CE:CV1-P1-1708

A WORLD-RENOWNED EQUIPMENT MANUFACTURER

享誉全球的专业设备制造商

世邦工业科技集团股份有限公司
Shibang Industry & Technology Group CO., Ltd.

LUM 系列超细立式磨粉机

L U M Series Ultrafine Vertical Roller Mills

产能更大 经济细度更高

Higher Capacity and More Economical Fineness

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Shibang Industry & Technology Group CO., Ltd.

上海浦东新区金桥南区建业路416号
Shanghai Shibang Machinery Co., Ltd.No.416 jianye Road, South Jinqiao Area, Pudong New District, Shanghai,China (201201)

国际市场部/International Trade Department
Tel: 0086-021-58386176 0086-021-58386189
Fax: 0086-021-58386211
Email: sbm@sbmchina.com
Web: www.sbmchina.com

国内市场部:
电话: 400-696-1899 021-5838-6699
传真: 021-58385681
邮箱: info@shibang.cn
网址: www.shibangchina.com

A WORLD-RENOWNED EQUIPMENT MANUFACTURER

享 誉 全 球 的 专 业 设 备 制 造 商

突破超细粉加工产能瓶颈的大型设备

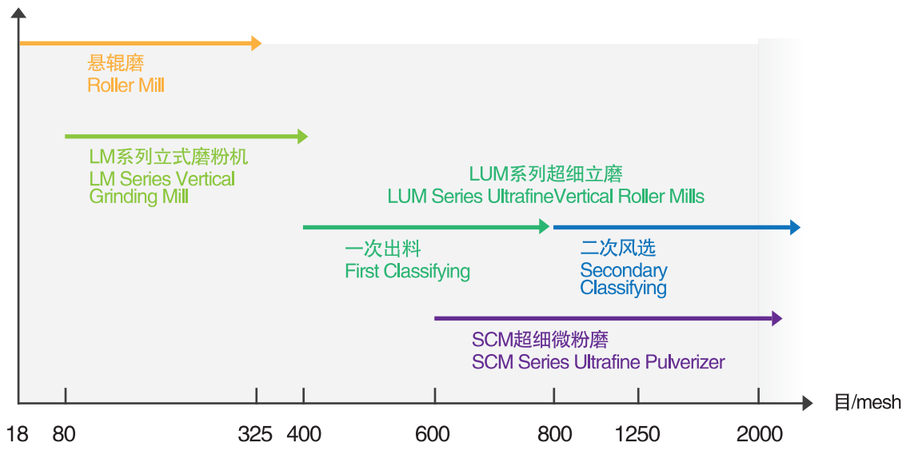
Large-Scale Equipment Breaking Through the Bottleneck of Ultrafine Powder Processing Capacity

在超细粉加工领域，面对越来越多的超细粉应用需求，传统超细粉加工设备因普遍存在产能低的问题，已很难满足市场需求。低产能严重制约了超细粉加工企业的发展。针对目前市场上的超细粉加工需求，上海世邦结合多年的磨机生产经验，以立式磨为基础，引进台湾磨辊技术和德国选粉技术，设计开发出一款集粉磨、分级、输送于一体的新型超细粉磨设备—LUM系列超细立式磨粉机，突破了超细粉加工产能低的瓶颈，给超细粉加工企业带来了更高效益。

In the ultrafine powder-processing field, the conventional ultrafine powder-processing equipment generally, due to its low production capacity, encounters severe difficulty in producing ultrafine powder to satisfy the increasingly great market demand. This also seriously restricts the development of ultrafine powder-processing enterprises. Combining many years' experience in manufacturing mills, and by introducing the roller technology from Taiwan and powder separation technology from Germany, SBM has designed and developed a new-type ultrafine pulverizing equipment—LUM series ultrafine vertical roller mill, based on the vertical roller mill. The LUM series ultrafine vertical roller mill integrates the functions of pulverization, classification and conveyance into one machine. It is the breakthrough in addressing the issue of low production capacity mentioned herein. Meanwhile, it is capable of helping ultrafine powder-processing enterprises enhance economic efficiency.

