

KÖRÖTE

Körte Környezettechnika Kft.

SHORT COMPANY PROFILE



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Foundation, planned main activities

Our company has been operating since 1992, was founded by the current owners. Our goal was to become – take advantage innovation potential of our engineering know-how – one of the market leading provider of water treatment and purification and environmental remediation services fields – ranging from industrial wastewater treatment to hazardous waste disposal

(Our company's name comes from the abbreviation of Hungarian technical term “environmental technology” – translated it to English – this shortened word is means the *pear fruit* – as can be seen on our logo.)

Corporate Philosophy

Mission of KÖRTE is to provide products and services which enable customers all over the world to build and operate space and energy efficient water and wastewater treatment technologies. We would like to serve complex – “Turn-key” – solutions for our clients.

Our employees, company's and other resources for problem solving

The company has more than 30 employees, including 15 engineers who are cooperating as multidisciplinary teams – chemists, biologists, mechanical engineers, civil engineers, and environmental management experts – to solve the tasks arising for our business partners.

The experts of KÖRTE have 25 years of experience in the area of wastewater treatment and technological planning, implementation and operation of wastewater treatment plants and environmental protection services. The environmental protection services include the daily routine operation of various system constructed by us.

In Hungary our firm has become the dominant participant in the solution of environmental protection problems in the physical-chemical treatment of oily, greasy, emulsion wastewater; paint contaminated wastewater; wastewater of heavy metal content; galvanizing plant and other similar wastewater generated in engineering industry, metalworking, metallurgy and food industry. Our staff has worked in almost all the industries in Hungary in the past decades and we have gathered extensive experiences.

As members of the **Hungarian Chamber of Engineers**, our engineers have all the designer and expert authorizations that are necessary for designing complete technologies or unique equipment, and performing environmental protection tests and services, in various areas of environmental protection.

Using all of these knowledge and together with our technicians and other experts, we have participated at the installation and commissioning for more than 100 plants as designer, constructor, and test runner in Hungary. In addition to routine solutions, our experiences have made it possible that our firm can provide series of successful solutions – based mostly on technology developed by us – for many environmental protection problems and wastewater treatment previously considered as “impossible to solve”. The laboratory background necessary for our work is provided by the staff of the **University of Pannonia in Veszprém**.

We have all conditions for examination and analysis of any source and amount of storm water, wastewater and sludge. On the basis of these tests we are determining the suitable technolo-

gy, designing the facility, collecting official water right's permits from local authorities and finally constructing and commissioning the full facility. We can continue to perform the operation of wastewater treatment facilities in the form of service as well, in this area we also have two decades of experience at major enterprises in Hungary.

In cases if we do not have enough resources, experience in solution extraordinary technological problems we can be involved the resources of **VITI.group Water- and Environmental Technologies Cluster** services. The **VITI.group Cluster** is an alliance of small and medium size Hungarian private enterprises which are active in lot of fields of environmental protection industry. This cluster includes already eighteen companies – **KÖRTE Kft.** is one of the main initiator and founder of this business group.

This one is capable of designing and executing any tasks on all the field of environmental protection. It's main activities are: communal and industrial wastewater treatment, waste management, groundwater and soil remediation, air quality protection, natural water pretreatment for drinking water production, handling different types of industrial water (boiler feed water, cooling water, etc.).

Our firm ready to offer you our chemical, technological, laboratory, mechanical and maintenance services of the level accustomed to during the years, which will probably be welcome by you in the various economic situations.

We are applying **MSZ EN ISO 9001:2009** quality assurance system requirements in our official work and **MSZ EN ISO 14001:2005** environmental centric quality assurance system in our industrial, design and technological activities. (Please see below these certifications.)



Our typical working activities

Pilot plant experiments and laboratorial analysis

Filtration and Wastewater Analysis

KÖRTE has a lab onsite where we have the ability to run some basic tests (Chemical Oxygen Demand, acidity-alkalinity, pH, conductivity, grease-oil organic solvent extract, metal bearing, etc.) as well as those that are more analytical.



