

**Air Classifiers**

Accurate fines control for  
engineered sands





Quality specification engineered sands from crushed rock

# Evolving dry sand solutions

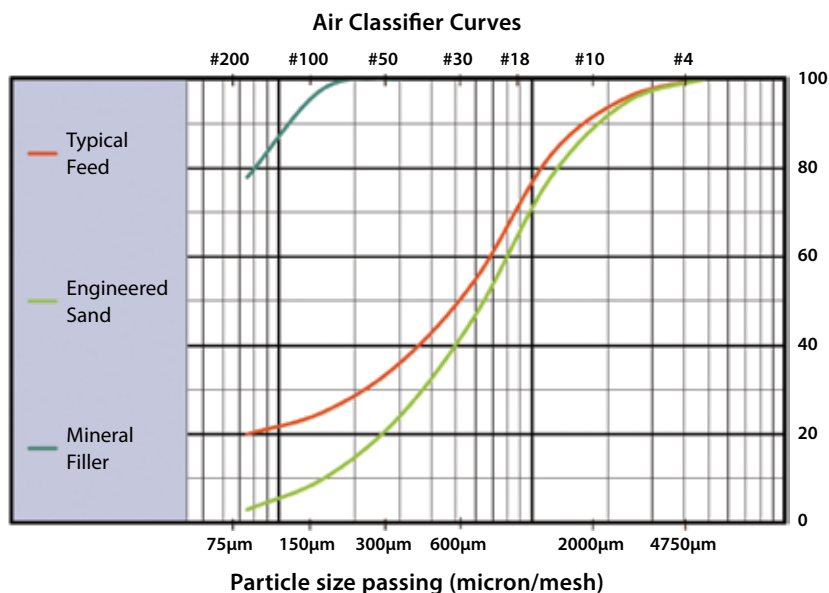
Global growth equates to increased demand for dwindling natural sand resources. In many regions, the availability of natural sand is further impacted by a combination of increased environmental awareness, along with higher demand for land in sand-producing areas.

## Engineered sand solution

Metso Air Classifiers give operators the ability to add significant value to the normally low value crushed rock fines by removing ultrafines to produce specification manufactured sand. This technology gives quarries the ability to produce dry engineered sand to a quality level that can meet the exacting requirements for both concrete and asphalt sands.

## Focus on the environment and the future

As cities grow, the availability of natural sand sites becomes limited and the public and governmental resistance to developing these new locations increases.



## Engineered sand advantages

- Quarries tend to be closer to their markets
- Quarries have significantly longer lifecycles
- Crushed stone is free from clays that must be washed and disposed of
- Engineered sands are free from natural gradation fluctuations



- Cut point and retained ultrafines are fine-tuned to meet specifications
- Separation requirements normally at 63µm, 75µm or 150µm (#230, #200 or #100)
- Suitable for EN, ASTM, GOST, IS, JS and GB specifications
- Amount of ultrafines retained in the product is adjustable and normally in the range of 3% to 10%

# Classifying to specification

## Fine tuning your engineered sands

The Metso Air Classifier has the ability to adjust the amount of ultrafines in the end product to meet the full range of sand requirements and regional specifications from anywhere in the world. The Metso Air Classifier is capable of processing asphalt, concrete, foundry, plaster and blasting sand.

### Asphalt Sands

Manufactured asphalt sand is typically produced from crushed 0/5mm (#4) with the 75µm (#200) reduced to meet product specifications. This process is normally performed on the crushed by-product from the normal crushing and screening process which is fed directly to the Air Classifier. The Air Classifier removes only the excess superfine material so that the asphalt sand meets specification. The engineered asphalt sand will have a very low moisture content which offers significant fuel savings over washed sands that need to be dried as part of the process.

### Concrete Sands

Engineered concrete sands are normally produced from aggregate feeds in the region of 0/5mm (#4) to 0/2mm (#10) and separations are normally at 150µm, 75µm or 63µm (#100, #200 or #230). Operated correctly, the classifier will ensure high quality, stable, consistent specification engineered concrete sand. As the product is consistent, savings are often possible as less cement is required to give the safety factor that is needed with natural sands.