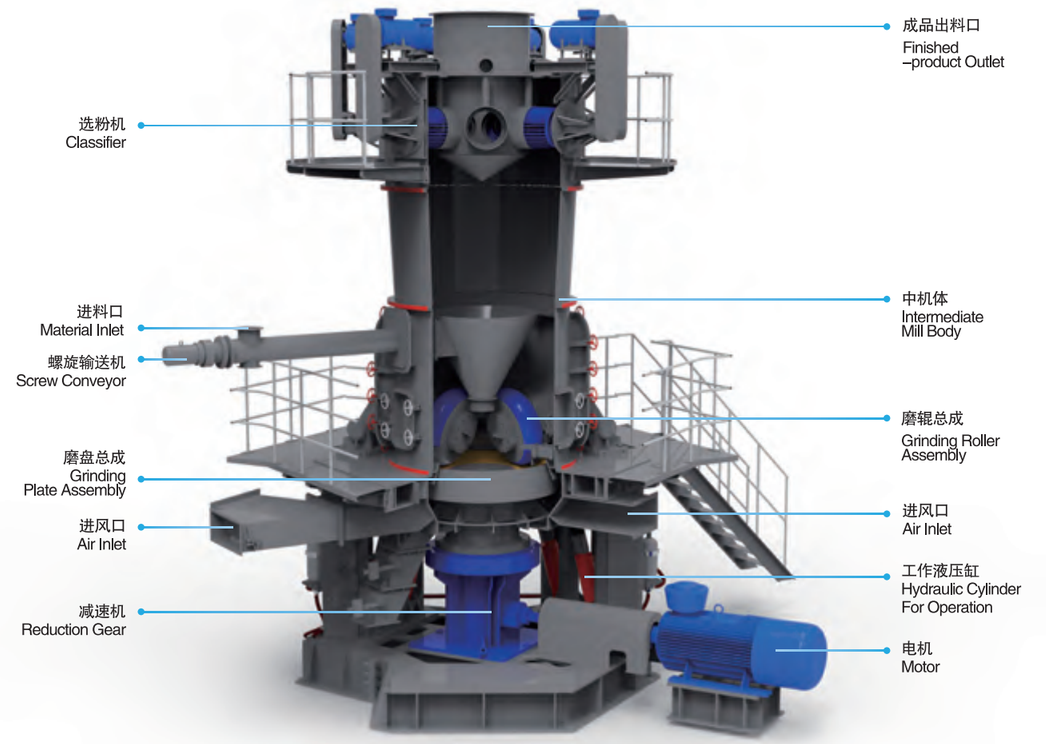
LUM系列超细立式磨粉机，可广泛应用于化工、冶金、非金属矿等行业，尤其在超细白色非金属矿的粉磨加工领域，有着出色表现，可为造纸、涂料、颜料、塑料、橡胶、PVC、油墨等行业提供高品质的填料和添加剂。

LUM series ultrafine vertical roller mill can be widely used in such industries as non-metallic mining, chemical and metallurgy. In particular, it is outstanding in the pulverization of white ultra-metallic ore. It is capable of providing high quality fillers and additives used in the segments of plastic, rubber, papermaking, PVC, printing ink, coating and pigment.



主机结构

Construction of the Mill



1、LUM系列超细立式磨粉机主要由电动机、减速机、磨辊装置、磨盘装置、加压装置、选粉机、机体、油站、主机电控系统等部分组成。

2、磨辊：用来对物料进行碾压粉碎的主要部件，它配合磨盘上的衬板共同形成研磨区。

3、磨盘：固定在减速机输出轴上，是磨辊碾压物料的地方。

4、加压装置：为磨辊提供碾压力的部件，向磨辊提供足够的压力以粉碎物料。

5、选粉机：一种高效、节能的选粉装置，采用多头选粉机原理，出磨成品细度在选定范围内均可实现，不需要二次风选分级，无下品料的存在。

1. LUM series ultrafine vertical roller mill mainly consists of the motor, reduction gear, grinding rollers, grinding plate, pressure-applying device, classifier, mill body, oil station, and electrical system.

2. Grinding roller: Main component used for crushing and grinding materials.Together with the liner plate on the grinding plate, it can provide an effective grinding area.

3. Grinding plate: Component fixed on the output shaft of the reduction gear and where the grinding roller grinds materials.

4. Pressure-applying device: Component used for applying sufficient pressure to the grinding roller to crush materials.

5. Classifier: A highly-efficient and energy-saving powder separation device with the principle of multi-rotor powder classifier. The device is capable of providing finished powder product within the selected fineness range, removing the necessity of secondary air separation and the existence of inferior finished powder product.

