

Business Unit

Technology



Environmental technology solutions for a sustainable future



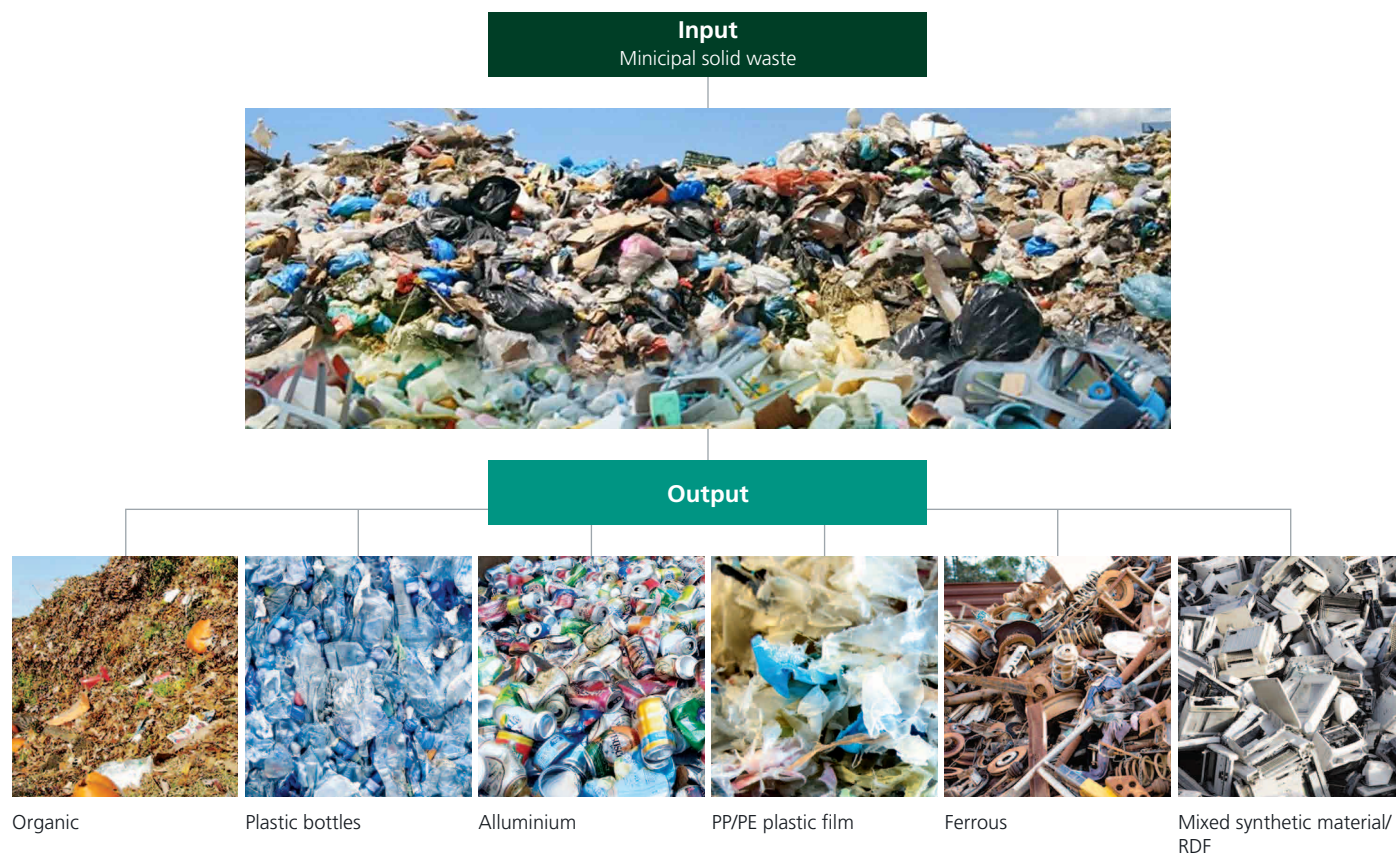
Business Line
Environmental Technology Solutions

Think Asia. Think DKSH.

