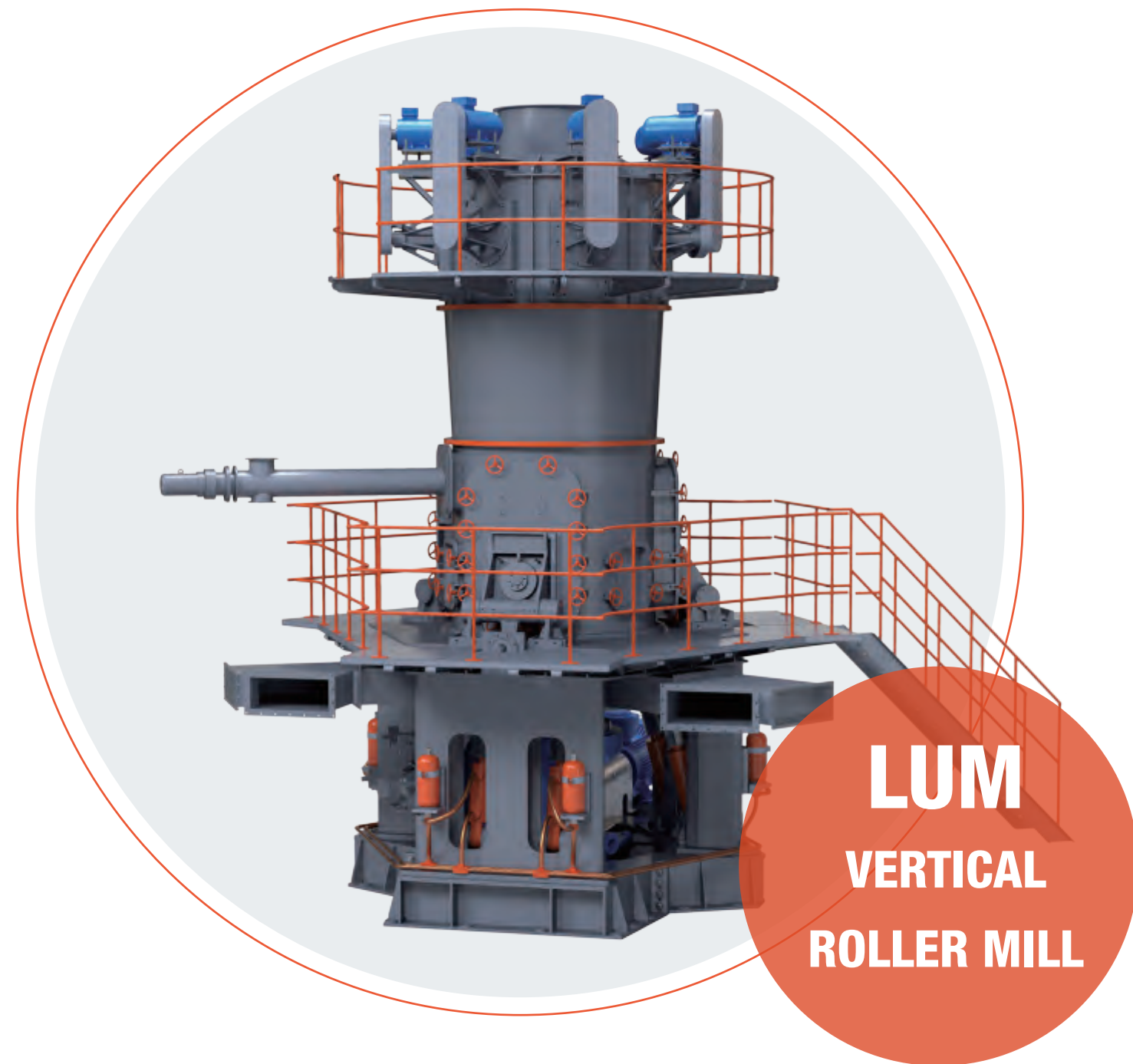


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**Shanghai Zenith Minerals Co., Ltd.**

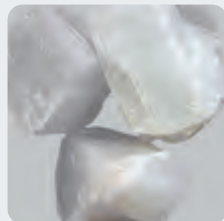
# LUM

## Series Vertical Roller Mill

### Brief introduction

LUM Series Ultrafine Vertical Mill is designed on the basic of years of mill production experience. It adopts the latest Taiwan grinding roller technology and German powder separating technology. The ultrafine vertical mill is a new kind of ultrafine grinding equipment that integrates ultrafine powder grinding, grading, collecting and transporting into one set.

