



## PLANTS AND SYSTEMS

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

*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](http://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 – ONE STOP SOLUTION FOR MINERAL BENEFICIATION PACKAGES**



DELKOR is an industry specialist in mineral processing applications for the metallic minerals, industrial minerals, coal and chemical industries, offering gravity separation systems, flotation, sedimentation, filtration and screening solutions. DELKOR's services range from test work, flowsheet design and process optimization, to engineering, installation, commissioning and aftermarket support. DELKOR has a proven track record in the installation of process plants across a wide range of commodities such as iron ore, gold, base metals, coal, placer minerals, rock phosphate, fluorspar, manganese and others.

DELKOR manages the complete project lifecycle from concept to commissioning. By leveraging our state-of-the-art engineering and design solutions, together with our experienced project management systems, we are able to maximize the success and profitability of your project.



## DELKOR AIMS TO BE YOUR GLOBAL, LOCAL SPECIALIST!

**DELKOR delivers greenfield plant designs, brownfield plant expansions and plant de-bottlenecking projects with the following services:**

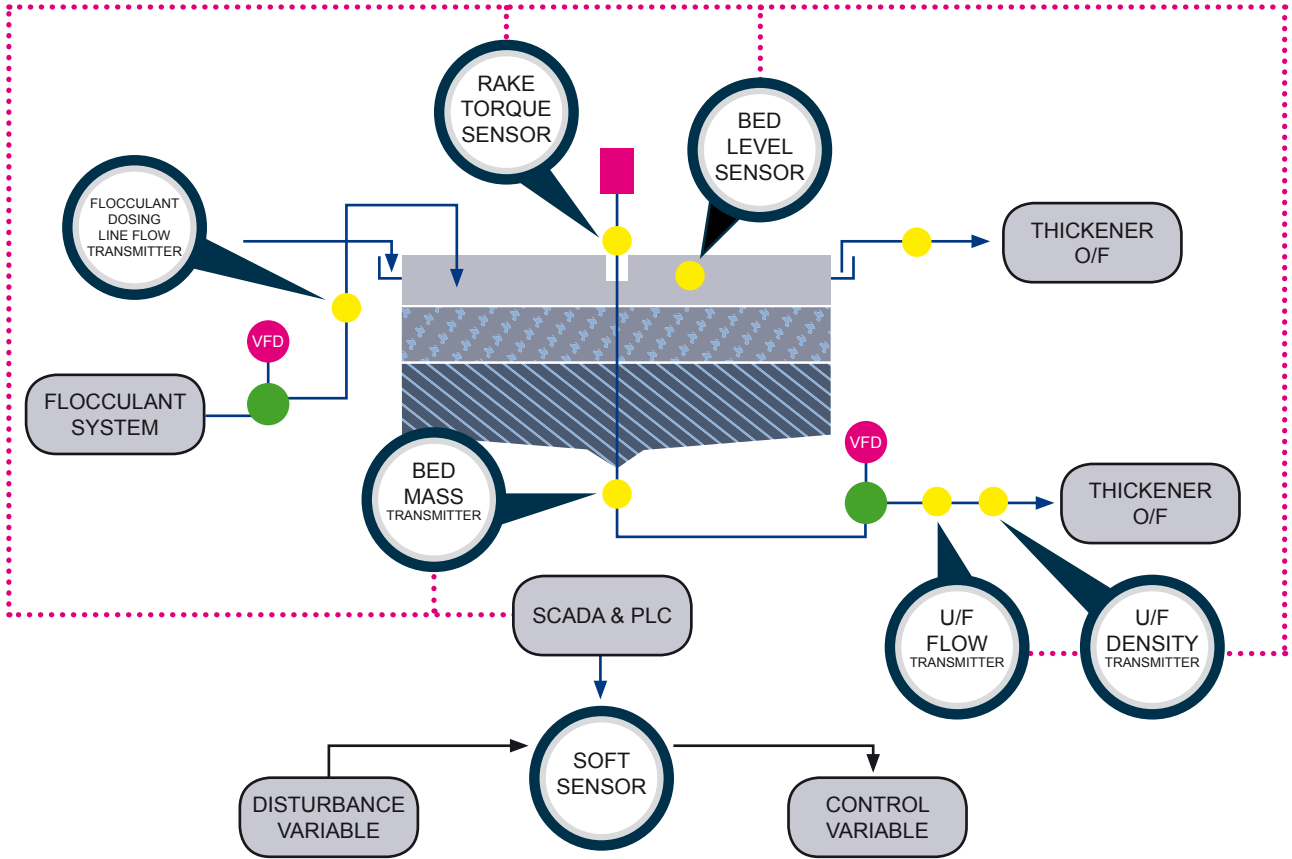
- Test-work design and management
- Feasibility studies
- Complete engineering solutions
  - Process engineering
  - Mechanical engineering
  - Piping engineering
  - Civil & structural engineering
  - Electrical & instrumentation engineering
- Plant audit and process optimization studies
- EPC/ESS services
- Advanced Process Control (APC)
- Remote plant data monitoring system
- Full range of comprehensive client support and aftermarket services



DELKOR has a comprehensive and multidisciplinary team focused on the project, offering extensive collective experience. Our team works closely with the client to design and build a complete plant optimizing CAPEX, OPEX, process efficiency and site considerations. Our team also offers a recommendation for the most suitable mineral processing method to adopt, based on relevant material testwork.

