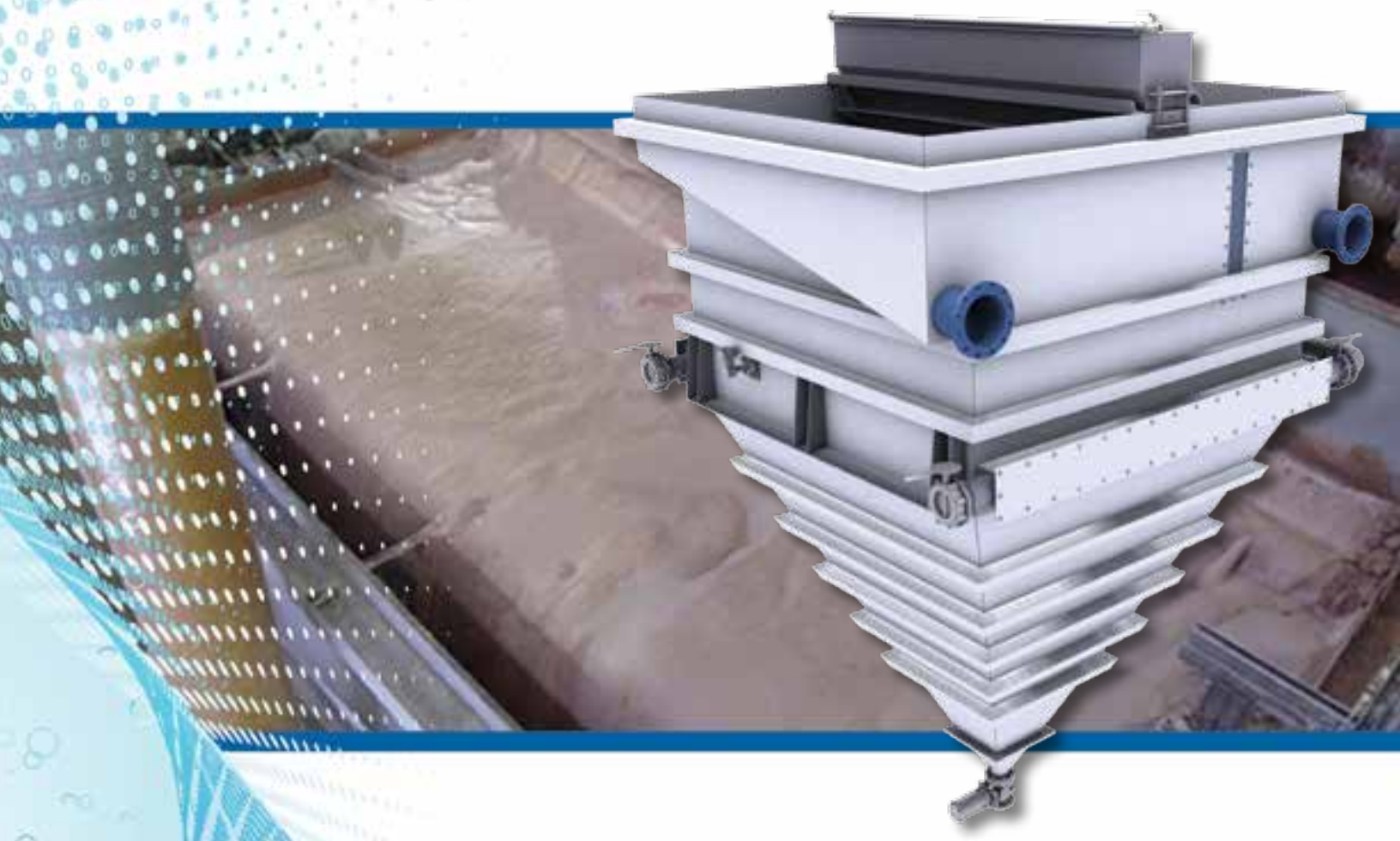
FGB-107B

ERIEZ

FLOTATION DIVISION



• CROSSFLOW SEPARATOR •

CROSSFLOW SEPARATOR

A high capacity teeter-bed separator

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.

