Circuit
Water Engineering Equipment

The World's Best Water And Wastewater Treatment Equipment

Pond remediation

1mm Monoscreen for abattoir screening

Oxidation Pond Upgrade

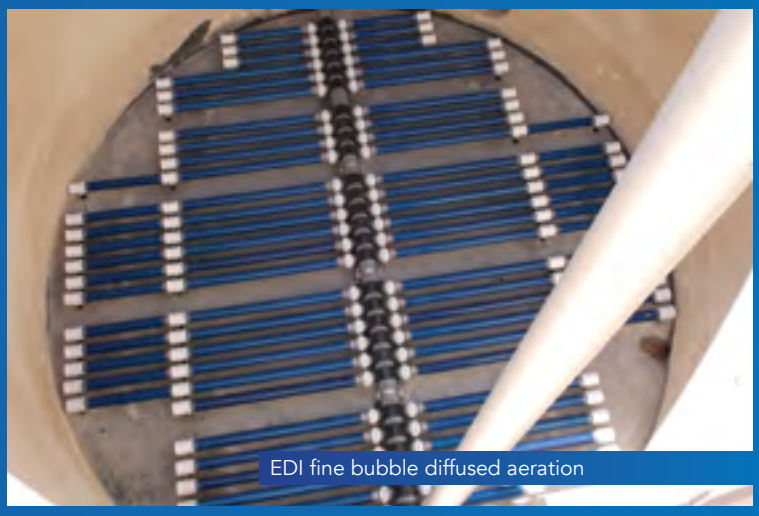
RAS & WAS Pump Station

Polokwane WWTW 17 x 18,5 kW Triton Aerators

Mobile Belt Filter Press

ERWAT Aerators 83 x Hansen Gearboxes

County Fair Chickens 4 x 45 kW Triton Aerators



EDI fine bubble diffused aeration

Gravity Belt Thickeners / Linear Screens

Circuit
Water Engineering Equipment

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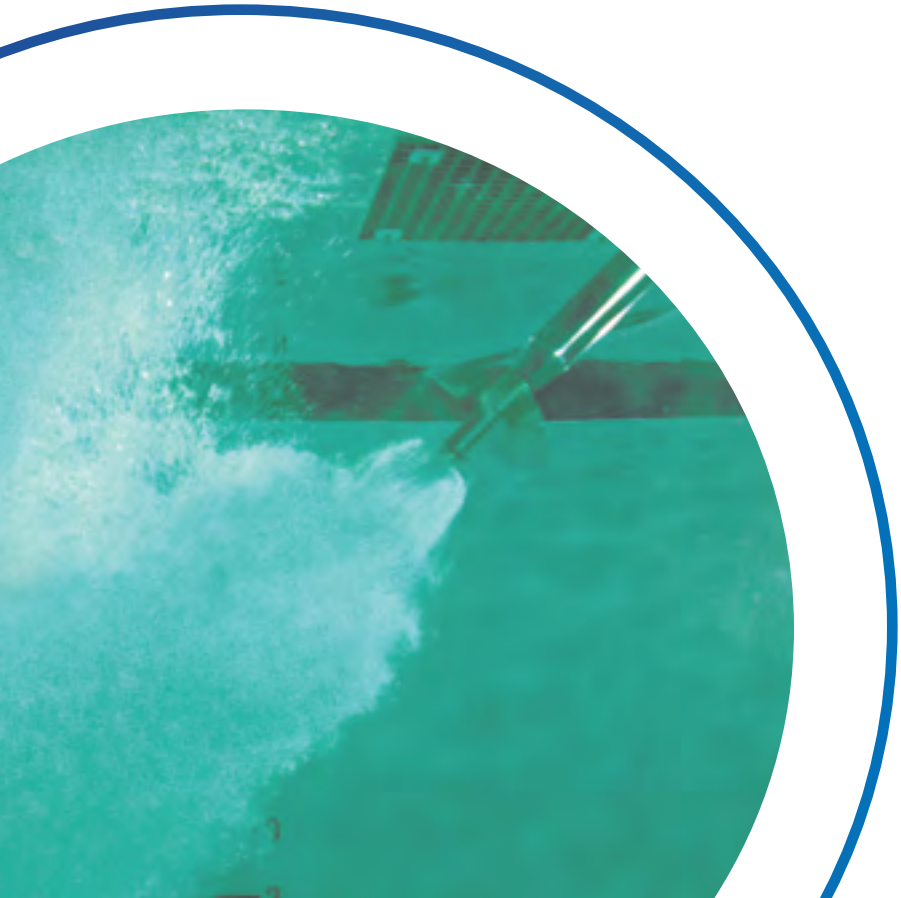


Circuit Water Engineering Equipment

The World's Best Water And Wastewater Treatment Equipment

Circuit Water Engineering Equipment an established family owned business, has an excellent management team that has exceeded in growing the ever expanding demands of the industry.

The company was founded in 1974 by Jack Beswick as a manufacturing facility providing specialist Stainless Steel products. The manufacturing facility was started as the need for high quality Stainless Steel products could not be met by the market. It was a time of sanctions and for the first 10 years of its existence Circuit was manufacturing products using the best Boiler Makers and Sheet Metal Workers Gauteng had to offer. Most items were made according to supplied drawings, samples or mostly just ideas provided by customers. Circuit Engineering (as it was originally known) quickly established itself as the fore-runner in providing high quality Stainless Steel products. Often called upon by high end clients ranging from once off architectural designed items, to industrial giants such as Impala Platinum, De Beers Mining, Nestle, JHB Water, Rand Water, Umgeni Water and SASSDA to name but a few.

As the company grew and diversified its product offering, sanctions also came to an end and South Africa could once again trade with the rest of the world. Circuit Engineering, quickly realised that the South African market was extremely small on the global scale, and the negatives thereof was that true scale could not be achieved to ensure manufacturing costs were low. The importance of any industry is to ensure that it is at the forefront of research and development to provide customers with the best equipment for their needs. Circuit's factory at this point had grown to around 25,000m² under roof, with three separate buildings housing a machine shop, mild steel workshop and then a Stainless Steel workshop with 85 of the most skilled staff the Gauteng area could provide. Despite this, it became clear that it was the market size of Europe, Asia and America that would provide the volumes which allowed significant research and development to take place.

At this point it was decided to start importing the market leading equipment from across the globe. Agency agreements for exclusive distribution into South Africa and surrounding countries have been entered into with Aeration Industries International (USA), Kamps (Belguim), EMO (France) and Nordic Water (Sweden) which owns the brands of MEVA, Zickert, Lamella, NCS, Dynadisc and Dynasand.

