

# REFLUX™ Classifier

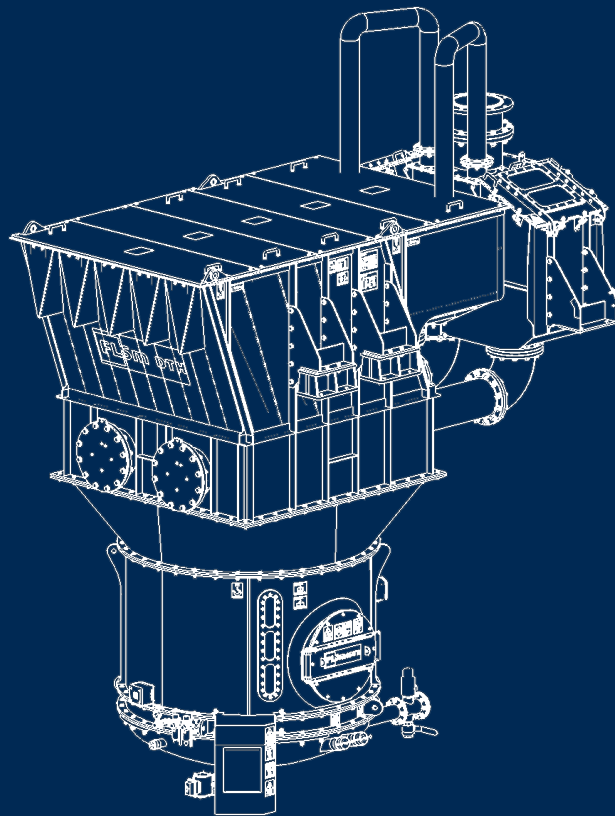
Fine particle technology –  
separate the best from the rest



**FLS**

# Gravity-based separation with **maximum efficiency**

The FLS 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. 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 bed apparent bed density. The RC uses the relative density of the fluidised bed between the two probes to determine the discharge rate of the high-density solids via a single central underflow valve.

The automated underflow valve is manufactured from highly wear-resistant materials that are ideal for reducing wear. The underflow typically will discharge into a collection tundish 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 launders at the top of the RC direct the overflow slurry into a single discharge “overflow” collector.

## Ideal for

- Coal
- Iron ore
- Spodumene
- Manganese
- Mineral sands
- Accurate particle sizing (for homogenous mineral feeds)

## 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 density 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

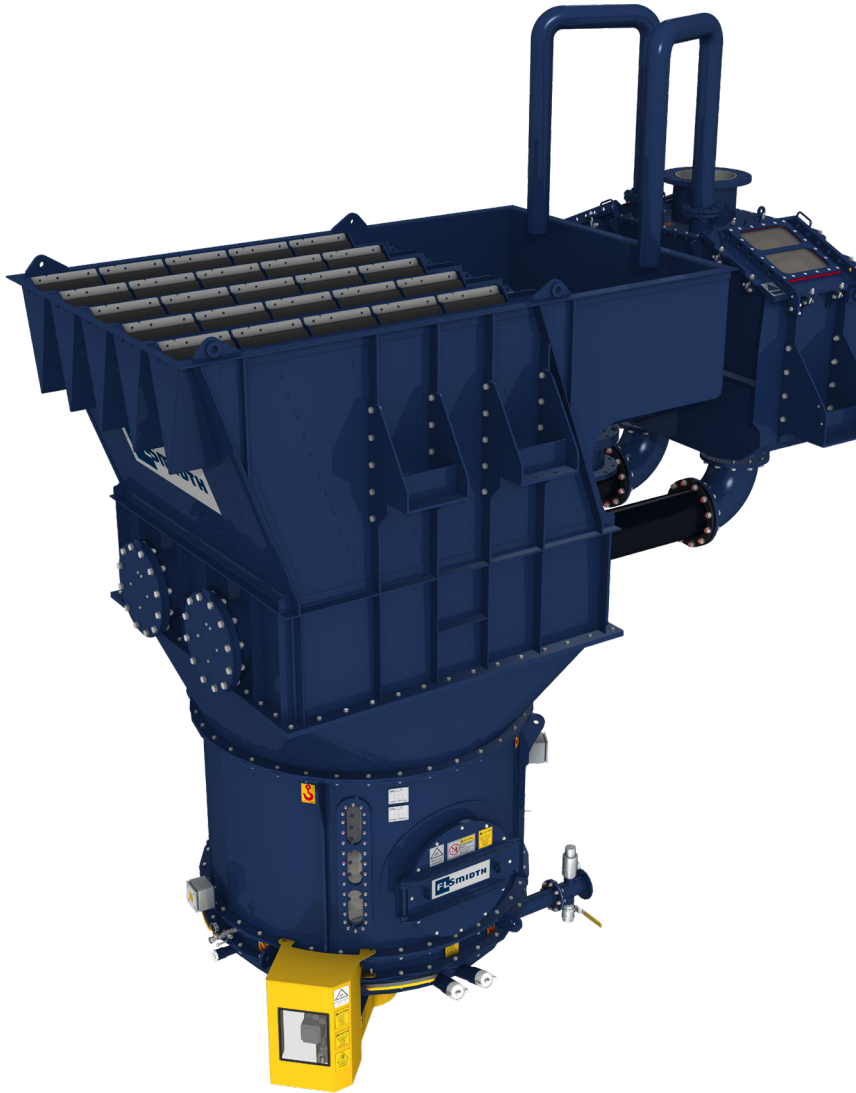
The RC will significantly improve your plant productivity through recovery of fine material using new technology never before seen in the mining industry. The smaller footprint allows installation of the RC in tight spaces within existing plants. The classifier uses minimal power and water and provides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

