

KFO SOLUTION

WASTEWATER AND SLUDGE TREATMENT

IN PARTNERSHIP TO



WHAT WE PROPOSE:



- **TREATMENT OF WASTEWATER AND SEWAGE**
- **TREATMENT OF WASTEWATER SLUDGE AND FARMING ORGANIC SLUDGE**
- **ELIMINATION OF SMELL AND HARMFUL EMISSIONS FROM SEWAGE FACILITIES**
- **IMPROVE OF EFFICIENCY OF WASTEWATER AND SLUDGE TREATMENT**

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KEY ADVANTAGES

WASTEWATER TREATMENT

- ❖ **TREATMENT OF HIGH CONTAMINATED WASTEWATER**
OXIDIZING CAPACITY 2 AND MORE TIMES HIGHER
THAN OF TRADITIONAL TREATMENT PLANTS
- ❖ **GUARANTEED TREATMENT RATE FOR DISCHARGE TO NATURE POOLS**
WITHOUT ANY ADDITIONAL TREATMENT OR BIOLOGICAL PONDS
- ❖ **COMPLETE ELIMINATION OF FOUL SMELL AND HARMFUL EMISSIONS**
- ❖ **SUPREME COMPACTNESS**
REQUIRED FOOTPRINT 20-50 TIMES LESS
THAN OF TRADITIONAL TREATMENT PLANTS



WASTEWATER SLUDGE

- ❖ **COMPLETE SLUDGE STABILIZATION IN-PROCESS**
- ❖ **COMPLETE SLUDGE HYGIENIZATION IN-PROCESS**
- ❖ **COMPLETE ELIMINATION OF FOUL SMELL AND HARMFUL EMISSIONS**
- ❖ **EASY FINAL DEWATERING AND DISPOSAL**
- ❖ **RE-USE OF TREATED SLUDGE AS ORGANIC FERTILIZER**
- ❖ **RECLAMATION OF OLD SLUDGE DEPOSITS**



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APPLICATION MAP

New wastewater treatment plants (WWTP) by KFO technology

- TO SMALL AND MIDDLE TOWNS
- TO LARGE CITIES
- TO INDUSTRIAL FACILITIES OR RECREATIONAL SITES



Modernization of existing WWTPs or sewage facilities by KFO technology

- IMPROVEMENT OF EFFICIENCY OF TRADITIONAL WWTPS
- ELIMINATION OF FOUL SMELL AT PUMPING STATIONS AND WWTPS



Treatment of wastewater sludge by KFO technology

- SLUDGE TREATMENT AT TRADITIONAL MUNICIPAL WWTPS
- RECLAMATION OF OLD SLUDGE DEPOSITS



KFO SOLUTION

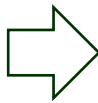
WASTEWATER AND SLUDGE TREATMENT

IN PARTNERSHIP TO



COST COMPARISON

KFO
WASTEWATER
TREATMENT



USING THE KFO SOLUTION

TO TREAT SEWAGE AND WASTEWATER

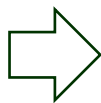
CAPEX REDUCTION *

10...20% OR MORE

OPEX REDUCTION *

20% OR MORE

KFO
SLUDGE
TREATMENT



USING THE KFO SOLUTION

TO CHEAPEN FINAL TREATMENT AND DISPOSAL

CAPEX REDUCTION *

APPROX. 30...50%

OPEX REDUCTION *

30% OR MORE

USING THE KFO SOLUTION

INSTEAD ANAEROBIC DIGESTION

CAPEX REDUCTION *

APPROX. 2-3 TIMES

OPEX REDUCTION *

30% OR MORE

** Typical rates of cost reduction, based on the engineered and operated cases.
Actual reduction of CAPEX and OPEX depends on detailed technical solutions at each site*

KFO TECHNOLOGY

WASTEWATER BIOLOGICAL TREATMENT PLANTS

PARTNERS



Cavitation and fermentation processing (branded as "KFO") is an advanced technology of biological treatment of wastewater, based on three main principles:

- destruction of pathogenic bodies by physical methods (low intense cavitation)
- self-fermentation of active sludge, what accelerates wastewater treatment processes
- vertical and air-closed design of wastewater treatment plants (WWTP) provides compactness and absence of foul smell

KFO technology solutions are protected by patents



and implemented on a number of existing facilities



APPLICATION OF KFO TECHNOLOGY WITH DIFFERENT TASKS OF WASTEWATER TREATMENT

complete KFO WWTP

- Simply scaled to a wide range of capacity (from 100 up to 1 mio. cubic m per day)
- High quality of wastewater treatment

Modernization of existing WWTP

- Improving the quality of wastewater treatment
- Increase of WWTP capacity without expansion of the required footprint

Sludge processing

- Production of organic fertilizer from the WWTP sludge
- Reduction of sludge depositing footprint in several times

Sewage pumping stations

- Complete elimination of foul smell
- Preliminary treatment of sewage, to reduce WWTP load

KEY BENEFITS OF KFO TECHNOLOGY

1. Supreme compactness

Application of the KFO technology allows to reduce the required WWTP footprint by 20 or more times, comparing to traditional WWTP technologies.