Filter Press Feasibility and Sizing Test:

If we or one of our customers is not certain that a filter press is the correct application, we can run a lab **filter press test**. With less than 20 liters of your typical wastewater, we can see if a filter press will provide the desired result. We will then send you the filtrate (liquid) as well as the solids that we are able to separate from your waste stream. This will also help us to determine whether or not a filter aid will be required for your slurry. The filter press test can also provide information enabling us to estimate the percentage of solids in order to properly size a unit.

Sludge Dryer Testing:

Another standard test is a **sludge dryer test**. With this test, we take the filter cake (solids that have been separated from your waste stream from a filter press) and we heat them in our lab in a sludge dryer simulation oven. This tells us if a sludge dryer will be beneficial and also helps in assessing the total drying time and solids reduction that you should expect.

On-site laboratory work test of manufactured equipment



Pilot plant wastewater treatment experiments and analysis:

Our other testing is more involved. These analyses are conducted for full waste treatment systems or we can focus solely on specific aspects of your system. This type of testing provides information on the amount and what types of chemistry that will be required of your system from pH adjust to polymer additions in order to keep your wastewater treatment system operating at the optimal level.



Evaporator Functional Pilot Testing:

The purpose of conducting the **evaporator feasibility** test is to determine whether or not an evaporator is the correct solution for your particular application. It is far better to accomplish this via a pilot test rather than onsite.

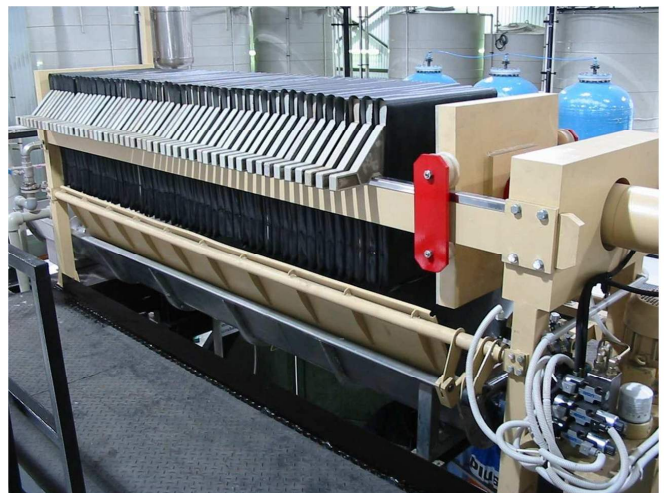
This testing also helps us to determine the operating recommendations for your wastewater in order to optimize the performance of your evaporator.

Our waste stream analysis is unique just as every waste stream is unique. Our testing provides an accurate demonstration of how each waste stream will function in an evaporator. Ultimately we will be able to determine the expected reduction wastewater volume which is typically 90-99%.



Special equipment manufacturing

Based on specialty demands of individual projects we can design, manufacture, factory test, transport, on-site test and installation of unique equipment such as polypropylene tanks, small to medium capacity chamber filter presses flocculent preparation units, air dissolvers for flotation equipment, clarifiers, etc. Please see sample pictures below.



Engineering Turn-Key Waste Treatment Systems

KÖRTE has designed, sold, manufactured and installed many waste water treatment systems over the years. We have the ability to design and build all of the necessary components to enable you to install your waste treatment system or we can design and install the whole system to meet your requirements. With over 30 years of experience in building and designing wastewater treatment systems our staff acquired knowledge and talent in system and project engineering, produce all the drawings, prepare the necessary paperwork comply with environmental laws, manufactured the equipment and installed it at your request.