主机工作原理

Operating Principle of the Mill

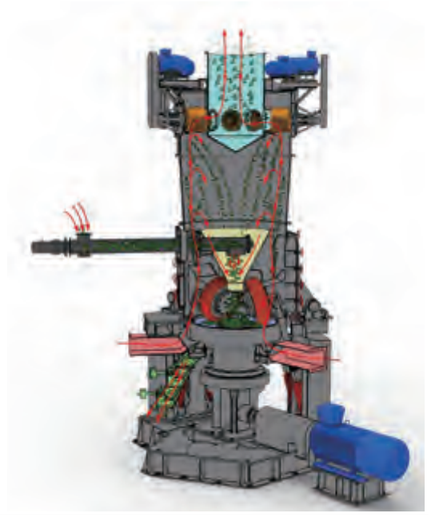
LUM超细立式磨粉机研磨过程
Operating Process of LUM Series Ultrafine Vertical Roller Mill

主电机通过减速机带动磨盘转动，同时风从进风口进入磨机内，物料经螺旋给料机落在磨盘中央，在离心力作用下，物料从磨盘中央向边缘均匀移动，经过磨盘上的粉磨辊道区域时，受磨辊碾压，大块物料直接被压碎，细粒物料受挤压后形成料床进行粒间粉碎。

The grinding plate is rotated by the main motor via the reduction gear. Meanwhile, air enters the mill interior via the air inlet. The screw conveyor is responsible for conveying materials. Materials then fall onto the center of the grinding plate in rotation. Due to the centrifugal force, the materials evenly move from the center of the grinding plate towards its fringe. While passing across the track in the grinding plate, large blocks of materials are crushed and ground directly by the grinding roller. The fine particles form the material bed, owing to squeezing, where the inter-particle crushing takes place.

粉碎后的物料继续向磨盘边缘移动，直到被风环处的强气流带走，气流中的物料经过上部分离器时，在转子叶片作用下，粗颗粒重新回到磨盘上粉磨，合格的粉体随气流出磨后经集粉器收集并排出，即为成品。

The crushed materials continue to move towards the fringe of the grinding plate until they are taken away by strong air flow at the air ring. While the materials along with the air flow pass through the separator located above the grinding plate, the coarse particles return to the grinding plate for re-pulverization due to the action of the rotor blade; the fine particles along with the air flow leave the mill interior and are collected and discharged as finished powder product by the powder collector.



多重调节控制，保证成品品质
Multiple Adjustment and Control to Ensure the Quality of Product

混入物料的铁块等杂物随物料运动到磨盘边缘时，由于自身重量大而不能被风吹起，落入磨机下腔被刮料板刮入排渣口排出，可有效保证成品品质。

Rotor speed of the multi-rotor classifier is easy to adjust to achieve conforming powder products of various fineness.

多头选粉机转子转速易调节，可获得多种规格的合格产品。通过调节液压系统的压力可调节磨辊压力，一定范围内可以适应不同硬度的原料。

Adjustment of the pressure of hydraulic system is capable of regulating the pressure applied to the grinding roller, achieving adaptability to the raw materials within the specified hardness range.

机械装置和电子限位装置可调节，保证磨辊和磨盘衬板间的安全间隙，有效避免磨机工作中因断料引起的剧烈震动，实现安全经济运行。

The mechanical device and the electronic limit device are capable of being adjusted so as to ensure the safety clearance between the grinding roller and the liner plate on the grinding plate. This effectively removes the possibility of fierce vibration of the mill caused by sudden materials feeding interruption and maintains the safe and economical operation.

-----产品特点-----

Features of LUM

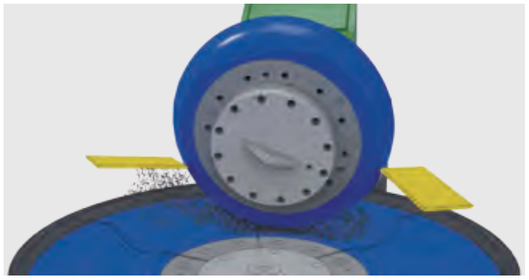
研磨效率高，成品品质优
High Efficiency & High Quality of Finished Product

专门为实现超细粉磨原理而独特设计的辊套和衬板研磨曲线，更易形成料层，研磨效率更高，一次粉磨获得的成品率高。

The grinding curves of the roller shell and liner plate are uniquely designed based on the ultrafine pulverization principle. It allows enhanced material bed forming, grinding efficiency and the increase in the ratio of finished powder product from the primary grinding.