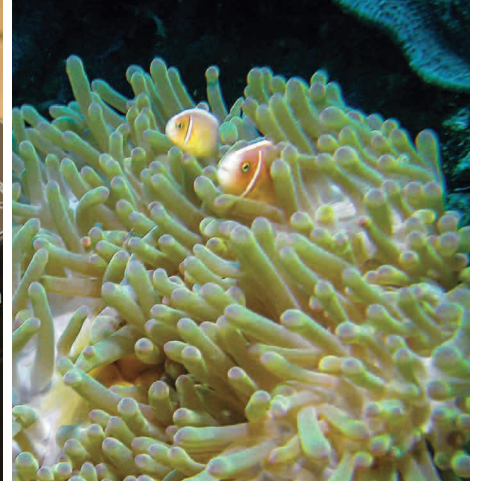
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Process on the treatment of municipal solid waste



Business Unit Technology



DKSH is a leading provider of Market Expansion Services, proficient across various industries. As a total solutions provider and system integrator, we serve our customers as a one-stop-shop and provide customized technology solutions. We provide professional after-sales services as well as cover the entire product life cycle including installation and commissioning, final acceptance testing, production start-up support, training, maintenance, repair, spare parts and consumables supply and trade-ins. We operate as a trusted link between suppliers from Asia, Europe or America and customers in Asia, enabling suppliers to expand their markets.

Sales and services are our core competencies. Our sales, service and applications specialists are highly trained and dedicated to deliver complete, integrated laboratory solutions to our customers. Industry-specific expertise, in-depth process knowledge and complementary product-service portfolio enable us to stand out as a total solutions provider.

Business Line Environmental Technologies

DKSH offers a world class portfolio of machinery and services tailored around reducing the overall carbon footprint.

With our core expertise in recycling, size reduction and resource recovery, we offer well established and proven technologies and solutions to the Singapore industries.

Our portfolio has been purposely built around our customers' needs and focuses on innovative and highly efficient technologies. We create wealth for our customers and assist them in building a sustainable future.

Our mission is to provide professional expertise for the long-term profitability of our customers whilst working towards a meaningful and sustainable solution of business and the environment.

Recycling and resource recovery

Plastics recycling

– Erema

Erema's plastic recycling machines are by far the most efficient and reliable equipment for your plastics recovery. Erema machines range from fully autonomous and versatile edge trim re-pelletizing units for film extruders, fully automatic back flush screen changers, to full capacity reclaim lines with up to 3 t/hr capacity.

In the PET extrusion and recycling, Erema's Vacurema System offers energy and investment savings, adding to our customer's bottom line. With over two thousand lines installed, Erema's expertise is unparalleled.



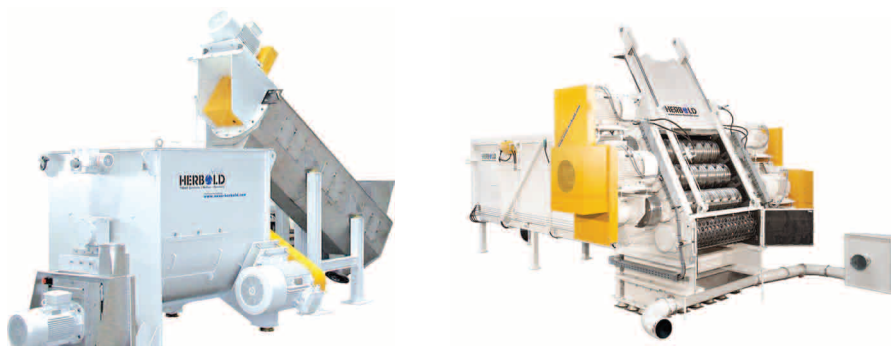
www.erima.at

Plastics washing

– NEUE HERBOLD

NEUE HERBOLD offers complete turn-key washing and granulation systems engineered and built in Germany.

