

Vertical Mill Grinding Roller Grinding Process

Grinding roller of vertical mill advantages

Great Wall Steel Casting Company

Vertical mill grinding roller working process:

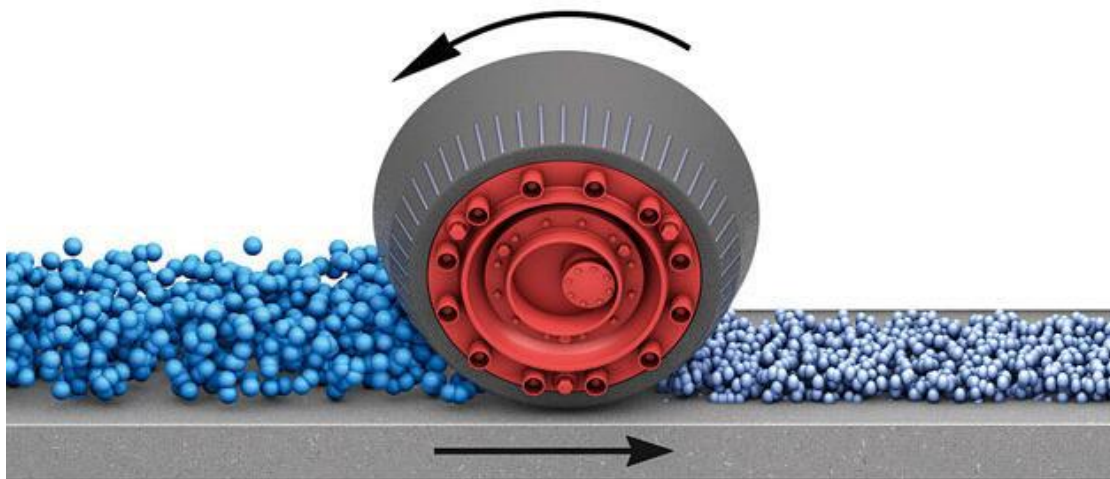
Over the last three decades the vertical roller mill has become the preferred mill for grinding of raw materials. The grinding efficiency of the vertical roller mill combined with an ability to dry, grind and classify within a single unit gives the vertical roller mill a decided advantage over a ball mill system. However, despite these benefits, applications of the vertical roller mill for cement grinding are less prevalent.

The grinding process in ball mills and vertical roller mills differ fundamentally. In a ball mill the comminution takes place by impact and attrition. The comminution in the vertical roller mill takes place by exposing a bed of material to a pressure sufficiently high to cause fracture of the individual particles in the bed, although the majority of the particles in the bed are considerably smaller than the thickness of the bed.

It is thus necessary that a stable and consistent grinding bed is formed between the rollers and the table of the vertical roller mill, able to sustain such a pressure without the material being squeezed away from the pressure zone.

A stable grinding bed is usually easily obtained in raw material grinding in a vertical roller mill with a high efficiency separator. However, in cement grinding it becomes more difficult to form a stable grinding bed as

- cement is ground much finer than raw meal
- the feed to a cement mill is often completely dry and is significantly more difficult to grind than raw materials
- requirements to the particle size distribution of the finished product are much more strict when grinding cement than when grinding raw materials

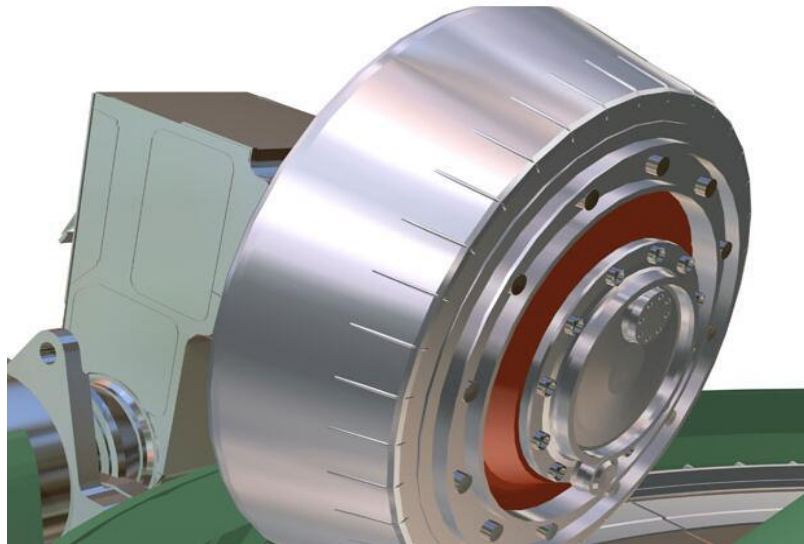


The special working and functional principles make every roller mill operate with a great flexibility.

