

ERIEZ



FLOTATION TECHNOLOGIES

EQUIPMENT • SYSTEMS • SERVICES



ERIEZ
GLOBAL LEADER IN SEPARATION TECHNOLOGIES

About Eriez

Established in 1942, Eriez stands as a pioneering force in separation technologies, embodying a truly global presence.

With 12 wholly owned subsidiaries spread across the globe, we proudly design, manufacture, and support our magnetic separation, flotation, metal detection, and material handling equipment on an international scale.

Our dedicated team of knowledgeable and experienced sales engineers collaborates closely with customers, understanding their unique challenges to deliver dependable, high-performance equipment, systems, and solutions.

Whether clients require our standard equipment or bespoke solutions tailored to their precise specifications, Eriez delivers.

Drawing from more than 80 years of experience across diverse industries, including mining and minerals processing, food processing and packaging, aggregates, metals recycling, and many other sectors, Eriez leverages its extensive experience to design and supply products that elevate productivity, efficiency, and product purity.

Eriez remains steadfast in its commitment to setting the global standard for excellence in key technologies, driving innovation and reliability across industries worldwide.

Eriez Flotation Solutions

Eriez Flotation provides game-changing innovations in process technology for the mining and mineral processing industries, such as HydroFloat® for coarse particle recovery and the StackCell® mechanical flotation cell, as well as advanced testing and engineering services, column flotation and sparging equipment.

Applications for Eriez Flotation equipment and systems include metallic and non-metallic minerals, bitumen recovery, fine coal recovery, organic recovery (solvent extraction and electrowinning) and gold/silver cyanidation.

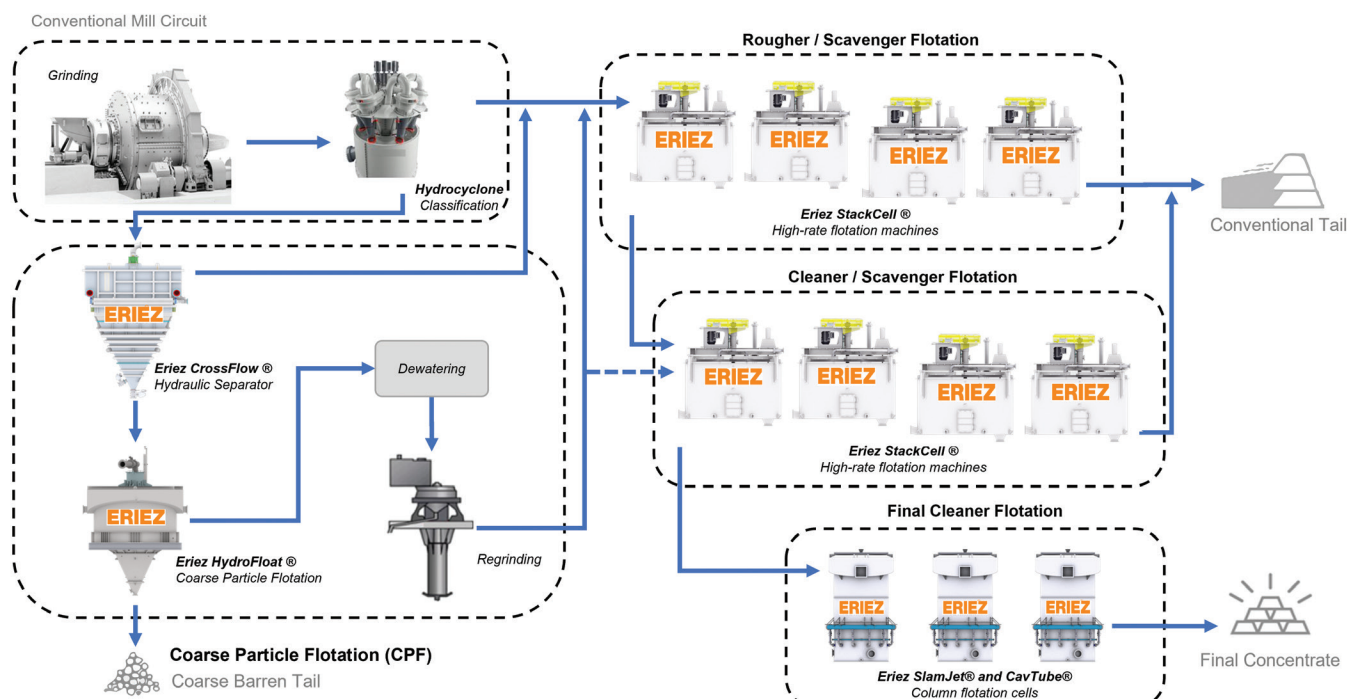
Eriez Flotation has designed, supplied and commissioned more than 1,000 flotation systems worldwide for cleaning, roughing and scavenging applications in metallic and non-metallic processing operations, and we are a leading producer of modular column flotation systems for recovering bitumen from oil sands. Strengths in process engineering, equipment design and fabrication position Eriez Flotation as a global leader in minerals flotation systems.



