



## Company Profile

**It pays to talk to a specialist**





# DELKOR

## It pays to talk to a specialist

### Filtration

- Delkor Belt Filters
- Ceramic Disc Filters
- Polishing Ceramic Filters
- Automated Filter Presses
- Bond Indexing Filters
- Gravity Sand Filters
- Tipping Pan Filters

### Sedimentation

- High Rate Thickeners
- High Density Thickeners
- Paste Thickeners
- Ultrasep Thickeners
- Conventional Thickeners

### Clarification

- Pinned Bed Clarifiers
- Sludge Bed Clarifiers

### Screening

- Delkor Belt Screens

### Flotation

- BQR Flotation Cells

### Flocculant Dosing Plants

- Automated
- Manual

Delkor is a diverse solutions-based equipment supply company in the Solid / Liquid Separation field which is grouped under Delkor Technik B.V, a wholly owned subsidiary of Bateman Engineering N.V

Delkor is the leading supplier in the Solid / Liquid Separation field and has built a reputation for the supply of quality engineered products to our client base in the minerals, chemical and industrial markets. Our track record stretches over 35 years and includes more than 2100 installations worldwide.

The Delkor organisational structure ensures that each major global centre is staffed with engineers assigned to gain an in-depth knowledge on specific products. These specialists offer an unmatched combination of experience, product-based process knowledge and are also tied into a global grouping that meet and communicate on a regular basis. This way knowledge gained in one part of the world is disseminated and applied in other similar applications. Our clients therefore benefit from face to face technical discussions with our local experts who are able to draw on global experience to offer you the best local solution. Delkor's unique style of operation is best summed up as

### DELKOR, THE GLOBAL LOCAL SPECIALIST

Delkors approach is to be able to back up its local specialist support with the following services:

- Pilot plant & laboratory testing, providing not only test work data but also an informed interpretation of this data into real operating data such as capital and operating costs and comments on the operability of the options presented.
- Specialised process design to suit the specific application; paying attention to detail such as design, optimisation of services and battery limits.
- Technical review of the installation & advice on layouts to ensure maximum benefit for ease of operation and maintenance
- Capital equipment supply including all associated documentation for after market support.
- Specialised engineering services for installation, site start up and process fine tuning.
- Ongoing maintenance support and spare part supply
- Modular plant capability to supply and start stand alone operations.



Delkor's can also tap multiple low cost fabrication centres around the world to enhance delivery times. These centres are subject to Delkor quality standards at the point of delivery to ensure that the product is the same no matter the source.

Delkor services mining & metallurgical, chemical, industrial, fertiliser and municipal and other industrial solid liquid separation applications from their following regional offices

**Asia Pacific**

- Australia
- China
- Thailand

**Americas**

- Canada
- Chile
- Brasil
- Mexico
- Peru

**Central Asia, Middle East & North Africa**

- India

**Europe & CIS**

- United Kingdom
- Russia

**Sub Saharan Africa**

- South Africa

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## Project 2015

In 2015, Delkor will be a **market leader** and a **preferred supplier**, with strong **technical capability**, continuously **developing new and existing technology** through strong **research** and sound **execution**.

This is achieved because of our strong **organisational capability** and the **talented people** who work in our **inspired company**.

## Our Mission

To be an **inspiring global** engineering company, **enabling talent** to provide **valuable solutions** in **collaboration** with our clients to **convert** natural resources into **marketable** products contributing to the **wealth** and **wellbeing** of our stakeholders

## Centres of Excellence

Delkor's unique business model means that each office boasts specialists in their chosen field, who also participate in the Delkor Centres of Excellence (CoEx). The CoEx teams are tasked to consolidate and disseminate Delkor know-how throughout the group, to initiate and promote new developments and define new directions in terms of Research and Development or improved Global Supply Chain capabilities.

As these teams are not located in any one geographical centre, this system allows Delkor to ensure effective knowledge transfer from our global organisation through to our local clients.

