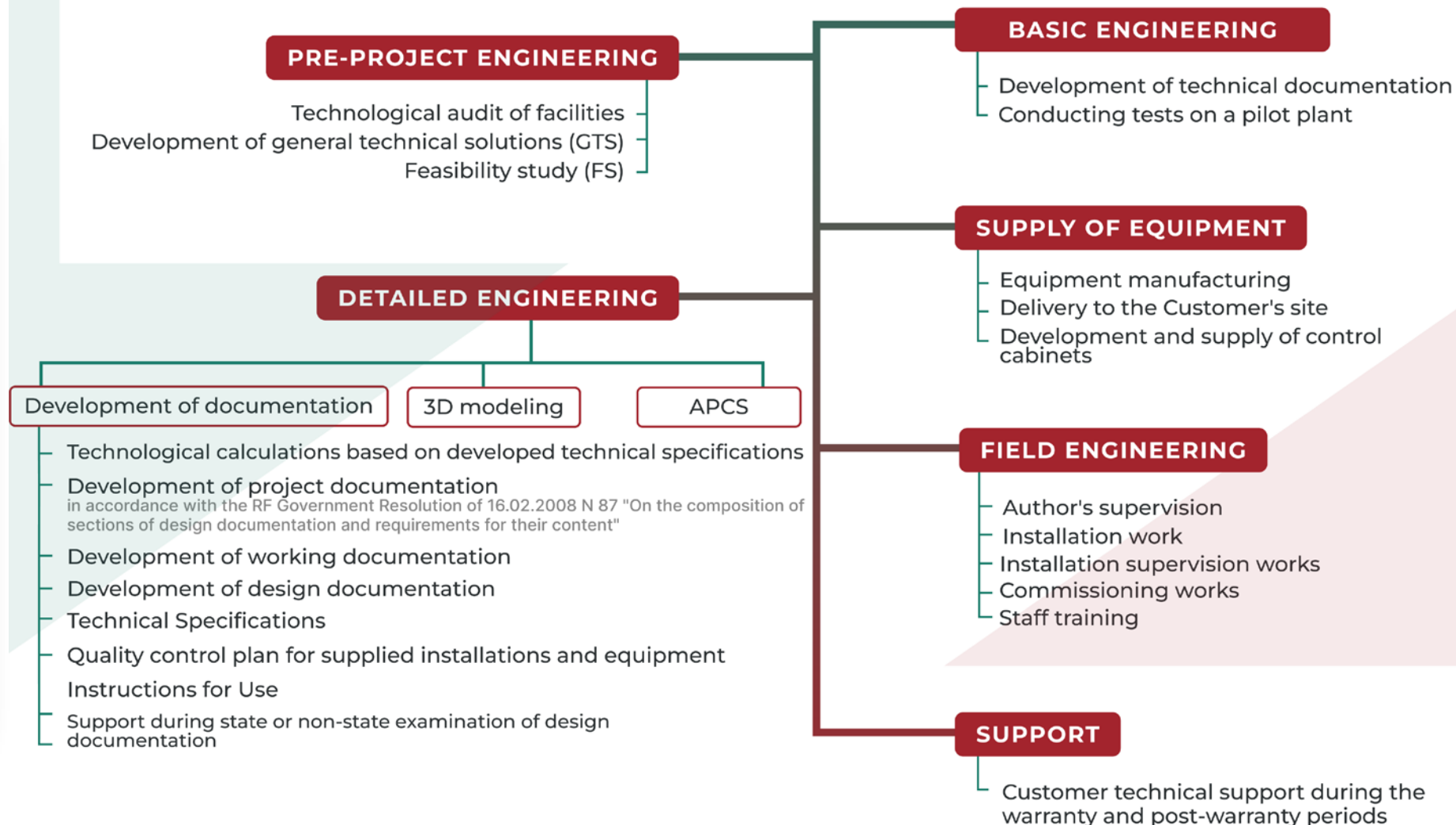
Wide Range of Engineering Services

Full Range of Engineering Services
for Industrial Enterprises



In the execution of contracts, the
Company acts as the sole legally and
financially responsible entity to the
Customer.

