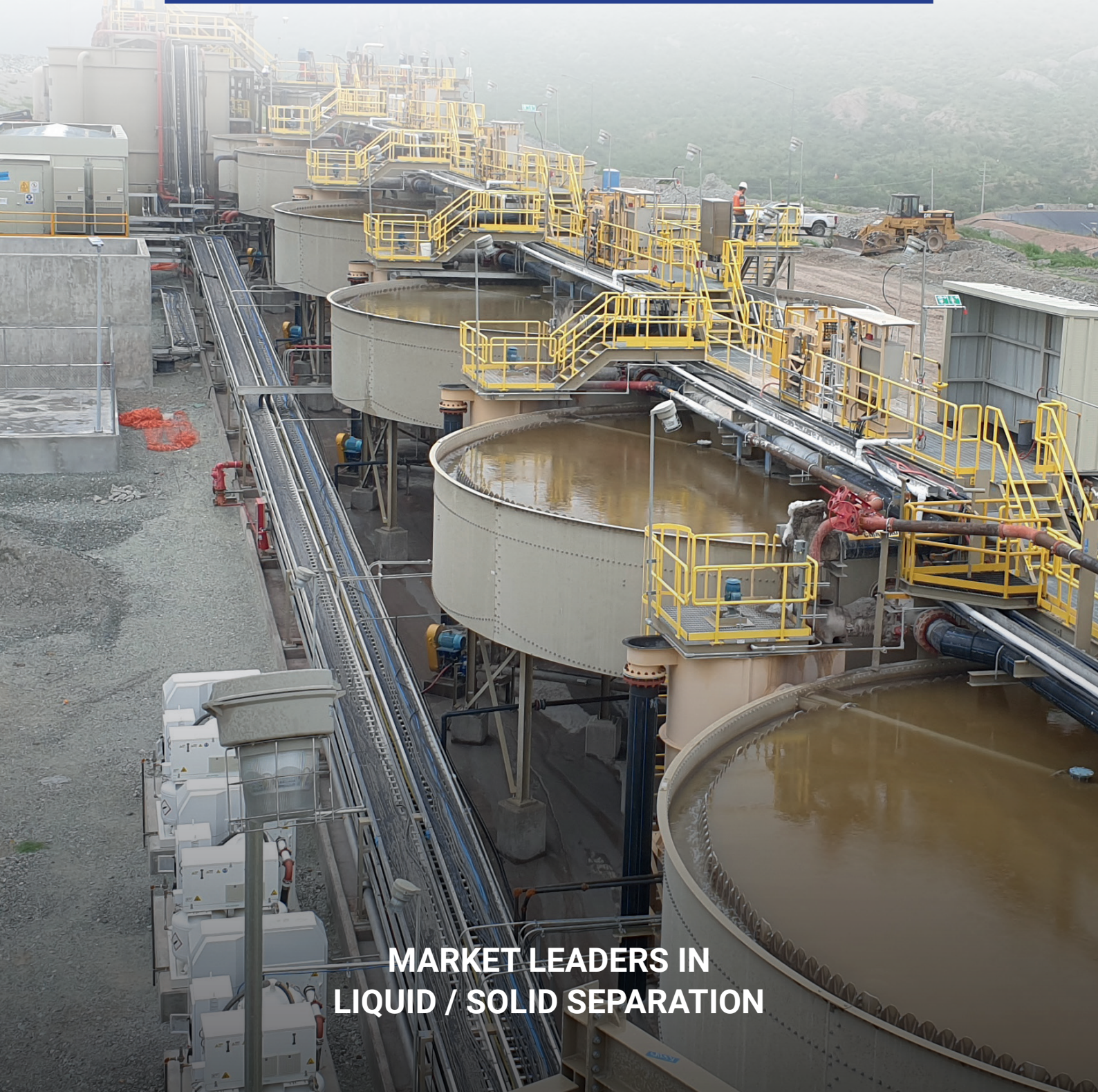




ROYTEC
Global Separation Solutions

Johannesburg | Perth | Toronto | Yantai

ROYTEC THICKENERS AND CLARIFIERS



**MARKET LEADERS IN
LIQUID / SOLID SEPARATION**

ROYTEC THICKENERS AND CLARIFIERS

ROYTEC GLOBAL is an International Company specializing in Liquid / Solid and mineral Separation technologies for the Mining and Industrial sectors.

Roytec is privately owned by Directors / Managers ensuring accountability and a passion for service. We have or service with offices in Johannesburg, Perth, Toronto and Yantai to support our clients globally. We pride ourselves on delivering to our promises and continuing improvement in our technologies.

ASIA'S FILTRATION TECHNOLOGY LEADER

Heijing Ceramic have a unique production process which includes:

- Mixing of the raw materials for the body of the disc which are then formed in a mould and heat treated at 1200 Degrees Celsius for 72 hours
- Further processing to ensure the correct shape, as well as the fitting of air-line and plate securing components.
- At this point the disc is pressure tested at 5 bar under backwash conditions, prior to the ceramic surface being added.
- The plate is further heat treated at 1000 degrees Celsius, to finish the Ceramic surface, before being allowed to cool for between 4 and 6 hours

Roytec Toncin Ceramic disc filters are available in sizes from 1 – 144m² and are always fitted with South African / European brand mechanical and electrical components to ensure parts availability.