Potable Water Treatment

Water is essential for all human life. Ensuring access to clean and pleasant tasting drinking water is therefore one of the most important tasks for every society.

The majority of all raw water comes from surface water sources in lakes and water courses. Surface water is exposed more heavily than groundwater to various impurities from the air, plant and animal life, precipitation and the surrounding environment. This also means that the quality of the raw water can worsen rapidly, for example due to heavy rain and flooding.

A modern water treatment plant must therefore be able to handle varying raw water quality with a good and consistent end result. Nordic Water's product lines offer effective, versatile and reliable technology for separation, sedimentation, sludge treatment, sieving and filtration. In addition, with the DynaSand Filter, we can deliver very compact water treatment plants that provide major savings in expensive floor space.

Industrial Water Treatment

Within industry, water is used as raw material, a rinsing agent, cooling fluid and for cleaning. For large industrial water users, it is often profitable to invest in their own equipment to treat their raw water, process water and wastewater.

Circuit Water's products are the first choice for a number of industrial applications such as breweries, abattoirs, dairies, canneries, steelworks, paper and pulp.

Circuit Water also specialises in equipment designed for the Mining sector. The principal waste-waters associated with mines and quarries are slurries of rock particles in water. These arise from rainfall washing exposed surfaces and from the rock washing and grading process. Following crushing and extraction of the desirable materials, undesirable materials may contaminate the wastewater. For metal mines, this can include unwanted metals such as zinc and arsenic. Extraction of high value metals such as gold and silver may generate slimes containing very fine particles, making the physical removal of contaminants particularly difficult.

Lake restoration

Every lake is unique. Specific strategies to address a lake's nutrient enrichment problems must focus on activities in the watershed and, if needed, in-lake restoration techniques. We have found that each lake has a certain amount of pollution that it can handle without human intervention.

The transfer of oxygen from the atmosphere to the top layer of the lake ensures a surface layer of varying depth which keeps nature in equilibrium. Urbanisation drastically increases pollutants into the lakes thus exceeding the capacity the water body can handle on its own and turning the oxidative layer into anaerobic conditions. The AIRE-O2 Aerators have proven time and again that they increase the ability of lakes to survive pollution, increased nutrient levels and eutrification. By providing sub surface aeration with directional mixing, the water moves in a circular pattern around the entire dam and increases in DO levels, the aerators assist nature in returning a healthy state of aerobic equilibrium.

Municipal Wastewater Treatment

Municipal wastewater treatment install-ations are often designed to handle solid particles, organic impurities and nutrients such as nitrogen and phosphorus. In every project, Circuit Water works closely with the client to optimise the solution adapted to local conditions.

Bad odours can cause problems in sewage treatment plants, both for the employees and for those living nearby. The problem occurs primarily in the handling of faeces-saturated screenings and during pre sedimentation.

Circuit Water offers intelligent solutions that solve the odour problem effectively, both by washing the screenings and by hermetically sealing the sedimentation tanks, combined with effective odour-removing carbon filters with a high purification level and a long lifetime.

Oxidation Pond

Artificial circulation combined with injected atmospheric oxygen provides increased aeration and oxygen to a pond by circulating the water to expose more of it to the atmosphere. Aeration systems are generally used in shallow water bodies. Artificial circulation disrupts or prevents stratification and increases aerobic habitat. The effect of aeration on algae varies. Subsurface aeration with uni-directional mixing decreases algal biomass, but may also lead to less cyanobacteria (blue-green algae). Some cyanobacteria have gas vacuoles which allow them to regulate their position in the water column. By circulating the water, cyanobacteria may spend more of their time in the dark, reducing their competitive advantage over other kinds of algae. Internal loading of phosphorous may also decline if sediments remain oxygenated. When lake sediments lack oxygen, conditions exist to release phosphorus into the water.

Mining

The principal waste-waters associated with mines and quarries are slurries of rock particles in water. These arise from rainfall washing exposed surfaces and haul roads and also from rock washing and grading processes. Volumes of water can be very high, especially rainfall related arisings on large sites. Some specialised separation operations, such as coal washing to separate coal from native rock using density gradients, can produce wastewater contaminated by fine particulate haematite and surfactants. Oils and hydraulic oils are also common contaminants. Wastewater from metal mines and ore recovery plants are inevitably contaminated by the minerals present in the native rock formations. Following crushing and extraction of the desirable materials, undesirable materials may become contaminated in the wastewater. For metal mines, this can include unwanted metals such as zinc and other materials such as arsenic. Extraction of high value metals such as gold and silver may generate slimes containing very fine particles in where physical removal of contaminants becomes particularly difficult.

Desalination

Water is our most essential resource, and with Seawater making up 97,5% of the Earth's total water reserve, we currently rely on the remaining 2,5% of fresh water to sustain life as we know it. Unfortunately, due to rapid population growth and other determining factors, the fresh water resources are under immense strain. For this reason, Desalination technology has been developed, which is capable of removing dissolved solids such as high salt concentrations. This unlocks the potential to treat Seawater to potable standards. Circuit Water Engineering Equipment specialises in every area of the Desalination process. We offer Pre-Treatment equipment which is best suited to your application. The DynaSand 2-stage continuous flow sand filter offers a low maintenance, robust solution. We also offer UltraFiltration technology. This system uses a membrane which can remove particles of 0.001 - 0.1 micron and removes 90% - 100% of pathogens. UltraFiltration has a compact design requiring a small footprint. The key to the Desalination process, is the Reverse Osmosis skid, which houses the hi-pressure pump, RO pressure vessels and the energy recovery device. This equipment can be specified to treat either Brackish Water (TDS <15 000mg/l), or Seawater (TDS 15 000mg/l - 45 000mg/l). Circuit Water RO skids are manufactured from the best materials and utilise industry leading components which ensure the longevity of the plant as well as the most economical running cost possible. We offer Compact Desalination Plants which produce from 4000l of permeate per day, up to Plants capable of producing 50 000 000l of potable water per day.