As medium and high-end specified processing equipment in plastic master batches, PVC, artificial stone, electric cable non-woven fabrics and other industries, LUM Series Ultrafine Vertical Mill is mainly used for the ultrafine grinding for calcite, marble, limestone, talc, dolomite, barite, kaolin, wollastonite, gypsum, feldspar, pyrophyllite and other non-metallic mineral ores.



• calcite •



• limestone •



• talc •



• dolomite •



• barite •



• kaolin •



• wollastonite •



• feldspar •



• Pyrophyllite •



**Advantages**

01

**Final products has strong diversity and high added value**

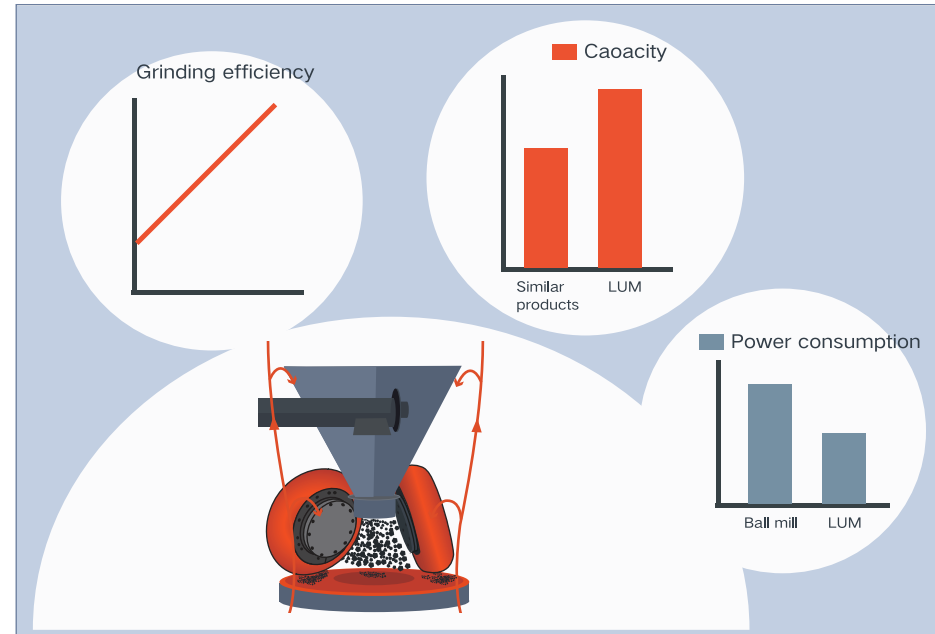
The main machine is equipped with high efficient multi-rotor powder concentrator, so that the final products have high wide particle size range. 2 $\mu$ m powder content can reach as high as 70%, D97=4—45 $\mu$ m, specific surface area 21000cm<sup>2</sup>/g. The powder discharge from main machine can reach to D97=8.5  $\mu$ m and the secondary classifying system can spate 4-5 $\mu$ m sized powder. The particle size distribution of finished powder is narrow, and the content of 2 $\mu$  m sized powder can be adjusted. And the finished powder has fine shape, making them has high added value.



02

**High efficiency, low power consumption**

The optimized roller, plate and inner airflow guidance design greatly improve the grinding efficiency. The capacity of LUM ultrafine roller mill is 30% higher than similar products and the power consumption is 30%-60% lower than ball mill.