A recent installation in Ferrochrome has shown the Toncin Filter to produce high vacuum and thicker cakes, with consequent increase in production as well as superior cake discharge moisture content.



TAILORED THICKENING SOLUTIONS

Roytec has a wealth of thickening application knowledge and we partner with clients to ensure the best fit solution.

We specialise in the following Thickener technology;

- High Rate
- Conventional
- High Density / Paste
- Deep cone (raked and unraked)
- Pin Bed and Dynamic Bed Clarifiers
- Underground Settlers

We use a combination of design approaches including first principles and an in-house developed iteration design program to arrive at the optimum design configuration for the Thickener unit.

Tank design uses 3D dynamic models and follows the SANS / API and other best practice international codes.

The use of 3D dynamic models ensures integrated design.



COUNTER-CURRENT THICKENER CIRCUITS

Roytec Thickeners are used extensively in CCD applications. Soluble metal recovery is maximised with a combination of highly effective inter-stage mixing, feed dilution, underflow density optimisation and circuit control.

Our designs incorporate combined inter-stage mixer / pump units, allowing all CCD stages to be installed at same elevation with the resulting significant decrease in civil and installation costs.

We have experience in acid and alkaline circuits for the recovery of copper, cobalt, uranium and gold.

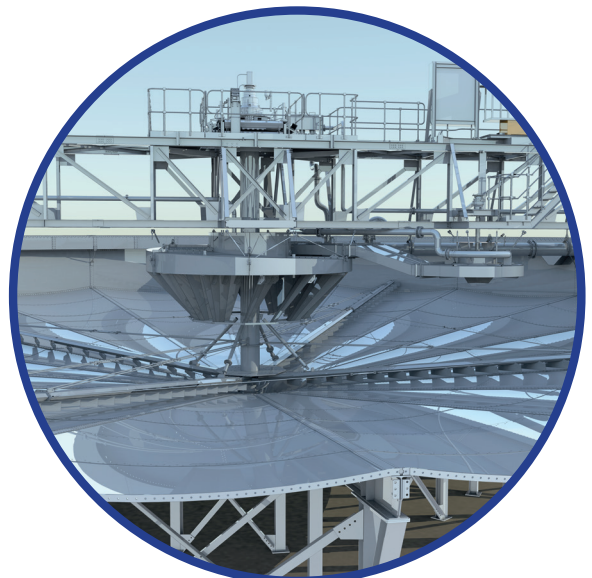


RAKE DRIVES & RAKING MECHANISMS

Drive heads and raking mechanisms are supported either by a full span or half span bridge arrangement. For larger diameter units (+45m), the mechanism is usually supported off a centre column.

Drive units are either hydraulic or electric and include a full regime of instrumentation to ensure drive train protection and plant safety. Fully automated rake lift and lower is standard on Roytec Thickeners.

The principle behind our drive train design is for all gears and bearings to have an operating life in excess of 100,000 hours. All mechanical components are European brands, which are well supported and serviced on all continents.



PACKAGE CAPABILITIES

Roytec can offer Package Plants for our client's thickening and filtration needs.

Our in-house engineers cover all disciplines to deliver packaged solutions including;

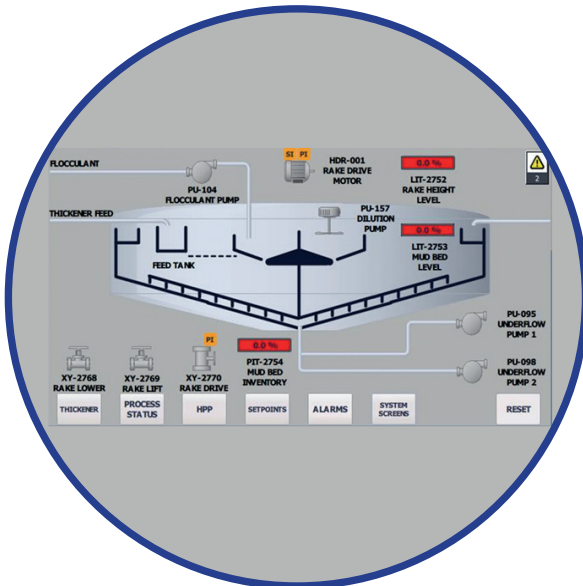
- Flocculant make-up stations
- Underflow pumping and storage for filtration
- Underflow filtration options with pressure or vacuum
- All ancillary requirements – civils / piping / power etc.
- Automation of the complete package



CONTROL

A fully instrumented and integrated control system allowing plant feed-back for continuous monitoring and optimum operation, comprises:

- Rake torque level monitoring.
- Automatic rake lifting and lowering.
- Rake position indication.
- Mud bed level indication.
- Feed density and flow monitoring.
- Underflow density and flow monitoring.
- Overflow turbidity measurement.
- Bed pressure measurement.
- Feedwell settling rate monitoring.
- Flocculant dosing rate control.
- Visual and audible alarming.
- System temperature and oil level measurement.



