

Metso:Outotec

Air classification technology

Gravitational inertial air classifiers

Precise dry
classification for
ultrafines in
manufactured
sands



Manufactured sand - the ideal ingredient for concrete

Sand is a key ingredient in concrete and asphalt, and has traditionally been obtained from natural sources; however, this is becoming increasingly difficult as environmental regulations catch up with public opinion and environmental concerns. Around the world, new regulations are being put in place to protect sources of natural sand, and in many cases sourcing sand from river banks and shorelines has been banned completely. As a result, manufactured sand is becoming a viable alternative for new construction.

Metso Outotec offers a complete industrial process and full equipment range for producing manufactured sand.

One of the key benefits of the Metso Outotec process is precise control and classification of different grades of sand, enabled by automation and deep integration between the various crushing and separation stages.

Screens separate out oversized aggregate fractions and return them to the crushers. Screening is then followed by the final and most critical stage in terms of controlling the continuous grading: classifying the material flow's different fractions with an accuracy of microns with gravitational inertial classifier. The end result is sand with optimized gradation and particle moisture.



A full scale industrial process



Feed

In crushed aggregates production, up to 30% (rock dependent) of materials acquired from the bedrock are reduced to sizes smaller than 4 mm, meaning they end up as waste. These waste stockpiles are a perfect feed material for manufactured sand production.



Crushing & screening

Efficient crushing and screening produces high-quality manufactured sand with uniform consistency and precise shaping and gradation based on customer specifications.



Air classification

Dry classification with a gravitational inertial classifier reduces the amount of dust and superfines in the manufactured sand, which helps to meet strict specifications and improve end-product quality.

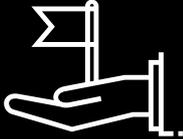


Sand

The final result is manufactured sand that is superior in quality to natural sand, giving you great returns on a raw material that was previously problem waste taking up space at your quarry site.



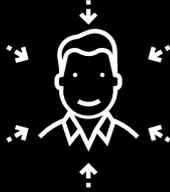
Metso Quad AC27 with dust collection system integrated in a complete Metso Outotec plant.



Ideal for classifying manufactured sand



Highly accurate separation from 300 μm to 63 μm



Tailored to meet your needs

The most efficient way to achieve ultrafine separation

Metso Outotec Gravitational Inertial Air Classifiers feature a unique chamber and airflow design to ensure precise separation of ultrafines from sand and ceramic liners to prevent wear.

Our solution achieves an extremely accurate separation and moisture rate without the need for moving elements in the airflow. It does this by using a secondary recirculating airflow.