Activated

Incoming flow

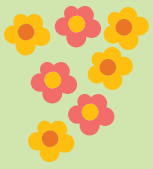
HEAD OF WORKS

Flow

filtrate

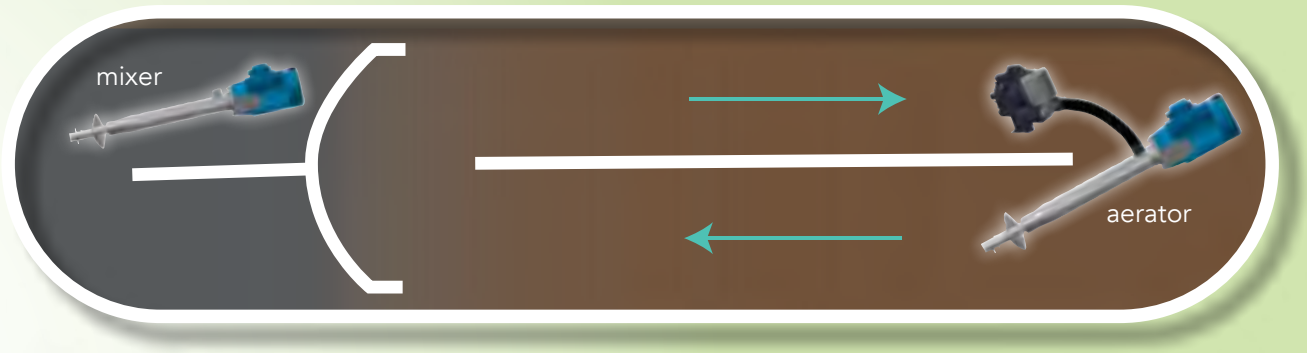
settled sludge

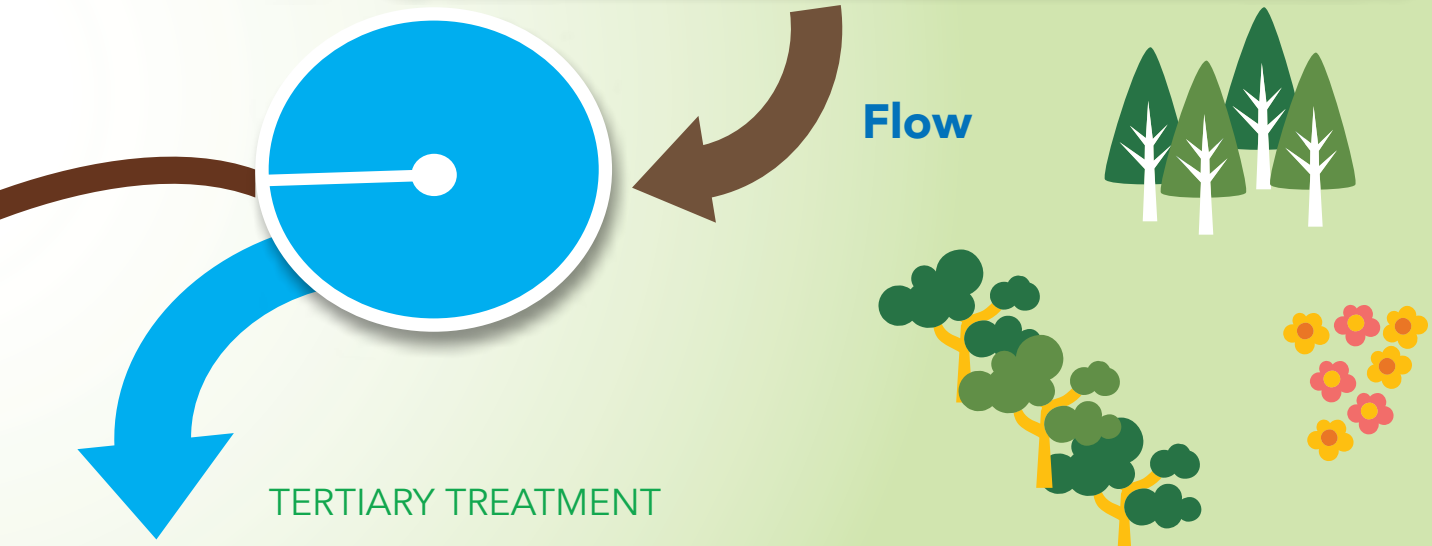
SLUDGE DEWATERING



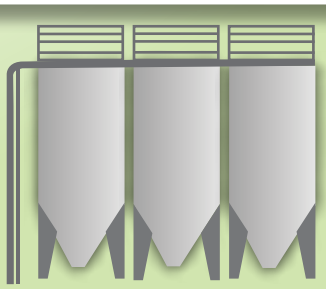
Sludge Treatment Process

BIOLOGICAL STEP

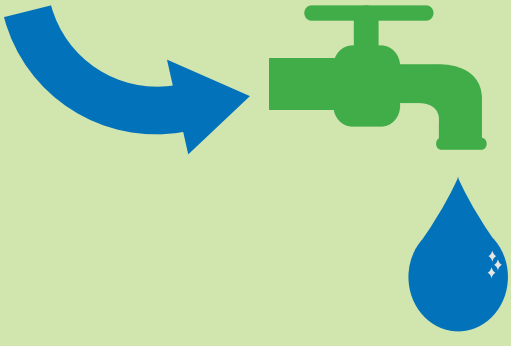




TERTIARY TREATMENT



In addition to equipment sales we provide application engineering, system engineering (including design and integration), fabrication services, project management, construction and installation, and equipment repair – which includes field service. For more information on our products please refer to our catalogue pages that follow.



MEVA Rotoscreen

Meva Rotoscreen RS:

- Fine screen with slot width 1 - 6 mm
- Robust design with 3 mm thick stainless steel stationary as well as moving bars
- High capacity and high separation degree of solids
- Bar fixings ensuring exact slot width
- Pivotable
- Fully enclosed sand resistant anti-blockage protection
- The widest and largest fine screen on the market
- High finish guarantees a long life time
- No wash water required

Area of use

To prevent the pumps, pipes and channels from clogging or blocking, as well as extending the lifespan of the mixers, aerators and dewatering equipment, a good fine screen at the Head of Works is critical.

The MEVA ROTOSCREEN is a strong, self-cleaning fine screen for separation of solids from water. It requires NO wash water, is extremely strong (nett weight is between 2 and 4 times the weight of conventional front rake screens). The Rotoscreen has only one moving part, and a very low flow resistance which results in low head loss. This is an advantage at installations in open channels. It can replace an existing course screen in the existing channel, without affecting the headloss through the channel.

Functionality

Whilst in operation, the ROTOSCREEN has an exact slot width (3 - 6mm) that is ensured by a robust bar fixing and intermediate spacers. The screen has an automatic anti-blockage protection at the channel bottom which makes the screen more resistant to sand. The screen can be pivoted for servicing and is the most easily accessible screen on the market. It is easy to maintain and clean without dismantling any equipment. The unique drive mechanism minimises the need for maintenance.