Over the years we have done systems that are simple skid mounted manual systems with pH adjust, settling and filtration to highly involved automated systems that are completely closed looped including reverse osmosis, ultra-filtration and evaporation where no wastewater is sent to sewer. Systems can be as simple or as complex as your process requires. Our installation crew and supervisors are professional and knowledgeable seeing that all systems are in proper working order including testing, start-up and troubleshooting all components before leaving the site. Although we supply manuals with all of our systems, our job doesn't end when the system is installed. Our technical staff is still available to answer any questions that may arise with the system or the components. Through the years we have been fortunate to establish excellent working relationships with our commercial partners. Because of that, and the fact that we manufacture all of the components ourselves, we are able to keep our prices competitive while providing the utmost quality. Our Start-Up Assistance and Installation provide full support as you get your system up and running.

Start-Up Assistance/Installation

The start-up and installation options are available with all KÖRTE waste treatment equipment. We can provide full support as you get your system up and running. We have installation technicians and technical representatives that we can send to your facility to make sure the system is running as it should base on the engineering and design.

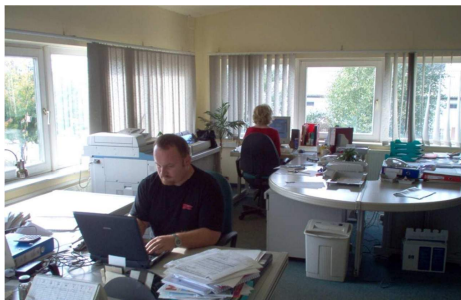
Our services include but are not limited to:

- Design and build the equipment per your specs
- Load, ship, and unload equipment
- Install and rig equipment in facility
- Electrical and plumbing connections
- Train employees
- Debug any issues and solve any equipment / installation troubles

All units and systems are complete with manuals and telephone support. However if you need someone to come to your facility, we will be happy to quote you on that as well.

KÖRTE has done systems ranging from simple pH adjust to those that are more complex requiring cyanide destruct, arsenic removal, chrome conversion (converting hexavalent chrome to trivalent chrome) and/or other special treatment and equipment, which could include sludge dryers, evaporators, sand filters and reverse osmosis.

Design and build, load, ship, unload, install and rig electrical and plumbing connections in client facility.



Engineering and manufacturing Containerized Wastewater Treatment Systems (CWTS)

Large-scale wastewater treatment operations face many challenges, and many of those challenges can be avoided or overcome by using a “containerized” approach. Containerized wastewater treatment plants are housed in pre-assembled shipping ISO cargo containers mounted with skids. They are environmentally friendly, low cost, and can be installed and operational within weeks - not years. Today, we will introduce the technology used in containerized wastewater treatment, explain when and where they are most beneficial, and give you a brief summary of the design and engineering capabilities offered by KÖRTE.

The Process

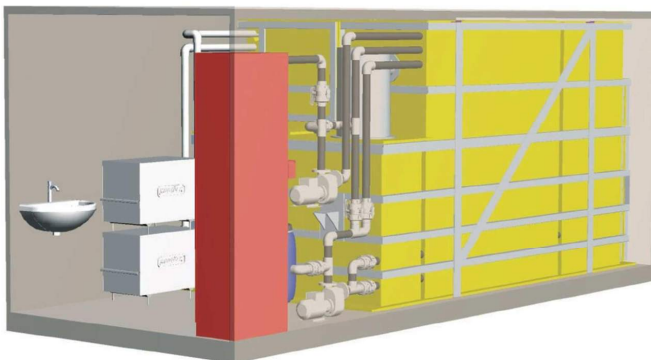
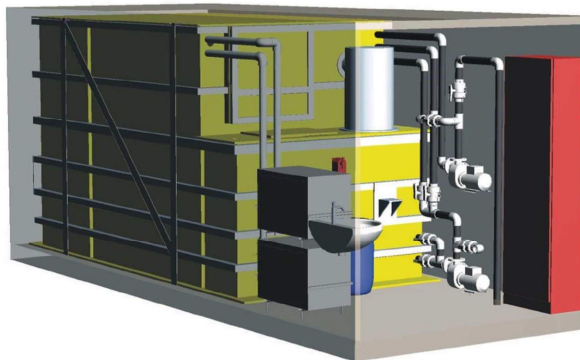
The process begins with an on-site, due diligence analysis, where KÖRTE’s engineers will determine the exact treatment devices needed to get the job done. Containerized wastewater treatment plant capabilities include sedimentation, flotation, conventional filtration, reverse osmosis filtration, biological treatment, and more complex processes like nutrient removal and resource recovery. We provide complete project planning, including pilot- and demonstration scale studies. To assess the success of all our projects/equipment, we use advanced lab analysis and data interpretation.

