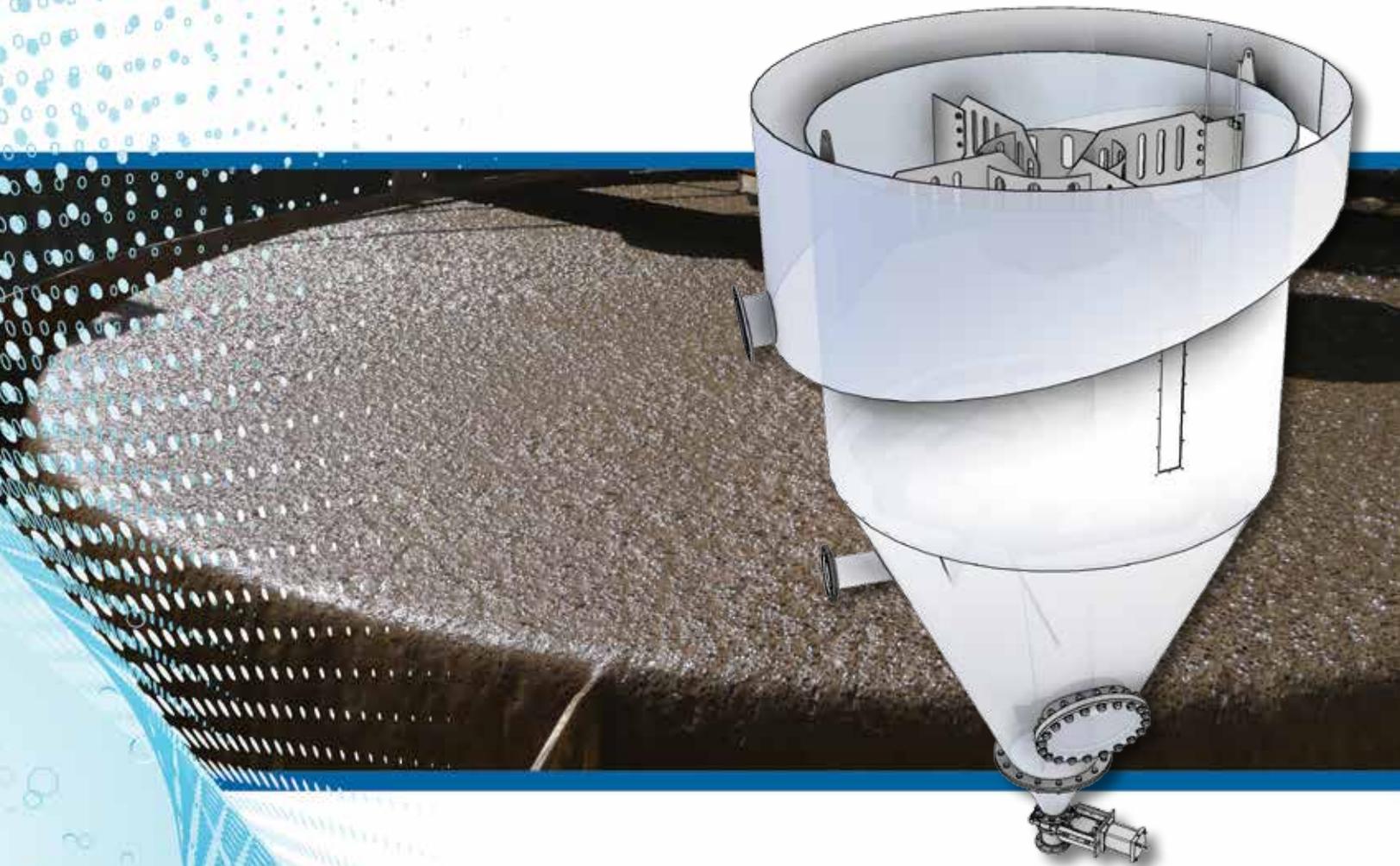


ERIEZ

FLOTATION DIVISION



● HYDROFLOAT SEPARATOR ●



HYDROFLOAT® SEPARATOR

The first in fluidized-bed flotation with more than 50 units installed worldwide!