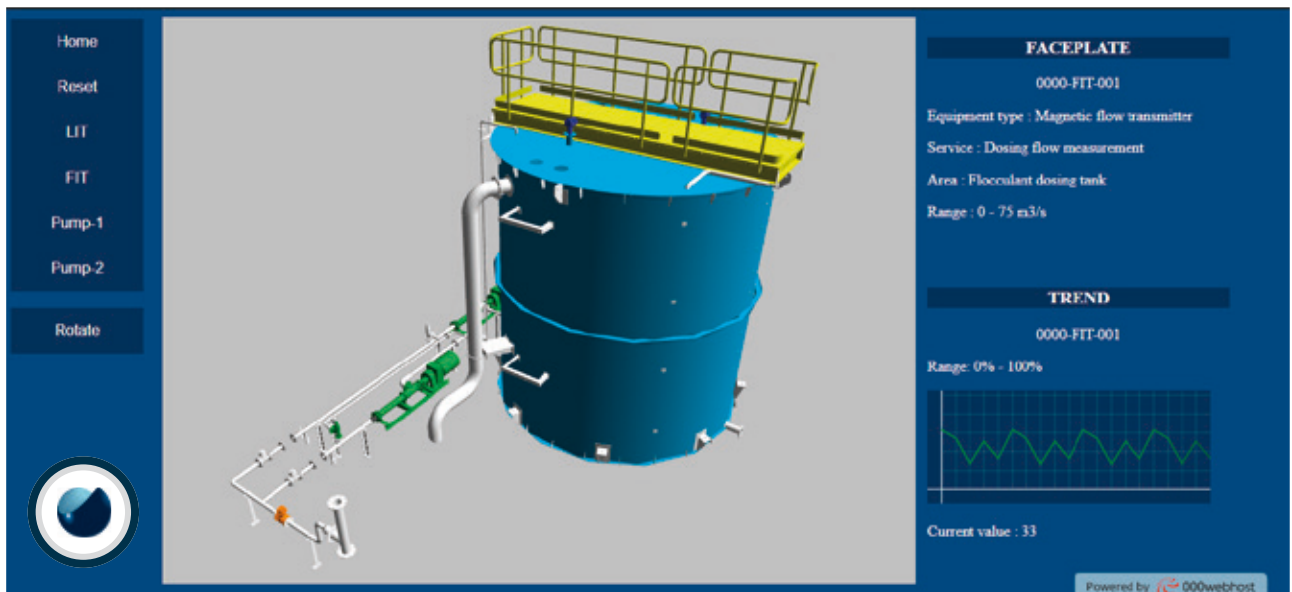
### THICKENER ADVANCED PROCESS CONTROL (APC)

DELKOR is developing an APC model to accomplish improved underflow density, minimize overflow turbidity and optimize flocculant consumption.



### REAL PLANT DATA MONITORING

DELKOR is developing a cloud based 3D model SCADA system to monitor real time plant data, which is capable of generating KPI reports and alarms through e-mail and sms.



# KEY PROJECTS

## IRON ORE

8 mtpa iron ore crushing and washing plant, successfully installed and commissioned at Tata Steel's Khondbond Iron Ore Mines in Odisha, India. The project was awarded on an EPC basis covering basic and detail engineering, procurement, supply of process equipment, inspection, transportation, supervision of site erection, testing and plant commissioning.



## BASE METALS

Successfully completed 1 mtpa lead-zinc ore beneficiation plant. The process plant comprises crushing, grinding, flotation cells, thickening and filtration circuits.



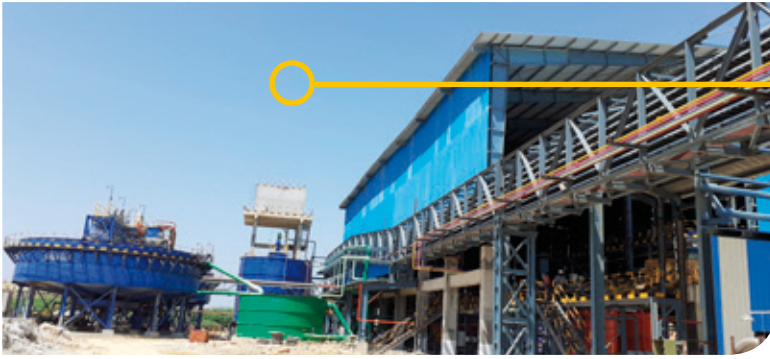
## FLUORSPAR

Fluorspar beneficiation plant in Morocco executed on an EPC basis. The plant boasts a design capacity of 50 t/h crushing and 25 t/h beneficiation. The process plant includes crushing, grinding, flotation and dewatering circuits.

