

Raymond[®] Mechanical Air Separator Produces materials with high fineness

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- Operates in open or closes circuit
- Excellent for de-dusting
- Provides drying and cooling
- Built in 11 sizes

Raymond[®] Mechanical Air Separators produce material with high uniform fineness, operate in open or closed circuit and are excellent for de-dusting. They can provide drying and cooling more efficiently and feature the unique single or double whizzer for separation of fines and more positive rejection of oversize.

Built in eleven sizes ranging from 4-24ft / 1.21-7.31m in diameter, as well as a 30in / 762mm unit for small capacities and test runs. Each size is available in single or double whizzer configuration.

Single whizzer separator

Single whizzer separators have one row or bank of whizzer blades to set up centrifugal action. These units are ordinarily used for coarser separations up to approximately 85 to 90% passing 200 mesh (10-15% R74 microns) which is excellent for de-dusting and raw mix cement operations.



Double whizzer separator

Double whizzer separators have two rows or banks of whizzer blades. In normal operations they can produce finished materials up to 99 to 99.5% passing 324 mesh (0.5-1% R44 microns) and in finished cement circuits 2800 to 6000 Blaine or masonary cements.

Experience

Raymond[®] pulverizing and classification equipment has been setting the standard in size reduction since 1887, serving many types of mineral processing industries. Our portfolio includes not only the Raymond[®] Mechanical Air Separator, but the Raymond[®] Jet-Stream Classifier, Raymond[®] Turbine Classifier for Roller Mills and the Raymond[®] Hybrid Classifier for Bowl Mills.



Raymond[®] is known for its reliable size reduction and classification equipment by customers worldwide. Our products are supported by our engineering and field service departments to ensure the highest level of customer satisfaction, while delivering the reliability and high level of performance that today's industrial applications require.

Mechanical air separator operation cycle

Material enters the center feed pipe at the top of the separator and drops onto the rotating distributor plate below. The distributor plate disperses the material into the upward stream of circulating air that is created by the fan in the top chamber of the drum. The whizzer blades create a centrifugal motion of the air and material. This concentrates the oversize material along the surface of the upper inner cone which flows out the coarse tails spout at the bottom. The airstream carrying the powdered material of required fineness moves through the fan and is delivered into the outer cone chamber where the fines are released into the outer cone, the air returns through the deflector ports to the inner cone, setting up a continuous circuit.

De-dusting

In addition to accomplishing faster separation of the fines and more positive rejection of the oversize, the whizzer action is also useful in de-dusting operations, making granular products by removing objectionable fines.

Fineness control

Both the single and double whizzer in 4-6ft / 1.2-1.8m diameter sizes are equipped with vertical slide dampers that allow external fineness adjustment while the unit is in operation. For precise fineness control, all units 8ft / 2.4m diameter and larger are provided with special vertical swing dampers to increase their efficiency and versatility when separating in the minus 35 mesh and subsieve size range. On many materials, finished products with a high percentage passing 15 to 20 microns can be obtained without difficulty.

Size	Approx. Weight	Height – H	Height – h	Diameter - D
30in/.76mm	950lb/400kg	5.2ft/1.6m	1.5ft/0.45m	3.2ft/0.97m
4ft/1.2m	2000lb/900kg	8.0ft/2.4m	4.3ft/1.3m	5.0ft/1.5m
6ft/1.8m	4000lb/1800kg	11.0ft/3.4m	5.8ft/1.8m	7.1ft/2.1m
8ft/2.4m	8000lb/3600kg	14.3ft/4.4m	7.7ft/2.3m	9.7ft/2.9m
10ft/3.0m	11500lb/5200kg	16.8ft/5.1m	8.5ft/2.6m	11.7ft/3.5m
12ft/3.7m	22500lb/10200kg	19.7ft/6.0m	9.7ft/2.9m	14.2ft/4.3m
14ft/4.3m	28500lb/12900kg	22.1ft/6.7m	10.3ft/3.1m	16.0ft/4.8m
16ft/4.9m	39300lb/17800kg	25.5ft/7.8m	12.1ft/3.7m	17.8ft/5.4m
18ft/5.5m	44800lb/20300kg	27.1ft/8.3m	11.9ft/3.6m	20.8ft/6.3m
21ft/6.4m	69400lb/31400kg	29.3ft/8.9m	14.9ft/4.5m	24.0ft/7.3m
24ft/7.3m	90000 lb/40800kg	37.3ft/11.4m	17.2ft/5.2m	27.0ft/8.2m





Construction and specification

Standard contruction includes cast, abrasion resistant whizzer cones and replaceable steel plate liners on the inner cone.