03

**Intelligent control system with stable and efficient operation**

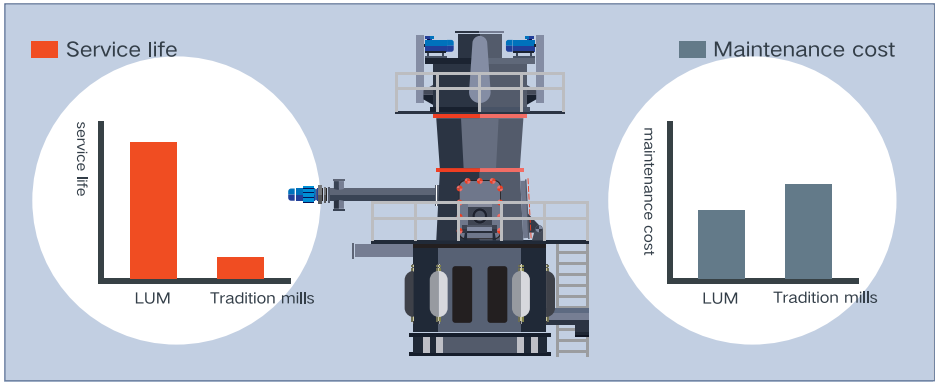
The internal part adopts PLC automatic control system, the external part adopts touch screen, displaying and adjusting the parameter in real time. The reserved modular interface has strong expansibility, which can realize the connection of front-end grinding aid adding system, back-end powder modification system and packaging system, ensuring the automatic control of the whole process.



04

**long service life, low maintenance cost**

The wear-resistant parts of main machine all adopt imported high wear-resistant material, which effectively prolong the service life of wear-resistant parts, reduce the iron content in the products and decrease the maintenance cost.