Installation of the treatment plants

The treatment plants are installed on a concrete base plate with prepared connections of pipeline systems. Except for the connection of the power supply and possibly the control elements of adjacent structures, the treatment plants do not require any electric installation work. The wastewater treatment plant is put in operation by the supplier or an authorized service organization. With regard to the installation of the technology in ISO containers, the treatment plants are transportable both by truck and by boat. In the place of installation, the openings for pipe passages and ventilation openings must be cut out of the walls of the ISO containers.

Benefits of Containerized Wastewater Treatment

KÖRTE is an eco-friendly company, and our containerized wastewater treatment projects leave a very small footprint. Besides the fact that they recycle water for reuse, containerized wastewater treatment plants are made from recycled shipping containers. This reduces resource consumption. Unlike larger facilities, containerized wastewater treatment plants are compact and minimally invasive. They have a high degree of automation, reliability, and consistency that makes them ideal for remote locations. Our designs minimize the operator’s use of chemicals and maximize the supply of available clean water, which can then be recycled back into the operator’s manufacturing processes. Our containerized wastewater treatment process is holistic. It includes assessment, design, construction, quality control, and monthly or bi-monthly maintenance (within the framework of proper maintenance contract). We are also available to upgrade and optimize existing wastewater treatment plants of small to medium sizes. We provide operator training, equipment analysis, and consulting services that will help keep your facility compliant with state and federal environmental regulations. When it comes time to renew your permit, we can help expedite the process.



Engineering, design, build, installation of landfill leachate wastewater treatment system

Project lifecycle from system design across the equipment manufacturing to site installation and commissioning.

Problem:

The object of this project is the wastewater treatment of municipal waste landfill and purified water discharged into natural surface water. This was a brand new containerized building, new line and new waste water treatment system. Although the wastewater treatment system is not intended to discharge to a municipal sewer system, the system had to be designed to meet the state legislation pre-treatment standards for standard wastewater discharge for heavy metals, toxic organics, total suspended solids and a discharge pH between 6.0 and 9.0. It was also essential that the filter cake solids be between 20-50%.

With this project proposal we had to supply:

- OSHA working safety standards
- Wastewater collection
- Wastewater treatment equipment
- Sludge precipitation and dewatering equipment
- Preventive maintenance schedule and training
- Field testing, start-up and installation
- Equipment warranties
- Fresh RO System
- Process RO water supply
- Critical spare parts recommendations
- Water reuse
- Engineering information

Process:

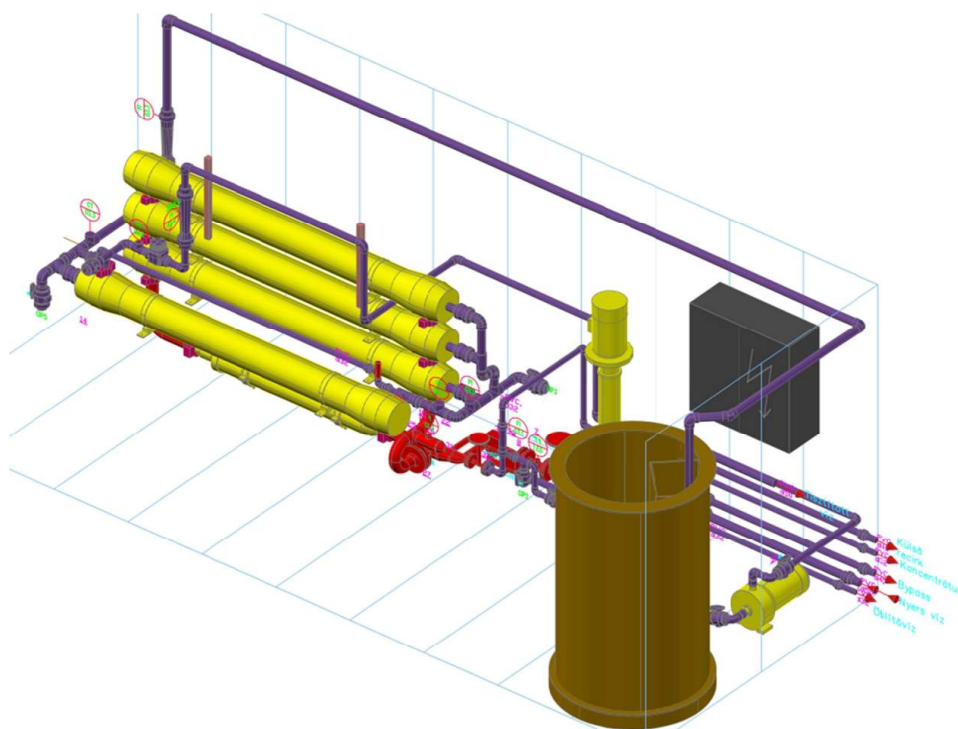
We began with a general discussion of the system requirements and expectations including how automated the system needed to be. There were several proposals that were modified as discussions continued regarding the type of treatment that would be best for this brand new application. We sent our engineering staff and project manager to the facility in order to go through the project and site details that needed to be considered.

Prior to the installation of the system, KÖRTE submitted drawings to a certified engineer in order to have them sign off, indicating that the proposed system was in compliance with that state's wastewater treatment and discharge requirements. Once the system was approved, we began manufacturing the equipment. We were working with tight time constraints to get this system built, installed and running.

Solution:

We started with the basic water treatment equipment which included wastewater collection, pH adjust, solids settling and dewatering. The key pieces of equipment installed included collection and treatment tanks, sludge thickening tank, clarifier, filter press water softeners, reverse osmosis system, cationic and anionic polymer feed, pumps, meters, level controls and alarms.

A 3D schematic diagram of a mechanical room. In the foreground, a red metal frame supports four horizontal white cylindrical units, likely boilers or heat exchangers. These units are interconnected by a complex network of yellow and blue pipes. A green vertical pipe rises from the center of the frame. To the right, a large green cylindrical tank is connected to the piping system. A blue control panel with a red lightning bolt symbol is mounted on the wall. The room is enclosed by blue walls and a blue floor.





The plan was to add evaporation equipment to these waste holding tanks to reduce this haul off water by 90% when the end user had more capital money available in the next budget year. This system allowed the customer to send no water to sewer, reuse 98% of the waste water on the process line and only haul off 2% of their water as waste (which can be reduced to 2% if evaporation equipment was added on the waste haul off tanks.)

KÖRTE handled the entire project in house from start to finish. We manufactured the equipment, installed the system, and personally handled the on-site trouble shooting and training of waste treatment personnel at the facility.

All requirements were met within the allotted timeframe, including installation and start up. The system continues to function as originally designed.

Engineering, research, development and design biological wastewater treatment systems

Sample project: ***Increasing capacity and operating performance of existing municipal wastewater biological treatment system*** (Sopron city's wastewater treatment plant with particular emphasis on the restoration of the sludge line).



Subjects of investigation:

- Oxygen supply of aeration basin
(There is no mechanical fault, unbalanced air distribution, descaling system – acid washing, sediment removal in the aeration basin.)



- Fibrous material load survey
(change the material of clothes, use of paper towels, "rag" appearance in the technology almost anywhere, decomposition of rag to filaments, felt formation problem.)
- Sludge line efficiency
(sediments in gravitational pipe system and sludge reservoirs – solution: forced flow)



Some of our References

In the following these are some examples of our references from various industrial areas (technological planning, mechanical design and implementation, commissioning, operation): planning and implementation of industrial wastewater and wastewater sludge treatment facilities, renovation of old wastewater treatment facilities and increasing their capacity, production and development of machines and equipment related to wastewater treatment, development and production of wastewater treatment agents, compilation of documentation necessary for obtaining permissions of water rights, and research and development works.

