PROCESS TECHNOLOGIES FOR TOMORROW SM

Hosokawa Alpine is a member of the Hosokawa Micron Group, responding to global needs through emphasis on materials science and engineering. The Group is an international provider of equipment and technology for powder and particle processing, plastics processing and confectionery products. The Group maintains facilities for research, engineering, manufacturing and service in each of the world's major industrial markets.

PRINCIPLE OF OPERATION

Table roller mills operate in accordance with the principle of pressure comminution, making them suitable for brittle feed products. The product is subjected to compressive stress between the grinding table and the grinding rollers. The specific grinding force (contact force divided by the cross-sectional area of the grinding roller) is adjusted according to material properties in the range between approx. 0.5 and 1 N/mm², whereby the effective pressures in the material bed are naturally much higher.

The grinding table is set into rotation by a motor and suitable gear unit, whereby peripheral speeds of between 2 and 6 m/s are employed. Because the gear unit has to absorb the forces of the grinding rollers, it is equipped with an axial friction bearing (segmented bearing). The product is fed to the centre of the grinding table where centrifugal force conveys it across the grinding table to the periphery. The grinding rollers roll over the product repeatedly during this time and crush it. The grinding rollers are pressed hydraulically against the grinding table, whereby fluctuations in the hydraulic pressure that occur in operation are buffered by the hydraulic gas accumulator charged with compressed air. The grinding table is equipped with a weir at its edge; the height of the weir can be chosen to set the residence time of the product in the grinding zone.

A nozzle ring is located around the grinding table from which the incoming air exits at high speed. The comminuted product is conveyed upwards to the integrated air classifier; the rejected coarse material is returned to the grinding table for further comminution. The end product is separated from the air in a downstream collection unit.

FEATURES

A fundamental feature of Alpine's table roller mill is the optimised kinematics of the grinding rollers and grinding table to permit the production of large amounts of fines. In combination with a Turboplex ultrafine classifier ATP, this now makes it possible to manufacture end products with a fineness of d97 = 10 µm.

- Three grinding rollers, each with two hydraulic cylinders to generate the requisite compressive force
- Rollers can be hinged out of the machine hydraulically for maintenance.
- Wear parts are easy to exchange.
- Compact design
- High quality gear units from renown manufacturers.
- Highly wear-resistant construction materials for grinding table and grinding roller jacket are standard.
- Low specific grinding energy.
- Integrated air classifier with sharp top-size limitation; selection of classifier to suit the desired end-product fineness.
- Fineness range between d97 = 10 µm and approx. 200 µm
- Mill drive with frequency converter to permit optimum adaptation of the mill to a wide range of particle sizes.
- Mill control by means of the drive power or differential pressure monitoring.
- Option: hardfaced plates as wear protection in the mill and classifier housing.
- Option: design for hot-gas operation to dry the product.
- Option: discharge of coarse material via a discharge screw.
applications.

- Sharp top-size limitation of the products
- Low energy consumption
- High throughput
- Compact design

Typical ALPINE table roller mill characteristics include:

- Very flexible operation over a wide range of fineness (d97 = 10 - 150 µm)
- Easy change of product fineness
- Lower noise level
- Simple system set-up
- Smaller foundations

New developments in technology enabled us to
accomplish specifications in the mineral powder sector. Not only soft materials such as limestone and
talc, but also hard materials such as dolomite or phonolite etc. can be processed with the
AWM new developed AWM.

APPLICATIONS

AWM FLASH DRYING / GRINDING SYSTEM

Curve 1: Particle size distribution of limestone after processing with the 960 AWM.
Curve 2: Particle size distribution of dolomite after processing with the 1200 AWM.

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PLC technology allows fully automatic operation.

FILLING LEVEL CONTROL

1) As a function of the table motor as measured by the
2) As a function of the differential pressure of the material
3) A combination of the above two parameters.

The filling level of the Alpine table roller mill can be con-
trrolled based on these parameters.