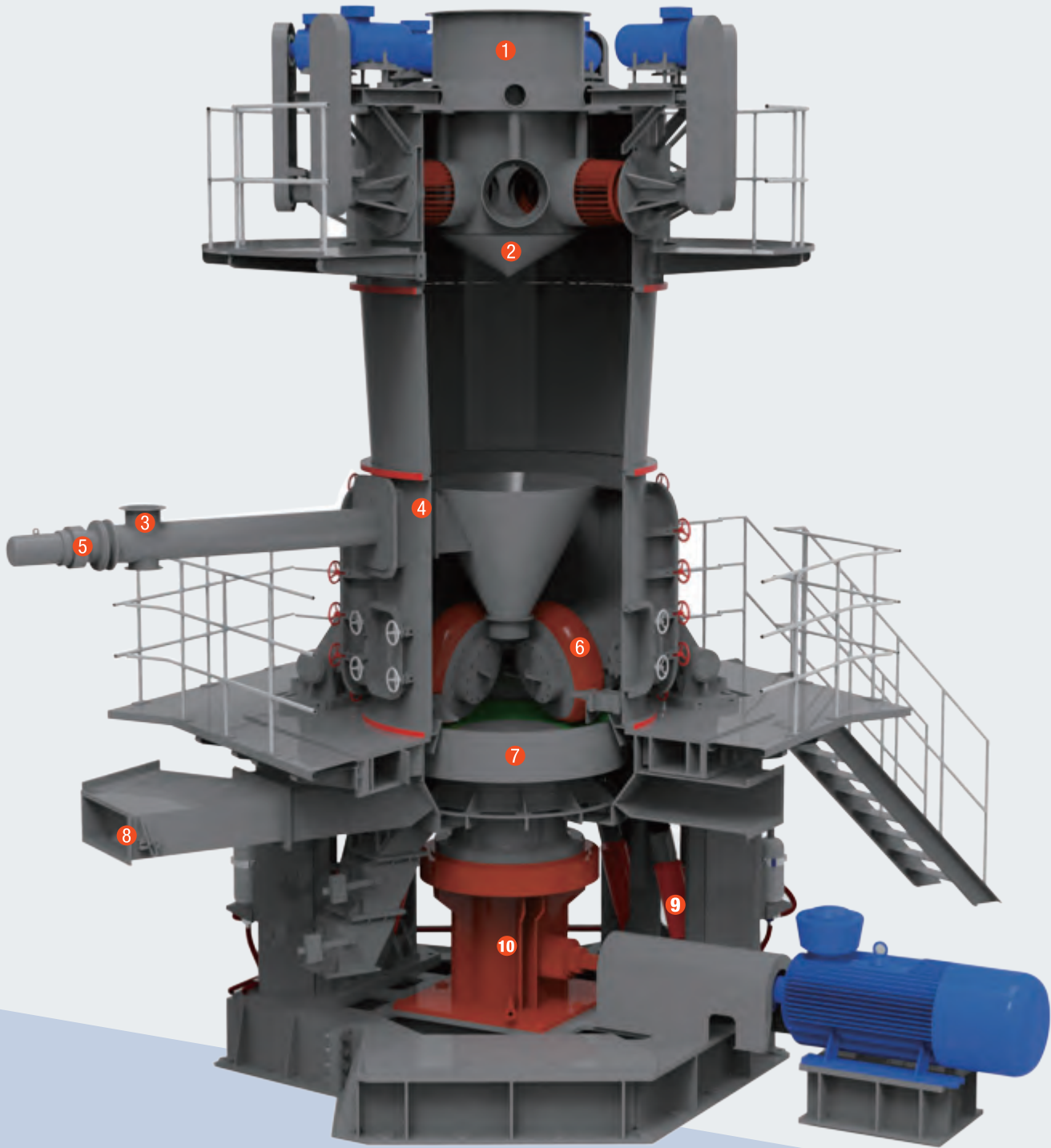
05

**Environmentally friendly**

With new structure design and grinding principle, LUM Series Ultrafine Vertical Mill has small vibration and low noise. The equipment is sealed as a whole and works under negative pressure. All the dust points are controlled by pulse dust filter, so there is no dust overflow, meeting the national environmental protection requirements.



Main unit structure



- 1

Finished-product  
Outlet
- 2

Classifier
- 3

Material Inlet
- 4

Intermediate  
Mill Body
- 5

Screw Conveyor
- 6

Grinding Roller  
Assembly
- 7

Grinding Plate  
Assembly
- 8

Air Inlet
- 9

Hydraulic Cylinder For  
For Operation
- 10

Motor and Reduction Gear

LUM Ultrafine Vertical Mill is mainly composed by motor, reducer, main unit, roller device, grinding disc device, pressure device, powder concentrator, lubrication station and hydraulic pressure station.



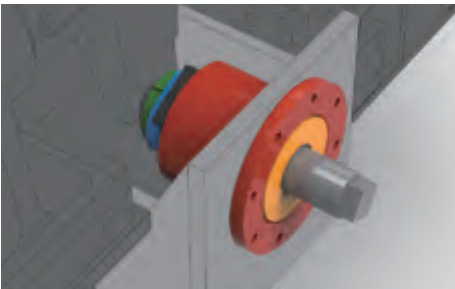
Roller and plate adopt imported high wear-resistant material, making them have long service life and low maintenance cost.



The grinding area between roller and plate adopts unique grinding curve, ensuring the stable operation and efficient grinding of the main machine.



Adopt hydraulic rod with adjustable elasticity coefficient to increase the pressure on the roller, ensuring the continuous grinding pressure on the raw material.



LUM Ultrafine Vertical Mill adopts mechanical position-limiting device, so that there is no contact point between grinding roller and plate, which can avoid the destructive impact caused by machine vibration.