Solutions start with size reduction and washing of slightly contaminated bottles/containers and films from packaging materials, right through to heavily contaminated agricultural films.



www.neue-herbold.com

Plastics washing

– Sorema

Sorema's washing lines are ideally suited and engineered for any washing application, from used agricultural film to post consumer PET and HDPE bottles.

With lines installed worldwide, Sorema has significantly supported the recycling community, turning waste streams into profitable products.



www.sorema.it/en_US

Recycling and resource recovery

Sorting plants, ballistic separators and trommels – Stadler

Stadler is one of Germany's leading engineering companies specialising in sorting plants for resource recovery from waste streams.

Applications range from co-mingled recyclables, household waste, commercial and industrial waste, paper to RDF and compost refining with over hundred fifty plants in operation worldwide.

Stadler is also one of the leading suppliers for ballistic separators, which separate flat from cubic material and are supplied within a turnkey plant, or are also available as a single machine.



www.w-stadler.de/en/

Recycling and resource recovery

Automatic sorting

- TITECH
- Mogensen MikroSort
- TOMRA

TITECH has pioneered the automation of waste sorting and is known as the world leader in this field. Founded in 1993, TITECH continues to offer cutting edge technology for the sorting of recyclables.

Typical application areas include:

- Recycling plastic bottles (e.g. separation of PET by colour) and beverage cartons
- Paper recycling (e.g. sorting paper from mixed wastes and sorting out a deinking fraction)
- Automotive recycling (e.g. recovery of nonferrous metals, stainless steels from mixed metals, recovering aluminium)
- Electronic waste recycling (e.g. recovery of printed circuit boards, precious metal compounds and nonferrous metals)
- Processing waste solids such as construction waste, slag and pellets
- Waste to energy (e.g. sorting plastics and flame retardant materials containing chlorine and bromine)
- Monitor glass recycling (sorting face-plate containing barium and conus glass containing lead oxide)



- Processing wood or timber (e.g. removal of metals)
- Commercial and industrial waste (e.g. extracting valuable materials)

vdrs.com/tomra-optical-sorting

The optoelectronic sorting system Mogensen MikroSort® makes it possible to remove foreign material from previously unsortable materials, to produce products of a higher quality and to open up new markets. Through the innovation of technology, MikroSort offers access to previously uneconomic sorting tasks. The improved utilisation of the raw materials is not only an economic but also an ecological advantage.

Different machine types were designed for different fields of application:

- Recycling glass (flat and hollow ware)
- Plastic flakes (PET, PE, PP, PVC)
- Construction waste (stone chips/ concrete)
- Rock salt
- Household and commercial waste
- Particle size analysis



www.tomra.com

www.mogensen.de

Recycling and resource recovery

TOMRA Sorting Solutions has pioneered the automation of waste sorting and is known as the world leader in this field. Tomra continues to spearhead the development of this market by offering cutting edge technology for the sorting of recyclables.

Typical application areas include:

- Recycling plastic bottles – separation of PET by colour and beverage cartons
- Paper recycling – sorting paper from mixed wastes and sorting out a deinking fraction
- Automotive recycling – recovery of nonferrous metals, stainless steel from mixed metals, aluminium
- Electronic waste recycling – recovery of printed circuit boards, precious metal compounds and nonferrous metals
- Monitor glass recycling – sorting faceplate containing barium and conus glass containing lead oxide
- Waste to energy – sorting plastics and flame retardant materials containing chlorine and bromine
- Processing waste solids such as construction waste, slag, pellets
- Processing wood or timber – removal of metals
- Commercial and industrial waste – extracting valuable materials

Industrial minerals sorting – CommodasUltrascort

CommodasUltrascort is a subsidiary of the world market leader for sensor based sorting solutions, Tomra, offers automated sensor based sorting equipment for mining companies and processing of industrial minerals.