These advantages coupled with a high hydraulic capacity and robust design makes the MEVA ROTOSCREEN DS the most durable and modern fine screen on the market.

The MEVA ROTOSCREEN DS is manufactured in different models depending on the discharge height. All models are available in different widths to fit into channels of various sizes. The screens are fully enclosed and equipped with a ventilation connection.

Automatic control

MEVA ROTOSCREEN works intermittently, allowing operation to be adjusted to the incoming flow. A level sensor is installed in the channel in front of the screen. The screen starts when a pre-set water level is reached and operates until the water level is below the pre-set value. The cycle is repeated when the level is reached again. This creates a screenings mat which allows particles even smaller than the slot width to be captured and removed from the treatment system.

Automatic control MEVA Monoscreen RSM:

- Patented fine screen with slot width 0.5-6 mm
- Exact slot width during the entire working cycle
- Fully covering screenings mat
- High capacity
- Few moving parts
- Fully enclosed
- The highest separation degree of solids on the market
- High finish guarantees a long life time
- No wash water required

Area of use

MEVA MONOSCREEN is a self-cleaning fine screen for water treatment with a very high degree of separation of solids from water. Extensive development of this product has led to a high separation at the bottom of the screen, a weak spot in other fine screens on the market when screening slot width is less than 6mm for wash water requirements.

The MEVA MONOSCREEN guarantees the slot width along the entire screening surface and can be operated whilst fully covered by the screening mat. Slot widths 0,5 - 6mm. A 1mm MEVA Monoscreen has similar separation to a 300 micron drum screen, without the accompanying clogging problems or washwater requirements.

Functionality

The unique patented design gives MEVA Monoscreen several advantages, especially below the water surface and at the bottom of the screen.

The screen's motion operates within the predetermined slot width for the duration of the working cycle. Due to the progressive movement only a small part of the screenings mat is transported upward during each cycle. This minimises the "rush" of water through the screen that can occur after a traditional screening cycle.

The blockage risk is eliminated by the design as the moving parts never open wider than the actual slot width. It is for this reason that the screenings mat can cover the screen fully during operation. This ensures a very high degree of separation (up to 50% more than other designs). Screenings capture ratio tests results at 83%, which equals that of punched hole screens, however without the need for wash water or brushes.

MEVA Monoscreen can uniquely ensure slot widths as little as 0.5mm for the entire screening surface.

Automatic control

MEVA MOTOSCREEN works intermittently, allowing operation to be adjusted to the incoming flow. A level sensor is installed in the channel in front of the screen. The screen starts when a pre-set water level is reached and operates until the water level is below the pre-set value. The cycle is repeated when the level is reached again.

Grit Removal:

Sand is collected in the head of works by settlement. For larger flows the most common practice is to use vortex chambers which settles the grit 4 - 6 m below ground level. Grit collected here is most effectively removed with air lift pumps. This can then be further dewatered or washed with other MEVA equipment.

MEVA Sand Separator (SA):

The Meva sand separator provides the perfect solution for slurries and wet mixtures as it traps sedimentary particles and dewaters them before discharging them. It is indespensible for grit handling in wwtw and for sand, bark and metal pollutants in paper mills.

The Meva design is full Stainless Steel, provides for inspection and makes cleaning possible in the unlikely event of blockage.

MEVA Sand Washer (SWA):

The Meva sand washer has been designed to remove organic material from sand. European regulations have become stricter and thus organic material must be removed from sand before you are able to dump it. The result has been that the sand is so clean, it can be used for construction purposes and does not always need to be taken to land fill sites.

MEVA Multi Rake Screen:

The MEVA Multi Rake Screen is a coarse mechanically cleaned bar screen suitable for inlet works of wastewater treatment plants, pump stations and inlet water structures. Bar spacings of 10 - 50 mm are the norm. For demanding fine screen installations, the front rake screen can also be fitted with 5mm bar spacings utilising teardrop shaped bars, which offers an unparalleled low flow resistance.

Vertical Front Rake Screen:

The EMO DCV screen is a vertical front rake bar screen which is operated by one, two or three cables rather than circular chains. The benefit is that moving parts remain at the top of the screen and there are no wear parts constantly below water level, thus extending life expectancy of the screens. The single larger rake is also stronger and can extend much further away from the screen field ensuring less down time due to large or heavy items in the flow.

Conveyors:

MEVA conveyors are designed for high efficiency, flexibility, ease of installation, maximised reliability and simplified maintenance. MEVA conveyor systems are capable of transporting different materials such as dewatered sludge, pulp, woodchips, abattoir refuse to name a few. The shaftless screw an they are double the thickness of locally produced conveyors and are manufactured from a hardened special steel dedicated to spirals. The wear liners are made from Hardox as standard or dual colour plastic for wear indication as optional.

Travelling Band Screens

Main areas of use and features:

- Punched holes for three dimensional screening
- Membrane applications
- High Reliability and ensured continuity of operation
- Filter elements optimally cleaned by spray bar and brush
- Low maintenance cost
- Suitable for outdoor sites and operation in extreme conditions
- Easily adapted to suit changing operating conditions
- Completely enclosed for odour control

How it works:

Nordic Water is famous for their extremely strong and robust Rotoscreen, which is a step-type screen used at Head of Works. They are also instrumental in the design and installation of perforated Band screens. Due to the hydraulic effect of all the extra steel on the screen, flow capacity is reduced for single directional screens. Nordic Water offer a side or double screen entry (known as cross flow), which ensures higher flow without changing channel civil requirements.

MEVA MPS is a modern perforated plate screen developed for use at waste water treatment plants and process industry with high demands for sturdy design, high separation degree and low costs. A lot of work has been spent on developing the design of the brush and strainers in order to bring the brush wear and flush water consumption to a minimum. MEVA MPS is hygienically fully enclosed and is delivered with a standard perforation of 2-12 mm.

For Mhlathuze Water, Circuit Water have just installed their largest screens to date. In total there are four 12 mm, punched hole, band screens. Two of which are installed at a sea water abstraction pump station (Alkanstrand) and are manufactured with 316L stainless steel. Futhermore it offers cathodic protection against corrosion. These screens are 1,8m wide and 11m high.

Another two punched hole band screens have been installed at the Nsezi WTP pump station for Mhlathuze Water to screen water from the Nsezi dam before it gets pumped to the water treatment plant. These two are manufactured from grade 304 stainless steel and are 13m tall. These are capable of a peak flow of 850m3/min.