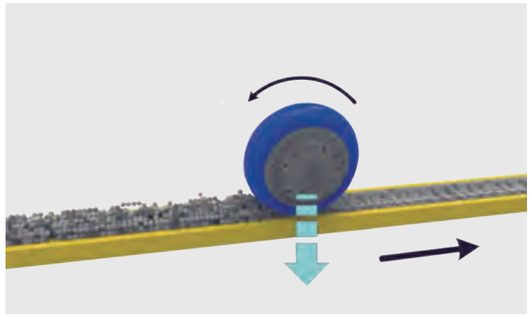
特殊预压实装置可确保物料得到有效研磨，保证成品细度，同时磨机震动小，功率得到有效发挥。

The special pre-compaction device is capable of ensuring the effective grinding of materials, thus ensure the desired fineness of finished powder product. Moreover, the vibration of the mill is reduced and power utilization is improved.



采用料层粉磨原理，物料在磨内停留时间短，减少重复碾磨，使成品中含铁量少，产品的白度和净度高。

The material bed pulverization principle reduces the duration of materials retention in the mill and the repeated grinding. As a result, the content of tramp iron in finished powder product is reduced, increasing the whiteness and purity of the finished powder product.



研磨过程中，加入微量不影响成品品质的助剂，可显著提高产品附加值。

During the grinding, addition of a small amount of additive that will not adversely affect the quality of finished powder product is capable of remarkably improving the added value of the finished powder product.

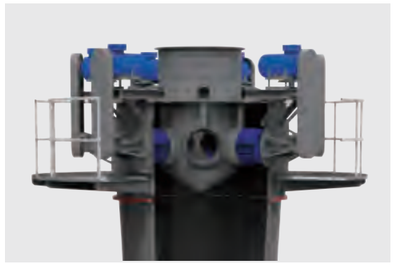
选粉技术先进，系统高效节能
Advanced Separation Technology & Energy Efficient

采用多头选粉机原理，出磨成品细度在选定范围内均可实现，不需要二次风选分级，无下品料的存在。

Operation in the principle of multi-rotor classifier is capable of providing finished powder product within the selected fineness range, removing the necessity of secondary air separation and the existence of inferior finished powder product.

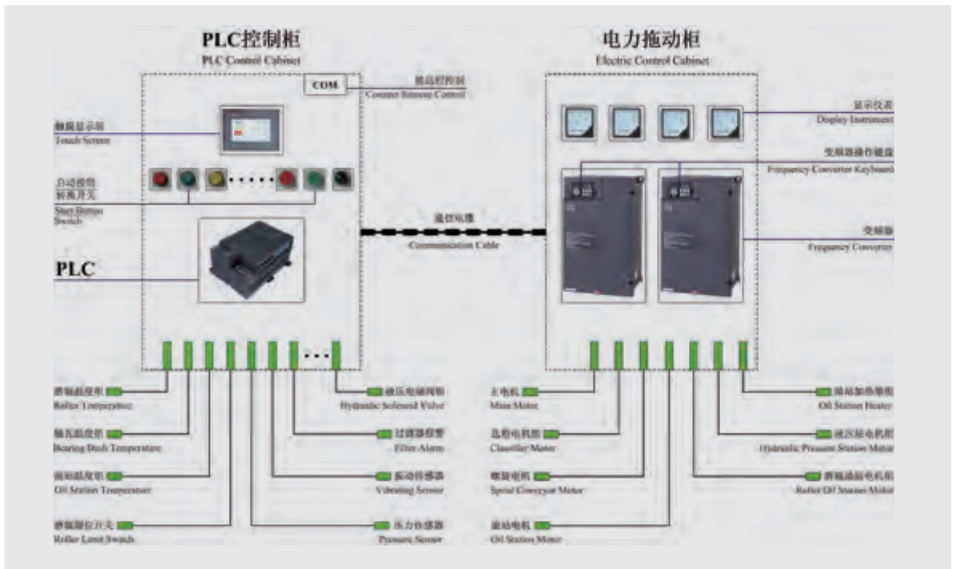
采用PLC控制系统，使粉磨压力、转盘转速、选粉机转速等主要参数得到精准控制，保证了产品的准确切割粒径和高度再现性。

The use of PLC control system enables the main parameters, for example, the speeds of grinding plate and powder classifier and the grinding pressure, to be controlled accurately, achieving accurate particle cutting size and high reproducibility of the same particle fineness.



采用超细粉磨和多头选粉原理，在生产相同细度等级的产品时，比普通磨机节约能耗30%-50%，经济效果更佳。

Thanks to the use of ultrafine pulverization and multi-rotor separation, LUM series ultrafine vertical roller mill does better in respect of economy, saving energy by 30% to 50% compared to a common type mill when producing the powder of the same fineness.