Applications for example range from feldspar, quartz, magnesite, talc, limestone, dolomite to calcite and rock salt.



www.tomra.com



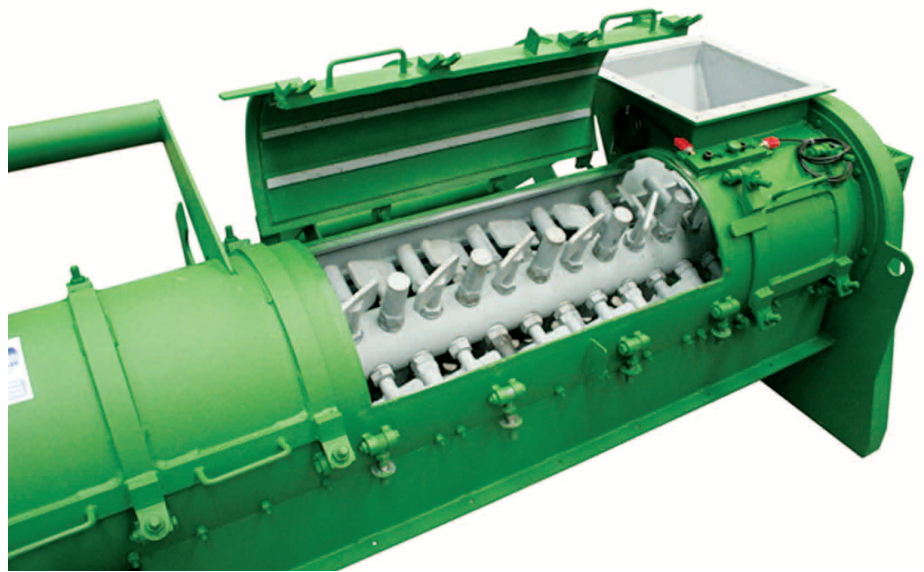
www.tomra.com/en/solutions-and-products/sorting-solutions/mining/mining-news/2014/commodasultrasort-gmbh/

Recycling and resource recovery

Turbo separator depackaging – ATRITOR

The ATRITOR Turbo separator is the most versatile packaging separation machine, capable of separating liquids and solids from numerous types of packaging and containers. Offering extremely high separation efficiencies, the machine allows efficient recycling or disposal.

The Turbo separator is ideal for separating out-of-spec, out-of-date and falsely labeled products from a variety of packaging including cans, plastic bottles and boxes. The diverse range of applications include the separation of general foodstuff from their packaging, supermarket wastes, plaster-board recycling and many others.



www.atritor.com

Metal recovery – Wagner Magnete

Wagner Magnete has more than 65 years of experience of separating ferrous material from bulk goods using magnetic belt technology. In 1953, Wagner Magnete built the first magnetic belt separator.

Wagner offers a wide range of well proven Eddy Current separators with configurations including eccentric and concentric rotors, further complemented with an array of personalized rotor designs to best suit the application.

With applications from overbelt and band magnets using Rare Earth as well as Electromagnets, to high speed Eddy Currents with 7000 rpm, the Wagner range is well engineered and at home in the some of the toughest conditions. Applications cover metal recycling, steel recovery, aluminium recovery magnetic pulleys, lifting magnets and metal detection.



www.wagner-magnete.de

Wagner also offers one of the most powerful magnets available for stainless steel separation with 11,000 Gauss.

Recycling and resource recovery

Crushing, shredding and wood recycling – HAAS

HAAS is a German leading manufacturer of recycling machinery for the waste industry. The machines are used in preparing timbers for biofuel, biomass, pellet, chipboard and MDF industries. Further applications range from demolition waste to household waste.

HAAS supply individual machines and complete turnkey projects. double shaft primary crusher, hammer mill, screens and conveying technology. All available in stationary and mobile version in three different sizes, with shaft length ranging from 150 cm – 250 cm.

Haas supply individual machines or complete turnkey projects.