Screw Wash Press (SWP)

Main areas of use and features:

- Removal of biodegradable content from screenings
- Dissolvable organics are returned to the treatment process
- Major weight and volume reduction of screenings
- SWP achieves DS content of 40-60%

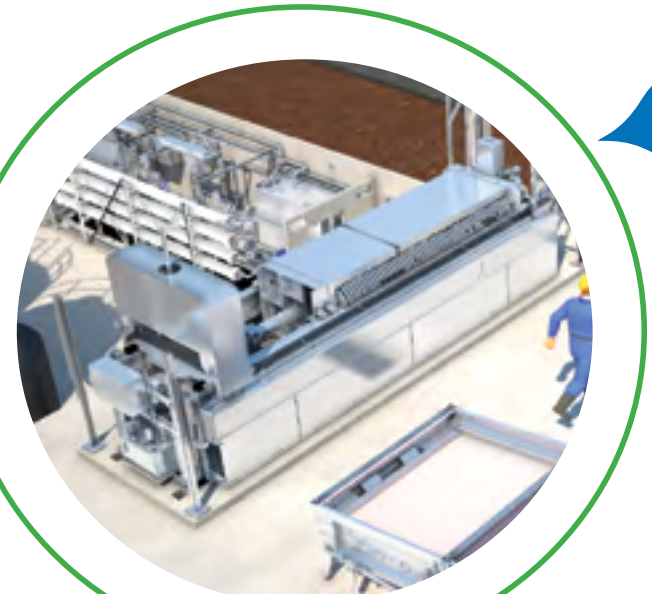
Area of use:

Due to the increased use of fine screens, the amount of screenings removed from the wastewater flow is constantly increasing. It is thus imperative to wash the organic matter from the screenings and ensure they remain in the treatment process. Undissolved organic matter will also be removed and this must also be returned to the process as a liquid.

Using the MEVA Screw Wash Press is thus beneficial to both the process as well as the environment surrounding the waste water treatment works.

Function:

Screenings fall vertically into the feed zone from a screen or conveyor. A slow rotating screw combined with wash water is the first step of the washing process. The press zone ensures that solids are dissolved and the dissolved material is discharged back to the channel. An automatic flush cycle ensures that the SWP is cleared of organics before the next cycle of screenings washing and pressing.



MEVA Counter Pressure System CPS

Main areas of use and features:

- Decreased disposal costs
- Highest level of volume and weight reduction
- Removal of odour and nuisance of screenings
- Screenings are shredded and ready for incineration
- SWP + CPS achieves DS content of 50-60%

Area of use:

The MEVA CPS is a market leader and provides unsurpassed dryness and volume reduction to the screenings.

The combination of MEVA SWP and MEVA's patented CPS-X results in a product which is optimal for incineration. With DS content of between 50 & 60%, the MEVA CPS is unequalled. By adding the CPS the detention time and washing function in the SWP is enhanced, as well as the water removal.

Function:

Attached to the Screw Wash Press, the CPS provides a high counter pressure, which creates a blockage to allow the SWP to press against a stationary plate. This ensures maximum dewatering of screenings. Screenings are then shredded before discharge which ensures the screenings are optimally prepared for incineration.

By exchanging the press pipe with a CPS-X, the discharged screenings show a 50% volume reduction.

"Water is critical for sustainable development, including environmental integrity and the alleviation of poverty and hunger, and is indispensable for human health and well-being."

- United Nations

Mixers have these in-demand features:

- Large, anti-fouling propeller
- No floc shears
- Designed to withstand corrosive environments
- Easy surface installation
- Dependable, extended service life
- Low maintenance
- Highly energy-efficient
- Surface mounted for easy access
- Simplifies retrofits and upgrades

Ultimate mixing power

The Aire - O2 mixer is a slow speed surface mounted, variable angle mixer with low power consumption for the mixing requirements of aeration tanks, oxidation ovals, digesters, lagoons, anoxic basins and chemical mix tanks. An above surface motor ensures simple, low maintenance operation.

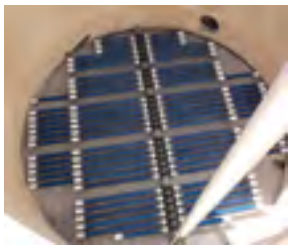
Aire - O2 Mixer benefits

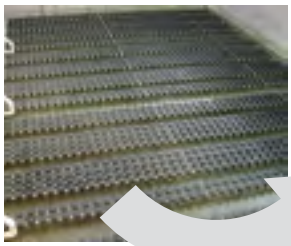
- Made of high-grade materials for corrosive environmental stainless steel
- Simple to install and maintain
- Large anti-fouling propellor
- Variable angle offers flexibility
- No floc shears, prevents short circuiting
- Low speed (750rpm) operation ensures extended equipment life, greatly improves mixing, and offers quiet operation.
- Fast and simple application retrofits
- Available in 1.5 to 56 kW sizes
- Up to 5 year warranty, depending on application

Vertical Shaft Mixers

Vertical shaft mixers are geared motor driven and are tailor made to fit each Anaerobic or Anoxic reactor's volume and dimensions. The design of a curved blade produces a radial flow mixing pattern. Backswept blades with anti-ragging technology will ensure complete mix conditions in your reactor.

Fine Bubble Diffused Aeration by EDI





Main areas of use and features:

- Energy savings
- Ease of installation
- Improved reliability
- High structural integrity
- Maximum oxygen transfer for high SOTE
- Lowest total cost of ownership

How it works:

Fine bubble diffuser systems are a key component in controlling the operational economics of a wastewater treatment plant. EDI's fine bubble diffuser platforms offer maximum performance and application flexibility for systems optimization.

Each EDI diffuser platform is available with the appropriate systems configuration for optimized functionality. System options are available for superior energy savings, process performance, improved systems reliability, ease of installation and maintenance, as well as service life.

Four models are offered namely, FlexAir Disc, FlexAir Tube, FlexAir MiniPanel and Streamline Panel. The Matrix Membrane has been fully embedded with PTFE, allowing the highest temperature rating of any panel and polyurethane membrane on the market. Matrix has proven to be the best performer in aggressive chemical applications, has longer runtimes, easier cleaning and optimum operating efficiency.