Engineering services include laboratory and onsite metallurgical testing, commissioning, technical auditing, in-plant optimization, training, and start-up. The group's world-class technical support ensures optimal separation efficiency and value with immediate access to industry best practices and protocols.

Eriez engineers have extensive experience in greenfield installations and plant expansions, having designed and installed column flotation plants treating a total of more than 100,000 tpd (90,718 mtpd). At several sites, Eriez has made complete conversions from mechanical cells to column installations, achieving higher recoveries and grades at lower operating costs.

Comprehensive Technology Offering



HydroFloat® Course Particle Flotation

To meet society's needs for critical mineral resources, the mining industry must develop projects that are socially accepted, environmentally sustainable, and economically profitable. One of the processes that have the highest potential to overcome some of these challenges is Coarse Particle Flotation (CPF).

Eriez has developed and patented the HydroFloat®, an innovative fluidized-bed coarse particle flotation machine with demonstrated commercial success in base metals and industrial minerals applications for nearly 20 years.

The HydroFloat® recovers particles +2x coarser than conventional flotation cells, which allows for a shift in the economic optimum grind size, and in turn increases profitability and improves environmental sustainability of mining projects.



Advantages

Increases plant profitability

- Increase plant throughput by 10% to 35% without the necessity of adding extra primary mills
- Improves global plant recovery by 2% to 6% (Cu typical)
- Reduces total OPEX of greenfield projects by more than 10%
- Enables processing hard and lower grade ores at coarser fractions

Improves environmental sustainability

- Increases water recovery by 85% in combination with advanced dewatering processes.
- Reduces energy consumption by 10 to 20%
- Produces +2x coarser tailings, optimizing tailings management, and facilitating safer tailings disposal (e.g., dry stacking, co-disposal)

Improves project economic KPIs

- Reduces total OPEX of greenfield projects by more than 10%
- Improves overall NPV by 20% to 40% with only an additional 5% to 10% CAPEX investment*
- Reduces conventional flotation circuit by 40%

**in greenfield project implementations*

Increases metallurgical efficiency

- Improves global plant recovery by 2% to 6% (Cu typical)
- Removes between 30% to 45% of the total gangue at early stages of the process, and in coarse fractions (+400µm), improving residence time in the conventional circuit by 40%
- Processes hard and lower grades ores at coarser fractions, improving plant production and profitability

StackCell® High Intensity Flotation

For mining companies that want to minimize environmental impacts of flotation circuits and maximize profitability, StackCell® offers reduced flotation circuit size and power consumption while delivering superior mineral recovery and concentrate grades. The StackCell® uses a 2-stage system for particle collection and froth recovery. Collection is optimized in a high shear single pass mixing canister, and froth recovery is optimized in a quiescent flotation chamber.

StackCell® flotation reduces the conventional flotation residence time requirement by 75 to 85% and increases the selective recovery of fine particles and slow-floating minerals, which increases profitability and improves the environmental sustainability of mining projects.



