



# c-series®

Dynamic air classifiers



international  
INNOVATIVE  
technologies

## Energy Efficient Precision

Introducing the latest essential element in precise powder production, from the manufacturers of the m-series® fine powder mill, IIT unveil another cost-effective product to tightly control the particle size distribution of finer products.

The new c-series® range of dynamic air classifiers - ideal for cut-points typically 10-160 µm are robust, high throughput air-stream units perfectly suited to most fine powder production applications. The smallest C320 unit achieves cut points down to  $d_{95}$  6.8 µm, based on limestone.



### Dynamic separation

The rotational speed of the classifier wheel and the airflow through it, combine to create perfect conditions for feed separation into fine and coarse streams. The fine product is extracted from the classifier on a fan-induced air stream and collected typically in a bag filter. The separated coarse particles meanwhile migrate cyclonically down to the coarse stream discharge at the base.

### Smooth, controllable operation

Under steady-state conditions the fineness of the product remains consistent. Particle size cut-point changes are easily controlled by stepless adjustment of the classifier wheel speed, even during operation - the higher the speed, the finer the product.

**KEY:**

- Main coarse particle stream
- Heavy, coarse particles
- Controlled Fine product stream

- 1 Primary mill product entry point on air stream from mill discharge rotary valve.
- 2 'Static velocity-drop' pre-classification stage to drop out heavier particles.
- 3 Outer static classifier vanes to assist particulate dispersion.
- 4 Dynamic classifier wheel - speed controlled according to required product cut-point/fineness. Particles of a certain mass and below will pass through the wheel whilst those of a greater mass will be rejected tangentially.
- 5 Controlled fine product stream extracted to product collection device, e.g. bag filter.
- 6 Rejected coarse, out-of-specification particles migrate to the coarse discharge valve.
- 7 Coarse discharge point, sealed typically by a rotary air-lock valve - generally for recycle to the mill feed system.
- 8 Classifier drive motor - speed control via a high efficiency inverter drive.



| classifier wheel diameter | airflow            | max feed | max fine product | speed range | cut-point*<br>d <sub>95</sub> | motor power installed /drawn | mill size |
|---------------------------|--------------------|----------|------------------|-------------|-------------------------------|------------------------------|-----------|
| mm                        | m <sup>3</sup> /hr | kg/h     | kg/h             | RPM         | µm                            | kW                           | m-series  |
| 320                       | 2,300              | 2,800    | 1,600            | 3400        | 6.8                           | 5.5/3.1                      | 300       |
| 320                       | 2,850              | 3,600    | 2,000            |             | 12.6                          | 5.5/1.4                      | 300       |
| 400                       | 3,600              | 4,500    | 2,500            | 2800        | 7.5                           | 7.5/4.8                      | 600       |
| 400                       | 4,500              | 5,600    | 3,150            |             | 14.0                          | 7.5/2.2                      | 600       |
| 630                       | 9,750              | 12,200   | 6,800            | 1650        | 9.8                           | 15/12.9                      | 1200      |
| 630                       | 12,200             | 15,200   | 8,500            |             | 18.3                          | 15/5.8                       | 1200      |

\* based on limestone - 2.7g/cm<sup>3</sup>

## System Efficiency Options

The classifier runs in circuit with typically the **m-series**® mill with 2 feeding options according to the PSD (particle size distribution) of the feed material, i.e. if the feed material has a high proportion of in-specification particles it is more efficient and economical to feed it directly into the classifier via an airlock valve. This means the mill does not expend energy on a high percentage of already fine material. If, as is more often the case, the feed contains little in-specification material, then it is fed directly to the mill. In both cases the coarse discharge from the classifier is recycled constantly to the mill feed. **c-series**® units can also be used independently where a customer simply wishes to separate one material into a fine and coarse fraction, both of which may be applicable products, or can be supplied singly where classification is the main unit operation e.g. where a mill is in operation but finer products are required.

## Economic, low energy design

The versatile range of **c-series**® classifiers are designed to maximise separation efficiency without compromising system energy requirements. The classifier body and wheel are aerodynamically formed to reduce system pressure drop, keeping power demand of the system fan at an optimum level. Additionally **c-series**® classifiers have no secondary airflow requirement which increases power consumption affecting efficiency in other designs.

## Safe low dust solution for Explodable Products

For safe processing of explodable materials the **c-series**® design minimises fine powder accumulation areas, with gradual, steeper angles in dimensional transitions. This makes it easier to extend manufacture into the area of 10bar explosion pressure shock resistance by strengthening the walls of the unit.

## Wear protection for low maintenance

As the **m-series**® mill has been designed to mill abrasive products, the **c-series**® classifier wheel blades, are made from specially hardened steel to reduce attrition.



IIT also manufacture high efficiency **m-series**® mills and cyclones

**c-series**®

m-series® and c-series® are based in Gateshead as part of the Product Development Centre of International Innovative Technologies Ltd (IIT Ltd).

Unit 5 Queens Court  
Third Avenue  
Team Valley Trading Estate  
Gateshead  
NE11 0BU

T 0191 491 3136  
F 0191 487 4409  
E [enquiries@iituk.com](mailto:enquiries@iituk.com)  
W [www.iituk.com](http://www.iituk.com)



### CE

All c-series classifiers carry a CE mark and have been assessed by an independent Notified Body to ensure compliance with all relevant EU legislation including the Supply of Machinery (Safety) Regulations.

### ATEX

Where materials which have the potential to combust or explode are to be processed, ATEX rated models of the c-series classifier are available.