PLC控制系统　PLC Control System

控制系统智能化，运行稳定高效
Intelligentized Control System & Stable Operation

采用PLC/DCS自动控制的磨辊加压控制方式，研磨压力得到精准控制，无需人工操作，运行高效稳定。

Pressure applied to the grinding roller being automatically controlled by the PLC/DCS enables the accurate control of grinding pressure and the highly efficient and stable operation of the mill without manual operation.

配备自动控制系统，可实现远程控制，操作简便。

Automatic control system enables remote control and simple operation.

主机转速采用变频控制，且适用物料较为广泛。

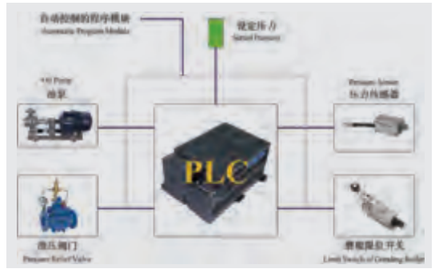
Frequency-conversion speed regulation enables the mill to be used for materials of a wide range of hardness.

辊套和磨盘衬板的接触采用电子限位和机械限位保护，避免剧烈振动和破坏性冲击，机器运行更稳定。

The mechanical limit device and the electronic limit device are capable of being adjusted so as to ensure the safety clearance between the roller shell and the liner plate on the grinding plate. This effectively removes the possibility of materials feeding interruption thus fierce vibration and destructive impact and maintains the safe and economical operation of the mill.

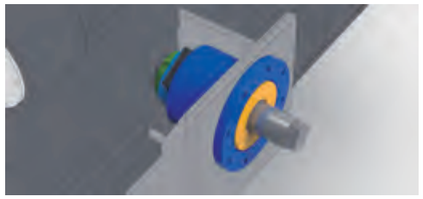
磨辊润滑采用单独润滑站，且单个磨辊回路采用双泵，泵吸同时工作的模式，既使磨辊轴承得到充分润滑和冷却，又能保证磨辊轴承室内不会因存油过多而导致泄漏。

A separate lubrication station is provided for the grinding roller. Each grinding roller circuit is equipped with two pumps, which operate simultaneously. The sufficient lubrication and cooling of the bearings for the grinding roller is ensured while no excess of lubricating oil in the bearing chamber thus no leakage could occur.



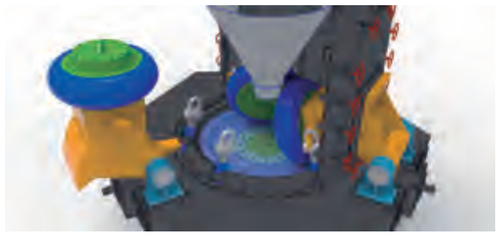
加压方式自动控制
Automatic Control of Pressure Applying Device

加压控制Pressure Applying Device



机械限位装置　Mechanical Limit Device

易于维护，运营成本低
Easy Maintenance & Low Operation Cost



翻出检修的磨辊
Grinding Roller Turned Outside for Maintenance

由于工作中磨辊并不与磨盘直接接触，且磨辊与衬板采用优质材料制作，使用寿命长，磨损少。

The grinding roller is not in direct contact with the grinding plate. Both the grinding roller and the liner plate are made of high quality materials. Therefore these parts have long service life and high wear resistance.

磨辊可翻出机壳外部进行检修，更换辊套、衬板方便快捷，减少停机损失。

The grinding roller can be turned outside the mill shell. This feature facilitates the inspection of grinding roller and the replacement of roller shell and liner plate, thus reduces down-time and labor cost.

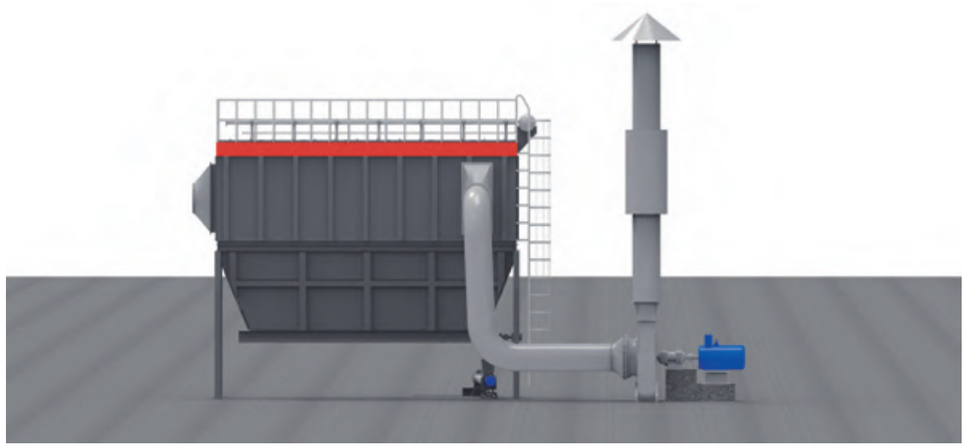
绿色环保
Environmentally Friendly

特殊结构设计和工作原理，设备振动小，噪音低。

Special structural design and operating principle of the mill ensures substantial reduction of vibration hence noise level.