Technical Advantages:

- Very high oxygen input efficiency in standard conditions
- Stable oxygen input efficiency in time
- Physical impossibility of fouling or clogging
- High alpha factor especially with a high concentration of activated sludge oxygen transfer of 10 to 450 kg O2/h and per unit
- Fully accessible without the need for draining the tanks
- Large agitation capacity (up to 6 m depth)
- Easy propulsion capacity (oxidation ditch)
- Power adjustment
- No bearing in contact with the water
- Very low maintenance
- Lifetime > 20 years
- International references

Less Energy

The development of the AIRMAX aerator has demonstrated that in order to use less energy, the diameter of the propeller has to be large, which leads to a lower rotation speed. The shape of the blades is also of primordial importance. Energy efficiency is stable over a wide range of speeds, 12 blades reduces wave size at impact, which in turn reduces wear on gearboxes.

Better mixing

At a given power level, an aerator with a large diameter and therefore operating at low-speed, guarantees proper mixing at a deep level as well as circulation to ensure that the sludge is brought or maintained in suspension in the water.

Simplicity and Reliability

Our years of experience have enabled us to evolve towards a simple, effective and reliable design, in line with our customers' long-term investment requirements. The gearboxes are lubricated at a low temperature, so that there is almost no wear.

Only Hansen Vertical design gearboxes are used for Kamps Aerators. These are the only gearboxes on the market that were designed for Aerators which are vertical applications. All other suppliers have taken horizontal gearboxes and turned them on their side, which is why the Hansen vertical designed gearboxes are the only gearboxes that are able to last more than 20 years in Aerator applications.

AIRE - O2 Aspirator Aerator

Main areas of use and features:

- Single motor
- No gearbox, direct drive
- Shallow ponds
- WWTW with flow <1Ml/day
- Golf courses and irrigation ponds
- Development and farm ponds
- Aquaculture
- Algae control

Areas of use

The original Aire-O2 Aerator was designed and patented in 1974 to prevent fish kills as the lakes in Northern USA froze over each winter. The mixing kept the frozen layer at bay and the oxygen ensured that the fish were able to survive the winter. The Aire-O2 Aspirator Aerator quickly became the go to machine for lake restoration and water control in ponds.

Functionality

The Aspirator uses a high speed motor to drive a propeller at the end of a HOLLOW shaft. This causes a vacuum effect and pulls atmospheric air down the shaft, which is then broken down into 2,2mm sized bubbles and pushed into the water body. This directional aeration ensures that even large water bodies can be controlled by this mixing and aeration device.

Series 275

The series 275 Aspirator is a workhorse and the most popular aerator on offer. Available from 1,5 up to 5,5 kW only. This model has the same essential design features and advantages of the original Aspirator. Offering a shortened stainless steel shaft and one-piece unifloat allows this aerator to be extremely cost effective while also being small and light enough to be carried in comfort by two people, yet powerful enough to treat surprisingly large ponds.

The Series 275 aspirator aerator is the first choice in the upgrade of Oxidation ponds in South Africa for municipalities, sports lovers and farmers alike.

Main areas of use and features:

- Fine bubble aeration <2,2mm sized bubbles
- Dual - functionality in that there is precision controlled aeration and mixing that allows for biological nutrient removal
- Horizontal mixing resulting in complete basin circulation and destratification
- No gearbox, direct drive
- A small footprint as deep mixing equals reduced civil costs
- Mixes and aerates up to 10m deep
- Sizes 4 - 55 kW

Area of use

The Aire-O2 Triton aerator is ideal for most applications that require the introduction of oxygen into a liquid. This includes all of the commonly used biological wastewater treatment processes that use aerated tanks, basins, ponds, and/or structures to implement the process. Typical applications include industrial and municipal wastewater treatment facilities employing aerated lagoons, equalisation basins, activated sludge systems, secondary aerobic digesters, and similar processes.

Because the Triton can operate either as an aerator/mixer or as a mixer only, the Triton is ideally suited for wastewater treatment processes utilising biological nitrification and denitrification. In the nitrification phase, both aeration and mixing are performed simultaneously. In the identification phase, aeration is stopped and the unit operates simply as a highly efficient mixer to facilitate the denitrification process.

Functionality

The system optimises the combination of hydraulic and aeration efficiency necessary to accomplish higher oxygen transfer, superior mixing, and allow unsurpassed control of the activated sludge process environment. Biological nutrient removal (BNR) processes are easier to regulate and more cost effective by combining mixing and aeration in one compact unit with independent aeration control.

Aeration and mixing mode: Air is pressurised using a high efficiency regenerative blower. The air is forced down a hollow shaft into the proprietary Powermix propeller/saturn ring design. The Saturn ring sheers the air into fine bubbles and enhances the nitrification process while the Powermix propeller forces the air into a downward direction, dramatically increasing bubble residence time and increasing oxygen transfer.

As a surface mounted energy efficient fine bubble aerator the applications are endless. Maintenance is done in-situ without the need for cranes, or draining the reactor. This lowers downtime and overall cost of ownership of the equipment. The Aire-O2 Triton can be mounted on bridges, walkways, walls or even on floating platforms.

Gravity Belt Thickener

Main areas of use and features:

- Designed for the continuous mechanical thickening of municipal or industrial sludge
- Aims to reduce sludge volume at least 4 times
- Low energy and polymer consumption
- Stainless steel construction
- Easy and low maintenance and supervision

Area of use:

The Gravity Belt Thickener can be used as:

- Final step to increase the sludge DS concentration to 6-8%. Therefore, replacing conventional gravity static thickener flotation system.
- Pre-dewatering stage when combined in-line with a Belt Filer Press to optimize the Belt Filter Press operation and performance.
- Sludge volume reduction before anaerobic digestion process to reduce digester size.

The EMO Gravity Belt Thickener range has been especially designed for very high capacity installation. Its mechanical functions and components have been adapted to process conditions up to 200m3/h of raw sludge per GBT.

Main areas of use and features:

- Two-belt belt filter press for dewatering sludge (primary and secondary)
- Gravity drainage section
- Entry to the EMO belt filter press is at the bottom of the machine
- Manufactured from stainless steel

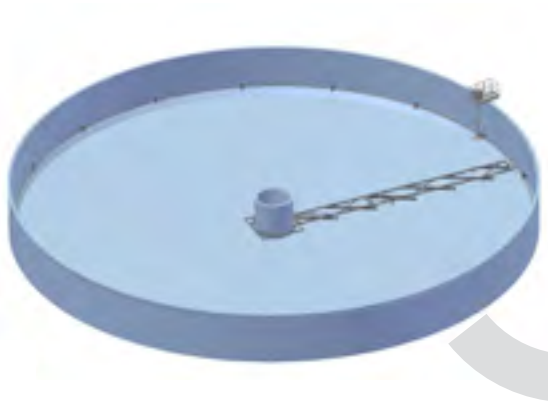
Area of use:

The two-belt belt filter press is a tried and trusted method for dewatering sludge (primary and secondary). As we all know that one good belt filter press cannot out perform another good belt filter press in terms of Dry Solids. The dewatering ability is more closely related to the type of sludge and the polymer used. Having said that, the EMO design offers some benefits which we believe offer a competitive advantage.