Advantages

Increase mill production and gross revenue

- Maximize brownfield expansion throughput or increase recovery at present throughput within existing plant footprint with cells that are 20% of the size of conventional cells
- Recover additional fines to concentrate that would otherwise be discarded to tailings

Reduce carbon footprint and environmental impacts

- Reduce carbon footprint via reduced power consumption and smaller plant size with less concrete and steel requirements
- Increase mine life at equivalent production level
- Reduce fine tailings disposal from improved fines recovery

ImReduce CAPEX for Greenfield Projects and Brownfield Expansions

- Benchmarking against conventional stirred-tank flotation cell shows reduction in foundation loads of 70% and reduction of installation footprint and envelope of 50%

Increase project net present value

- Lower TIC with reduced flotation plant footprint reduces payback period and improves project IRR/NPV
- Higher recovery of fine particles generates increased revenues at equivalent processing rate

Increase recovery of fine particles

- Improve recovery of fine and slow floating particles

Increase concentrate grade

- Increase flotation selectivity by rejecting entrained fine particles from concentrate froth
- Flexibility to produce final concentrate in rougher stage

Increase production capacity within existing plant footprint

- Maximize use of existing plant footprint by adding 4-5 times recovery improvement in available space compared to conventional stirred-tank cell

Column Flotation

Eriez has supplied more than 1,000 flotation columns throughout the world in mineral concentrating and purification applications that include iron ore, base-metals, gold, industrial minerals, fertilizers (phosphate and potash), energy, and specialty applications such as oil/water separation.

Flotation column cells act as three phase settlers where particles move downwards in a hindered settling environment counter-current to a flux of rising air bubbles that are generated by spargers located near the bottom of the cell. The sparger technology is an important design choice and allows the user to optimize the performance based on the feed characteristics (size distribution and liberation class). Within the vessel there is a distribution of particle residence times dependent on settling velocity that may impact on the flotation of large particles.



Advantages

Flotation columns incorporate design features that enhance metallurgical performance

- Reduced surface area to cell volume ratio, promoting froth stability
- Froth washing system stabilizes froth and minimizes entrainment of impurities
- Quiescent flotation conditions promote selectivity and enhance particle collection
- Internal feed distribution with lateral dispersion plates to promote uniform, low pressure distribution of incoming slurry
- Adjustable air sparging system (Eriez CavTube® or SlamJet®) to permit optimal control of air flow, bubble size, and air/bubble distribution
- Circular internal launders to enhance froth stability and minimize loaded bubble travel distances, increasing recovery

Benefits

- Superior metallurgical performance
- High recoveries and product/concentrate quality
- Reduced maintenance and improved equipment availability
- Low energy consumption
- Fully automated discharge control system
- Condensed technology footprint

CavTube[®] Sparging and SlamJet[®] Spargers

Flotation depends on the generation of bubbles that are correctly and uniformly sized and that are evenly dispersed across the column. The key is to generate the optimal number of bubbles of the correct size at the right rate. Eriez provides spargers for a range of separation applications including fine and coarse mineral flotation, liquid/liquid separation, oxygen service and air/water mixing duties. Spargers are designed, engineered and optimized for each application to ensure the generation of the best possible bubble distribution pattern.



CavTube[®] Sparging

Generate picobubbles to substantially improve flotation kinetics and increase the recovery of ultrafines.

Benefits

- Ensure a higher attachment probability and higher recovery of hydrophobic particles
- Produce higher recoveries for ultra-fine material and greater concentrate production
- Improve bubble/particle collision rates, which lowers reagent costs
- Have no direct impediments to flow, which equates to longer wear life with better materials of construction

SlamJet[®] Spargers

Eriez SlamJet[®] sparging systems promote the attachment and recovery of hydrophobic particles through the generation of a fine bubble dispersion that is evenly distributed across the flotation column. Eriez sparging systems are designed to generate a large number of bubbles at the optimum size for the given application. Specifically, they are designed to generate high rates of bubble surface area which guarantees a high probability of attachment and improved recoveries. In leaching and other hydrometallurgical applications, SlamJet[®] spargers improve the process kinetics of the vessel contents by ensuring a high rate of gas dissolution.

Benefits

- **Low Maintenance** – Simple design, wear resistant, long operating life
- **In-Situ Removal** – Doesn't require draining the flotation column or system shut-down
- **Automatic Shut-Off** – Slams shut on supply gas failure preventing the process fluid from backing up into the sparger tube and gas supply lines
- **Single Large Bore Orifice** – Virtually eliminates plugging or fouling

CrossFlow® Classifier

Eriez CrossFlow® Separator is a highly efficient hydraulic classifier for the separation of material based on particle size, shape and/or density. This technology can also be used for desliming, counter-current washing and acid neutralization of minerals.

