REFLUX™ Classifier
Fine particle technology – separate the best from the rest
Gravity-based separation with **maximum efficiency**

The FLSmidth REFLUX Classifier is one of our most advanced fine particle, gravity-based separators, offering significant advantages in capacity, adaptability and efficiency.

### Key benefits

- **Improved efficiency** produces higher recoveries
- **Compact design** delivers high throughput
- **Simple installation** and low OPEX
- **Decreased environmental impact**
Capacity, adaptability and efficiency

Incorporating a new “laminar high-shear-rate” mechanism, along with advancements in channel spacing and width, our REFLUX Classifiers are both efficient and compact.

How it works
Developed with your entire minerals processing plant in mind, the REFLUX Classifier (RC™) separates small particles based on a difference in density or particle size. The RC combines a conventional fluidised bed separator with a set of parallel inclined plates that form lamella channels. The feed slurry enters the RC below the lamella plates via internal feed chambers in the lamella chamber. As the fluidised bed builds up below the feed chambers, material with a higher density than the bed will sink, whereas material with a lower density than the bed will float.

At the bottom of the mixing chamber, a higher-density bed of settling solids forms, jets of incoming fluidisation water keep it in suspension. Two pressure probes in the mixing chamber’s lower and middle sections measure the material’s density. The RC uses the relative density of the fluidised bed between the two probes to determine the discharge rate of high-density solids via a single central underflow valve. The automated underflow valve is manufactured from highly wear-resistant ceramics and other materials that are ideal for reducing wear. The underflow typically will discharge into a collection launder or launder. The underflow contains high-density particles, and is generally coarser than the feed.

At the same time, the coarse and fine low-density particles that may have been trapped in the dense fluidised bed will rise and migrate to the lamella section of the classifier. The low density and finer particles overflow from the RC lamellas, along with the process water and any slimes. The slightly denser and larger particles encounter the autogenous process density within the vessel, enabling them to rise and be displaced to overflow. The lamella channels enhance the settling rate of any misplaced fine, high-density solids, which slide down the plates and slowly re-circulate back into the feed zone of the mixing chamber. The internal launderers at the top of the RC direct the overflow slurry into a single discharge “overflow” collector.

Ideal for
Gravity-based separation of:
- Coal (typically -2.0 mm Wedgewire)
- Minerals (typically -2.0 mm)

Unit capacity
Commercial units range in size from RC 850 up to our largest, the RC 3000 unit. Actual unit capacities are related to the type and size of feed material (refer chart on page 4).

Typical coal capacities up to 200 tph treating -1.4 mm + 0.250 mm feed.

Typical hematite ore capacities up to 250 tph treating -0.300 mm + 0.075 mm feed.

Key aspects
- High-capacity, compact design accommodates any plant layout.
  - Advancements in channel spacing and width, along with the ability to operate using minimal power and water, mean that the RC is efficient and compact, with a small footprint for tight spaces in existing plants.
- Easy to operate, with only one control.
- The RC requires only minimal operator input.
- Specifically designed for ease of transport, site assembly and installation, the smaller units up to our RC 2000 will fit inside a single, standard 20/40 ft open-top shipping container. Larger units must be flat-racked.
- Pilot-scale and laboratory testing available.
  - We also offer pilot-scale RC300 units, available for rental. The RC300 is designed for in-plant test work in coal and mineral applications. Typical throughput ranges from 1 tph to 5 tph, depending upon the feed material type and size.
Designed for your safety and productivity

We designed the REFLUX Classifier for safety, reliability and productivity. As a cost-effective solution in your entire process flow, the RC will help keep your operation running smoothly, safely and efficiently.

Safety
We engineered the RC to comply with global standards, using finite element analysis (FEA) on each section to ensure that our design is within allowable limits. Each section of the machine incorporates rated Lifting Lugs for lifting each section individually, or to lift the entire machine into the plant.

The pressurised fluidising chamber incorporates a stainless-steel pressure relief valve to ensure the fluidising chamber cannot be over-pressurised. A pressure indicator allows the operator to monitor the fluidising chamber pressure from the control room.

All moving components are covered by highly visible guards with ISO-compliant warning labels. All guarding is designed to allow easy removal and installation for maintenance.

Quality
The RC is manufactured from high-quality 316 stainless steel, which provides superior corrosion protection. The outside of the machine is painted with a high-build epoxy coating to provide additional corrosion protection. All joints are sealed with a high-quality elastic joint sealant to ensure leak-free operation. All RC units are preassembled in our factory and leak-tested prior to delivery.