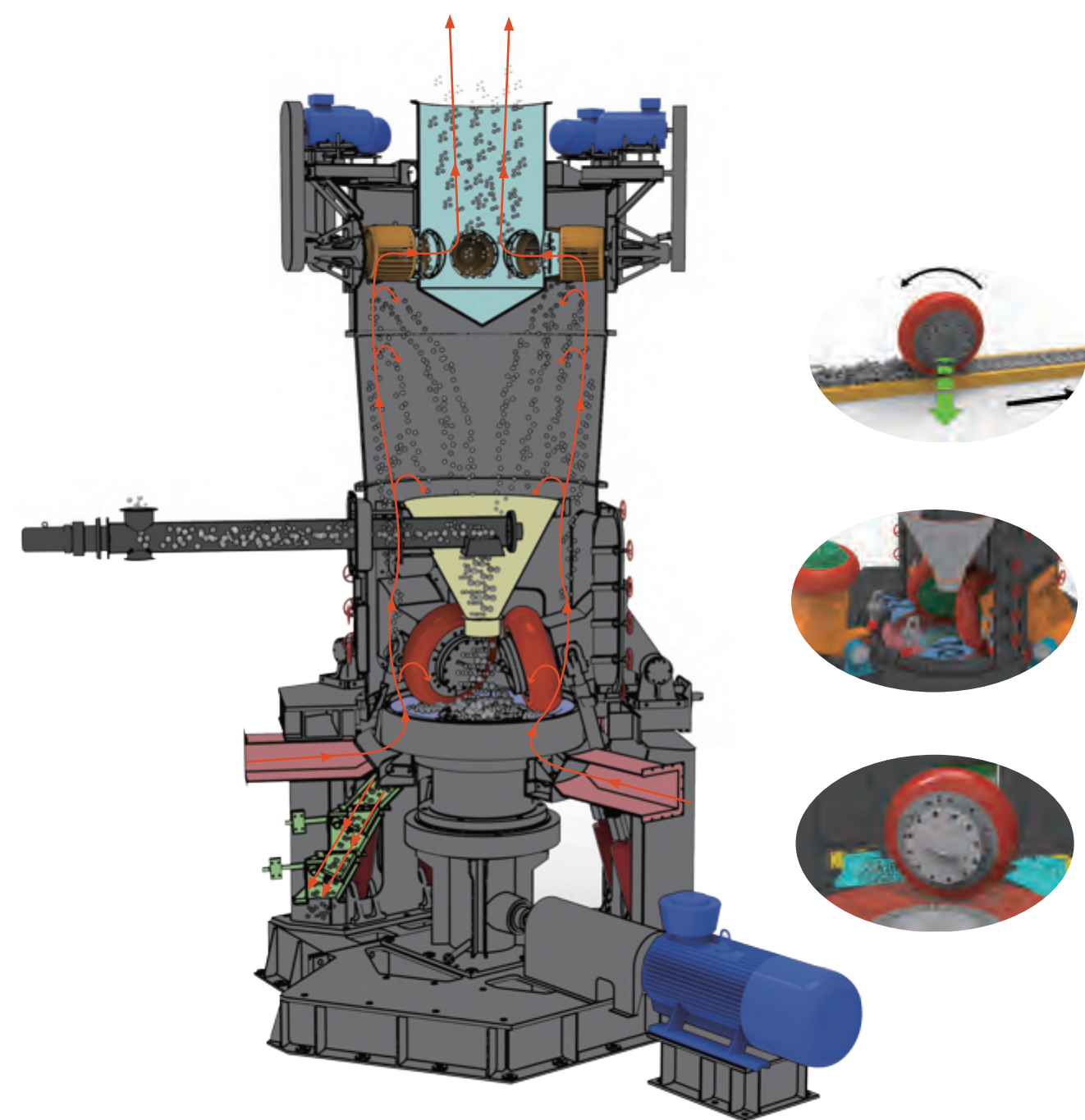


Multi-rotor cage-type powder concentrator has high efficiency and it's easy to adjust and control, achieving the fast switch of different production demands.