设备整体密封，系统在负压下工作，无粉尘外溢，环境清洁，满足国家环保要求。

Hermetic seal ensures that the system operates under negative pressure. Therefore, powder and dust are prevented from flowing out of the system. The environment is clean, meeting the national environmental protection requirements.



脉冲除尘装置 Pulse Dust Device

系统制粉工艺
Powder Production Process of the System

LUM超细立式磨粉机系统制粉流程
Powder Production Process of the System of LUM Series Ultrafine Vertical Roller Mill

物料通过斗式提升机提升至原料仓进行储存，经称重皮带机控制输送量，并有除铁器进行除铁，除铁后的物料被送入提升机经锁风阀和螺旋给料机送入主机内部进行粉磨。

The bucket elevator raises the materials to the hopper for raw materials. The materials are then released to and transmitted by the feeding belt conveyor, with the weight of the materials being controlled by the belt scale and the tramp iron in the materials being removed by the iron remover. Subsequently, the materials are sent to the elevator, via the air lock valve and screw conveyor, into the mill interior fur pulverization.

粉磨后经选粉机选出的合格产品用一台箱式脉冲除尘器来完成收集，减少设备台数，简化了系统配置。产品收集后用螺旋给料机通过斗式提升机送入成品料仓。

After pulverization, the powder product from the powder classifier is transmitted into the tank-type pulse dust collector, where dust collection is conducted. The configuration reduces the number of devices needed. The powder product from the dust collector is then transmitted by the screw conveyor to the bucket elevator. The bucket elevator raises the powder product to the hopper for finished powder product.

少量在超细立磨中没有得到粉磨的物料（俗称吐渣），经返料输送机回到给料机构中，重新进入超细立磨，进行粉磨。

A small amount of materials not fully pulverized in the ultrafine vertical roller mill (colloquially “slag”) will be transmitted by the return materials conveyor to the feeding machine, and will enter the ultrafine vertical roller mill again for pulverization.

皮带机的除铁器，保证了立磨的运行安全

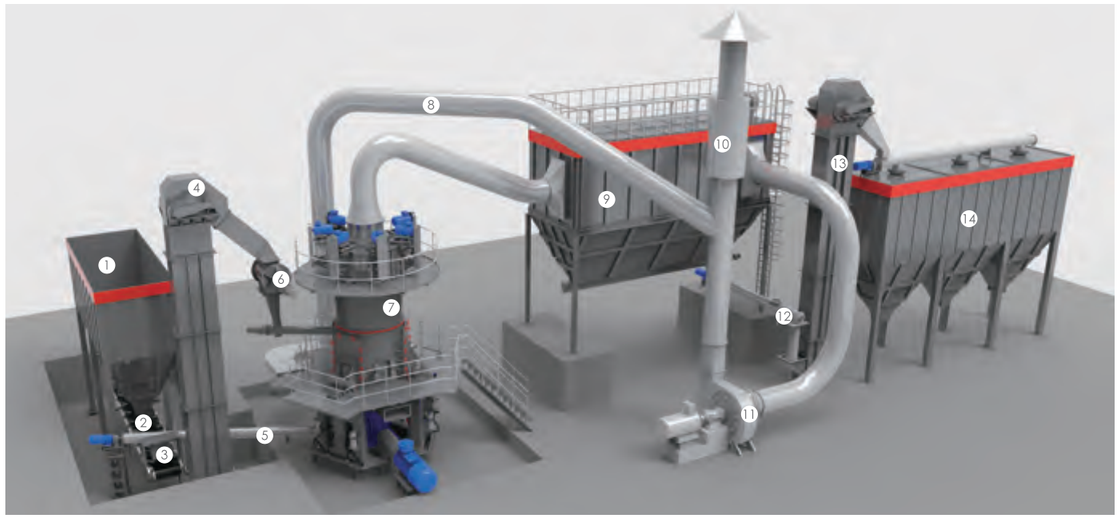
The iron remover of the feeding belt conveyor ensures the operation safety of ultrafine vertical roller mill.