EPC





Completed Projects and Partner Trust



**A Proven Track Record of Successful
Project Execution Across Russia —**

350 +

Successful Projects

Gazprom PJSC
Gazprom Neft Omsk Refinery JSC
Gazprom VNIIGAZ LLC
Tatneft PJSC
Sibur Holding PJSC
Amino-Sib JSC
Transneft PJSC
Organic Acids LLC
Sibagro JSC
SUEK-Kuzbass JSC
VZK LLC
URALCHEM OHC JSC
Voronezhsynthetkauchuk JSC
MMK PJSC
Geropharm LLC
Shattdecor LLC
GIPROBIOSINTEZ LLC
Rosatom State Corporation

Egyptian Maintenance Company
M-Sintez LLC
Murom CJSC
Sinergiya LLC
Metadinea LLC
SZSP LLC
Uzlovaya SEZ
Suez Methanol Derivatives Company
Afanasy Private Brewery LLC
Bravo-Premium LLC
Zhirovoy Kombinat OJSC
Pivzavod-Markovsky OJSC
Allnex Belgorod LLC
Pavlovsky DOK LLC
Zavod Sintanolov LLC
Avesto Gurukh LLC
SPEM LLC
Carlsberg Azerbaijan LLC

Zauralskiye Napitki LLC
NIKA-PETROTEK LLC
Khadyzhensky Brewery LLC
Vasileostrovskaya Pivovarnya LLC
AFSAR COMPANY LTD JV LLC
Zlatoust Sugar Refinery LLC
Znamensky Sugar Plant JSC
HANSEN BREWERY LLC
Olkhovatsky Sugar Refinery JSC
Pigment PJSC
Arkhangelsk Plywood Mill CJSC
IFOTOP LLC
ETB KAT LLC
Premix Plant No. 1 CJSC
Pereleshinsky Sugar Refinery LLC
PDK Apsheronsk JSC
Zhigulevsky Brewery OJSC
Yeletsky Sugar Plant JSC



We work with enterprises of the mining and metallurgical complex, the chemical and food industries, and the municipal sector.



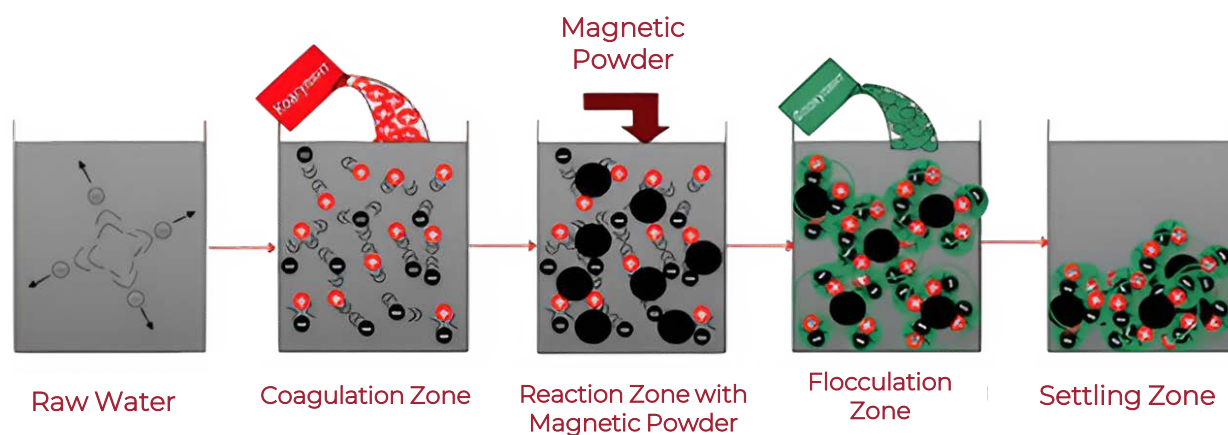
High-Efficiency Magnetic Separation Wastewater Treatment Systems