The 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.

Ores containing a mixture of high- and low-density components can also be upgraded based on their difference in specific gravity. Examples include iron ore, and heavy mineral with silica contamination and run-of-mine coal containing various ash-forming components such as rock and pyrite.

The hindered-settling environment creates the optimum conditions for efficient counter-current washing to rinse, clean, and neutralize ore prior to secondary unit operations.

Applications include:

- Sizing and Classification
- Density Separation and Concentration
- Washing and Neutralization of Minerals

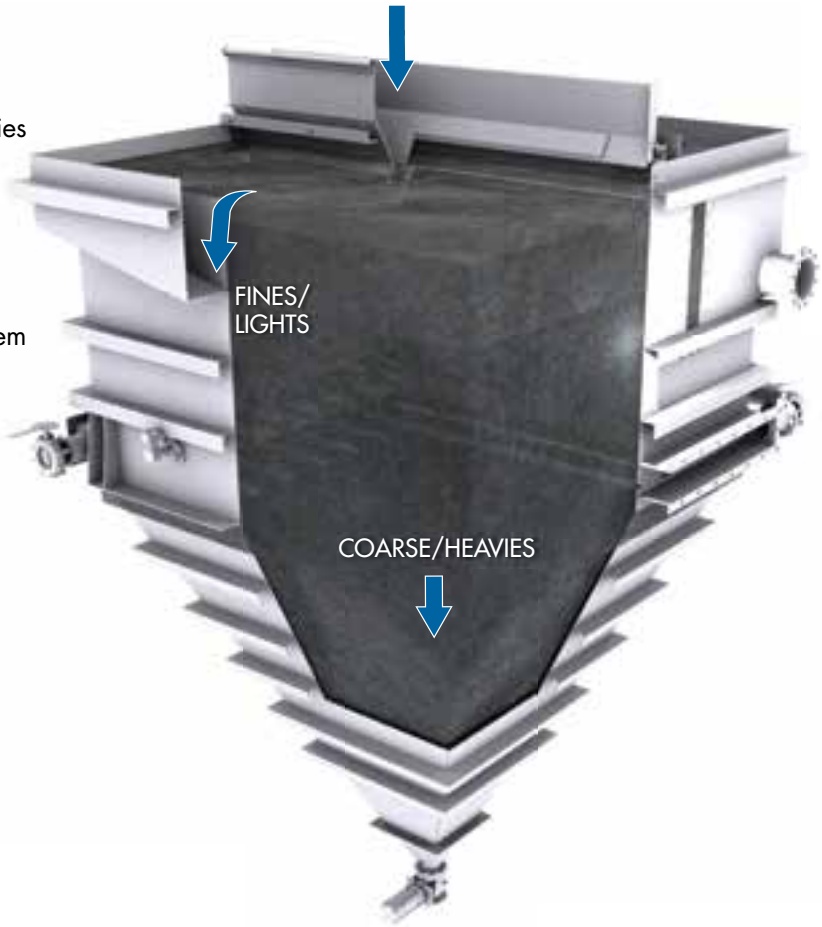
◀ At this processing plant, four CrossFlow Separators are classifying phosphate matrix in a split-feed flotation plant.

A view of several CrossFlow Separators at mid-body level showing manifold and piping detail, and optional teeter-water clean-out system. ▶

ERIEZ
FLOTATION DIVISION

NOVEL FEED PRESENTATION SYSTEM IMPROVES SEPARATION EFFICIENCY

Unlike traditional teeter-bed technologies, the Eriez CrossFlow uses a unique "tangential" feed presentation system to introduce feed into the top of the separation chamber. This novel approach can provide unit capacities up to three times that of a conventional classifier and eliminates particle misplacement caused by excessive feed volume and plant fluctuations.



In the CrossFlow, feed particles descend against a rising flow of teeter water established by a uniform system of water injection pipes located in the base of the main separator housing. Based on the settling characteristics of the ore and the water addition rate, a fluidized bed of solids is established in the separator.