此系统结构简单，所用设备甚少，设备投资少，运行成本低。

The system is popular with simple construction as few devices are included. Both the investment and the operation cost are low.

系统制粉工艺

Powder Production Process of the System



1. 原料仓
   Hopper for raw materials

2. 给料皮带机
   Feeding Belt Conveyor

3. 除铁器
   Iron Remover

4. 提升机
   Elevator

5. 螺旋输送机
   Screw Conveyor

6. 锁风喂料阀
   Air Lock Valve for Feeding

7. 超细立磨
   Ultrafine Vertical Roller Mill

8. 管道等非标件
   Non-standard parts including pipes

9. 脉冲除尘器
   Pulse Dust Collector

10. 消音器
    Silencer

11. 离心引风机
    Centrifugal Draft Fan

12. 螺旋输送机
    Screw Conveyor

13. 成品提升机
    Elevator for Finished Product

14. 成品仓
    Hopper for Finished Product

中控系统

Central Control System

工业控制单元（1）（制粉系统）
Industrial Control Unit(1)
(Powder Production System)

工业控制单元（2）（二次分选系统）
Industrial Control Unit(2)
(Secondary Air Separation System)

LUM中控系统由工业计算机、显示器、打印机、工业控制单元等部分组成。

Central control system of LUM consists of the industrial computer, displayer, printer, industrial control unit, etc.

中控系统，使主要参数可以得到精准控制，磨机和其它设备协调配合，整个磨机系统再现同一细度成品的再现性极高，生产产品细度稳定性好。

The central control system enables the main parameters to be controlled accurately, achieving the coordination of the mill and other devices, high reproducibility of the same particle fineness and high production stability of the entire mill system.

可对磨机系统的运行状态进行监测，例如磨机的振动、磨辊压力、油温、主机温度等，通过设定一定的保护值，可以避免人为因素对磨机造成的损害，提高了运行率，延长了磨机使用寿命，并将所有参数显示于屏幕之上，为操作者提供准确依据。

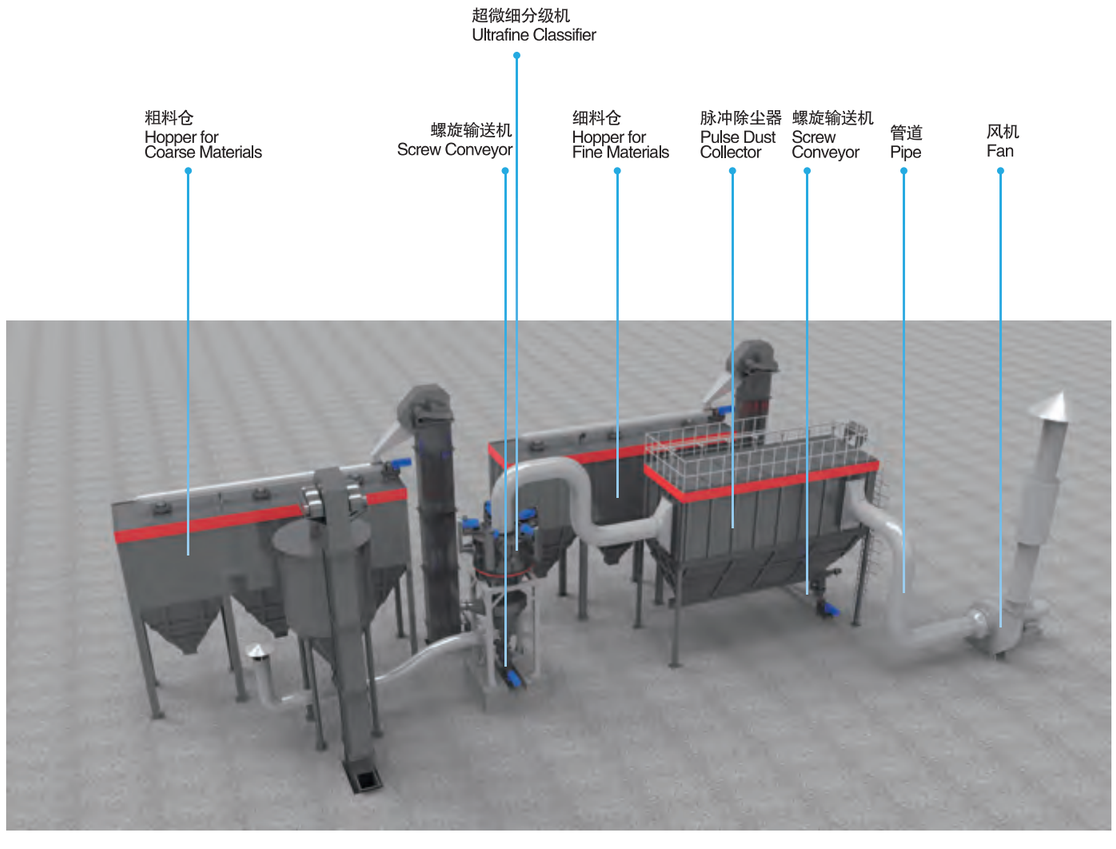
The central control system is capable of monitoring the operating conditions of the mill system, such as the mill vibration, grinding roller pressure, oil temperature, and mill temperature. Protection setting can avoid personnel caused damage to the mill. The result is the reduced outage ratio and prolonged service life of the mill. Moreover, the central control system is capable of displaying all parameters on the screen whereby the operator can make correct and accurate decision.