Productivity
The RC will significantly improve your plant productivity through recovery of fine material using new technology never before seen in the mining industry. The smaller footprint allows installation of the RC in tight spaces within existing plants. The classifier uses minimal power and water and provides efficient recovery of previously wasted material. All components in the RC are designed to minimise wear and reduce maintenance.

### REFLUX classifier models
(Other models available for specific applications)

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<tbody>
<tr>
<td>Nominal Maximum Capacity (tph)(^a)</td>
<td>36</td>
<td>56</td>
<td>95</td>
<td>134</td>
<td>168</td>
<td>233</td>
<td>376</td>
<td>551</td>
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Typical capacities for a RC treating -2.0 mm +0.5 mm coal, 60% of feed to overflow.
\(^a\) These throughput values are NOMINAL, these values are the total solids to the unit including any undersize and oversize.

### REFLUX classifier models

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<tbody>
<tr>
<td>Nominal Maximum Capacity (tph)(^b)</td>
<td>17</td>
<td>26</td>
<td>44</td>
<td>62</td>
<td>78</td>
<td>108</td>
<td>175</td>
<td>256</td>
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Typical capacities for a RC treating -0.15 mm +0.038 mm hematite, 80% of feed to underflow.
\(^b\) These throughput values are NOMINAL, these values are the total solids to the unit including any undersize and oversize.

\(^b\) Factors effecting RC throughput may include degree of mineral liberation, feed particle shape and size distribution, minerals present, mineral SGs, feed grade, product grade, slurry pulp density, liquid SG and slurry temperature.
### Standard specifications

We bring extensive experience to your process needs, and can configure the REFLUX classifier to fit your specific application and installation needs, without compromising quality or dependability.

#### Standard specifications

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<tr>
<td>Length (mm)</td>
<td>3668</td>
<td>4134</td>
<td>4095</td>
<td>4847</td>
<td>4847</td>
<td>5070</td>
<td>6456</td>
<td>7280</td>
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<tr>
<td>Width (mm)</td>
<td>1754</td>
<td>1987</td>
<td>2489</td>
<td>2489</td>
<td>2845</td>
<td>3253</td>
<td>3665</td>
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<tr>
<td>Height (mm)</td>
<td>6141</td>
<td>6126</td>
<td>6096</td>
<td>6176</td>
<td>6234</td>
<td>6344</td>
<td>6915</td>
<td>7525</td>
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#### Reflux Classifier Loads

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<tr>
<td>3.05 m³</td>
<td>4134</td>
<td>5.3</td>
<td>7.4</td>
<td>12.1</td>
<td>15.0</td>
<td>20.8</td>
<td>37.5</td>
<td>60.6</td>
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<tr>
<td>0.09 m³</td>
<td>0.15</td>
<td>0.3</td>
<td>0.6</td>
<td>1.3</td>
<td>1.8</td>
<td>2.25</td>
<td>3.2</td>
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<tbody>
<tr>
<td>3650 kg</td>
<td>6150</td>
<td>8750</td>
<td>11,65</td>
<td>13,540</td>
<td>17,795</td>
<td>28,120</td>
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#### Feed box Loads

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<tr>
<td>0.85 m³</td>
<td>1.5</td>
<td>1.4</td>
<td>1.7</td>
<td>2.1</td>
<td>3.0</td>
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<tr>
<td>850 kg</td>
<td>1250</td>
<td>1165</td>
<td>1165</td>
<td>1310</td>
<td>1655</td>
<td>2080</td>
<td>3072</td>
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*Dry Mass does not include the transport frame and is based on the heaviest configuration i.e. 3 mm plates*

#### Standard specification options

FLSmidth can engineer units for most applications.
Please contact your local FLSmith representative regarding unit specifics and your application.

1. Fluidisation nozzles from 0.6 mm to 10 mm.
2. Underflow valves from 60 mm to 200 mm. *Machine sizes RC1400-HC to RC3600-HC.
3. Underflow Operation. Fail Open or Fail Closed.
4. Lamella Plate spacing from 3 mm to 18 mm.
Optimise your gravity separation

Our fine particle experts are ready to help you. Contact them at:

✉️ info.australia@flsmidth.com

Learn from our experts

Subscribe to our newsletters and access expert analysis and research, industry event updates and insightful customer case studies, as well as priority webinar invitations. www.flsmidth.com/subscribe

Learn more about our REFLUX Classifiers at:

🔗 www.flsmidth.com/products/reflux-classifier
TOWARDS ZERO EMISSIONS IN MINING

Zero water waste
Zero emissions
Zero energy waste