### Delkor Centres of Excellence

CoEx	Technologies
Filtration	Delkor Belt Filters Ceramic Disc Filters Automated Filter Presses Bond Indexing Filters Tipping Pan Filters
Sedimentation	High Rate Thickeners High Density & Paste Thickeners Ultrasep Ultra High Rate Thickeners Conventional Thickeners
Clarification	Pinned Bed Clarifiers Automatic Gravity Sand Filters Polishing Ceramic Pressure Filters
Screening	Delkor Belt Screens
Flotation	BQR Flotation Cells
Flocculant Plants	Automated & Manual



# Our Core Values

## Accountability

We take ownership for our own actions and responsibilities, whether good or bad  
We empower others to take decisions in their areas of responsibility  
We act in a disciplined manner, following through on tasks and actions

## Customer Focus

We listen intently and engage with our customers to gain a deep understanding of their needs  
What we deliver and the way we execute reflect our understanding of their needs  
We develop mutually beneficial relationships that are courteous, respectful professional and focused  
We are proactive, enthusiastic and respond rapidly to our customers needs

## Coaching and Mentoring

We are eager & willing to share our knowledge and experiences helping others develop their capability  
We build relationships based on trust and respect by investing in each other to enhance personal growth  
We are role models for each other, leading by example and living our values

## Continuous Improvement

We always ask ourselves “how can I do it better”, to perform more effectively and productively  
We initiate and accept change  
We take responsibility for our own continuous learning and personal development

## Teamwork

We take collective ownership to complete challenging tasks together to achieve extraordinary outcomes  
We collaborate with teams across our Group to work in synergy toward a shared goal and vision  
We complement each other’s strengths and weaknesses  
We are considerate and support one another, building trust and respect





## Filtration

- Delkor Belt Filters
- Ceramic Disc Filters
- Polishing Ceramic Filters
- Automated Filter Presses
- Bond Indexing Filters
- Gravity Sand Filters
- Tipping Pan Filters

Delkor reputation as a class leader in the supply of solid/liquid separation equipment is built on a solid bedrock of experience in the filtration process equipment field. Over the last 35 years Delkor has led the way in innovation and implementation of world class development of the filtration industry – this strength is reflected in our extensive customer base of new, and returning clients looking for the best solution to their needs.

Delkor technology and know-how is founded in the Horizontal belt Filter and Delkor remain the supplier of the world's largest individual machine and filtration plants around the world. Product and technology development of this product line continues with concentration on both the commodity product needs of economically driven customers; and the exacting requirements of a low volume high demand global customer base. This product is available with custom engineered features and automation to suit the specific needs of any duty; and as such Delkor has achieved on-line operational reliability in excess of 99.8% on many plants.

This level of expertise and reliability has enabled Delkor to continue to be recognised as a global solution provider to the mineral processing, bulk chemicals and metallurgical processing industries.

Regardless of your need or interest in filtration technology solutions Delkor philosophy of providing rugged, high specification, reliable machinery ensures you and your customers always receive enhanced value and support from a Delkor equipment choice. Our teams of product experts are available to assist your process design team in reviewing and making the choices that are right for your needs.

### Process Design

At Delkor, our designs are making the crucial difference to providing the product, process and solution that best suits the specific application or industry.

Delkor has been at the forefront of devising unique and customized products – the result of several years of learning on the ground, coupled with conscious investments and concerted efforts in research and development.

All Delkor products and solutions are designed to help customers achieve optimal output and process specifications, enjoy high operational availability and cost efficiency, and ultimately realize better ROI.

## Delkor Belt Filters



### Features

- High filtration rates ► lower cost per ton
- Flexibility of Operation ► reduced operating costs
- Better washing efficiency ► reduced solute losses
- Co or Counter-Current washing ► optimised equipment use by operator
- Drier filter cake ► increased recoveries

### Applications

- Dewatering of Mineral Concentrates
  - Coal, Sands, Iron Ore
- Phosphoric Acid Processes – clarification, concentration & recovery Leachate or solute recovery
- Tailings treatment
  - Dewatering & environmental protection duties

## Ceramic Disc Filters



### Features

- Specialised ceramic micro pore types
  - Drier cakes ► Reduced chemical consumptions
  - Improved plant performance
- Power consumption economy
- High quality ceramic filtering element
  - Reduced downtime ► Reduced OPEX

### Applications

- Copper, Nickel, Lead and other base metal concentrates
- Iron ore - concentrate and tailings
- Fine aluminum oxide dewatering
- Slurries in water recycling systems

## Polishing Ceramic Filters



### Features

- 99.98% solids removal from solutions
- Continuous non-stop applications
- High regeneration ability
- High capacity – 1.9 m<sup>3</sup>/m