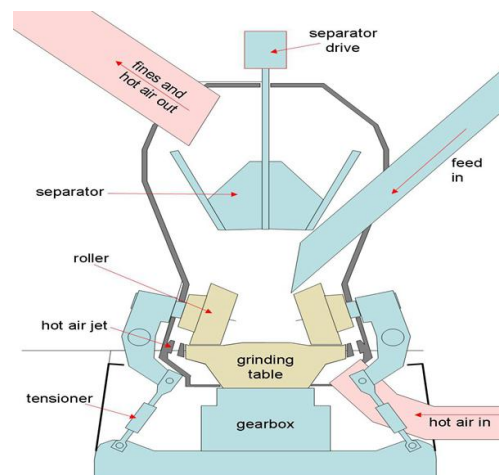
The material to be ground is crushed between the rotating grinding track and the individually guided grinding rollers. Grinding is carried out primarily through the application of compressive

force vertically, the secondary effect being the horizontal shear force.

These differences between cement grinding and grinding of raw materials made it a serious challenge to obtain a good performance of a vertical roller mill in cement grinding. Today, however, the GRMK has become an excellent example of a mill design that has overcome the difficult grinding conditions associated with finish grinding of cement clinker and related products.



Vertical roller mill working principle



This vertical cement mill is widely used in the grinding of cement raw meal, slag(GGBS plant), cement clinker, raw coal and other raw materials. It gathers grinding, drying and powder selecting as a whole, with high grinding efficiency and high drying capacity (the maximum handling material moisture is up to 20%). The vertical roller mill adopts dynamic powder selecting device, which comes with high powder-selecting efficiency and convenient adjustment of fineness. After crushed by crusher, the large materials become small ones and are sent to storage hopper by elevator, and then evenly sent to the upper distribution plate of the

turn plate by vibrating feeder and sloping feeding pipe. The grinding disc is driving by motor through reducer.

The material falls to grinding disc from the feed opening. The materials are driven to the edge of disc by the centrifugal force and crushed into fine powders by rollers. Then, the hot air from the nozzle take the fine powder to high efficiency classifier.

The qualified powder are taken by the air to the powder collector to be collected, while the unqualified powder are sent back for regrinding.

What are Great Wall grinding roller advantages?

- 1.Grinding rollers produced by Great Wall Casting have features of high hardness, good anti-cracking and strong wear-resistant capability.
- 2.During grinding roller production, technicians carry out finishing processing with arc air gouging, which can guarantee outlook quality of steel castings.
- 3.We promise that, all the grinding rollers shall be NDT inspected on the stress surface through routing testing methods to ensure that each grinding roller is qualified before leaving our factory. Any sub-standard product is forbidden to leave factory.

We can supply products with flow test report:

- ◆ Chemical composition report
- ◆ Tensile strength report
- ◆ Brinell hardness report
- ◆ Metallographic structure report
- ◆ Key dimension checking report
- ◆ Full dimension report
- ◆ Third part test report

Test report(For example):

Item	Unit	USA	Europe
Tensile strength	psi	>60000	>65000
	MPa	>414	>448
Yield strength	psi	>30000	>35000
	MPa	>207	>241
Elongation	%	>24,0	>35,0
Reduction of area	%	>35,0	>40,0

Technical parameters:

1. Material: GS 16Mn5 DIN 17182, Carbon steel, Carbon Steel, Alloy Steel, Heat Resistant Steel, Stainless Steel, High Manganese Steel, Copper alloy, Aluminum alloy, Hastelloy Alloy
2. Standard: AISI, ASTM, JIS, BS, DIN, ISO, EN
3. Surface treatment: Shot blasting, Polishing, Galvanizing, Chrome plating, Nickel plating, Passivation, Powder coating, Painting.
- 4.Technology: Arc furnace smelting; furan resin sand process, CNC machining center, etc. Slag pots are available with capacities of 30 - 1050 cubic feet. Finished weights range from 5 - 75 tons. Our slag pots are utilized in many applications including BOFs, AODs, Electric Arc and Blast Furnaces, and nonferrous refineries for the melting of magnesium and copper nickel smelting.Pots can be filled to capacity with up to 1649° C slag.