ERIEZ

COLUMN FLOTATION

UNPARALLELED METALLURGICAL PERFORMANCE

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 Column Flotation

Eriez has supplied more than 1,000 column flotation cells worldwide using tailored air sparging technologies for extensive mineral applications and flotation feed particle size distributions.

The Column Flotation Difference

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

Proven Column Flotation Applications

- Copper (Cu/Mo, Cu/Au)
- Gold
- Iron Ore
- Phosphate (Sedimentary and Igneous)
- Potash
- Spodumene
- Rare Earth Elements (REEs)
- Oil Sands
- Coal
- Silica
- Ilmenite
- Bauxite
- Lead-Zinc
- Tin
- Calcite
- Kaolin

Flotation Columns incorporate design features that enhance metallurgical performance, including:

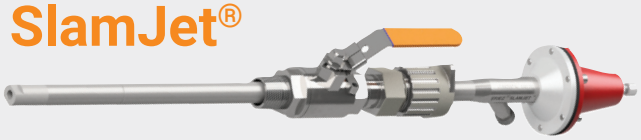
- Reduced surface area to cell volume ratio, promoting froth stability
- Froth washing system stabilizes froth and minimizes entrainment of impurities
- Quiescent flotation conditions promote selectivity and enhance particle collection
- Internal feed distribution with lateral dispersion plates to promote 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

CavTube® Column Flotation Cell

Industrial Air Sparging Systems

Eriez sparging systems are application specific and designed to provide an optimal bubble flux and bubble size distribution for unique flotation circuit designs and feed characteristics, including mineralogy, particle size distribution and shape, and density. Specifically, they are designed to efficiently generate high rates of bubble surface area to maximize probabilities of bubble-particle collision and attachment, and mineral recoveries and/or rejection.

SlamJet®



The Eriez SlamJet® is a lance style sparger proven in thousands of flotation and leaching applications. Designed for and used with Eriez Flotation systems, they are also easily retrofitted to improve the performance of other flotation cells, specifically columns. SlamJets introduce air, or an air-water mixture, over the complete cross sectional area of column cells via tailored sparger geometries, including length and nozzle diameter.

CavTube®

The Eriez CavTube® design is based on the principle of hydrodynamic cavitation. This occurs when the pressure in a moving liquid is momentarily reduced below its vapor pressure, creating ultra-fine vapor-filled bubbles. These fine bubbles are carried by the flow to a region of higher pressure resulting in a bubble dispersion that resembles fine smoke.

Cavitation and the shearing of additional gas ensures generation of fine bubbles suitable for recovery of both ultra-fine and coarse particles. CavTubes are offered in a variety of materials of construction to provide a long wear life.

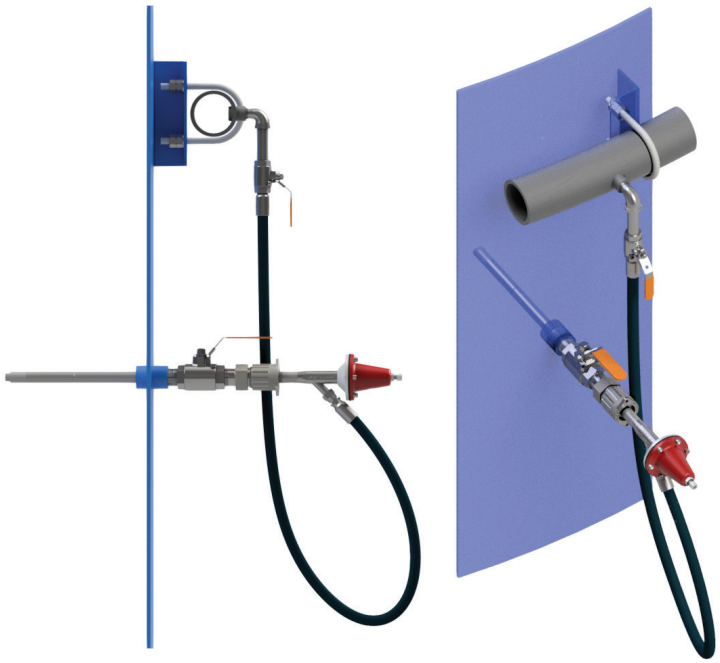
Key Eriez SlamJet® Attributes Include:

- **Reduced Maintenance:** A simple, wear-resistant design
- **In-situ Removal:** Can be removed for routine maintenance or replaced without draining the flotation column or shut down of the air system
- **Automatic Shut-off:** Engineered spring and diaphragm system closes air introduction nozzle in the event of a loss of air flow. This prevents the backflow of slurry or water into the sparger and air supply network
- **Single Large-bore Orifice:** Virtually eliminates plugging our fouling of air introduction nozzles

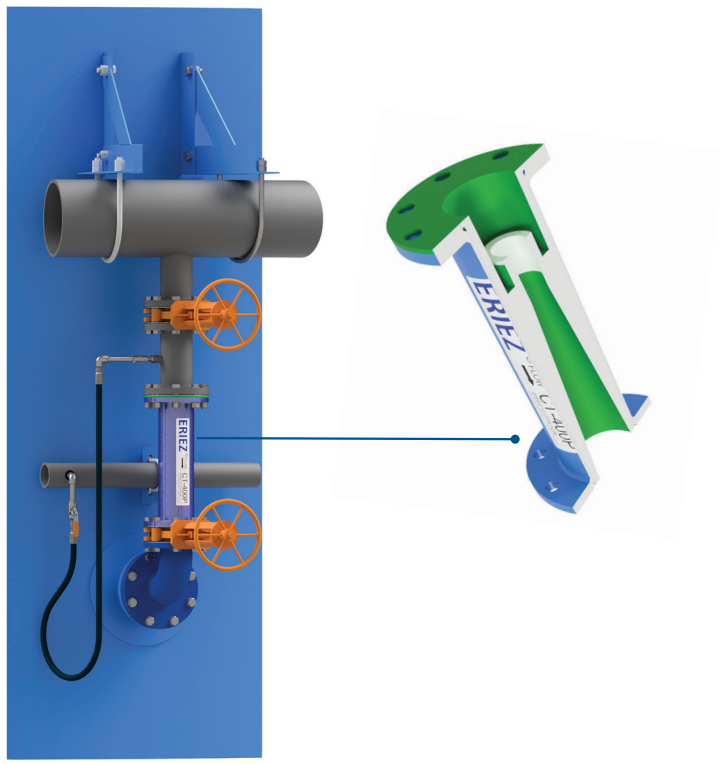
Key Eriez CavTube® Attributes Include:

- **Optimal Bubble Generation:** Maximize fine bubble generation and improve bubble-particle collision rates
- **Improved Recovery:** Improve bubble-particle attachment probability, increasing recovery of hydrophobic particles
- **Reduced Maintenance:** No impinging components within internal flow path, extending wear life

SlamJet® Air Distribution Manifold



CavTube® Air and Slurry Distribution Manifold



Metallurgical Testing Capabilities

Eriez has more than 30 years of fine and ultra-fine particle flotation knowledge and experience to ensure the development of optimal process flowsheets for greenfield and brownfield projects using column flotation technologies.

Column flotation metallurgical performance is accurately derived using Eriez' laboratory and pilot-scale column flotation equipment. Continuous tests are performed under steady-state conditions to design and size industrial scale column flotation equipment with associated process guarantees.

Using the only fully automated four-stage column flotation circuit in the world at its Global Testing Facility in the United States, Eriez is also capable of simulating the performance of numerous flotation circuit configurations with and without incorporation of recirculating process streams.

Laboratory Column Flotation Testing

Laboratory and pilot-scale column flotation studies are conducted to optimize and define operating parameters and flotation conditions with respect to flotation performance.

These include, but are not limited to:

- Wash water rate
- Aeration rate
- Froth level or depth
- Flotation chemistry
- Flotation carrying capacity/rate
- Flotation feed characteristics, including particle size distribution (PSD) and feed solids percentage

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