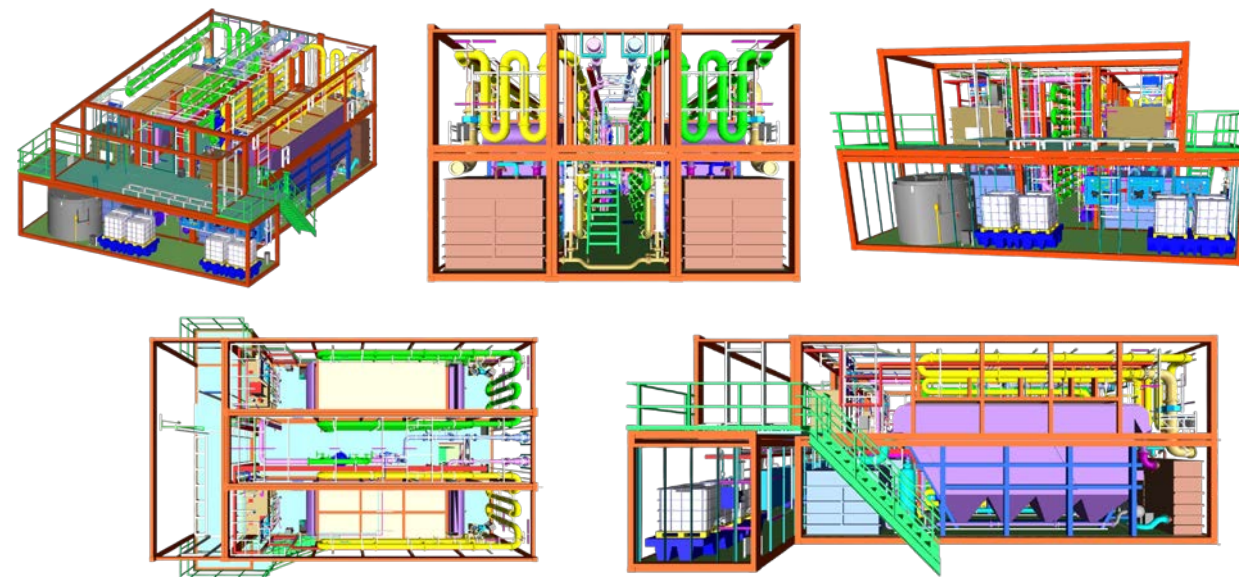
Compact and High-Speed Solutions for the Treatment of Complex Industrial Wastewater from ZAVKOM-ENGINEERING LLC



Concept of Magnetic Coagulation Technology



Dissolved Air Flotation (DAF) Unit in Modular Skid-Mounted Design





Essence of the Technology

Coagulation and Flocculation

Under the influence of a magnetic field, finely dispersed suspended particles align into chains and agglomerate — this is magnetic coagulation and flocculation.



Aggregate Separation

Large flocs are effectively removed in the magnetic separator.

