



DELKOR SOLUTIONS OFFERING

Leading solutions for your liquid/solid separation
and mineral beneficiation requirements

Innovation out of tradition – It pays to talk to a specialist!

TAKRAF Group, through its established and well-known brands, TAKRAF and DELKOR, provides innovative technological solutions to the mining and associated industries. We leverage our experience, acquired over more than a century, to provide equipment, systems and services that best satisfy our clients' mining, comminution, material handling, liquid/solid separation and beneficiation requirements. Owners and operators around the world trust our engineered solutions to lower the total cost of ownership and reduce environmental impact by improving efficiency with safe and reliable equipment. For sustainable solutions backed by expert service you can rely on TAKRAF Group. Visit us at www.takraf.com.

We at TAKRAF Group are committed to environmental and social sustainability in all our business interactions and have adopted a Zero Harm approach under our global safety promise.

Owners and operators around the world are confident that TAKRAF Group provides the most suitable solution to their unique project requirements. We assist our clients in overcoming the most complicated challenges in transforming the resource industry towards a sustainable future. We focus on specific areas that are critical for reliable and sustainable operations, as it is here where we best support our clients with innovative solutions that save energy, lower environmental impact and meet or exceed operational requirements.

One focus area is liquid/solid separation, where we capitalize on our global DELKOR brand and its track record of thousands of successful installations. In line with our commitment to environmental sustainability, DELKOR dewatering and process equipment are specifically designed for the needs of the mining industry.

We leverage our global organization and aggregate our extensive expertise by offering a unique combination of both application experience and product based knowledge. Clients therefore benefit from direct technical discussions with our local specialists, who are able to draw upon this expertise and provide the most suitable local solution and service that enhances safety, improves sustainability, decreases costs and increases efficiency.

Our commitment is summarized by:

Safety | Reliability | Innovation | Sustainability



DELKOR belt linear screens, 8 x 25 m² for copper in Chile

DELKOR EQUIPMENT AND SERVICES

DELKOR APIC JIGS

For efficient gravity separation.

The DELKOR APIC jig is an efficient gravity separator that separates particles of different densities in a homogeneous bed of granular material.

DELKOR's under bed air-pulsed APIC jigs are also equipped with the "JigScan" control system in order to further enhance performance and ease of operation. JigScan has been used industrially with great success across various industries and is exclusively supplied with new DELKOR APIC jigs.



- Sizes: 0.5 m - 6 m
- Copes with a wide range of deslimed and non-deslimed feed and discharge rates
- Efficiently deals with fine and coarse material as it handles an extended range of particle sizes
- Effectively stratifies and separates floats or sinks
- Handles continually varying material feed grades
- Mobile, modular or conventional installations
- Only water used as media
- Low cost gravity separation

APPLICATIONS

- Any ore application with a moderate density difference and particle size
- Recovering ferroalloys from slag ferrochrome (FeCr), ferromanganese, silicomanganese (SiMn), ferrovanadium (FeV), iron (Fe), etc.
- Upgrading ferrous ores like iron ore and manganese ores, chromite ore
- Upgrading industrial minerals like barites
- Washing and sorting of wastes
- Washing fine, medium and coarse coal

DELKOR BELT LINEAR SCREENS

For effective removal of trash material from slurries.

The DELKOR belt linear screen was developed through extensive test work in order to resolve a major problem within Carbon-In-Pulp (CIP) and Carbon-In-Leach (CIL) processes in the gold industry – that is, the effective removal of trash material from slurries.

DELKOR screens efficiently separate a relatively small amount of a well-defined size fraction from ground slurries that are coarser than the particles required for downstream processing. This ultimately safeguards and reduces any downtime of downstream equipment and improves overall plant performance. DELKOR has supplied hundreds of screens for various applications around the globe, with these screens being widely employed for the removal of tramp material from fine mineral or chemical slurries.



- Sizes: 0.5 m² up to 40 m²
- Capable of screening between 300 and 4,000 microns
- Screening efficiencies as high as 98%
- Low maintenance costs
- Low power consumption
- Bolted construction designs for ease of transportation
- Option of reverse feed arrangement
- Split spray bars with quick fix nozzles
- Low cost of supporting civil works and structural steel

APPLICATIONS

- **Trash Removal**
In gold plants, flotation plants, autoclave, in wet high intensity magnetic separation, in sand plants, mine drainage and in water treatment plants
- **Oversize Removal**
Coarse material in heavy minerals, fine screening of mill discharge and fine screening of spiral feed
- **Effluent**
Removal of coarse/trash material at inlet of ETP/STP and in the scavenging of step screen sludge product

DELKOR BQR FLOTATION CELLS

For best-in-class metallurgical performance.