The distribution plate is protected with special liners along the outer edge with a cone at the center to provide further protection and insure even flow of the incoming material off the distributor plate at the start of classification.

Separators for handling abrasive materials can be equipped with special abrasion resistant liners in all parts of the machine.

All Raymond[®] mechanical air separators are provided with vent connection in the cone section as standard equipment for removing infiltrating air and keeping the unit under negative pressure for dust free operation.

The 4ft / 1.2m and 6ft / 1.8m diameter mechanical air separators are built on the same principle as the larger units but are arranged with a vertical motor drive. This eliminates the need for a gear and pinion.



Typical applications

- Cement for closed circuit grinding to classify and dry raw mix, and to classify and cool finish cement.
- Limestone produces limestone sand to meet the specifications required for use in bituminous concrete, mortor, aggregate and many similar uses.
- Flour mixes makes fine, uniform cake mixes for the production of protien enriched grade flour.
- Hydrated lime produces a high-fineness, uniformly classified hydrated lime for chemical and spray purposes.
- Food products classifies various food products including sugar, cocoa, milk powder, food mixtures, corn starch, wheat starch and soybean meal.
- Chemicals makes various grades ranging from extremely fine to the granular, dust-free gradations, such as soda ash and sodium phosphate.
- Talc and clays beneficiates materials such as talc, kaolin, clays and phophate rock by removing such impurities as silica, flint and other foreign materials.
- Metal and metallurgical powders classifies metal powders such as copper, bronze, iron and various alloys. De-dusting of sea-coal for foundry facing is another typical applications.



Closed circuit grinding

When operated in closed circuit in combination with a pulverizer, the separator skims off the fines as fast as they are made so the mill works only on fresh material without wasting power. The coarse tailings are dischared back to the mill for further reduction. The reground material is returned to the separator with the feed, so that a constant circulating load is set up between the mill and the separator. It saves power in the overall operation and increases the capacity of the complete unit.

The separator may be used in combination with ball mills, tube mills, and compartment mills. Its function is to maintain a constant fineness in the finished product.



Schenck Process LLC 2151 Fisher Drive Naperville, IL 60563 USA T +1 (630) 393-1000 F +1 (630) 393-1001 <u>RBS@schenckprocess.com</u> www.schenckprocess.com/rbs



www.schenckprocess.com/contact

Advantages

The advantages of using a mechanical air separator in closed circuit with a grinding mill for producing closely sized finished products include:

- Positive control of fineness and the elimination of oversized particles.
- Convenient variation of product fineness. Vertical dampers permit wide range changes in fineness, externally while the separator is in operation.
- Increase in the output capacity of the grinding mill. Experience has shown increase from 25 to 75% or more.
- Lowering the temperature of the mill and product.
- Improvement in grinding efficiency, as in the case of ball mills where ball coating with fine materials can reduce grinding ball effectiveness.

Internal air flow system for cooling and drying

Effective drying within the separator is normally limited to those installations where the separator is used in closed circuit with the grinding unit. The oversize particles with entrained moisture, rejected in the first pass as coarse, are further reduced in the grinding mill to permit efficient drying in the second pass through the system.

Both the single and double whizzer units can be provided with cooling and drying auxiliaries which consist of up to four inlet openings in the drum section and two air outlets in the cone section. Water jackets can also be provided on the cone sections for use in cooling finished cement on sizes 18ft / 5.4m to 24ft / 7.3m diameter.

Open Circuit

In some cases, it is convenient to install a separator independently from the mill to make both fine and coarse product simultaneously.