### 80% mas split to UF (higher yielding)

Model	Top Size 1.000 / Bottom Size 0.250 (mm)	Top Size 0.600 / Bottom Size 0.150 (mm)	Top Size 0.430 / Bottom Size 0.110 (mm)	Top Size 0.300 / Bottom Size 0.075 (mm)	Top Size 0.150 / Bottom Size 0.038 (mm)
RC 300-HC	6.3 tph	4.0 tph	3.1 tph	2.5 tph	1.7 tph
RC 450-HC	12.9 tph	8.2 tph	6.4 tph	5.0 tph	3.5 tph
RC 650-HC	37.7 tph	23.8 tph	18.5 tph	14.7 tph	10.2 tph
RC 8500-HC	61.0 tph	38.0 tph	30.0 tph	24.0 tph	17.0 tph
RC 1100-HC	96.0 tph	60.0 tph	47.0 tph	37.0 tph	26.0 tph
RC 1400-HC	162.0 tph	102.0 tph	80.0 tph	63.0 tph	44.0 tph
RC 1750-HC	230.0 tph	145.0 tph	113.0 tph	90.0 tph	62.0 tph
RC 2000-HC	287.0 tph	181.0 tph	141.0 tph	112.0 tph	78.0 tph
RC 2350-HC	397.0 tph	251.0 tph	195.0 tph	155.0 tph	108.0 tph
RC 3000-HC	643.0 tph	405.0 tph	316.0 tph	251.0 tph	175.0 tph
RC 3600-HC	942.0 tph	594.0 tph	463.0 tph	368.0 tph	256.0 tph

- The above table can be used for estimation purposes. For project specific duties please contact your FLS representative.





**60% mas split to UF (lower yielding)**

Model	Top Size 1.000 / Bottom Size 0.250 (mm)	Top Size 0.600 / Bottom Size 0.150 (mm)	Top Size 0.430 / Bottom Size 0.110 (mm)	Top Size 0.300/ Bottom Size 0.075 (mm)	Top Size 0.150 / Bottom Size 0.038 (mm)
RC 300-HC	8.5tph	5.3 tph	4.1 tph	3.3 tph	2.3 tph
RC 450-HC	17.3 tph	10.9 tph	8.5 tph	6.8 tph	4.7 tph
RC 650-HC	50.4 tph	31.8 tph	24.7 tph	19.7 tph	13.8 tph
RC 850-HC	81.0 tph	51.0 tph	40.0 tph	32.0 tph	22.0 tph
RC 1100-HC	128.0 tph	81.0 tph	63.0 tph	50.0 tph	35.0 tph
RC 1400-HC	217.0 tph	137.0 tph	106.0 tph	85.0 tph	59.0 tph
RC 1750-HC	307.0 tph	194.0 tph	150.0 tph	120.0 tph	84.0 tph
RC 2000-HC	384.0 tph	242.0 tph	188.0 tph	150.0 tph	105.0 tph
RC 2350-HC	531.0 tph	355.0 tph	260.0 tph	208.0 tph	145.0 tph
RC 3000-HC	860.0 tph	542.0 tph	421.0 tph	336.0 tph	235.0 tph
RC 3600-HC	1260.0 tph	794.0 tph	617.0 tph	492.0 tph	345.0 tph

- The above table can be used for estimation purposes. For project specific duties please contact your FLS representative.

# Standard specifications and options

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

Unit	RC 850-HC	RC 1100-HC	RC 1400-HC	RC 1750-HC	RC 2000-HC	RC 2350-HC	RC 3000-HC	RC 3600-HC
Length (mm)	3668	4134	4095	4847	4847	5070	6456	7280
Width (mm)	1754	1987	2489	2489	2845	3253	3665	4481
Height (mm)	6141	6126	6096	6176	6234	6344	6915	7525
<b>Reflux Classifier Loads</b>								
Volume Slurry (m <sup>3</sup> )	3.05	5.3	7.4	12.1	15.0	20.8	37.5	60.6
Volume Fluidizing (m <sup>3</sup> )	0.09	0.15	0.3	0.6	0.8	1.18	2.25	3.2
Dry Mass (kg)*	3650	6150	8750	11,165	13,540	17,795	28,120	40,700

\* Dry Mass does not include the transport frame and is based on the heaviest configuration i.e. 3 mm plates

## Standard specification options

We can engineer units for most applications. Please contact your local FLS 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





“The REFLUX™ Classifier has displayed acceptance in various sectors of the mining industry. As we introduced the RC to different markets, our continuous research and development endeavors have enabled us to enhance our offerings, catering to diverse markets. Consequently, our customers can confidently embrace this new and improved method of beneficiation, knowing it is more efficient and effective.”

NICOLOAS BOONZAIR

Global Product Line Manager  
REFLUX™ Classifiers



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