### Mineral Filler

Dry mineral filler is produced as a by-product of the classification of engineered sands. This is the fine material that has been removed to achieve the sand specification and is collected from the dust collector. When this product meets local specifications, it is sold as an additive for bituminous paving mixtures, agricultural lime and other manufacturing processes.

## Model range - sand solutions

Air Classifier	Feed	Air Volume		Power	
		tph	m <sup>3</sup> /s	cfm	KW
AC22.5GI	50	5.7	12,000	60	80
AC27GI	75	6.8	14,400	77	105
AC30GI	85	7.5	16,000	77	105
AC22.5GI - Dual	100	11.3	24,000	114	155
AC27GI - Dual	150	13.6	28,800	152	207
AC30GI - Dual	175	15.1	32,000	152	207
AC27GI - Quad	300	27.2	57,600	240	325

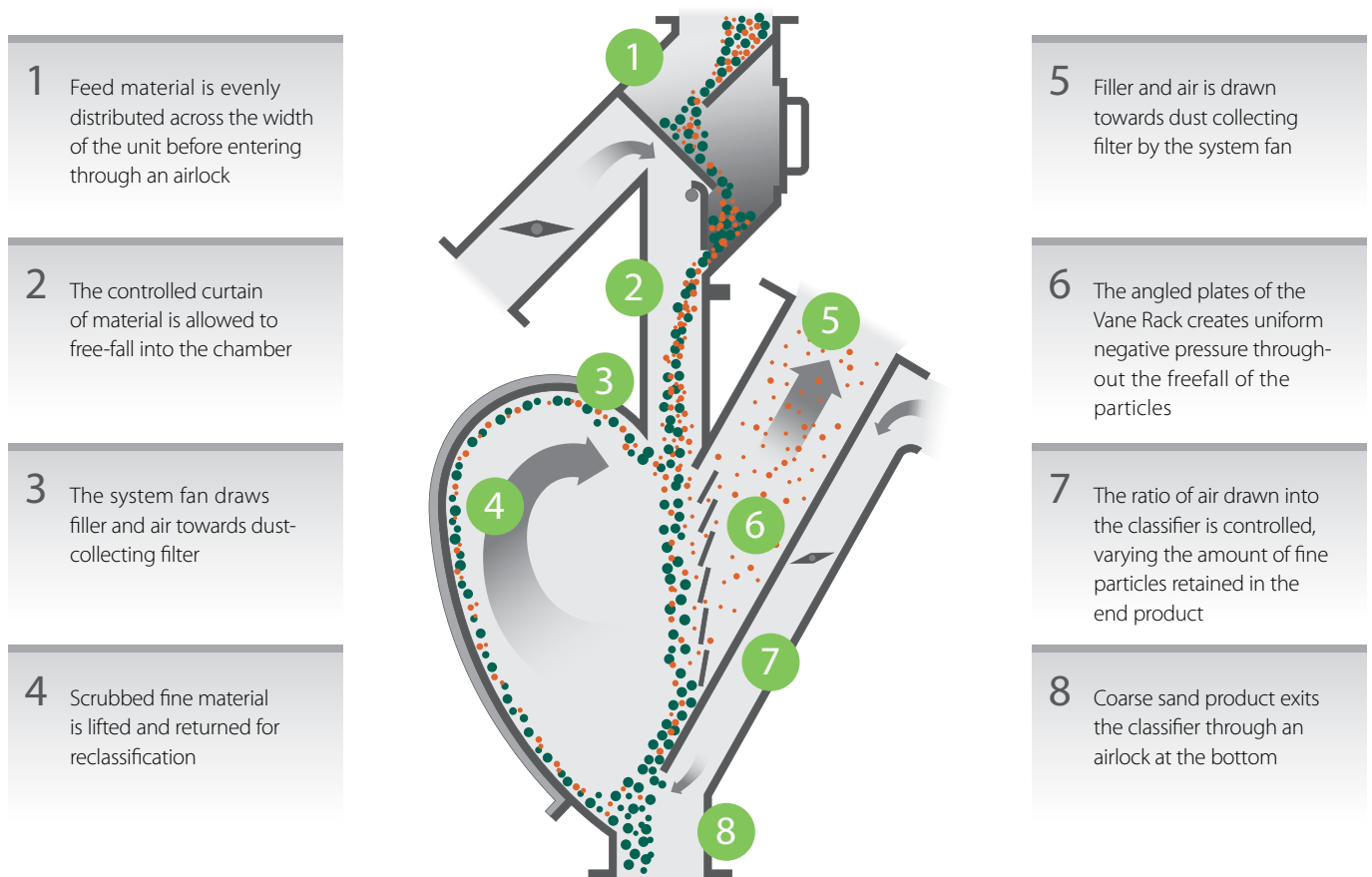




# Simplicity by design

## Efficient operation, accurate separation, no moving parts

The Metso Gravitational Inertial (GI) Classifier is a highly versatile classifier with multiple applications in construction, mining, and industrial mineral sectors. The GI Classifier achieves high degrees of accuracy for separations from 300µm to 63µm (#50 to #230), making it ideal for precise engineered sand applications.





# Control cost and accuracy

## Low operating cost and long life

The secret to the low operating costs of the Metso Air Classifier stems from its intelligent design. It eliminates the need for moving parts and reduces power draw by effectively utilizing the air movement.

## No Moving Parts

The Metso Air Classifier contains no moving wear parts. Unlike competitor air classifiers, the only purpose of the wear liners is to protect the classifier body so no adjustment for wear is required as all the work is done by the air. Other classifiers require their customers to make frequent adjustments when classifying abrasive material to try and maintain product specifications. The intelligent static design of the Metso Air Classifier translates to low total power draw, minimal maintenance and low operating costs.

## Extremely Low Maintenance

All internal surfaces exposed to wear are protected by ceramic tiles which give exceptional wear properties, even in highly abrasive applications. Most of the ceramic tiles will last the life of the classifier with high wear area tiles only being replaced after 4–7 years.

The only other wear part in the classifier is the abrasion resistant steel “vane rack”. It is designed to give consistent draft to ensure accurate separations. The vane rack assembly is an easy to change cartridge that is hard wearing typically lasting 8–18 months dependant on feed.