ROYTEC'S MODULAR BOLTED TANKS

Roytec supplies a bolted construction / segmented steel tank concept for our Thickeners, with significant advantages over site welded tanks:

Elimination of all on-site welding.

Reduced erection crew and minimal skill requirement (typically bolted tanks are installed in a third of the time it would require to install a welded tank).

Shop tested / assembled prior to delivery.

Durable, reliable and well proven in service.

Ideal for modular plant designs and equipment relocation plans.

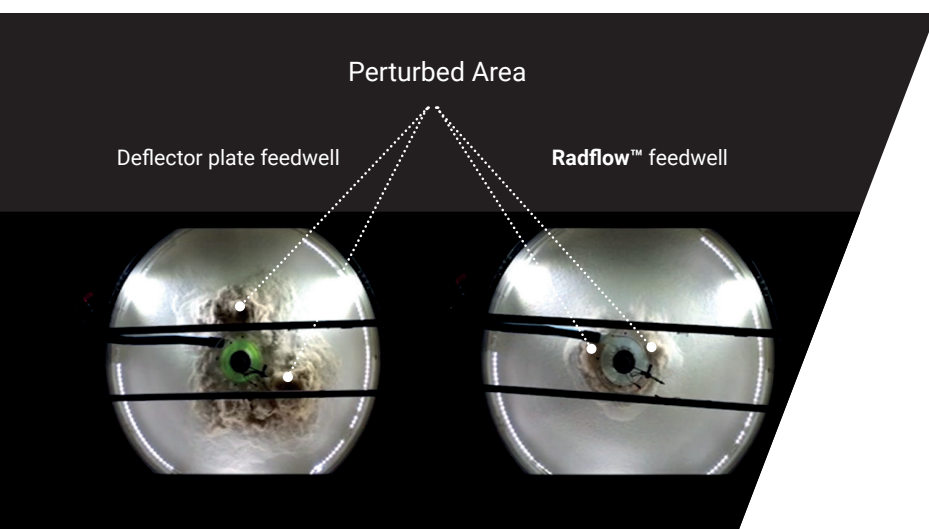




RADFLOW™ FEEDWELLS

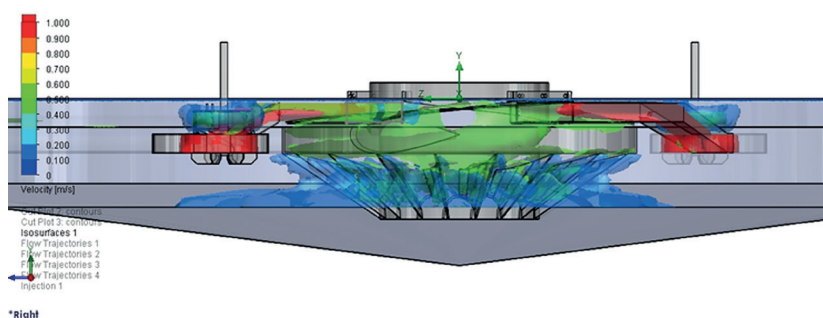
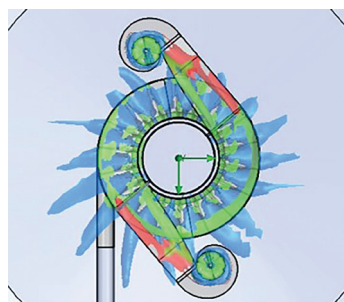
Our revolutionary **RADFLOW™** feedwell has been designed for optimum energy dissipation. Feed is introduced into an upper tangential zone before discharging downwards into a vertical vane zone, where eddy currents form and clash with incoming flows. This leads to very effective energy destruction and uniform, balanced and quiescent discharge, characterised by a restricted radial throw of solids.

- Extremely good energy dissipation.
- Reduced tangential and radial swirl.
- Improved feed / flocculant mixing.
- Reduced operating torque.
- Elimination of feedwell clogging.



RADFLOW™ FEEDWELLS A step-change in improved Thickener operation

Feedwell type comparison in scale model thickeners both running at 3m/hr rise rate. Note the significantly smaller & uniform perturbed area produced by the **RADFLOW™** feedwell



ETAQ™ DILUTION PUMP

The **ETAQ™** feed dilution system, comprises an axial inflow / radial outflow pump specially designed for high volume low head operation.

The **ETAQ™** draws supernatant from the Thickener surface and pumps into the **RADFLOW™** feed stream to achieve the perfect level of feed dilution for optimal flocculation.



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Other ROYTEC equipment

- Vacuum Belt Filters & Vacuum Disc Filters
- Dynamic Bed & Pin Bed Clarifiers
- BGRIMM Flotation Cells, Magnetic Separators and Attritioning Mills
- Filter Presses & Tower Presses
- Dual Media Filters
- Ion Exchange Systems
- Flocculant/Coagulant Preparation and Dosing Plants
- Linear Screens



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