



ROYTEC
Global Separation Solutions

Johannesburg | Perth | Toronto | Yantai

THICKENERS AND CLARIFIERS



**MARKET LEADERS IN
LIQUID / SOLID SEPARATION**

ROYTEC GLOBAL

ROYTEC GLOBAL is an International Company specializing in Liquid / Solid Separation technologies for the Mining and Industrial sectors. Formed in 2001 by a group of engineers with over 150 man-years of Thickener experience, Roytec is privately owned by Directors / Managers ensuring accountability and a passion for service. We have 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.

Roytec have advanced the development of our Thickeners and Clarifiers to exceed the demands of the modern process plant, in keeping with our goals of reducing overall cost of ownership through technology. Our Thickener and Clarifier product range has been tailored to the specific duty requirements of the mining and metallurgical industries.



To achieve best performance and efficiency for our clients, the Roytec **NexGen™** Thickener programme has been developed to improve Thickener operation, reduce flocculant usage, achieve high underflow densities, improve overflow quality and allow for high levels of automation; all in keeping with best modern processing practises.

Key advances from the Roytec **NexGen™** programme are the revolutionary **RADFLOW™** feedwell and the **ETAQ™** feed dilution pump system.

ROYTEC THICKENERS

Robust, reliable and efficient is the best way to describe the Roytec range of Thickeners - exactly what any operating plant needs.

Thickener units are available up to 90m diameter with a range of sidewall and centre pier mounted bridge designs, electric and hydraulic drives and fully integrated lift and automated control systems. Tanks are available in site bolted, site welded and concrete designs.

The Roytec range of Thickeners are designed to operate under the most arduous plant conditions.



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.

Our ETAQ controlled feed dilution system allows concentrated flocculant to be dosed directly into the feed dilution stream - eliminating flocculant dilution water & increasing Wash Ratio.



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;

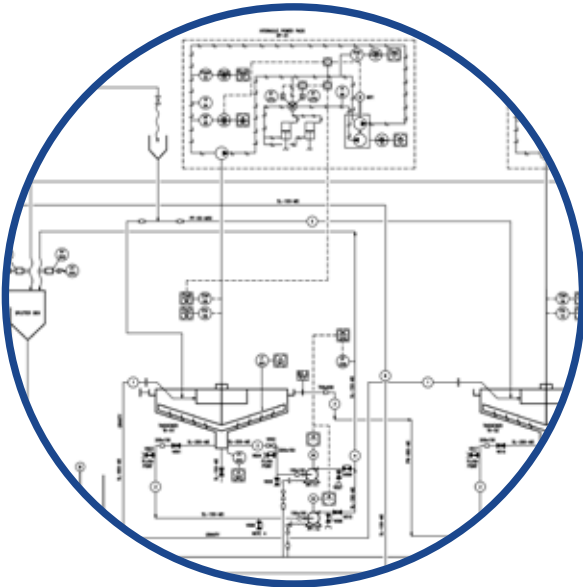
- Flocculant make-up stations
- Underflow pumping and storage for filtration
- Underflow filtration options with pressure or vacuum
- All ancillary requirements – civils / piping / power etc.
- Automation of the complete package



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.

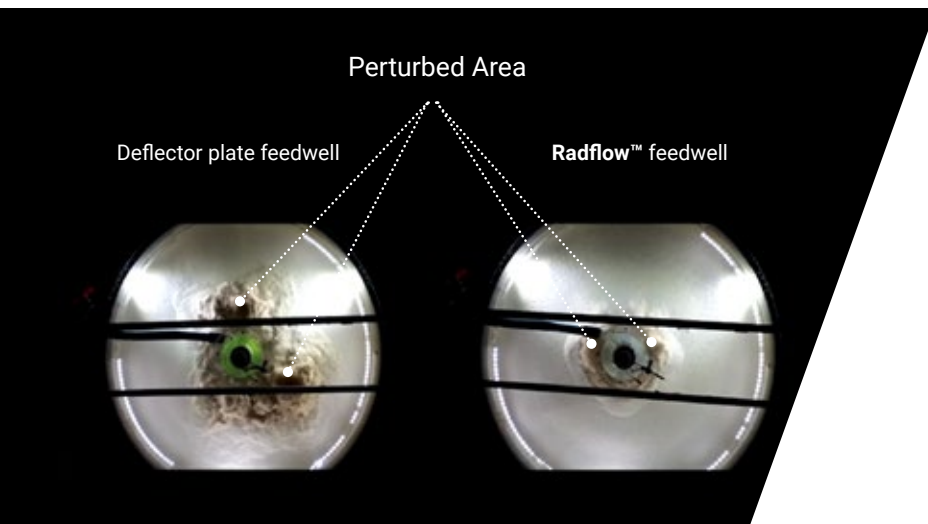




RADFLOW™ FEEDWELLS

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 focculation.



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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
- Ceramic Disc Filters
- Dual Media Filters
- Ion Exchange Systems
- Flocculant/Coagulant Preparation and Dosing Plants
- Linear Screens

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