CrossFlow® separates particles based on hindered-settling principles providing an economical and efficient means of classifying material such as silica and frac sands, mineral sands and industrial minerals. The hindered-settling environment creates the optimum conditions for efficient counter-current washing to rinse, clean, and neutralize ore prior to secondary unit operations.



Features & Benefits

- High capacity
- Precise, efficient classification
- Improved efficiency with fluctuating and/or dilute feed streams
- Easy, on-line cut-point control using true density measurement
- Fully automated discharge control system
- Dewatering cone for consistent underflow discharge characteristics

Advances in Teeter Bed Control Technology

Traditionally, particle size and/or density cut-point has been controlled by adjusting only the fluidization flow rate and the relative level of the teeter bed. Eriez engineered a superior control system that improves metallurgical results by regulating the true density of the teeter bed through continuous measurements of differential pressure. This approach better handles the continuous changes in feed stock characteristics such as pulp density, mineralogy and particle size distribution. As a result, CrossFlow® is better able to deliver a continuously efficient separation.

RSP Distributor

The rotary slurry-powered distributor (RSP) is used to accurately and evenly split a slurry stream into two or more parts, without creating differences based on flow, percent solids, particle size or density.

The requirement to split a slurry stream to feed two or more parallel units—and to do it uniformly and reliably—has been a problem throughout the history of milling.

A variety of gravity, pressurized, and motorized distributors have tackled this problem with limited success. Gravity and pressure cans are notoriously unreliable—the accuracy of the feed split is always in question, and the distribution worsens when one or more outlets are taken offline. Motorized rotating distributors get the job done, but at the cost of high maintenance.



Benefits

- Modest capital cost
- Low maintenance cost
- Highly accurate feed split
- Reliable, trouble-free operation
- Slurry driven – no motors
- Unique internal launder provides
- Improved distribution when one or more outlets are offline

Our Experience

TRSP shape and dimensions, especially of the internal rotating element, are critical for proper operation. Eriez Flotation has developed the modeling and design capability necessary to ensure accurate geometry required for the proper operation of the RSP.

Lab Testing

Eriez can provide a complete and detailed analysis of most mineral processing applications. With more than 15,000 square feet of dedicated laboratory space and an array of lab and pilot equipment, Eriez has the tools to test and provide detailed process analysis and state-of-the-art solutions for nearly any application.

Typical tests range from exploratory batch testing to the evaluation of multi-stage flotation circuits. With analytical capabilities, including a glass fluxer and an XRF (x-ray fluorescence), Eriez can quickly conduct in-house assays and improve turn-around time on testing.

Our experienced team conducts field trials, startups, and is available to evaluate process flow sheets and help improve plant performance.



Advantages

Increases plant profitability

- Bench-top batch testing
- Batch milling (ball, rod)
- Continuous milling (ball, rod)
- Steady-state column flotation testing
- High and low gradient magnetic separation
- HydroFloat®
- CrossFlow®
- StackCell®

Examples

- Single and multi-stage column flotation circuits
- Bench top flotation cells
- Pilot-scale columns
- Lab- and pilot-scale HydroFloat® Separators
- Lab- and pilot-scale CrossFlow® Separators
- Grinding equipment (cone, ball, and rod mills)
- XRF analytical capabilities
- Use Lab Testing photo



Field Services

Eriez' array of field services includes pilot-scale and production-scale demonstration testing of Eriez' flotation technologies, commissioning and start-up assistance, and optimization of existing flotation circuits.

The key to successful onsite collaboration with customers is Eriez Flotation's team of over 25 degreed metallurgists and mineral processing engineers distributed strategically in key mining jurisdictions, including Australia, Brazil, Canada, Chile, China, Mexico, Peru, South Africa, and USA. Each local team specializes in flotation of key metals and minerals and is supported by a team of corporate flotation experts providing additional field support to strategic customers and projects.

Onsite pilot-scale testing is often conducted by Eriez Flotation to assist customers with business case confirmation and risk mitigation for flotation expansion projects, particularly when considering new or innovative flotation technologies. The specific objectives of these test programs are generally to confirm metallurgical performance and design criteria for the proposed full-scale circuit, to investigate equipment operation and maintenance over an extended trial period, and to familiarize the customer with the technology.



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HEADQUARTERS

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