## COAL

DELKOR executed a 250 t/h coal jiggling plant in India on a turnkey basis, boasting a bucket-elevator discharge system dovetailed within an existing crushing, screening and dry jig circuit.





## LIMESTONE

DELKOR executed a limestone beneficiation plant consisting of flotation cells and the dewatering of both products, ie. concentrate and tailings through high-rate thickeners and horizontal belt filters.

# DELKOR PROPRIETARY EQUIPMENT FOR MINERALS PROCESSING

## DELKOR THICKENERS

conventional, high-rate and paste – together with mechanisms

## DELKOR HORIZONTAL VACUUM BELT FILTERS

## DELKOR BQR FLOTATION CELLS

with **MAXGen** mechanism for best-in-class metallurgical performance

## DELKOR DRY STACK TAILINGS (DST) SYSTEMS

from individual machines to complete systems - covering sedimentation, dewatering and material handling

**DELKOR**

## GRAVITY CONCENTRATION

DELKOR APIC jigs and gravity sand filters

## DELKOR BELT LINEAR SCREENS

trash, carbon recovery and carbon safety

## DELKOR CLARIFIERS

conventional and pinned bed

## DELKOR FP FILTER PRESSES

overhead beam and sidebar

## WET PROCESSING:

### BQR FLOTATION CELLS

DELKOR's revised and improved BQR flotation cells, now with the proprietary **MAXGen** mechanism, provide superior recoveries with higher grades, along with faster flotation kinetics by generating a favorable bubble size distribution and energy efficient hydrodynamics. BQR flotation cells range in size from 1.5 m<sup>3</sup> to 300 m<sup>3</sup>.



**SEDIMENTATION:  
THICKENERS  
AND CLARIFIERS**

DELKOR's thickener is a proven performer across a variety of applications. The benefits of our DELKOR conventional, high-rate, high-density and paste thickeners include their low capital cost, smaller footprint, effective use of flocculants and advanced automation.



**FILTRATION:  
HORIZONTAL BELT FILTERS**

DELKOR horizontal vacuum belt filters make use of most modern design capabilities and materials making it an efficient, reliable and cost effective liquid/solid separation unit, able to withstand operating under the most arduous conditions. Our continuous improvement approach has enabled us to simplify its design for easy operation, yet all wear parts remain easily accessible for routine maintenance purposes.

**FILTRATION:  
DELKOR FILTER PRESSES**

DELKOR designs and supplies its own range of filter presses, guaranteeing flexible operation, reliability and easy maintenance. Our portfolio of technologies (overhead beam and side bar) allows us to select the machine best suited to your specific process application. Our filter presses are suitable for various dewatering applications, from mineral concentrates and tailings filtration, to polishing and electrolytic processes.





#### **WET PROCESSING:**

#### **DELKOR BELT LINEAR SCREENS**

DELKOR belt linear screens were developed in order to resolve a major problem within CIP or CIL processes – the efficient and effective removal of oversize or trash material from process slurries. Our units are capable of screening between 150 and 2,000 microns and are widely employed for the removal of tramp from fine mineral or chemical slurries.

#### **WET PROCESSING:**

#### **DELKOR APIC JIGS**

DELKOR's APIC jig is an efficient gravity separator that separates valuable product from gangue (waste) material, based upon their specific gravity difference, resulting in a clean, salable product.

DELKOR's APIC jig technology and controls (JIGSCAN) make jigs more effective in high density separations and significant coal applications.



---

## **OUR GLOBAL DELKOR PRESENCE**

DELKOR provides comprehensive client support services around the world. We can also propose customized maintenance solutions, such as spare parts supply, stock management and/or maintenance contracts.





## **TAKRAF GmbH**

Torgauer Strasse 336  
04347 Leipzig – Germany  
T +49 341 2423 500  
info@takraf.com

## **Americas**

Canada  
T +1 403 252 8003  
(Calgary)  
T +1 604 451 7767  
(Vancouver)

## **USA**

T +1 303 714 8050

## **Mexico**

T +52 55 8525 7363

## **Brazil**

T +55 31 3298 3000

## **Chile**

T +56 223 983 000

## **Peru**

T +51 1 264 2224

## **Asia**

### **India**

T +91 80 4262 1000  
(Bengaluru)  
T +91 44 2499 5514  
(Chennai)  
T +91 33 6645 5800  
(Kolkata)

### **China**

T +86 10 8447 5656

## **Sub-Saharan Africa**

### **South Africa**

T +27 11 201 2300

## **Europe, Central Asia, North Africa, Middle East**

### **Germany**

T +49 341 2423 500  
(Leipzig)  
T +49 3574 854 0  
(Lauchhammer)

### **Russia**

T +7 495 787 4336

### **Uzbekistan**

T +998 71 202 4639

### **Kazakhstan**

T + 7 717 227 3097

## **Asia Pacific**

### **Australia**

T +61 7 3015 3200  
(Brisbane)  
T +61 2 8335 0400  
(Sydney)  
T +61 8 6146 1200  
(Perth)