Particles with a low settling velocity (fine/low density) that cannot penetrate the teeter bed are carried over the top of the separator with the bulk of the fluidizing medium. Particles with a high settling rate (coarse/high density) settle through the fluidized bed and are eventually discharged at a high solids content through the underflow control valve.

CrossFlow Features

- 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

APPLICATION: **PARTICLE CONCENTRATION**

Hindered-bed separators can concentrate particles based on size, density and shape. With feed stocks having a relatively tight size distribution, separations based on density and shape can be successfully achieved.

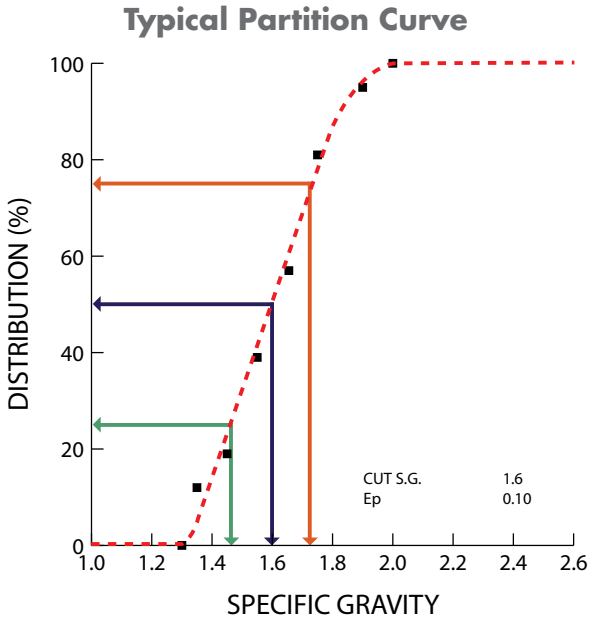
Common applications include removing rock (SG 2.65) from coal (SG 1.35), upgrading iron ore, and the removal of silica from heavy-mineral concentrates. In addition, minerals such as mica can be separated from ores such as phosphate and sand due to its flat shape.

High-density rock (left) has been removed from a low-density coal (right).

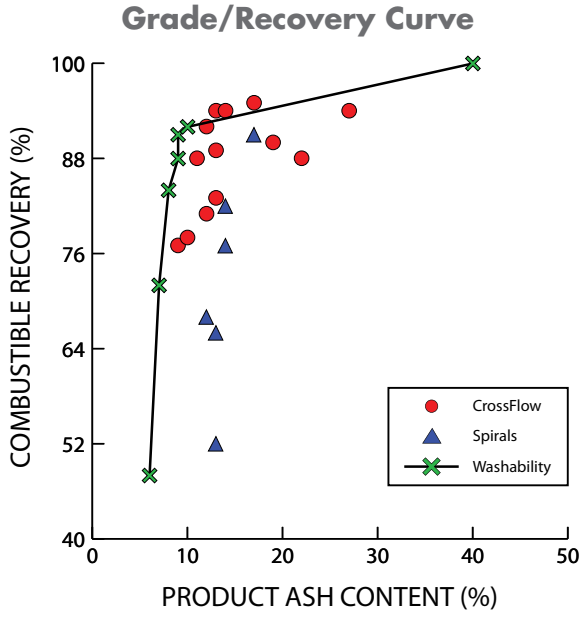
Removal of mica from a phosphate ore based on particle shape characteristics.

Silica removal from heavy mineral concentrate prior to dry beneficiation.

Lab test showing highly efficient teeter-bed separation.



Partition curve from an industrial unit showing a low gravity cut (SG_{50}) and efficient separation of rock from a coal feed stock.