DELKOR BQR flotation cells, now incorporating DELKOR's proprietary **MAXGen mechanism**, are a culmination of state-of-the-art research, extensive testing and industrial trials.

DELKOR flotation cells achieve optimum operation through purpose-designed levels of solids suspension, air rate adjustment, easy froth cone positioning and a stable pulp-froth interface. This results in best-in-class metallurgical performance, combined with improved ease of maintenance and lower cost of ownership.

The **MAXGen mechanism** focuses on the generation of a swarm of air bubbles with optimum size distribution, which facilitates the flotation of fine and coarse particles equally, while efficiently keeping the solids in suspension. This maximizes the probability of bubble-particle interaction and leads to greater recovery of valuables and energy efficient hydrodynamics.



DELKOR BQR flotation cells with MAXGen mechanism

- **Sizes:** BQR5 (0.5 m³ cell volume) to BQR3000 (300 m³ cell volume)
- Suitable for various minerals such as copper, phosphate, iron, lithium etc.
- Tailored solution for the actual process requirement with the optimum number of cells for effective recovery
- Bypass ready tank design
- Improved flotation kinetics with superior air bubble distribution
- Best-in-class metallurgical performance
- Ease of maintenance
- Lower cost of ownership

DELKOR THICKENERS & CLARIFIERS

Sedimentation is the cost effective method of increasing percentage solids in a liquid/solid phase.

DELKOR thickeners are proven across a variety of applications and industries. With units of up to 100 m in diameter having been installed, the benefits of using DELKOR thickeners include their low capital cost, smaller footprint, effective use of flocculants and advanced automation. DELKOR can offer everything from an upgrade on an existing thickener with its high performance feedwells through to a full turnkey supply of the design, fabrication and supervision of installation.

DELKOR specialists are also ready to assist you throughout the entire process – from the conceptual stage including test work, equipment selection and sizing, right through to the planning, engineering, commissioning and operational phases of a project. This results in offering you the best solution for the specific local conditions of the application. DELKOR aims to be your local but global specialist.

- **Range:** Conventional, high-rate, high-density and paste thickeners, clarifiers, Pin Bed Clarifiers (PBC) and Counter Current Decantation (CCD) thickeners
- Thickener diameters up to 100 m
- Welded or bolted steel tank design for ease and flexibility of installation
- Custom made for process requirement to attain sustainable recovery
- Auto dilution and forced dilution feedwell for optimized flocculant dosage with better underflow density and clear water
- Drive capacity up to 14 MNm



DELKOR high-rate thickener in Morocco

DELKOR HORIZONTAL BELT FILTERS

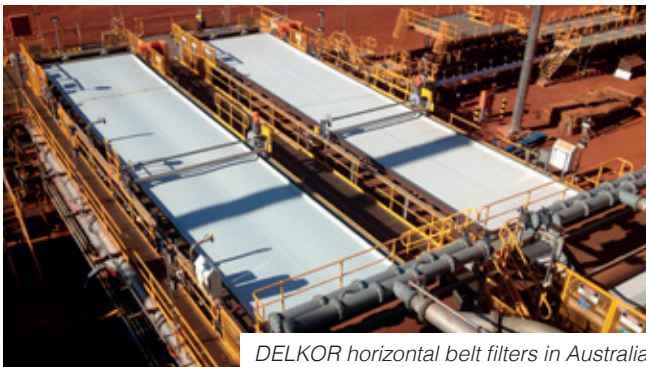
For efficient and reliable dewatering.

DELKOR belt filters boast low capital, running and maintenance costs and thereby outperform traditional filter technologies in all situations where capacity, efficient cake washing and minimum liquor dilution are required. Over the years, DELKOR has pioneered the use of belt filters for acid filtration and various other applications driven through unparalleled expertise and experience – case in point, our belt filters are now also well accepted for tailings filtration.

Dewatered tailings can either be used as mine backfill or sent straight to the **Dry Stack Tailings (DST)** impoundment. This results in a technically viable and economically feasible solution to handle process plant tailings in the safest and most environmentally friendly manner. DELKOR filters can be employed as stand-alone machines or in combination with other filtration processes.



DELKOR horizontal belt filter



DELKOR horizontal belt filters in Australia

- Sizes from effective area of 1 m² to 162 m² as a single machine and design up to 300 m²
- Design and selection of MOC and its ancillaries to suit process
- Supplied >850 filters around the world in which >35 % boast a belt width above 3,2 m
- Controlled cycle time to cater to filtration and cake wash times by controlling drive through VFD

DELKOR FILTER PRESSES

Environmentally friendly dewatering of process slurries.