Main unit working principle

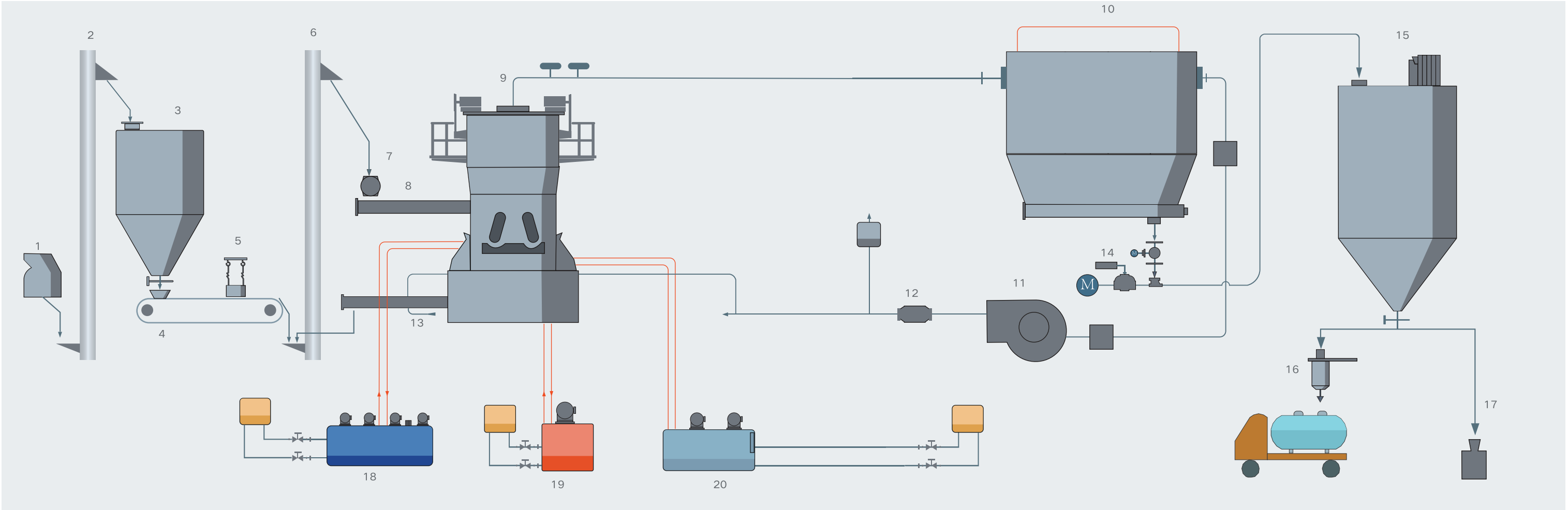
The millstone is driven by motor of main unit through reducer, after the calculation of belt scale, raw materials, through elevator, spiral conveyer, star-shaped feeding valve and feed screw, fall on the center of plate from feed opening and they move to the edge of plate under centrifugal force, while passing through the grinding area between roller and plate, raw materials will be pulverized by the pressure of roller and the shearing force between roller and millstone. Raw materials after grinding continue moving to the edge of millstone until they are brought into multi-rotor powder concentrator by the airflow at the edge of millstone from the high-pressure fan. Oversize powder falls on the plate for re-grinding while the ones meet production requirements enter the dust filter along with airflow, and then transported to product bin by elevator or pneumatic transport system.



Product comparison

Model and item		Final products performance	Equipment performance
Suspension roller mill		2μm powder content is above 6%. The fineness can reach to 45μm. Low-end finished powder.	Produce coarse powder and general fine powder above 45μm. Stable operation, high cost performance, large noise.
Hoop-roller mill		2μm powder content is above 20%. The fineness can reach to 8-10 μm.	Produce 10-15μm powder, stable operation, short service life of wear-resistant parts, large noise, low production capacity.
Ball mill		Generally for producing powder coarser than 45μm, ultrafine ball mill can produce powder finer than 10μm. Ceramic ball mill can produce powder with high fineness and whiteness, low iron content. Good particle size, globular shape;	Suitable for various raw materials. Finished powder has wide particle size range. High power consumption, large noise. Long switch time for different production demands. Difficult to adjust fineness.
Jet mill		Produce powder finer than 5μm. Grind raw material by airflow force, finished powder has best whiteness. High-end food-grade finished powder.	Mechanical grinding, powder fineness is high. Only suitable for producing high-end or high added value powder. High power consumption, low production capacity.
LUM vertical mill		2μm powder content 30%-70%. D97=4-45μm. The fineness can reach to 8.5μm after primary grinding. high specific surface area.	No contact between roller and millstone, small vibration, stable operation. Low power consumption, large production capacity. Fast switch of different production demands. Products are highly specialized. Large upfront investment.