- The Gravity drainage section is always a separate machine for low DS concentrations (typically used when pumped directly from the biological reactors at 4-5g/l). This allows a larger aperture to be used in that machine.
- Entry to the EMO belt filter press is at the bottom of the machine.
- The largest percentage of water is removed by the first pressing roller, and this ensures that water is at the bottom of the machine and is discharged directly to the outlet.
- Bottom entry also allows for a flatter machine which in turn ensure that platforms next to the equipment are not required for inspection and maintenance.
- All rollers (but one) are the same diameter, which ensures emergency spare parts required on site are reduced to only one roller and one set of bearings.
- Discharging of dried sludge is also thus at the top of the machine, which allows for easy installation of a screw conveyor below the discharge. Dewatered Sludge transportation from a low level is troublesome due to the sticky thick nature of the product.

Furthermore the EMO Belt Filter Press is manufactured from stainless steel and the design takes into consideration fitting a standard sea freight container (even for the largest model) to minimise transportation costs.

Sedimentation Tank Scrapers



Zickert Round:

Sand is collected in the head of works by settlement. For larger flows the most common practice is to use vortex chambers which settles the grit 4 - 6 m below ground level. Grit collected here is most effectively removed with air lift pumps. This can then be further dewatered or washed with other MEVA equipment.

Zickert Rectangular:

The Zickert bottom sludge scraper is based on the forward and return movement of its hydrodynamically designed sections. The concave face of the scraper slowly moves the sludge towards the collection chamber. During the return, the wedge shape of the opposite side quickly slides under the sludge blanket, without disturbing the sludge layer.

Travelling Bridge scraper:

Full or half bridges travelling bridge scrapers for primary or secondary sedimentation tanks. Submerged parts are manufactured from stainless steel parts while walkways can be from HDG mild steel. This greatly extends the lifespan of the bridges.

Plate filter press:

The Plate Filter Press is designed for the thickening and dewatering of industrial and municipal sludge. It is the only choice when extra-high levels of dryness are required. The principle consists of injecting the sludge between a series of plates with 15 bars of pressure between filtering cloths. The cloths hold back the conditioned sludge to separate as much water from the sludge as is possible. Sludge can be "conditioned" by polymer addition, by ferric chloride and/or lime addition. Three product lines are available; manual, semi-automatic and fully automated.

Lamella:

By allowing the liquid to enter the plate assembly through the side, rather than underneath, the settled material is not disturbed. The well proven flow control feature and excellent hydraulic design ensure equal flow distribution over the Lamella plates to enhance separation. By selecting the Nordic Water Lamella customers are assured of optimal operation and longevity of the equipment. Available as freestanding settler units or Lamella plate packs which fit into existing structures to increase sedimentation capacity.

Filtration Belt:

Preferred supplier to manufacturers of Belt filter presses and Linear Screens, the Rai Tillieres Polyester Monofilament belts offer unequalled quality. The weave pattern provides enhanced liquid drainage. The clipper seams are glued, resulting in a no-hook, smooth join. Belts are furthermore head treated to eliminate folding during operation. Lifespan is between 4 and 10 times longer than low cost belts. Try it once, and keep your equipment operating.

DAF - Dissolved Air Flotation

DAF:

Flotation units with dissolved air allow to accelerate the separation of water and suspended solids. Compact and simple of use, they make it possible to recover at the same time floated and settling particles, and produce rejections with strong content of dry matter.

- Simple of use
- Compact construction
- Capacity for treatment: 2 to 30 m3/h according to the models
- Low cost of maintenance
- Recovery of the solids on the surface and at the bottom of the flotation unit
- Single system of drainage of the recovered solids

How it works:

The aim of Physico Chemical treatment is to agglomerate the fine particles like certain soluble pollutants, which have difficulty in settling naturally or are in a dissolved state. These particles are coagulated into stable solids called "flocs" which allow the separator either settle them at the base of the DAF tank and remove them or alternatively float them to the surface where they are scraped off and removed from the liquid.

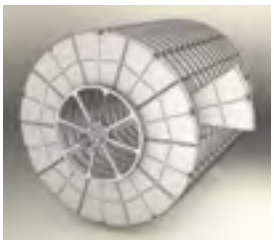
To reduce floor space required, Lamella packs are inserted into the tanks, and sludge is removed and dewatered further by belt filter presses. Pipe flocculators are mounted on the side of the tank or wall of the building. Whitewater is created and inserted at the inlet side, to ensure all light particles are floated to the surface. For FOG separation, DAFs are often used without the need for chemical addition.

"My secret is one the world needs to know - nearly a billion people a year die from unsafe drinking water."

- Bella Thorne

Main areas of use and features:

- Effluent polishing of wastewater
- Water reuse
- Versatile design allows for a wide variety of water treatment applications
- Raw water filtration
- Process water filtration
- Cooling water filtration
- Pre-filtration before sand filters
- Pulp and paper industry



How it works:

Consisting of multiple rotating filter discs, the DynaDisc Filter features a well proven system that uses fine woven filter media. This sophisticated design produces a highly effective filtration process that can achieve high filtration efficiencies.

Water to be filtered is guided into the rotor drum and flows by gravity into the filter discs through openings in the drum, and passes through the filter media on the sides of the discs. Suspended solids are separated and accumulated on the inside of the filter cloth. When the water level inside the filter rotor increases to a pre-set point, the filter rotor starts rotating and the backwash of the filter media starts. The high pressure backwash spray removes the accumulated suspended solids into the reject flume inside the filter. The suspended solids are then discharged via the reject pipe. The discs are submerged to approximately 60% and the water level of the filtrate is kept by a level tank.

Applications are for high flow rates and where small footprints are required. The disc system drastically increases the capacity over standard drum filters, and also should you have a small tear in the filtration cloth, you do not need to replace / repair the entire drum. A new cassette can be fitted by a single person in a short period of time. The new cassette is simply removed from storage and fitted to the Dynadisc filter by unclipping the old and inserting the new cassette, resulting in minimal downtime.