Eriez, a world leader in separation technology, has designed the new **HydroFloat** Separator for coarse particle mineral concentration delivering the capacity of a density separator while maintaining the selectivity of a flotation device. Using a novel aeration system to disperse fine bubbles into a fluidized-bed environment, the HydroFloat Separator significantly increases the selective recovery of coarse particles by applying flotation fundamentals to gravity separation.

Can be applied to:

- Coal
- Iron Ore
- Industrial Minerals
- Base Metals
- Sulfides

Applications include:

- Coarse Recovery in Split-Feed Flotation Circuits
- Tailings Scavenging
- Flash Flotation in Grinding Circuits

◀ Single, 3 meter (10-ft) HydroFloat cell installed for recovery of coarse potash.

▶ Two, 2.4 meter (8-ft) diameter HydroFloat Separators for the recovery of 1-mm coarse phosphate.

PRINCIPLES OF OPERATION

The HydroFloat Separator is an aerated fluidized-bed (or teeter-bed) separator. The synergistic effect of combining flotation with gravity concentration results in an outcome that cannot be achieved by either approach alone.

Air bubbles are dispersed by the fluidization system, percolate through the hindered-setting zone and attach to the hydrophobic component altering its density and rendering it sufficiently buoyant to float and be recovered. The use of the dense phase, fluidized bed eliminates axial mixing, increases coarse particle residence time and improves the flotation rate through enhanced bubble-particle interactions. As a result, the rate of recovery is high for both fully-liberated and semi-liberated particles.

HydroFloat Separators Improve Coarse Particle Recovery through:

- Increased bubble/particle collision rates
- Increased bubble/particle sliding time
- Increased residence time
- Decreased mixing
- Decreased turbulence and detachment
- Decreased buoyancy restrictions



APPLICATION: SPLIT-FEED COARSE FLOTATION CIRCUITS

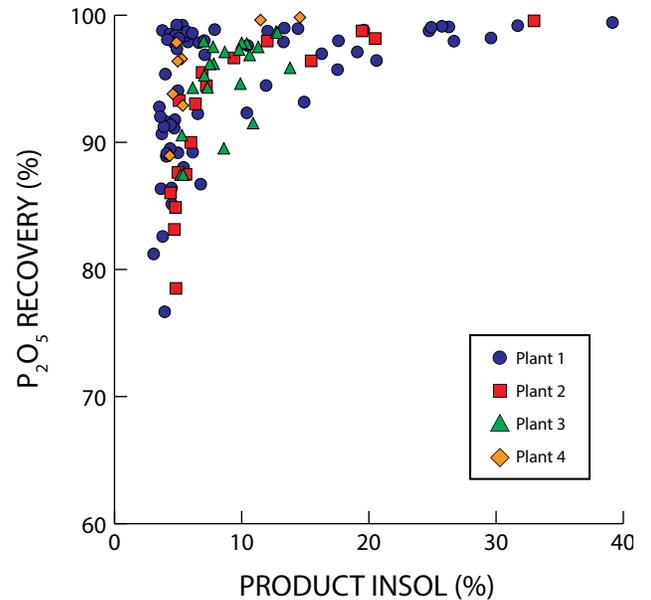
Eriez developed the HydroFloat Separator specifically to treat coarse material. With this new separator, process engineers can now maximize efficiency by designing split-feed flotation circuits where coarse material is treated separately from the fines.

The HydroFloat Separator was invented to provide a solution for industry to overcome a long-standing challenge - the efficient recovery of particles coarser than 150-200 micron.

Conventional and column flotation cells are well suited for concentrating ores ranging from 50-150 micron. However, their effectiveness when treating particles coarser than this threshold is suspect due to turbulence and buoyancy issues.

Process engineers no longer have to try to achieve optimum performance in a single unit operation. Coarse material can now be isolated and treated in a separator specifically designed for and ideally suited to selectively recover coarse particles that are otherwise lost using conventional methods.

Plant Trials Recovering Coarse Phosphate



▲ This graph is showing the high recovery and selectivity offered by the HydroFloat when treating coarse phosphate. Data from 4 different plants yielded consistent results.

◀ A typical coarse phosphate result showing high recovery and very good selectivity.



Phosphate separation in a split-feed flotation circuit.



Ultra-Coarse phosphate particles recovered by the HydroFloat.