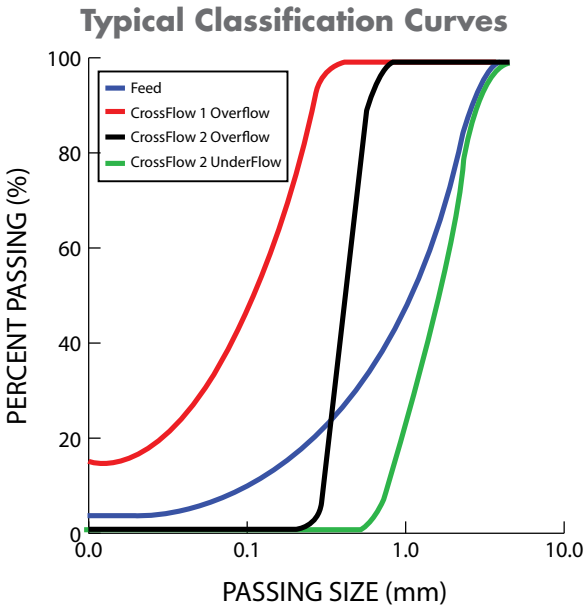
Comparison of teeter-bed separator to spiral concentrator for upgrading 2.0x0.150-mm coal showing superior performance of the CrossFlow with respect to the washability curve.

ERIEZ
FLOTATION DIVISION

APPLICATION: **SIZING/CLASSIFICATION**

Minerals can be separated based on particle diameter when treating feed stocks having a consistent density but a wide size distribution.

The novel CrossFlow feed presentation system improves upon the already quiescent hindered-settling environment of a teeter-bed separator. As a result, very efficient size cuts can be provided when treating mono-density feed stocks such as those found in silica sand, frac sand, and phosphate matrix.



This graph shows the typical size distributions generated during normal operations using two CrossFlow Separators in series to produce 3 tightly-sized product streams for a frac-sand application.

Above are examples of particle size separations.