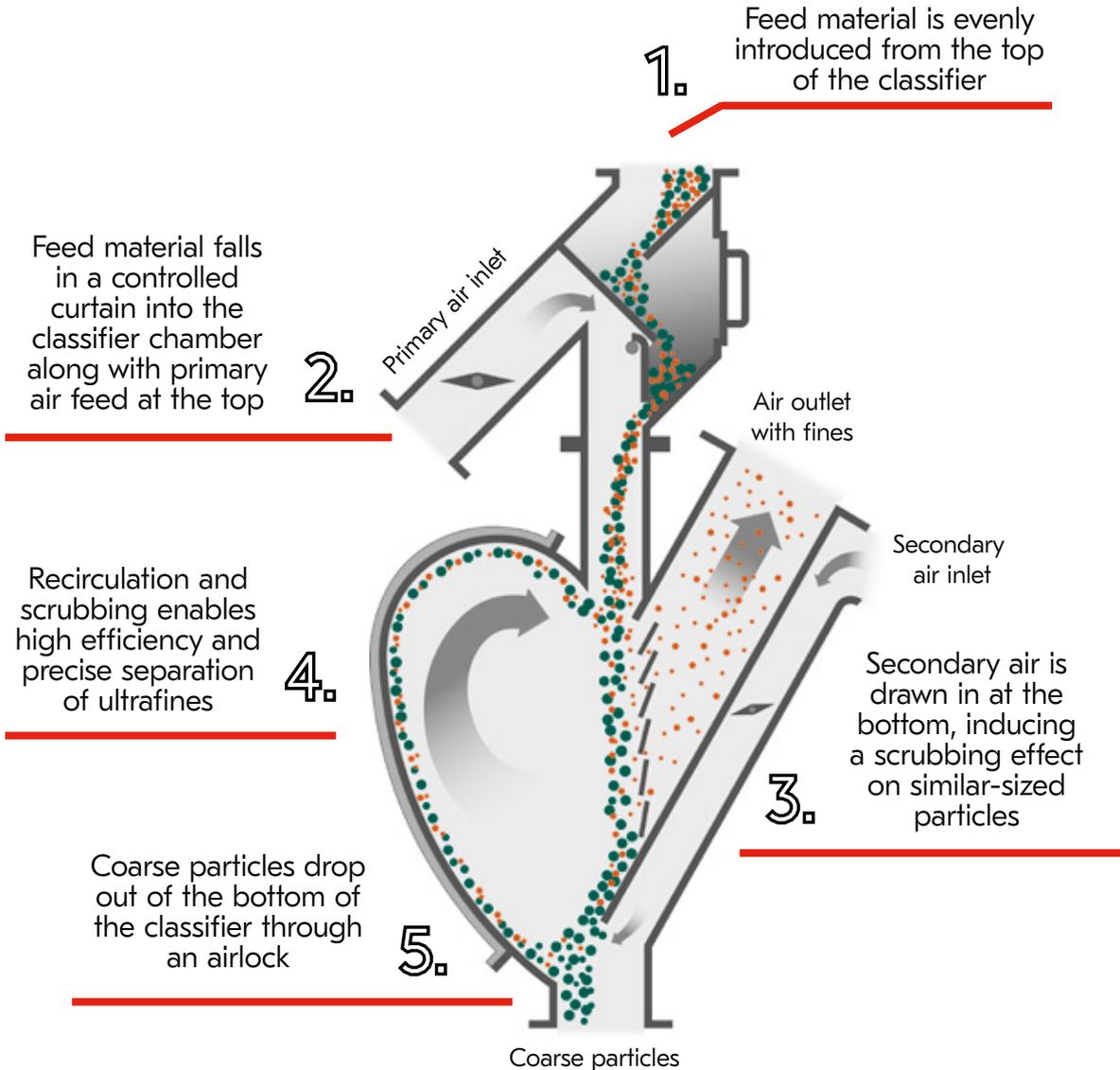
Because the airflows are not affected by wear, the grading remains consistent to an accuracy of microns.

At the same time, particle moisture remains at an optimal level.

As the process uses no water it is both economical and environmentally friendly, as well as being ideal for cold climates.



How does it work?



Gravitational Inertial Air Classifier models

Model	Capacity (MTPH)	Air volume (CMH)	Weight (kg)
AC22.5*	45	20,400	12,856
AC27	54	24,500	13,858
AC30	61	27,200	15,932
AC36*	73	32,620	22,120
Dual AC22.5*	90	40,800	22,120
Dual AC27	108	48,900	24,252
Dual AC30	122	54,400	39,200
Dual AC36*	146	64,240	51,000
Quad AC27*	216	97,900	59,595

Available options for all models include an electrical package, VSD on fan, extraction solution, and mobile installation

*Available as made-to-order models. Please contact Metso Outotec representative for detailed information.

