The fully automated Floatex Density Separator is a proven technology for classifying particles based on size and/or density. Versatile in operation, the units can be sized to treat 1-600 tph. Performance of a traditional wet-gravity separation circuit is greatly improved with the introduction of a Floatex unit and at less cost. All in all, Floatex Density Separators set the standard for unit and circuit efficiency.
Effective classification and separation

The Floatex Density Separator is a hindered settling classifier that has been continuously developed and perfected for more than 50 years. Initially, Floatex units proved their utility for the more precise classification of glass and construction sands. More recently, units have been integrated into separation circuits where they complement and enhance the separation of a broad range of mineral species or contaminating particles.

Today, in addition to industrial minerals, Floatex separators are routinely used in iron, chromite, and titanium ore operations where the more immediate and higher recovery of quality products allows for simpler and less costly operations. In glass sand operations, Floatex units are routinely used to answer the challenges of increasing size and quality specifications.

Separators range from laboratory to industrial scale, and the applications from simple to complex. Incorporating Floatex technology, customers are now able to meet the high demands of an ever-changing industry.
Hindered settling: A brief explanation

The uniform introduction of a rising current of water across the bottom of a tank will cause the contained particles to expand into a state of teeter. By monitoring and controlling the apparent density of the teetered suspension a dense media is created. Particles of greater mass will migrate downward and thereby “hinder the settling” of particles of less mass. The particles of less mass will be dispersed into the upper levels of the tank, carried by the current of water, where they may reside in more open suspension. In the minerals industry this teetered suspension is often used to “float off” particles of lower density and smaller size, and create a concentration of coarse/heavy minerals.
The Floatex Density Separator distributes the upward current water through an arrangement of perforated spray pipes that are spaced across the tank at the bottom of the sorting column. The coarse classified material is allowed to collapse through the spaces between the spray pipes over the whole area of the tank, thus achieving an infinite number of discharge positions from the teetering sands.

Beneath the level of the spray pipes the tank is closed by a conical dewatering cone with a discharge valve at the apex. The settled sands are discharged with a minimum of entrained water, so variations in the tonnage discharge have little effect on the true upward current.

**Fully automated**

The Floatex Density Separator incorporates an extremely accurate control system designed for reliability and simplicity of operation. A powerful software package has been developed to give accurate prediction of performance, machine sizing and water requirements. Adjustment and monitoring can be carried out from a remote control room.
Benefits of the Floatex

- High capacity
- Simple operation
- Efficiency: Lower operating costs, a reduced footprint and less water consumption than with spirals alone - all the while processing more effectively.
- Control: Extremely accurate control system allows operators to monitor and adjust from a remote control room.
- Accepts pump or gravity feed.

Advanced features

- Underflow dewatering cone
- Central feedwell
- Perforated upward current water pipes
- Optional secondary water introduction capabilities for constant upward current.
- Control system compatible with SCADA/Computer control systems.
Concentration of heavy minerals

Floatex introduced the use of density separators for concentrating heavy minerals enabling many modern, high-tonnage concentration plants. Hindered settling enhances the differences in specific gravity’s between minerals enabling a concentration to be made of one or more minerals.

In the processing of heavy minerals the Floatex Density Separator greatly increase the overall recovery through a number of methods:

- Use of the Floatex Density Separator creates a greater concentration of heavy minerals making it ideal for cleaning of final concentrates from gravity circuits.
- The separator can be used to replace cleaner spiral circuits to provide more simple operation with higher recovery.
- Floatex Density Separator are finding increasing applications in the processing of iron ores and beach sands.
- Hindered settling has the effect of enhancing the difference in specific gravity’s between minerals, to the extent that a heavy mineral can generate sufficient density to support quartz, therefore a concentration of minerals can be made.
- When treating iron ore, the underflow may be suitable as a final concentrate without further processing.
- The Floatex Density Separator is capable of replacing many banks of spirals, simplifying the flowsheet, and improving the performance of conventional concentrator circuits, either to separate prior to processes such as spirals, or to retreat concentrates.
- Additionally, the Floatex Density Separator is extremely effective in primary classification and concentration, and fully automatic in operation.
**Industrial sands and minerals**

- Concentration of heavy minerals.
- Size classification of a single specific gravity material where accuracy is of importance.
- Removal of light contaminating materials such as coal.
- Separation of mica (flake) from quartz sands.
- Separation of minerals of sufficiently different specific gravities.
- Removal of silt/slimes.
- Preparation of sands for attrition scrubbing, acid treatment or froth flotation and for the rinsing of sands following these processes.

**Coal preparation**

- Separation of fine coal from shale.

**Construction sands**

- Production of consistently graded sand products.
- Removal of light contaminating material.
- Preparation of sand for direct stockpiling.
- Removal of silt from sand.
- An integral component of a Floatex auto-blend classification plant.

**Industrial sands processing**

Glass sand preparation now requires producers to accept the imposition of more stringent size specifications from a glass industry seeking to reduce melting times by reducing the top size of the sand being fed to the furnace. The Floatex Density Separator is the simplest method for achieving this goal.

In the preparation of foundry sands, there is an increasing awareness of the consistent product achieved by the Floatex Density Separator, which allows producers more confidence in accepting ever-increasing product liability.

In the construction sand industry, deposits that were previously considered unworkable due to very high silt and/or lignite content, are now viable due to the highly efficient cleaning action of the Floatex Density Separator. When placed in series they can provide several size fractions that can be blended together to make consistent products from a varying feed material.

**Washing**

The Floatex Density Separator will remove all free silts/slimes; by means of the clean upward current of water displacing the silt laden water to the overflow, making it more efficient than air tables or hydrocyclones.

**Direct stockpiling of industrial sands**

The underflow (coarse/heavy product) is discharged in a semi-dewatered state, up to 80% solids by weight, enabling the product to be directly stockpiled. In most cases no further pumping or dewatering is required therefore saving on capital and power consumption.

**Laboratory separators**

Laboratory facilities are available for carrying out tests on customer’s material.

These tests are backed by short runs through demonstration equipment. Small machines are available for a pilot trial installation in a customer’s plant. These smaller units give results comparable to those achieved by a production unit.

**Classifier selection**

The Floatex Density Separator is manufactured in sizes from 0.2 to 18 m². Classifiers are selected to suit each application. The following is required to assist in sizing: Analysis of minerals present, feed tonnage, size analysis of feed, product requirements and feed (% solids).

- Particle Size Range: 800 - 75 μm (20 – 200 mesh)
- Capacity Range for a Single Unit: 1 to 600 tph