### Applications

- Purification of Electrolyte Solutions
- Cleansing of industrial cooling waters and waste waters
- Filtration of Acids and Alkali's from admixtures
- Cleaning of hot gases from solid aerosols

## Automated Filter Presses



### Features

- Robust & reliable pressure filter design
- More than 98% availability
- Simple operation
- Conservative sizing parameters
- Low internal velocities

### Applications

- Mineral Concentrates / Effluent Treatment
- Underground Mud / Phosphate Rock
- Precipitates / Hydroxides / Copper Cement
- Solution Recovery from fine precipitates

## Bond Indexing Filters



### Features

- Low Capital Cost
- High efficiency separation & washing
- Single or multistage washing Co-Current or Counter current
- Fully automated ► Low operator involvement

### Applications

- Pigment dewatering & washing
- Fine chemical production
- Pharmaceuticals
- Fluorosilic acid & Chemical Intermediates
- Nitrate / Nitric acid solutions

## Gravity Sand Filters



### Applications

- Groundwater & surface water treatment for industrial & potable supplies
- Slipstream filtration of cooling water
- Filtration & treatment of industrial process and operating water
- Tertiary treatment of effluent water in sewage treatment plants
- Waste water treatment, removal of phosphates & reduction of suspended solids

## Tipping Pan Filters



### Features

- Compact & Inexpensive
- Stand-alone or integrated
- Manual, auto or semi-automatic
- Corrosion resistant
- Wide range of slurry types

### Applications

- Suitable for low throughput applications such as effluent treatment or polishing acids in a wide range of industries where Delkor Belt Filters and Filter Presses are impractical or too expensive



# Sedimentation

- High Rate Thickeners
- High Density Thickeners
- Paste Thickeners
- Ultrasep Thickeners
- Conventional Thickeners

## Test Work

Delkor performs testwork programs that consider the relationship between the rheological properties of the material (based on the underflow conditions) and the key design factors of the thickener. This allows us to ensure both optimum performance and steady process control of the equipment. By using the latest generation rheometer, the HAAKE VISCOTESTER VT 550, it allows Delkor process staff analyze underflow pulp under a wide range of process conditions.



## Pilot Plant

The Delkor Pilot Thickener with its modular Construction allows us to easily modify the tank wall height. With this feature we can alter the height of the solids bed, which dictates the type of thickener required (High Rate-High Density-Paste). The Pilot unit can provide information such as dilution, flocculant consumption, underflow density, & overflow clarity. It can also be used to back up laboratory bench scale testwork results. Pilot Plant testwork provides clients peace of mind as well as economic benefits.





## High Rate Thickeners



### Features

- Market Leading Self Dilution
- Minimum Flocculant Consumption
- Proven Mechanical Design
- Bolted/Welded Tank Construction
- Designs Up To 100m Diameter

### Applications

- Concentrates • Tailing • CCDs
- Grind • Leach • Pre leach
- Mix of Gypsum, lime and hydroxide metal
- Cu raffinate neutralised • Gypsum
- Precipitate of SART process

## High Density Thickeners



### Features

- Efficient Drive Designs
- Minimal Maintenance Requirements
- 98%+ Availability
- Improved Chemical Recoveries
- Higher Water Recovery

### Applications

- Concentrates • Tailing • CCDs
- Grind • Leach • Pre.leach
- Mix of Gypsum, lime and hydroxide metal
- Cu raffinate neutralised • Gypsum
- Precipitate of SART process

## Paste Thickeners



### Features

- FEA Rake Design
- Accurate Torque Measurement
- Extensive Testwork Database
- Drives to 14MNm of Torque
- Designs up to 40m Diameter

### Applications

- Tailings
- CCD Circuits
- Paste Backfill

## Ultrasep Thickeners



### Features

- Smaller Footprint
- Tolerance to Process Fluctuations
- Optimal Flocculant Consumption
- Quick Start-up & Ease of Operation
- Reduced Operating Cost / Maintenance

### Applications

- Mill circuit thickening
- Counter-current decantation processes
- Water recovery
- Backfill reject thickening
- Carbon fines recovery

## Conventional Thickeners



### Features

- Easy Operation
- Handles Process Fluctuations
- Good Overflow Clarities
- High solids transport efficiency
- Robust construction for long service life

### Applications

- Tailings
- Concentrates
- Clarification Duties
- Leach thickening
- Grind thickening



# Clarification

- Pinned Bed Clarifiers
- Sludge Bed Clarifiers



## Pinned Bed Clarifiers



Formally a **BATEMAN** product the Pinned Bed Clarifier has been merged with the traditional Delkor products and renamed the Delkor Pinned Bed Clarifier.