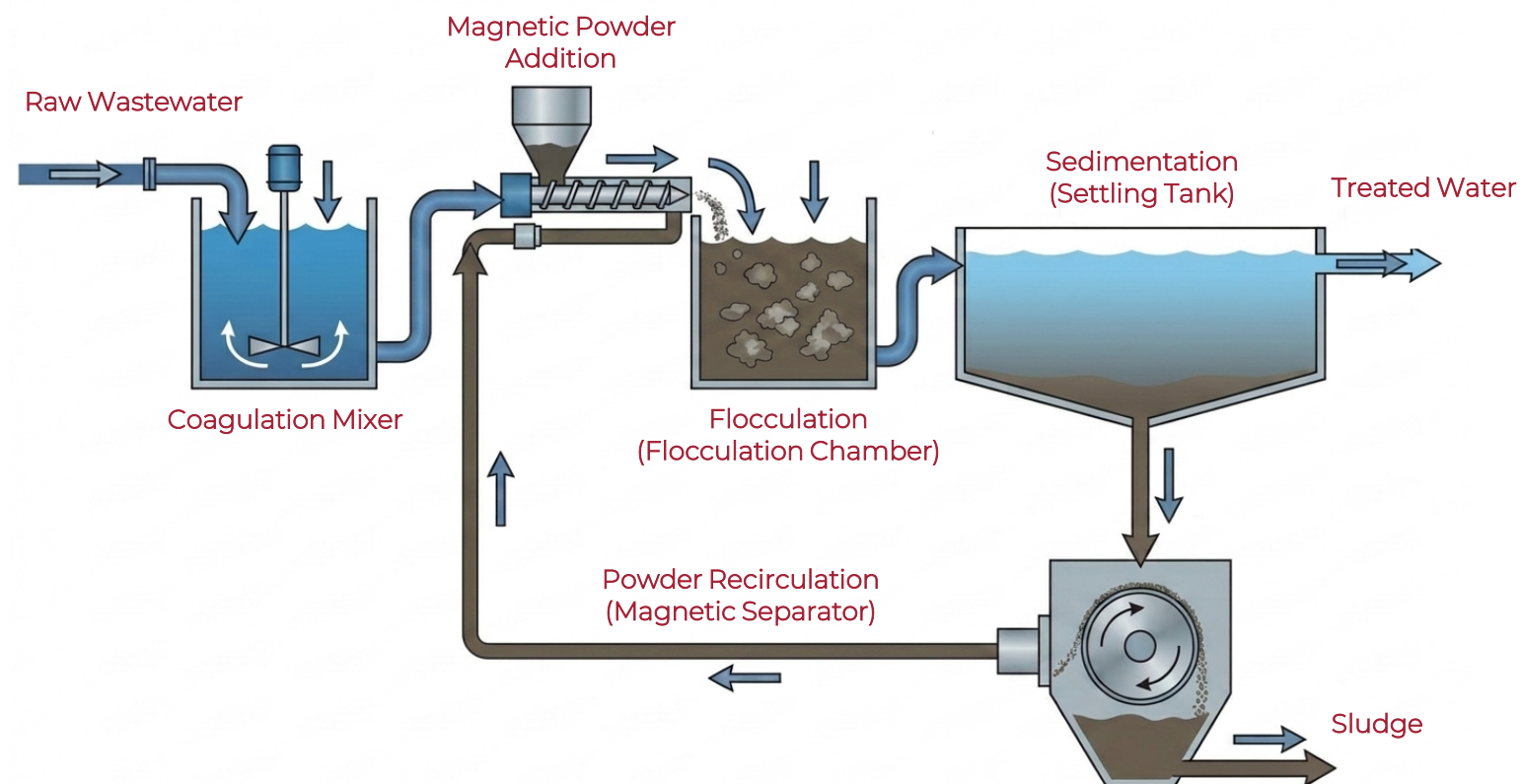


Post-Treatment

The water passes through filters to meet discharge standards.

Effective removal of suspended solids, phosphorus, heavy metals, and COD reduction.

- ❑ **Innovation:** A special magnetic powder (Fe-based) with high specific gravity is integrated into the conventional coagulation and flocculation process.
- ❑ **Process:** Magnetic powder particles act as a "core" (ballast) for pollutants, forming heavy, dense flocs.
- ❑ **Result — Speed:** Settling velocity increases manifold (up to 40 m/h and higher) compared to conventional clarifiers.
- ❑ **Cost Efficiency — Recirculation:** An integrated magnetic separation system captures and returns up to 99% of the magnetic powder to the cycle, minimizing operating costs.





System Product Range and Technical Specifications



ZAVKOM-ENGINEERING offers standardized modular skid-mounted solutions and custom-designed projects of any capacity.

Wide Capacity Range

The systems are flexibly scalable to meet the needs of your enterprise.

- Local applications: minimum capacity from 500 m³/day.
- Standard modular units: from 2,000 to 10,000 m³/day in a single factory-ready block.
- Large industrial complexes: capacity up to 200,000 m³/day and beyond (achieved through parallel connection of modules or permanent construction).