DynaSand

Main areas of use and features:

- The DynaSand unit is a continuously operating sand filter
- No first filtrate. Always clean effluent
- Operation is straightforward and reliable
- The sand is cleaned at all times by an internal washing system and unit doesn't have to be taken out of service for backwashing
- No shock loads on the wash water treatment system
- Handles high suspended solids without the need for pretreatment
- Low head loss and energy consumption

How it works

The DynaSand filter is based on the counterflow principle. The water to be treated is enters through the inlet distributor in the lower section of the unit and is cleaned as it flows upwards through the sand bed, prior to discharge through the filtrate outlet at the top. The sand containing the entrapped solids is conveyed from the tapered bottom section of the unit, the water on the other hand is in slow, constant upward movement. Cleaning of the sand commences in the pump itself, in which impurities are separated from the sand grains by the turbulent mixing action. The contaminated sand spills from the pump outlet into the washer labyrinth where it is washed by a small countercurrent flow of clean water.

The separated solids are discharged through the wash water outlet, while the grains of clean sand are returned to the sand bed. As a result, the bed is in a slow, constant downward motion through the unit. Compressed air for the sand pump is provided via the control panel. Thus water purification and sand washing both take place continuously, enabling the filter to remain in service without interruption.

Main areas of use and features:

- Hydraulic scroll drive with Rotodiff technology is the most powerful and precise drive in the industry
- Highest torque to weight ratio with optimum control
- Lowest installed power
- Lowest energy consumption
- 100% torque at all speeds
- Highest torque rating in the industry resulting in increased solids loading capacity

How it works:

Centrisys is a USA Manufacturer of dewatering and thickening centrifuges and systems for municipal and industrial wastewater. The company came into being 25 years ago, as a repair facility for the number of Centrifuge brands in the USA. Their hands on approach led them to innovative design improvements which has provided an opportunity to manufacture the most advanced Centrifuges available in today's marketplace.

The Centrisys team is focused on centrifuge equipment including the innovative THK-Series Thickening Centrifuge, 2 and 3 phase technologies and custom engineered design solutions. Centrisys provides global service, repair and maintenance for all manufacturers' centrifuges on the market today. Centrisys is known for their process optimization expertise and hands on approach to find the most efficient dewatering solutions, giving their customers the results they need.

Magflow UltraFiltration

Main areas of use and features:

- Pre-treatment
- Primary treatment
- Final Polishing
- Removes particulate >0.03 micron (Dependant on membrane pore size)
- Single pass offers 95% recovery

How it works

Ultrafiltration, also known as UF, is a class of filtration that uses a membrane, in the form of a tubular element known as a hollow fibre membrane. Flow can either be outside in or inside out.

Ultrafiltration is a size-exclusion processes that reject particles, pathogens, and high molecular weight species. UF has pore sizes in the range of 0.001 to 0.1 micron, with a 0.03 nominal micron rating being typical.

The UF membranes remove the majority of particulates that could cause fouling of RO membranes, as well as colloids, harmful bacteria, most viruses, and parasites such as Cryptosporidium and Giardia. Due to efficacy, UF is also frequently used as a police filter on treated water, to manage only a portion of the flow to ensure the water quality average remains within desired limits.

UltraFiltration modules are used in a variety of water treatment applications such as ground and surface water, seawater, industrial and municipal tertiary treatment.

Main areas of use and features:

- Potable water
- Beverage
- Food processing
- Waste Water recovery
- Automatic inlet shutoff valve
- 316 Stainless steel pre-filter
- 8 inch FRP Pressure vessel

How it works:

Reverse Osmosis, also known as RO, is a physical process which allows dissolved salts to be removed by forcing water to pass through a semipermeable membrane. The permeate or product water, passes through the membrane, whilst the dissolved solids which are unable to pass, are conveyed to the drain as concentrate or reject water.

Reverse Osmosis is very effective in treating seawater, brackish, surface and ground water for both large and small flow applications. Some examples of industries that use RO water include seawater desalination, pharmaceutical, boiler feed water, food and beverage, metal finishing and semiconductor manufacturing to name a few.

Magflow Reverse Osmosis skids employ the duty of Fedco/ ERI / duplex stainless steel hi-pressure pumps, capable of exerting 60bar pressure, which are designed and manufactured purely for RO applications. Magflow has sourced industry leading components to ensure plant longevity and economical running costs.

A choice of membranes is available for a host of applications, including H.P. membranes for desalinating seawater, BW membranes for treating brackish water and L.P. membranes for purifying tap water.

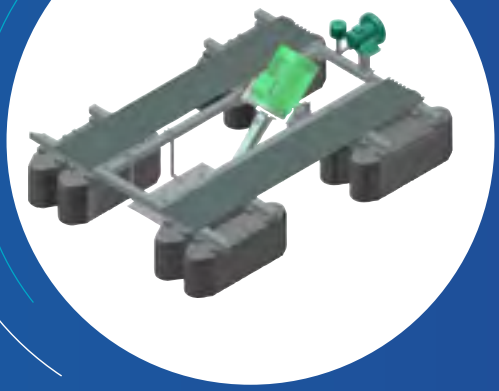
Rentals at Circuit Water

Circuit Water has a fleet of aerators and the rental mixer sizes available.

The rental aerators are available in the following sizes 4 kW, 11 kW, 30 kW and 45 kW. The rental mixers are available as 4 kW or 11 kW only.

The aerators are mounted on floats and can be easily installed into activated sludge systems, aeration pond systems or lagoons on a temporary basis.

The World's Best Water and Waste Water Treatment Solutions



EMO NORDIC WATER MAG FLOW RT Rai-Tillières KAMPS DYNASAND MEVA

Hartbeespoort Dam Harbour - Before

Hartbeespoort Dam Harbour - After (4 x series 275 Aspirators)

Ceres Fruit Pulp 8 x 11 kW Triton Aerators

Aerators are available ex-stock for purchase or rental

Nsezi WTP - 2 x 13m high Dual Flow Band screens

Op Die Berg WWTW - 2 x 5,5 kW Aire-O2 Triton Aerators

Oxidation ditch upgrade 4 x 45 kW Tritons

Dynasand sand filters Mpumelanga 5Ml/day

Darvill WWTW - Aeration capacity upgrade

Aire-O2 Triton Bubble Release

Barberton WWTW - 3mm Rotoscreen with SWP and CPS

Driftsand WWTW - Oxidation ditch upgrade

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Water Engineering Equipment