- Double shaft primary crusher, hammer mills, screens and conveying technology
- All available in mobile and stationary
- Turn key operations
- Specialising in areas of waste and timber recycling



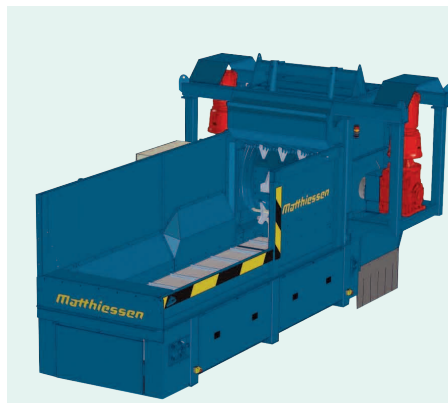
www.haas-recycling.com/

Bale and bag opening – Matthiessen

The Matthiessen bale and bag openers offer the best and most reliable plant infeed for waste and recyclable materials available in bags or bales.

Being able to cater for different types of materials, from MSW to paper bales, the Matthiessen machines combine reliability, continuous feed and plant metering with a high opening grade of material, suitable for automatic sorting.

With references in Australia, Europe and the USA, Matthiessen is proven to be the right choice.



www.bagsplitter.com

Recycling and resource recovery

Baling

– Techgene Machinery

– Macpresse

Since 1999, Techgene Machinery has established itself as one of the leading baling equipment manufacturers from Taiwan, providing solutions for the waste and recycling industry.

With numerous references across more than 30 countries worldwide, Techgene offers reliable technical baling solutions at a very competitive price. They can offer the full range of baling solutions from automatic horizontal baling press, close-end balers, vertical balers, corrugated sheet shredders and belt conveyor.



www.techgene.com.tw

Macpresse is recognised as one of Europe's leading manufacturers of balers and conveyors. With installations worldwide, Macpresse balers have a reputation for high productivity, ease of operation and maintenance as well as maximising machine uptime.

Macpresse specialises in balers for handling aggressive materials such as MSW and RDF. Their L-series of balers are lined throughout with 15 mm replaceable Hardox plates, ensuring a long and profitable operating life, even under the most trying of conditions.



lnx.macpresse.com

Recycling and resource recovery

Screening

– Spaleck

Spaleck GmbH is the leading manufacturer for Recycling Screens. With solutions for screening almost any recycling and waste stream, ranging from co-mingled recyclables to steel and compost processing, C+D and aggregate screening, Spaleck builds reliable and accurate screening machines.

This includes the well-proven bar sizer, the recycling waste screen, the "specialist for fine screening" - the Flip-Flow-Screen Elastica, vibratory feeders, density separators and the latest development, the 3D-Combi-Flip-Flow Screen.



Wind sifting and classification

– TrennsoTechnik

TrennsoTechnik offers the solutions to material separation predominantly in sizes between 0-100 mm.

With the leading technologies such as zig-zag wind sifters, cross-flow wind sifters and separating tables, Trennso machines are separating materials by density and size in a broad range of applications.



Wind sifting

– Westeria

The patented Westeria windsifters are the common choice for heavy and light separation tasks across the recycling sectors. covering applications from construction and demolition waste, commercial and industrial waste recycling to MRF and waste to energy!

With a range of heavy duty sifting machines, Westeria Wind sifters use a speed conveyor, air nozzle and separating drum mechanism, which offers high flexibility and reliability. The machines come as stationary systems, or in mobile execution on a track drive system to enable ease of movement.