### Features

- Small Footprint
- Optimal Flocculant Consumption
- No moving parts
- Lower energy consumption
- On-line backwashing
- Extremely clear overflow
- Flexible to high solids content in the feed

### Applications

- Cu / Co PLS Clarification
- Gold Merrill Crowe Clarification
- Uranium PLS Clarification
- Au Scrubber Off gas Clarification
- Zn PLS Clarification

## Sludge Bed Clarifiers



Delkor manufactures, supplies steel and installs clarifiers for use in primary settling or secondary settling. With a range of up to 80 feet in diameter, these clarifiers are partially pre-assembled in the factory and the components are welded together on site.

Delkor Clarifiers use the filtering action of the mud bed to produce overflows that are very low in suspended solids (with 20-50 ppm clarity). Efficient de-aeration, flocculation and mixing can be achieved in the external de-aerator / mixing vessel.

A variety of options can be provided with flexibility in relation to size, flow rates, design options and site requirements.



# Screening / Scalping

## Features

- No vibration
- Low maintenance costs
- Low power consumption
- Low noise levels
- Low cost of supporting civil and structural steel
- Simple operation
- Availabilities of 99%
- No scaling of cloth from chemical precipitation

## Screen Sizes Available

- 0.5m<sup>2</sup>
- 1.0m<sup>2</sup>
- 1.5m<sup>2</sup>
- 3.0m<sup>2</sup>
- 6.0m<sup>2</sup>
- 9.0m<sup>2</sup>
- 12.0m<sup>2</sup>
- 20.0m<sup>2</sup>
- 25.0m<sup>2</sup>
- 32.0m<sup>2</sup>

## Screen Options

- Reverse feed arrangement
- Spillage launders
- Full length drip trays
- Side Windage / spray reduction panels
- 2 stage cloth drift switches
- 2 part spray bars
- Feed distribution weirs
- Cloth tensioning weights
- Local control cabinets
- High Pressure spray bars
- Split Spray bars
- Distribution box covers
- Dodge Bearings
- Bearing Lubrication Systems (various)

## Delkor Belt Screens

The Delkor Belt Screen (traditionally known as the Delkor Linear Belt Screen) was developed through extensive test work, to solve a major problem in the CIP/CIL process - the effective removal of trash material from slurries. The unit is capable of screening between 150 and 2000 microns, and is widely accepted by the mining industry for the removal of tramp material from fine mineral or chemical slurries.

The Delkor Belt Screen is primarily suited to scalping coarse oversize material from process slurries. Vacuum assisted operation is available as an enhanced option.

Delkor also supply discharge systems such as the Delkor Sieve Bend Process Screen.

## Applications

### Trash Removal

- Gold Plants ▶ Fibre ▶ Scalp Oversize
- Flotation Plants ▶ Removes Fibre to protect froth overflow points
- Autoclave ▶ Scalps Feed to prevent "In Vessel" Sanding
- WHIMS ▶ Scalps Coarse Material which causes Drum damage
- Sand Plants ▶ Scalps shell and fibre
- Mine Drainage ▶ Removal of oversize
- Filter Press ▶ Feed prep Screen
- Water
  - Asbestos in furnace cooling water
  - Ash in power stations
  - Fibre in pulp and paper plants
  - Scraps from Abattoirs

### Oversize Removal

- Coarse material in heavy minerals
- Fine screening of mill discharge
- Fine screening of coal spiral feed

### Effluent

- Sewage sludge thickening
- Scavenging of step screen sludge product



# Flotation

## Features

- High shear forces due to the rotor/ stator assembly ensure better bubble-particle contact
- Simple process optimization and startup under load
- Stable froth – slurry interface and formation of quiescent zone
- Minimised downtime and easy maintenance due to “hooded” stator assembly
- Maximisation of aerated volume to meet residence time requirements

## BQR Flotation Cells

Formally a **BATEMAN** product the BQR Flotation Cell has been merged with the traditional Delkor products and renamed the Delkor BQR Flotation Cell.