COMPACT DIMENSIONS (FOR STANDARD MODULES)

Minimal footprint for rapid integration into existing sites.

- Length (L): from 6,500 mm to 14,000 mm.
- Width (W): from 2,500 mm to 3,600 mm.
- Height (H): standard 3,500 – 7,000 mm (depending on the climatic version).

Capacity (m ³ /day)	Approximate Dimensions LxW (m)
2 000	6.5 x 2.5
5 000	10.0 x 3.0
10 000	14.0 x 3.6
> 10,000 m ³ /day or Custom-Engineered Solution	Available Upon Request

Note: Technical specifications depend on the level of contamination of the raw wastewater and the quality requirements for the treated water.



Key Advantages of the Technology Compared to Conventional Solutions

Comparison with Conventional Settling Tanks and Flotation Units



Compactness: The footprint is approximately $1/20$ of the area required by conventional settling tanks of equivalent capacity. Ideal for space-constrained sites.



High Performance: Total water treatment time in the system is less than 20 minutes (compared to several hours in conventional systems).



Deep Treatment: Effective removal of Suspended Solids ($SS < 5 \text{ mg/L}$), Total Phosphorus ($TP < 0.1 \text{ mg/L}$), COD reduction, and heavy metals removal.



Resilience to Load Fluctuations: The system operates stably under sudden variations in flow rate and wastewater composition (shock loads), as well as temperature fluctuations.



Mobility and Modularity: Fully factory-ready containerized design enables easy relocation of the unit and rapid capacity expansion.





Applications: Effective Solution for Complex Wastewater



- ☑ The technology is ideally suited for treating water with high levels of finely dispersed suspended solids, heavy metals, and other specific contaminants.

KEY INDUSTRIES

1

Coal, Mining, and Metallurgical Industries

- ☑ Coal Mines
- ☑ Precious Metals Mining (removal of suspended solids, arsenic, cyanides)
- ☑ Rare Earth Metals (removal of heavy metals, suspended solids, etc.)
- ☑ Other Mining and Chemical Enterprises



2

Fertilizer Production

- ☑ Nitrogen: Ammonium nitrate, urea, ammonium sulfate, UAN.
- ☑ Phosphorus: Superphosphates, monoammonium phosphate (MAP), diammonium phosphate (DAP), phosphate rock powder.
- ☑ Potassium: Potassium chloride (MOP), potassium sulfate (SOP), potassium magnesium sulfate (Kainite), potassium nitrate.
- ☑ Compound (NPK): Nitroammophoska, Azophoska, liquid compound fertilizers (LCF).
- ☑ Micronutrient and specialty: Boron, zinc, copper, chelated, and suspension fertilizers.



3

Construction Materials Production

- ☑ Cement, Building Materials, and Dry Mix Production

4

Municipal and Industrial Wastewater Treatment Plants

- ☑ Upgrade for Enhanced Phosphorus Removal (Tertiary Treatment) and Capacity Increase Within Existing Footprint



Unique Selling Proposition

SINGLE POINT OF RESPONSIBILITY

From task to result



PROPRIETARY LICENSED TECHNOLOGIES



IN-HOUSE MANUFACTURING

Guaranteed Quality and On-Time Delivery



EXPERIENCE VALIDATED BY INDUSTRY LEADERS

Gazprom, Sibur, Tatneft, Gazprom Neft, Novatek



VALIDATE TECHNOLOGIES WITH ZERO RISK

Pilot Testing



CERTIFIED QUALITY



WORK WITH ALL FINANCIAL INSTRUMENTS

LG, LC, SBLC, PB



FLEXIBLE PAYMENT TERMS



CUSTOM AUTOMATION

Software, Control Panels, Instrumentation



GUARANTEED QUALITY OF SHUT-OFF CONTROL VALVES

Manufactured Under Our Own Brand





ZAVKOM-ENGINEERING LLC — Your Partner in Industrial Ecology

Contact us for a technical consultation, pilot testing, and selection of the optimal unit for your needs.

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