A 2.4 meter (8-ft) HydroFloat in a split-feed flotation circuit.

For more information, visit eriezflotation.com

APPLICATION: **SCAVENGING**

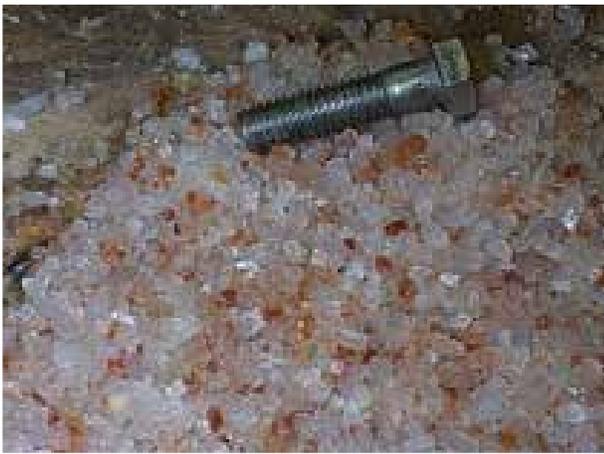
The development of the HydroFloat was based on applying flotation fundamentals to teeter-bed separation. The presence of the fluidized bed increases collision rates beyond that which can be obtained in open flotation cells. As a result, the HydroFloat excels as a scavenging device.

It can be installed on the tail end of processing circuits to capture the "hard-to-recover" coarse and middling particles. These particles are typically lost when using conventional technology. Both test work and industrial data show that the HydroFloat is able to recover particles up to and exceeding 3-mm in potash and up to 2-mm in sulfides.

Most importantly, the HydroFloat is able to recover particles with minimal exposed hydrophobic surface area. Mineral liberation analysis has verified the high flotation rate offered by this device, as SEM back-scatter images showed no valuable species present on the mineral surface after treatment in the HydroFloat.



Recovery of +250 micron, non-liberated copper values from a tailings stream demonstrating the high flotation rate of the HydroFloat Separator.



◀ *Coarse potash recovered from a scavenging circuit with a top size exceeding 3-mm. A 3/8-inch bolt is included for scale.*



3-meter (10-ft) diameter HydroFloat operating in a scavenging duty for the recovery of coarse potash.

APPLICATION: FLASH FLOTATION

The ability of the HydroFloat Separator to recover both coarse and middling material combined with its high flotation rate lends itself well to flash flotation applications. In fact, data show that for some applications, the HydroFloat can produce a *throw-away* tail which can dramatically reduce grinding costs.

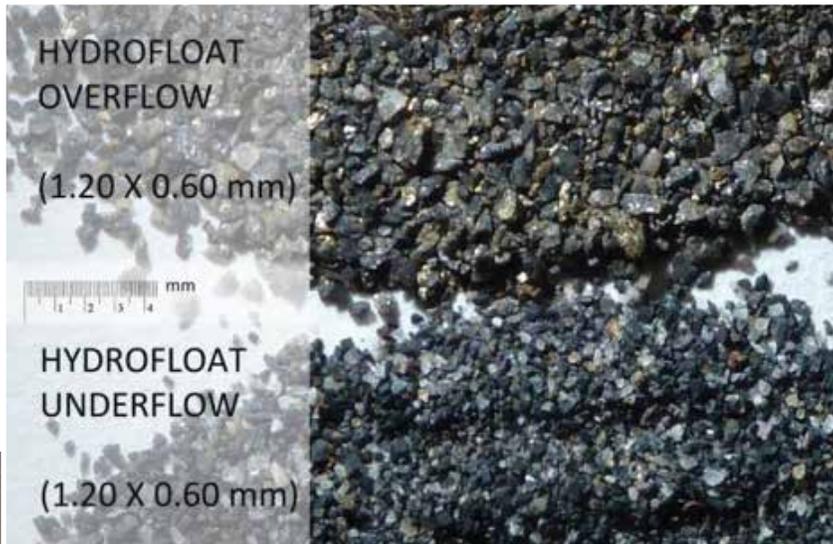
No longer is it required to grind the entire flotation feed stream to a size suitable for traditional flotation technology. With fluidized-bed flotation, it is only necessary to grind the feed to a size sufficient for bubble attachment. This greatly reduces the tonnage that must be ground to achieve liberation for the sake of attaining grade.