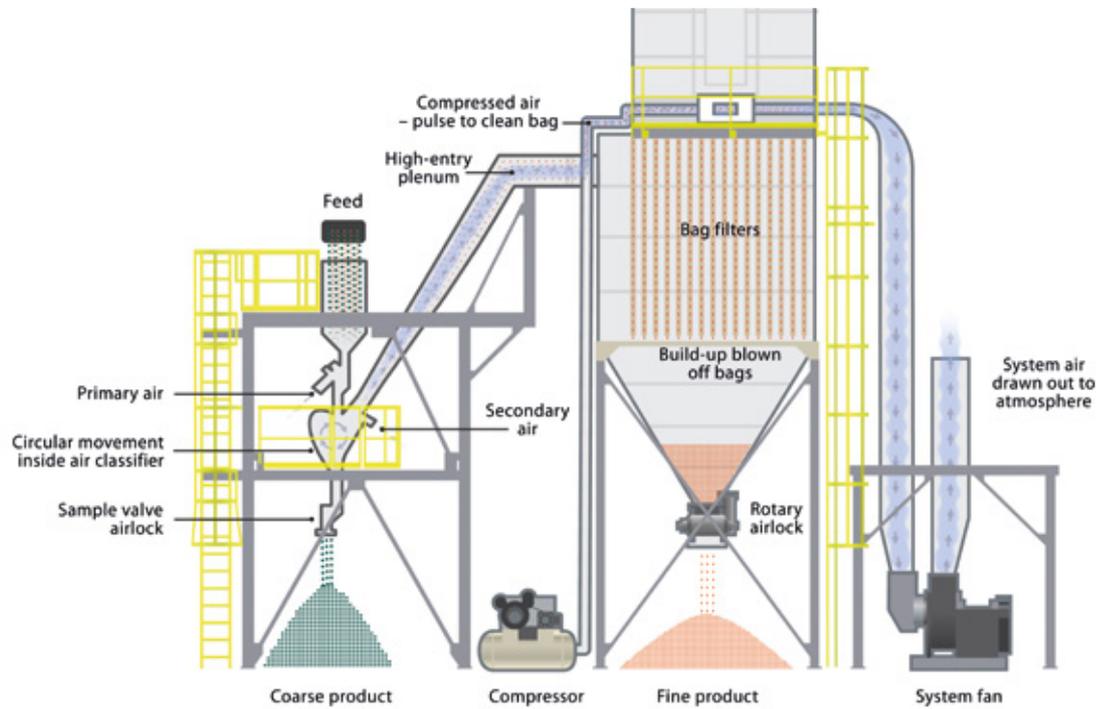


Scan the code and see it in action!

A complete solution

In precise dry classification of different fractions of sand, a complete solution for separation and dust collection is needed.

The system consists of an air classifier and dust collector system with a fan, a compressor, airlock, and piping. We can provide a complete system with all equipment and steel structures, or individual equipment as needed. Each system is designed according to customer need and the requirements of local safety and environmental regulations.



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and see it in
action!



Lab verified performance

Metso Outotec conducts lab tests with the customer's feed material for a best equipment recommendation. We have laboratories in the USA, Finland, and Brazil.



Low operating costs with minimal wear

Ceramic liners that last for years

Highly durable ceramic tiles are used to protect the classifier's body. The tiles need to be replaced every four to seven years, which is double the two to three year replacement interval of hard-rock liners. Because our solution has no moving parts in the material airflow stream it provides highly effective protection against wear. Ceramic tiles are suitable for all types of feed material: abrasive, hard, and soft rock.

Easy to adjust

The amount of ultrafines in the end product is adjusted by changing the total airflow, and by changing the ratio of primary and secondary airflows. With the right combination both separation size and accuracy can be fine-tuned to meet application requirements.



Ceramic liners after 4 years
of usage



Ceramic liners after 7 years
of usage



Metso Outotec solution:

Sand manufacturing process that uses fractionizing of fine sands and dry air classifying

Results:

- Superior particle shape, consistent gradation, and the flexibility to balance the sand mix according to customer needs
- Local cement producers have achieved cement savings of up to 10–15%



“With manufactured sand, it’s all about consistent moisture, gradation, and shape. After a lot of testing, we can now say with confidence that Velde Pukk can accurately achieve the gradation that our customers require for their asphalt and concrete production.”

- Egil Velde, Managing Director Velde Pukk, Norway



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