## Easily fine-tune end products

- By controlling the primary to secondary air ratio along with the total airflow, both the separation size and accuracy can be fine-tuned to meet application requirements.
- Adjusting the ratio of primary to secondary air controls the amount of ultrafines in the end product.



View inside the door of a 17-year-old GI Classifier, which is operating in an abrasive, high-tonnage application. Nearly all of these ceramic tiles are still original.

# Engineered sand benefits

## Quality end products

- **High-value product**
  - Consistent, monitored, quality sand
  - Contains no impurities (e.g., clay, salt)
- **Highly efficient air classification technology**
  - Produces accurate product to spec
  - Minimizes waste handling
- **Highly adjustable separation**
  - Accurate fine-tuning
  - Easily meet changes to specification
- **Sharp separation for mineral filler by-product**
  - All products of classification can be sold
  - Mineral fillers can be high-end products

## Reduced environmental impact

- **No need for water**
  - No wastewater discharge into rivers
  - No consumption of water resources
- **No transportation of natural sand**
  - Significant CO<sub>2</sub>, dust and noise reduction
  - Large savings in transportation costs
- **Utilize nearly all rock from quarry**
  - Everything blasted is sold
  - Mineral filler by-product can be profitable
- **More eco-friendly**
  - By-product of quarrying
  - Much lower environmental impact than sand mining

## Dry process

- **Accurate moisture control in products**
  - Offers further moisture control for downstream processes
- **Lower transportation costs**
  - Little or no moisture in end product
  - No money wasted on moving wet materials
- **Dry asphalt sand**
  - No need to boil off water (as with natural sands) – creates large energy savings
- **Dry mineral filler**
  - No wet sludge, which requires dewatering and disposal
  - Dry mineral filler can be sold

## Low operational cost

- **Ceramic lining**
  - Makes extremely abrasive rocks and mineral separation viable
- **No moving parts**
  - Only the particles and air move
  - No wear compensation required
- **Extremely low maintenance**
  - Relining intervals typically more than five years
  - 8–18 month replacement intervals for vane rack (abrasive applications)
- **Simple maintenance**
  - Easy to adjust and maintain



All of this is backed by Metso's extensive crushing and screening expertise, providing a complete engineered sand solution.





**Expect results**

It is our promise  
to our customers and  
the essence of our strategy.

It is the attitude  
we share globally;  
our business is to deliver  
results to our customers,  
to help them reach  
their goals.