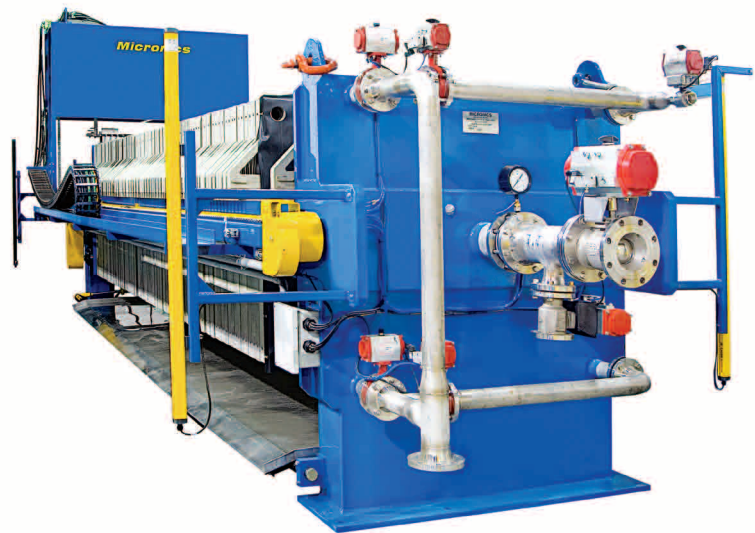
www.spaleck.de/en

Recycling and resource recovery

Filter press – Micronics

Beginning in 1983 with a core expertise in filter cloth, Micronics has since expanded its filtration product line and now serves the European, Asian and African markets. With its range of filter presses, filter press plates, parts and subsystems, Micronics offers increased efficiency at reduced costs.

Micronics offers a variety of filter presses ranging from lab scale presses using plates as small as 150 mm, to industrial presses that use plates up to 2000+ mm. Offering a wide range of options to provide for a high degree of customization, the filter press frames can be designed in either sidebar or overhead configurations and with a choice of hydraulic system from electro-hydraulic, air/oil and hand-pump hydraulic systems. Further customization is possible for the cycle time, cloth life and degree of operator involvement.



Most importantly, Micronics focuses on producing designs that ensure:

- Low operating costs
- Trouble free operations

- Sustained operating ability
- Efficient and economical dewatering

www.micronicsinc.com

Pumps and motors – Saer

Saer is a leading Italian manufacturer and supplier of surface and submersible pumps and motors, renowned for the flexibility, efficiency, innovativeness and versatility of their solutions. With over 60 years of experience in the Italian and international markets, 5 plants in Italy and raw materials of maximum quality, Saer boasts a high standard of quality and reliability for their range of products.

Saer's flexibility and ability to customize solutions allows them to serve a wide range of applications in different sectors: civil, industrial, agriculture and irrigation, underground extraction, mining, oil and gas and water treatment. Today Saer produces over seven hundred different types of pumps, for both surface and wet applications, in a vari-



ety of materials including but not limited to brass, cast iron, stainless steel and Duplex. With dedicated R&D services as well as assembly and testing rooms, Saer ensures premier technology and high reliability for your pump solutions.

www.saerlettropompe.com

Recycling and resource recovery

Shredding and granulation-size reduction – Weima

Weima is the solution for your size reduction problems. Over 30,000 Weima shredders worldwide are down-sizing plastic, paper and wood, preparing it for further value add applications and waste to energy applications or reducing cost for transport and land fill. These extremely durable machines are the preferred solution of experienced recycling operations.



Briquetting-volume reduction – Weima

The Weima briquette press range comprises some of the best solutions for briquetting dusts, wood chips, small offcuts, paper and soft metal swarfs. These powerful hydraulic machines achieve volume reduction up to 90%. Capable of dealing with problem materials such as MDF and sander dust, Weima offer these quality machines for throughputs from 30kg/hr to 6000 kg/hr.



www.weima.com

Industrial fluid management – SmartSkim

Founded in 1998, SmartSkim has grown from a company serving a limited customer base in the Midwestern automotive industry to a global leader in industrial fluid management serving numerous industries including aerospace, energy, medical and transportation.

SmartSkim provides a variety of industrial fluid management solutions. Holding seven different patents relating to skimming and separation processes, the SmartSkim line of products combines innovative design, rugged durability and performance to produce some of the finest solutions for your industry.



www.smartskim.com

SmartSkim products cater to a range of processes, with some of the best tools in the world for skimming and separating floating oils, metallic fines and other contaminants from industrial process fluids.