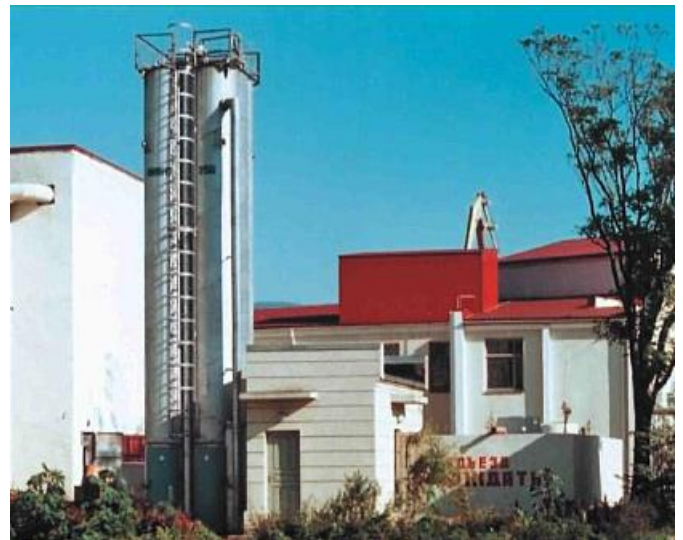
Look an example of reduction of WWTP footprint at the image right



2. Complete absence of smell and air emissions

The KFO technology guarantees no any foul smell or emission into the atmosphere; it allows to allocate WWTP just near living and industrial areas.

Look a module KFO WWTP located just next to office of an industrial facility at the image right



3. KFO sludge is the high efficient fertilizer

KFO sludge is safe and environment friendly organic fertilizer. Its high efficiency is confirmed by field tests, and the product can be certified as a biological fertilizer.

Look pictures of testing fields of 2008 – 2009 at the image right



KFO/SL TECHNOLOGY

EFFICIENT TREATMENT OF WWTP SLUDGE

PARTNERS



Cavitation and fermentation treatment (branded as "KFO") is an advanced technology of utilization of wastewater sludge, **provided number of important benefits:**

➤ **Efficient stabilization in-process**

Any kind of sludge (raw, active, digested) is stabilized just during treatment in KFO reactors

➤ **Elimination of foul smell**

Stabilized sludge does not smell while stored

➤ **Avoiding of mechanical dewatering and post-treatment**

Treated KFO sludge is self-dewatered and 100% stabilized in a few weeks. Mechanical dewatering, composting, combustion and other special processing are not required

➤ **Converting waste to commodity**

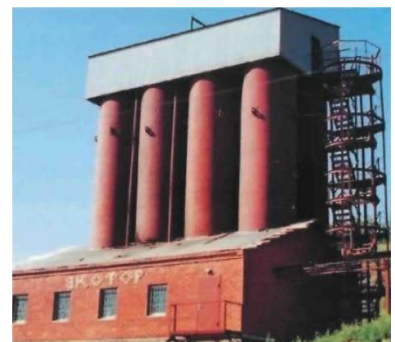
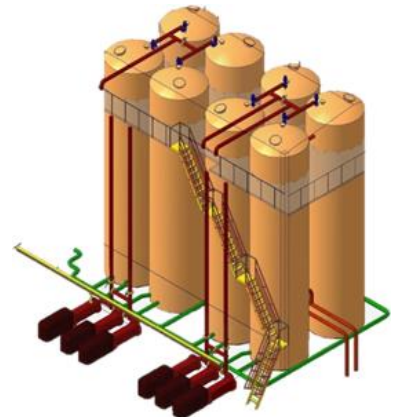
Treated KFO sludge is a high valued organic fertilizer, not a waste

➤ **Recovery of old sludge deposits**

Fresh KFO sludge may recover old deposited wastewater sludge

➤ **Supreme compactness**

KFO unit is composed with vertical columns only, requiring very small footprint



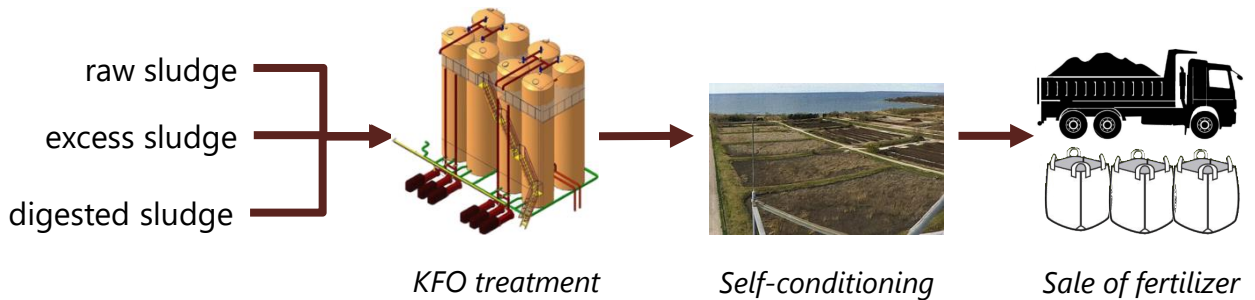
Sewage treatment by KFO technology is based on three main principles:

- destruction of pathogenic bodies by physical methods (low intense cavitation)
- self-fermentation of active sludge, accelerating sewage treatment processes
- vertical oriented air-closed design of vessels and reactors provides compactness and absence of foul smell

KFO technology solutions are protected by patents



2-STEP SLUDGE TREATMENT



Samples of implemented sludge treatment facilities



Zhitomir city WWTP,
commissioning
(Ukraine, 2007)

Silk dyeing
factory TINSETA
(Italy, 1998)



Engels city WWTP,
in operation
(Russia, 2002)

KFO TECHNOLOGY

SEWAGE TREATMENT UNITS FOR INDUSTRIAL FACILITIES

PARTNERS



Cavitation and fermentation treatment (branded as "KFO") of sewages is an advanced technology of biological treatment, **provided number of important benefits:**

➤ **Treatment of heavy contaminated sewage**

Clean water is returned to the technology loop or discharged into a natural water pool

➤ **Supreme compactness**

Required footprint is reduced by 20 or more times, comparing to traditional WWTP

➤ **Complete absence of smell and emissions**

Closed design of reactors and pools

➤ **Shrunk sanitary protection area**

down to 10-30 m

➤ **Absence of liquid or solid waste**

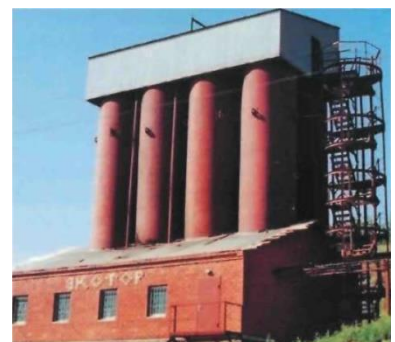
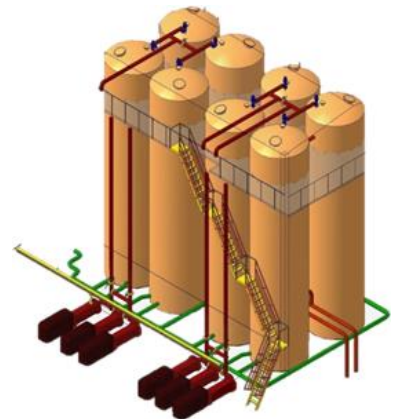
Discharge of excessive sludge once per year

➤ **Automatic adjustment**

Technology process is self-balanced for wide range of sewage properties

➤ **Low cost of ownership**

Reduction of erection investment and operational charges



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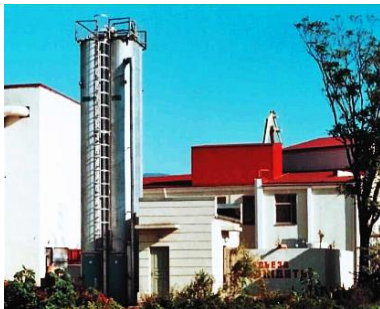
and implemented on a number of existing facilities

Typical properties of KFO treated water

COD, mg/L	max 30
BOD, mg/L	max 3
Suspended solids, mg/L	max 3



Samples of implemented industrial sewage treatment plants



Novorossiysk sea merchant port
(Russia, 2001)

Silk dyeing factory TINSETA
(Italy, 1998)



Vyngapur natural gas field, Gazpromneft
(Russia, 2006)

Solutions for water and wastewater treatment

Wastewater treatment plants by KFO technology

- deep treatment of highly contaminated wastewater
- complete elimination of foul smell
- compactness (required footprint is reduced by 20 – 50 times)



WWTP sludge treatment by KFO technology

- production of commodity organic fertilizer
- complete elimination of foul smell
- reclamation of old sludge deposits



Removal of deposits in liquid pipeline

- certain removal of any kind deposits
- chemical reagents or mechanical purging are not required
- low electricity consumption



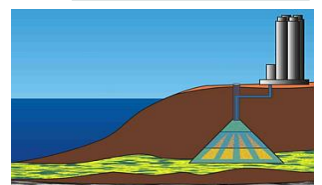
Elimination of foul smell and air emission at pumping stations

- complete elimination of foul smell
- destruction of pathogenic bodies
- early pre-treatment of wastewater



Discharge of treated water into underground aquifers

- improving of condition of the receiving basin
- solution of peak discharge problem



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