Components of system



Primary milling system	Mainly consist of raw material crushing, raw material transportation, ultrafine grinding and grading, final products collection, final products transportation, final products storage and auxiliary equipment.
Raw material crushing	jaw crusher, hammer crusher
Raw material transportation	elevator, belt scale, surge bin, star-shaped feeding valve, spiral conveyer etc.
Ultrafine grinding and grading	main machine and multi-rotor classifier of ultrafine vertical mill.
Final products collection	gas box pulse bag type dust collector
Final products transportation	spiral conveyer, discharge valve, elevator or pneumatic transport system etc.
Final products storage	final products tank
Auxiliary equipment	grinding aid additive system, cooling water system, compressed air system, iron separator etc.
Secondary classify- ing system	Mainly consist of multi-rotor ultrafine classifier, fan, pulse filter, elevator, discharge valve, spiral conveyer and final products tank etc.

1 Hammer	6 Elevator	11 Fan	16 Transport car
2 Elevator	7 Air Lock Valve for Feeding	12 Belt Conveyor	17 Packing machine
3 Hopper for raw materials	8 Screw Conveyor	13 Screw Conveyor	18 Roller lubri- cation station
4 Belt Conveyor	9 LUM Vertical Roller Mill	14 Belt Conveyor	19 Reducer lubri- cation station
5 Iron Remover	10 Pulse Dust	15 Hopper for Finished Product	20 Hydraulic station

**Parameter**

Item and mode	LUM1125					LUM1232				LUM1436		
Main unit power (kw)	180-250					280-315				355-410		
Powder concentrator power (kw)	1x75/5x15					1x110/7x15				1x132/7x18.5		
Fan power (kw)	160-200					220-250				255-355		
Capacity (t/h)	11-14	8-10	7-8	5-6	3-4	13-17	11-13	9-10	7-8	14.0-19.0	12.5-14.5	10.0-11.0
Specific surface area(cm2/g)	11000±500	13500±500	15000±500	17000±500	19000±1000	11000±500	13500±500	15000±500	17000±500	11000±500	13500±500	15000±500
325 mesh residue on sieve(%)	0.015	0.015	0.01	0	0	0.015	0.015	0.01	0	0.015	0.015	0.01
Content >2μm(%)	34± 2	40± 2	45 ±2	50 ±2	60 ±2	34± 2	40 ±2	45 ±2	50 ±2	34± 2	40 ±2	45 ±2
Average particle size D50(μm)	4.2	3.0	2.4	1.8	1.4	4.2	3.0	2.4	1.8	4.2	3.0	2.4
Size distribution D97(μm)	30	25	20	15	9	30	25	20	15	30	25	20
Size cut point(μm)	80	48	38	28	18	80	48	38	28	80	48	38
Compact apparent specific gravity(g/cm3)	1.18	1.06	0.90	0.85	0.76	1.18	1.06	0.90	0.85	1.18	1.06	0.90
Loose apparent specific gravity(g/cm3)	0.45	0.40	0.34	0.32	0.28	0.45	0.40	0.34	0.32	0.45	0.40	0.34
Moisture content(%)	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3
Sedimentation volume(After 1 hour.c)	24	27	33	43	51	24	27	33	43	24	27	33
Energy consumption(kw/t)	38-40	40-50	47-53	50-53	110-125	38-40	40-50	47-53	50-53	38-40	40-50	47-53

Notes:

1. particle size distribution: determined by MALVERN3000 laser beam diameter analyzer from MALVERN company in Britain.

2. specific surface area: transformed from average particle size, the relative area of 1g powder.

3. average particle size: evaluate the intermediate value according to particle size distribution.
4. 325 mesh residue on sieve: put 1000g weight sample on 325mesh screen mesh to filter with wet method, and then calculate the percentage.

5. moisture content: put 5g weight sample into the moisture analyzer for 6 minutes at 150°C, and then measure the moisture content.

6. raw material: limestone, calcite, dolomite, talc, barite, wollastonite, brucite, calcium hydroxide, gypsum, coking coal, slag, phosphate and other minerals.



**Case**