Automotive industry

- **Hankook Tires Hungary Ltd. Dunaújváros**
Completion, modernization and efficiency improvement of 15 m³/h capacity oily-emulsion wastewater treatment system;
- **OPEL Hungary Ltd. Szentgotthárd**
Reconstruction of oily-emulsion wastewater treatment system of capacity of 250 m³/h;
- **Opel Hungary Ltd., Szentgotthárd**
Planning and construction of oily-emulsion wastewater treatment facility of capacity of 20 m³/h. Direction of operation the wastewater treatment facility.
- **Győri Rába Hungarian Wagon and Machine Factory, Győr**
Planning and construction of oily and emulsion wastewater treatment facility of capacity of 15 m³/h and the subsequent expansion of its capacity to twice. The plant also treats the oily emulsions originating in the factory of Audi Hungária in Győr. Control of operation of the wastewater treatment facility.
- **Magyar SUZUKI Rt., Esztergom**
Planning and construction of wastewater treatment and sludge de-watering system of capacity of 20 m³/h.

Iron- and Steel-making, Steel-processing industry

- **U. S. Steel Kosice s.r.o. , Košice, Slovak Republic**
Technological reconstruction and processing output expansion up to 100 m³ /h of coking plant wastewater treatment facility:
Increase processing capacity by 30 % of biological treatment unit;
Building new physicochemical treatment unit for removal of cyanide content;
General contract for design, implementation, commissioning, test run.
- **U. S. Steel Košice, s. r. o. Košice, Slovak Republic**
Reconstruction and increasing processing output of the local wastewater treatment system for acidic-alkaline and oily emulsion industrial wastewater up to capacity of 210 m³/h.
- **U. S. Steel Košice, s. r. o. Košice, Slovak Republic**
Planning and construction of oily-emulsion wastewater treatment facility capacity of 200 m³/day.

- **Dunaferr Dunai Vasmű Rt., Dunaújváros**

Planning and construction of the largest capacity industrial wastewater treatment facility ever implemented in Hungary. The industrial wastewater treatment system of capacity of 5,000 m³/h – 120,000 m³/day) performs the joint treatment of hot rolling mill scale-oily wastewater and furnace gas treatment sludge.

Petroleum and Petrochemicals processing industry

- **BorsodChem Rt., Kazincbarcika**

Planning and implementation of sludge treatment and de-watering equipment for 50 m³/h throughput. Planning and construction of PVC factory wastewater treatment facility up to capacity of 125 m³/h with PVC powder extraction and re-use.

Electrical and electronics industry

- **General Electric Hungary Rt., Zalaegerszeg**

Planning and construction of wastewater treatment facility of capacity of 160 m³/day, used for cleaning oily-emulsion wastewater in the light bulb factory of the company.

- **General Electric Hungary Rt., Nagykanizsa**

Planning and construction of 300 m³/day capacity industrial wastewater treatment facility for cleaning water contaminated with ammonia and fluorine.

- **General Electric Hungary Rt., Kaposvár**

Planning and construction of 120 m³/day capacity wastewater treatment facility for electroplating plant.

- **Vishay Hungary Kft. Gyöngyös**

Planning and construction of 400 m³/day capacity wastewater treatment facility for electroplating plant.

Technological research and development

- **ISD Dunaferr Rt. Dunaújváros**

Expansion capacity of coke-oven plant effluent treatment system – reanimation and intensification of bacterium strains, cooperation with PureAqua Ltd (member of VITgroup).

- **Hermann Ottó Institute, Budapest**

Various natural wetland revitalization programs – Project financed by European Union.

Public water supply

Engineering, design commissioning of surface water pretreatment for public water supply in Colombo, Sri Lanka; Manufacturing supplemental specific equipment for sludge line.

Where are we – our geographical situation