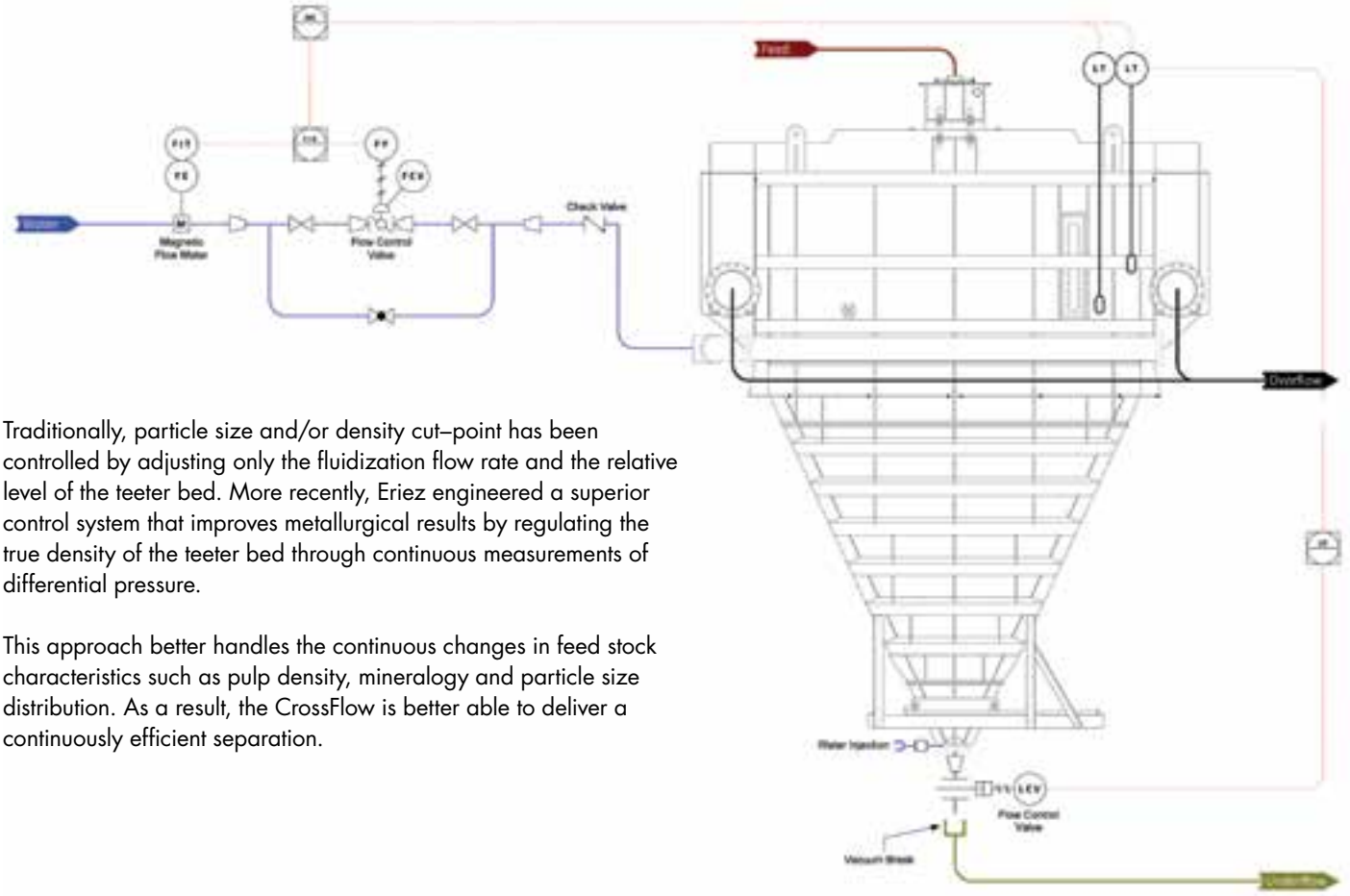
APPLICATION: **WASHING**

In the CrossFlow separator, particles settle against a counter-current flow of fluidization water. As a result, this quiescent, plug-flow system provides an excellent method for rinsing, cleaning and washing material.

The CrossFlow provides an efficient method for acid neutralization where particles are continuously washed by fresh teeter water. One such example is for treating low pH zircon which can be rendered neutral in a relatively small foot print while generating a minimum amount of acidic liquor.

For more information, visit eriezflotation.com

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. More recently, 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, the CrossFlow is better able to deliver a continuously efficient separation.

3.6x3.6 meter (12x12 ft) CrossFlow Separator for the classification of potash prior to a split feed flotation circuit.

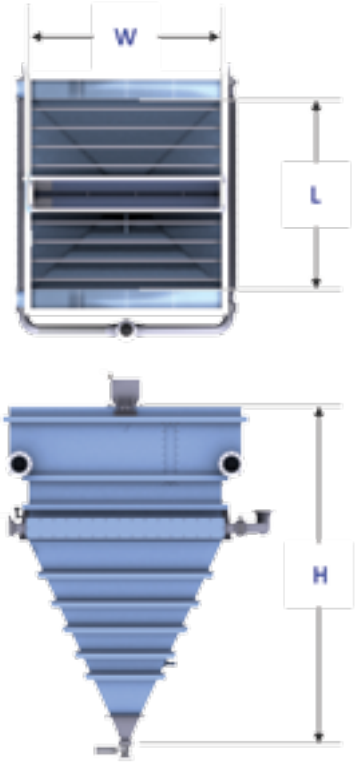
2.2x2.2 meter (7x7 ft) CrossFlow Separator for the recovery of fine tungsten.

CrossFlow Separator installation for the recovery of heavy mineral.

One of many ways to provide feed to the CrossFlow. In this case, cyclone underflow is discharged directly into the ceramic-lined feed box of a 3x3 meter (10x10 ft) CrossFlow Separator.

