THICKENERS

It pays to talk to a specialist
DELKOR is an industry specialist in solid/liquid separation and mineral processing applications for the mineral, chemical and industrial markets, offering flotation, sedimentation, filtration, screening, and gravity separation systems. DELKOR’s services range from test work, process optimization and flowsheet design, to installation, commissioning and aftermarket support.

DELKOR’s track record in solid/liquid separation and mineral processing applications stretches back to the seventies with more than 3,000 successful installations worldwide.

DELKOR specialists offer an unmatched combination of experience and product-based knowledge that is enhanced through sharing of the company’s extensive experiences worldwide. Clients therefore benefit from face-to-face technical discussions with DELKOR local experts who are able to draw upon global experiences so as to offer clients the best local solution. DELKOR aims to be your global, local specialist.

TAKRAF and DELKOR have committed to both environmental and social sustainability in their business interactions and have adopted a Zero harm approach to safety under the SAFETY FIRST promise of the Tenova Group.
HEAVY DUTY DRIVE TECHNOLOGY

DELKOR drive range technology includes single planetary unit delivering 1.2 MNm of torque as well as multi-pinion center drive systems capable of 14 MNm of torque.

With more than a thousand operating thickeners - our drive design is well known to be highly reliable and can be operated hydraulically or electrically. As process plants seldom include standby thickeners, we focus on providing the best design to ensure the client highest availability.

For 30 years DELKOR high quality drives have set the standard and with more recent advent of FEA the designs have been refined and improved to work seamlessly with the tracking system. The high torque and stresses associated with paste have made the drive design and selection even more important.

UNIQUE DILUTION TECHNOLOGY

DELKOR has two unique systems for injecting overflow into the thickener feed:
- Gravity Dilution
- Forced Dilution

DELKORs Gravity Dilution system has the capability of adding very large volumes of dilution liquor through the double concentric ring design. Operating data from one installation shows high feed volumes at 40 % being diluted to 12 % solids using the system. This unique design of high dilution capability enhances flocculation that contributes to reduced polymer usage.

DELKORs patented Forced Dilution system is also capable to adding additional overflow liquor into the feed of a thickener using a low head axial pump to drive dilution water into the feedwell.

The main advantage of the Forced Dilution system is that it takes the overflow liquor from a large surface area - negating the risk of causing localized high internal rise rates. The system then optimally mixes with the feed to produce an ideal slurry concentration prior to flocculation, which improves setting and reduces flocculant consumption.

Another advantage of DELKORs patented Forced Dilution system is its ability to draw large volumes from the surface of the thickener. This attribute enhances the withdrawal and elimination of froth layers.
SEDIMENTATION

Sedimentation is a cost-effective method of increasing the percentage of solids in a liquid-solid process. It can be used in conjunction with filtration where the pre-treatment of the slurry to a higher percentage of solids will enhance and reduce the operational and capital cost of the subsequent filtration stage, the sedimentation step can also replace the filtration stage when a high density slurry is sufficient for disposal or subsequent processing stages.

HIGH RATE THICKENER

The DELKOR High Rate Thickener is a proven performer in a variety of different applications including minerals, industrial, chemical, water treatment and waste water industries. The reliability and performance of DELKOR thickeners means that they are well represented throughout the world.

With a wealth of experience and a large database of test work and commissioning, DELKOR can provide accurate estimates on sizing of a thickener for most applications. Bench scale testing on representative samples can be carried out at our numerous laboratories around the world and outside. A pilot plant testing facility is also available in Bangalore, India to generate sufficient data for accurately scaling up to commercial sizes.

CONVENTIONAL CLARIFIER

The DELKOR Conventional Clarifier is often used where the process requires minimal addition of reagents that could affect downstream operations. The large area and hence low rise rates allow particles to settle with little or no flocculant addition.

Though area requirements and capital costs (CAPEX) are often higher, compared to a High Rate design - long term running costs (OPEX) can be lower.
DEKKOR THICKENERS

- High Rate Thickeners
- Paste & High Compaction (Density) Thickeners
- Shear Thinning Systems
- Conventional Thickeners
- Pinned Bed Clarifiers
- Conventional Clarifiers

PINNED BED CLARIFIERS

The DELKOR Pinned Bed Clarifier is a unique process for hydrometallurgical plants where solution clarity is important. Offering very low suspended solids count in the overflows, the clarifier regularly achieves clarities of less than 50 ppm solids, and even as low as 20 ppm.

Typical applications include:
- Cu / Co PLS clarification
- Gold Merrill Crowe clarification
- Uranium PLS clarification
- Au scrubber off gas clarification
- Zn PLS clarification

SHEAR THINNING SYSTEMS

Our newly developed shear thinning system imparts energy efficiently in a well controlled environment into highly viscous and high yield stress slurries to make them easily flow able.
APPLICATIONS

DELKOR Thickeners have been used on a variety of different materials in a number of different industries.

MINERAL PROCESSING, BENEFICIATION AND HYDROMETALLURGY
- Ferrous
- Nonferrous
- Tailings
- Mine backfill
- Industrial minerals
- Coal
- Mineral sands
- CCD circuits

WATER TREATMENT
- Acid effluent neutralization plants
- Treatment plant residues
- Water purification plant effluents

CHEMICAL / INDUSTRIAL
- Smelters & refineries
- Chemical plants
- Cement industry

PASTE & HIGH COMPACTION THICKENER

DELKOR takes its knowledge and experience of over 30 years providing thickeners for the mining industry and applies it to the extreme mechanical and process requirements needed when dealing with high yield stress underflows. The key driver for the use of this technology is improved water recovery but there are also numerous other advantages that minimize environmental risks by reducing the footprint of tailings dams and permitting backfill tailings emplacement.

With years of bench scale and site pilot testing and full scale thickener experience, DELKOR is able to accurately and quickly ascertain the type, geometry and number of thickeners for a particular application. Design can vary from large diameters with standard side walls and deep cones to smaller diameters, very high sided walls and deep cones for production of paste.

Paste Thickening is an environmentally friendly method used to compact and store tailings at ultra-high densities. To gain the maximum efficiency DELKOR has developed a system to reduce the yield stress generated by these paste like slurries. Our newly developed shear thinning system imparts energy efficiently in a well controlled environment into highly viscous and high yield stress slurries to make them easily flow able.
BOLTED TANK CAPABILITIES

Bolted tank construction is an attractive option in many countries where site labour is expensive or not available. Benefits include faster installation, lower cost and better quality control. Although the ex-works capital cost (fabrication) and transportation costs can be higher, the overall (fabrication, transportation and install) cost to the client can be lower with a bolted design.

Other benefits include:
- Improved site safety
- No site welding & less painting
- Faster site installation
- Reduced site manpower
- Reduced exposure to weather
- Minimized exposure to industrial disputes

DELKOR has numerous large diameter installations as single units or in a CCD configuration. Our specialists can provide detailed information on this design alternative.