The savings in grinding may exceed an order of magnitude based on a simple Bond Work Index calculation. While the HydroFloat has been proven to work with particles exceeding 1-mm, it is important to realize even small changes in grind size will yield significant cost savings.

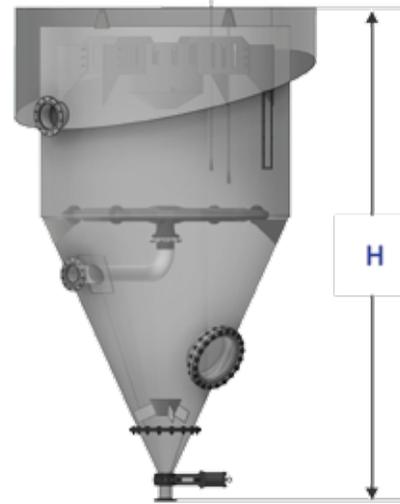
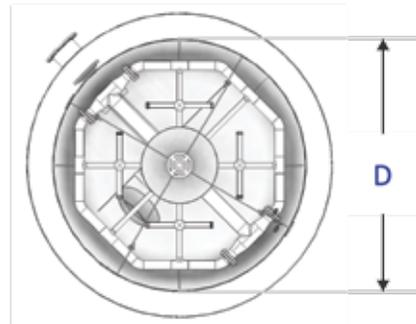


◀ Example of coarse sulfides recovered from finer gangue material using the HydroFloat to treat material in a grinding circuit

▼ A 3 meter (10-ft) HydroFloat for Coarse Potash recovery in a scavenging circuit.



SPECIFICATIONS



| MODEL NUMBER | DESCRIPTION | DIMENSIONS (DxH) | | APPROX. WEIGHT | | CAPACITY (T/H) |
|--------------|------------------|------------------|------------|----------------|--------|----------------|
| | | MM | IN | KG | LBS | |
| HF-150 | Laboratory Unit | 140 x 600 | 5.5 x 23.5 | 165 | 365 | 0.30 - 0.45 |
| HF-400 | Pilot Unit | 410 x 1350 | 16 x 53 | 240 | 530 | 2.5 - 3.8 |
| HF-450 | Pilot Unit | 460 x 1380 | 18 x 54.5 | 250 | 550 | 3 - 5 |
| HF-600 | Pilot/Industrial | 610 x 1380 | 24 x 54.5 | 325 | 715 | 6 - 9 |
| HF-900 | Pilot/Industrial | 910 x 2080 | 36 x 82 | 635 | 1,400 | 13 - 19 |
| HF-1200 | Industrial | 1220 x 2790 | 48 x 110 | 860 | 1,900 | 23 - 34 |
| HF-1500 | Industrial | 1520 x 3400 | 60 x 134 | 1,740 | 3,830 | 36 - 54 |
| HF-1800 | Industrial | 1830 x 3990 | 72 x 157 | 2,430 | 5,355 | 51 - 77 |
| HF-2100 | Industrial | 2140 x 4320 | 84 x 170 | 3,085 | 6,800 | 70 - 105 |
| HF-2400 | Industrial | 2440 x 4620 | 96 x 182 | 3,600 | 7,945 | 91 - 137 |
| HF-2700 | Industrial | 2740 x 4950 | 108 x 195 | 4,045 | 8,915 | 116 - 173 |
| HF-3050 | Industrial | 3050 x 5740 | 120 x 226 | 4,765 | 10,500 | 143 - 214 |
| HF-3350 | Industrial | 3350 x 6220 | 132 x 245 | 5,445 | 12,000 | 173 - 259 |
| HF-3650 | Industrial | 3660 x 7160 | 144 x 282 | 6,500 | 14,335 | 206 - 308 |
| HF-4250 | Industrial | 4270 x 8590 | 168 x 338 | 8,300 | 18,300 | 280 - 420 |
| HF-4850 | Industrial | 4870 x 6700 | 192 x 264 | 9,800 | 21,560 | 364 - 546 |

*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

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 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.



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Website: www.eriezflotation.com