二次分级系统

Secondary Classifying System

分级系统以超微细分级机为核心设备，由风机、除尘器、料仓、螺旋输送机、管道等设备组成。LUM系列超细立式磨粉机配有二次风选的分级系统，选粉效率高，可有效分离粗粉和细粉，获得多种规格的合格产品。

In the core of the classifying system is the ultrafine classifier. The classifying system includes also other devices such as the fan, dust collector, hopper, screw conveyor and pipes. LUM series ultrafine vertical roller mill is equipped with the classifying system of secondary air separation. The classifying system is notable for high powder separation efficiency, which is capable of efficiently separating coarse powder from fine powder thus obtaining finished powder product of various fineness.



LUM分级系统具有以下特点
Features of LUM classifying system:

成品细度高：可将经超细立磨粉磨过的物料中的细颗粒分选出来，分选细度达到800至2000目。

运行成本低，电耗较同类分级机低20%左右。

分级轮和风机采用变频调速，通过调整分级轮转子和风机的转速，可快速获得不同规格可靠稳定的成品细度，且分级效率高。

高度的产品再现性：即使经常更换产品，亦可快速稳定地再生产相同细度的产品。

适用范围广，适用如下物料：碳酸钙、方解石、硫酸钡、滑石、硅灰石、叶腊石、白云石、石墨、高岭土、石灰石等

High Fineness of Finished Powder Product: The classifying system is capable of selecting fine particles out from the materials that have undergone pulverization in ultrafine vertical roller mill. The obtained fineness of particles can range from 800 meshes to 2000meshes.

Low Operation Cost: The power consumption of LUM classifier is just approximately 80% of that of the classifiers of the same category.

Frequency-conversion Speed adjustment of Classifier Wheel and the Fan: Various fineness of finished powder product can be obtained rapidly, stably and reliably by adjusting the speeds of the classifier wheel and the fan. The classifying efficiency is high.

High Reproducibility of the Same Particle Fineness: Even if the specifications of finished powder products are changed frequently owing to actual requirements, it is rapid to achieve high production stability hence high reproducibility of the same particle fineness.

Wide Application Range: The classifying system applies to a wide range of materials, including calcium carbonate, calcite, barium sulfate, talcum, wollastonite, pyrophyllite, dolomite, graphite, kaolinite and limestone,etc.

技术参数

Technology Parameters

项目 Item / 型号 Model	LUM1125	LUM1232	LUM1436
转盘中径 Working Diameters (mm)	1100	1200	1400
产量 Output(t/h)	5~12	7~16	8~18
细度400~800目 Fineness 400-800 mesh	~D97	~D97	~D97
入磨物料粒度 Feed Size (mm)	<10mm	<10mm	<10mm
入磨物料水份 Moisture of Feeding Material	<3%	<3%	<3%
主电机功率 Power of Main Unit (kW)	250	315	355
磨辊数量（个） Number of Rollers (pieces)	3	3	3
多头选粉机功率×个数 Power of Classifier x Number	15 kW×5	15 kW×7	15 kW×7

备注：表中产量和细度以粉磨莫氏硬度为3级以下的碳酸钙类矿石为参考，实际生产过程中受多种因素的影响，如物料粒度与成分、湿度、杂质等，产量以实际运行为准。

Note: The output and fineness listed in the table above are obtained with reference to the pulverization of ores with Mohs hardness less than 3, like calcium carbonate. The actual output may be different as actual production is affected by quite a few factors of the materials, such as particle size, particle size composition, humidity, and content of impurities.

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