DELKOR filter presses are designed for flexible operation and easy maintenance, and are suitable to a wide range of dewatering applications. This can range from mineral concentrates and tailings filtration, to polishing and electrolytic processes; and from coarse to very fine materials in the mining, aggregates, chemical, iron & steel, food processing and water treatment sectors.

DELKOR filter presses boast a heavy-duty design and each machine is customized to the specific process requirement and as such are specifically designed to handle the rigors of the mining industry.



DELKOR filter press in Uzbekistan

- **Plate Sizes:** 630 x 630 mm to 2,500 x 2,500 mm
- Optimized number of plates and tailored to suit the application requirement
- Available in two design variants: overhead beam (OH) or sidebar (SB)
- Capable of handling larger volumes of slurry
- Superior efficiency and reliability with low moisture in cake
- Totally protected mechanism providing precise, automatic and correct alignment of the plates
- Drive and faster shifting plates: 3 seconds/plate
- Adequate free spacing for quick and easy maintenance

PLANTS AND PROCESS ISLANDS

End-to-end technology solutions across the mining and minerals value chain

We offer complete solutions based upon our DELKOR and TAKRAF equipment and technologies.

Our expertise includes greenfield plant designs, brown-field plant expansions and plant de-bottlenecking projects with the following services:

- Test work design and management
- Concept studies
- Complete engineering solutions
 - Process engineering
 - Mechanical engineering
 - Piping engineering
 - Civil & Structural engineering
 - Electrical & Instrumentation engineering



DELKOR beneficiation plant for flourspar in Morocco

- Plant audit and process optimization studies
- ESS or EPC contract model
- Advanced Process Control (APC)
- Remote plant data monitoring system
- Full range of comprehensive client support and after market services

DELKOR specialists work closely with the client to design and build a complete plant optimizing capex, opex, process efficiency and site considerations. The team also offers a recommendation for the most suitable minerals processing method to adopt, based on relevant material test work.

R&D/AFTERSALES AND SERVICE SUPPORT

DELKOR's **R&D-team** offers various options for the performing of special tests in our laboratories or on site. DELKOR specialists also provide recommendations on appropriate equipment sizing and selection based on specific process requirements.

DELKOR's dedicated aftersales team monitor the performance of installed equipment and conduct regular health checks on site. Where necessary, they will provide suitable suggestions for part replacement for refresh and/or rectification, resulting in improved machine performance. The service team is available 24/7, providing a timely and reliable service for installed equipment, ensuring faster rectification/service, ensuring that your system is back in operation as quickly as possible!

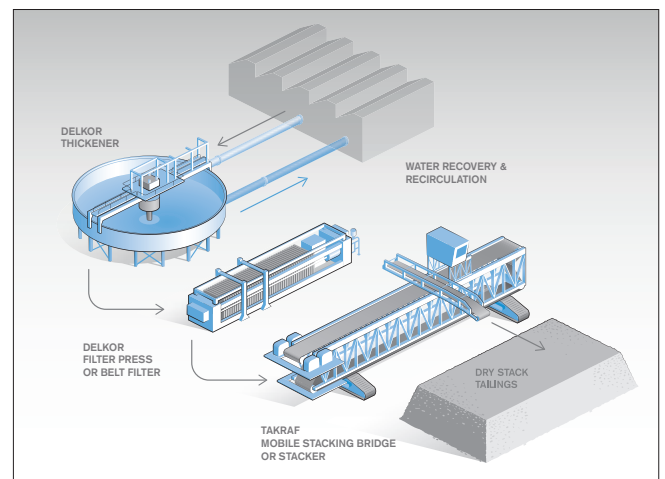


DELKOR laboratory in Canada

DRY STACK TAILINGS (DST) SOLUTIONS AND WASTE HANDLING SYSTEMS

By combining DELKOR liquid/solid separation products with TAKRAF material handling systems, we are able to provide customized DST solutions that consider all factors, including residual water content in dewatered tailings on total system capex and opex. Thus, these solutions include all filtration options (filter press vs. belt filter), as well as all material handling options (from portable grasshopper systems to conveyors, mobile trippers and stacking bridges to spreaders).

You give us your specific requirement – We choose the right equipment for you!





DELKOR Product & Service Center in Bengaluru, India

GLOBAL PRESENCE

DELKOR product specialists located in our global offices provide comprehensive customer support with their intimate process knowledge, because we are convinced that adequate solutions require an understanding of the specific needs of each customer and its operations. In combination with the expertise in engineering, product design and production at the DELKOR Product & Service Center, this ensures that quality products are turned into tailored solutions. We are also able to provide customized maintenance support as well as spare parts supply and stock management.



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