Delkor round tank BQR flotation cells are applied in mineral processing circuits globally for roughing, scavenging, cleaning and re-cleaning, unit and pilot cell applications to process all floatable mineral types such as copper, zinc, platinum group metals, phosphates, graphite slag and effluents.

The number of cells required depends on the application. Cells feature an overhung stator, open inlet to the rotor, adjustable air flow rates and froth-cone settings and a launder external to the pulp zone to yield an excellent combination of process, operational and cost benefits.

The Delkor flotation cells range in size from 0.5m<sup>3</sup> (BQR5) to 150m<sup>3</sup> (BQR1500).

## Operational advantages

- Easy start-up under load
- Ideal froth conditions are maintained
- Robust instrumentation achieves stable operation
- Quiescent pulp-froth interface
- Low downtime and easy maintenance
- Spares readily available
- Complete mechanism removable for workshop maintenance



## Flocculant Dosing Plants

Delkor Flocculant plants are designed as fully automated or manual systems and can mix between 10 and 11 000 kg/day of dry powder. Designs include auto mixing and auto diluting systems as well.

Delkor has supplied over 140 Flocculant Plants around the world.



Skid Mounted Mix and Storage tanks fully assembled ready to ship





## After Market Support

- Test Work / Pilot Plants
- Field Service
  - Installation
  - Assembly
  - Mechanical Commissioning
  - Process Commissioning
  - Refurbishment
  - Maintenance
  - On Site Inspections
  - Training
- Spares & Stock Holding Systems

At Delkor, we not only craft ground breaking products and solutions, we also package it with the best in line range of services, to ensure customers realise the full worth of every product, process and installation.

Delkor philosophy is to build equipment which offers low operating and maintenance costs, for the customer to gain the best of this Delkor offers aftermarket packages including maintenance support and training that enables the operator to maintain high equipment availability whilst keeping control of his maintenance costs.

Customers, worldwide can derive significant benefits in terms of optimizing and improving performance - from Delkor's comprehensive range of specialized services.

### Test and Pilot Plant work to monitor and optimise existing processes

Delkor's bench or pilot scale test work can be conducted either on site or in one of our local laboratories in your regional area. Delkor can conduct test work on any of our equipment range and provide process guarantees upon completion. As part of our issued test work report, our experienced process engineers can identify which equipment solution is required and the appropriate size to satisfy the process requirements for each application





### Field Service Representatives for Installation, Assembly, Mechanical and Process Commissioning

Starting from the initial contact and through planning, design, production, delivery, installation and final commissioning - Delkor customers can gain access to a range of services provided by well trained and highly experienced staff; some of our site engineers have been with the company for more than 15 years.

Delkor field-service teams ensure that equipment continues operating as required. This could range from routine servicing and replacement of worn parts that require precautionary remedial action, such as the re-alignment of components to prevent serious damage to major on-site overhauls.

Delkor's objective is that the client can use these services to reduce the site work portion of the supply contract and ensure a speedy and efficient mechanical and process commissioning

### Post Start up Process and Maintenance Optimisation and Training

We are always on call to assist with erection supervision, installation check-outs, and process start-ups. Our qualified and experienced engineers are available to discuss your requirements, make recommendations, suggest solutions and provide on site training. We also provide maintenance services for all equipment to improve equipment performance, reliability and prolong equipment life spans.

### On Going After Market Support including Training, Equipment Rebuild and Refurbishment

Delkor can provide equipment rebuild and refurbishment to existing equipment to ensure the equipment lifespan is prolonged.

Restored equipment performance levels at a fraction of the cost of a new unit

### On-Site Inspections

Identifying potential causes for mechanical breakdown in the future. Technical evaluations are conducted on site according to operational information collected during technical evaluations, site visits and maintenance tasks, enabling Delkor engineers to track critical operating parameters and predict potential equipment failures, spares and / or maintenance requirements.

### Spares and Stock Holding Systems

A comprehensive range of spares is available for all equipment supplied by Delkor, be it filtration, sedimentation, screening, clarification or flotation equipment. This service is also extended to equipment obtained from other manufacturers.

Recommended Spare Parts Lists are provided in Delkor's Operating and Maintenance Manuals supplied with all capital equipment.



## Corporate Holding

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