Having served a number of large and small firms across a wide variety of industries, SmartSkim systems have been proven to reduce costs and improve operating efficiencies for customers.

Waste and wastewater management

Wastewater treatment: AK-DOS

– Suelzle

With a history dating back to 1880, Suelzle has grown from a small operation into a powerful company with over five hundred employees. Under the hands of four generations of the founding family, Suelzle has made commercial knowledge and technical expertise its trademark. With a wide range of solutions, Suelzle has expanded its company network to form a corporate group that joins steel, energy and ideas, in a symbiosis.

AK-DOS is an innovative technique for the elimination of micropollutants. As micropollutants bind tightly to the PAC, they are removed from the water body for good, allowing customers to meet tight discharge limits and easily satisfy compliance regulations. A turnkey powdered activated carbon (PAC) system, AK-DOS measures the optimal quantity of PAC to be dosed into your waste water system, based on a detailed data analysis.



The space-saving system has many cost reducing features, including a small footprint and minimal maintenance requirements. The system comes with a high standard of safety to ensure high availability. With redundant



www.suelzle-kopf.de

dosing units to maintain the fluidized state of the PAC, as well as an alarm and extinguishing system for smouldering fires, the AK-DOS ensures safe and reliable operation.

Modular water solutions

– NewTerra

Founded in the early years of the industrial revolution, NewTerra has over a 150 years of experience in the water industry. While the business has undergone significant commercial expansion, it continues to embody innovation with a focus on technology-driven product development and improvement.

NewTerra has been challenging the boundaries of modularity with their new range of "plug and play" solutions for water treatment systems. Not only can these systems be deployed in any location, they can also be scaled up or down depending on customer requirements.

With over ten thousand installations world-



wide, NewTerra serves a wide range of industries, with a comprehensive tool kit of proven technologies that provide solutions customised to your requirements. These solutions are designed to not only facilitate quick, efficient and cost-effective implementation, but also to simplify maintenance



www.suelzle-kopf.de

and servicing.

With over thirty five patents granted or pending, NewTerra's capabilities range from membrane bioreactor, membrane filtration, reverse osmosis, electrodeionization and desalination, to chemical treatment.

Waste and wastewater management

Evaporation technologies

– Veolia

Veolia Water Technologies is a leading provider of water treatment solutions, with a portfolio of over three hundred fifty proprietary technologies and a revenue of 2.3 billion. With nine thousand employees worldwide, Veolia's global presence allows it to specialise according to your geographical needs. Beyond innovative technology development, Veolia also provides clients with tools for sustainable growth to improve economic and environmental performance by turning wastewater into a valuable resource operation.



www.veoliawatertechnologies.com

Veolia's Eved evaporators offer a natural, clean separation technology with fully automated, standardized, modular units. Low in terms of energy consumption and carbon dioxide footprint, the technology ensures high cost savings and minimal environmental impact.

These highly reliable evaporators are effective in reducing wastewater volume and producing high quality, reusable distillate. The applications include removal/concentration of salts, heavy metals and various other hazardous materials.

A choice of three technologies ensures more flexibility and customisation for customers:

- The heat pump vacuum evaporation system allows better control of problematic foaming phenomena to allow total separation of metals and surfactants, for a higher yield and distillate quality. Equipped with an ozone friendly refrigerant gas and with low electrical consumption, the system provides a reliable and environmentally friendly solution.
- The Hot/Cold Water Cogeneration evaporators allow for maximum cost and space savings by making use of your existing hot water or steam from cogeneration or cooling plants. The forced circulation system also reduces fouling and scaling phenomena, enabling the system to handle a variety of wastewater feed.
- The Mechanical Vapour Recompression technology is specifically designed for treatment of large volumes at high temperatures. With the capacity to treat up to 63,400 gallons of distillate per day, these evaporators are especially ideal when treating large quantities of waste which can cause fouling, precipitation and crystal formation.



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corporate brochure.



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