CROSSFLOW SEPARATOR SPECIFICATIONS

ERIEZ
FLOTATION DIVISION



MODEL NUMBER	DESCRIPTION	DIMENSIONS (W x L x H)		APPROX. WEIGHT		CAPACITY*	
		MM	IN	KG	LBS	SIZING (T/H)	DENSITY (T/H)
XF-50	Laboratory Unit	50 x 100 x 710	2.0 x 4.0 x 28.0	20	45	0.05 - 0.13	0.05 - 0.08
XF-100	Pilot Unit	50 x 200 x 900	2.0 x 8.0 x 35.5	70	150	0.2 - 0.5	0.2 - 0.3
XF-200	Pilot Unit	220 x 410 x 1240	8.8 x 16.0 x 49.0	95	210	1.0 - 2.6	1.0 - 1.5
XF-450	Pilot/Industrial	460 x 460 x 1470	18 x 18 x 58	400	880	4 - 10	4 - 6
XF-600	Pilot/Industrial	610 x 610 x 2130	24 x 24 x 84	570	1,255	7 - 18	7 - 11
XF-900	Industrial	910 x 910 x 2380	36 x 36 x 94	1090	2,400	16 - 14	16 - 25
XF-1200	Industrial	1220 x 1220 x 2700	48 x 48 x 106	1620	3,570	29 - 73	29 - 44
XF-1500	Industrial	1520 x 1520 x 3460	60 x 60 x 148	1950	4,300	45 - 114	45 - 68
XF-1800	Industrial	1840 x 1840 x 4090	72 x 72 x 161	3520	7,765	65 - 164	65 - 98
XF-2100	Industrial	2140 x 2140 x 4670	84 x 84 x 184	4315	9,510	89 - 223	89 - 134
XF-2450	Industrial	2440 x 2440 x 5280	96 x 96 x 208	5400	11,900	116 - 291	116 - 175
XF-2700	Industrial	2740 x 2740 x 5280	108 x 108 x 230	6510	14,355	147 - 368	147 - 221
XF-3050	Industrial	3050 x 3050 x 6430	120 x 120 x 253	7750	17,090	182 - 455	182 - 273
XF-3350	Industrial	3350 x 3350 x 7040	132 x 132 x 277	9550	21,055	220 - 550	220 - 330
XF-3650	Industrial	3660 x 3660 x 7620	144 x 144 x 300	10,855	23,935	262 - 655	262 - 393
XF-4250	Industrial	4270 x 7270 x 8790	168 x 168 x 346	13,470	29,700	356 - 891	356 - 535
XF-6000	Industrial	3050 x 6710 x 6430	120 x 264 x 253	17,465	38,500	727 - 1818	727 - 1091

**Please note that all capacities are in long tons.*

For more information, visit eriezflotation.com

Flotation

Hydraulic Separation

Lab & Pilot Equipment, Testing, and Technical Services

WORLD AUTHORITY IN ADVANCED SEPARATION TECHNOLOGIES

Customer-Focused Service Spanning the World of Minerals

The Eriez Flotation Division (EFD) is focused on addressing specialty flotation applications through innovative technology and expert support.

EFD is committed to providing state-of-the-art equipment and process solutions for new and existing projects worldwide. We understand and quickly respond to the needs of our clients. Our versatility is demonstrated by the diversity of our engineering services and the varying sizes of projects we have successfully completed around the world.

Our state-of-the-art test lab and pilot facilities in Erie, PA are available to demonstrate and pilot solutions based on your unique needs.

Contact the nearest Eriez Flotation Division office for technical support or design engineering to suit your specific application.

ERIEZ
FLOTATION DIVISION

Eriez Flotation Division | Canada
7168 Venture St
Delta, BC, V4G 1H6
Canada
Office: +1 604-952-2300
efdca@eriez.com

Eriez Flotation Division | USA
2200 Asbury Road
Erie, PA 16506
USA
Office: (814) 835-6000
efdusa@eriez.com

Eriez Flotation Division | Brazil
Av. Getúlio Vargas, n0 456 - 120 andar
Funcionários – Belo Horizonte - MG
Brazil
Office: +55 31 3281 9108
efdbr@eriez.com

Eriez Flotation Division | Australia
21 Shirley Way,
Epping, Victoria 3076
Australia
Office: +61 3 8401 7400
efdau@eriez.com

Eriez Flotation Division | Chile
Badajoz, 130 Of. 1505
Las Condes, Santiago
Chile
Office: +56 2 29523400
efdcl@eriez.com

Eriez Flotation Division | Perú
Av. Manuel Olguin 335, oficina 1008
Surco, Lima
Perú
Office: +51 1 719 4150
efdpe@eriez.com

Website: www.eriezflotation.com

ERIEZ®