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立式辊磨机

Vertical Roller Mill

矿物粉磨整体解决方案

Complete Solution For Mineral Grinding

专业执着、精益求精

PROFESSIONALISM, PERSISTENCE, PERFECTION

上海英用机械有限公司

SHANGHAI YINGYONG MACHINERY CO., LTD

VRM系列立式辊磨机

VRM Series
Vertical Roller Mill



产品简介

VRM 型立式磨在不同行业也通常被叫做辊式磨，中速磨等，该机型具有集破碎、粉磨、烘干、 分级于一体等特点，可针对各类不同水分、性质和硬度的物料粉碎至所需要的粒度，是目前磨粉行业的理想设备。

Product Introduction

VRM vertical mills are also commonly called roller mills, medium speed mills, etc. in different industries. crushing, grinding, drying and powder separating set-in-one,VRM can be used for grinding various materials of different moisture, nature and hardness to a required particle finesse. Therefore, it becomes ideal equipment in current grinding industry.

应用领域

水泥生料制粉，矿渣微粉生产，碳酸钙粉磨加工、煤粉制备，石膏粉加工、电厂脱硫、磷矿粉磨，冶金行业，超细粉磨行业其他非金属矿制粉等

Application field

Cement raw material grinding, slag powder production, calcium carbonate pulverization, pulverized coal preparation station, gypsum powder processing, power plant desulfurization, phosphate rock grinding, metallurgical industry, ultra-fine grinding industry, other non-metallic mineral powder, etc.



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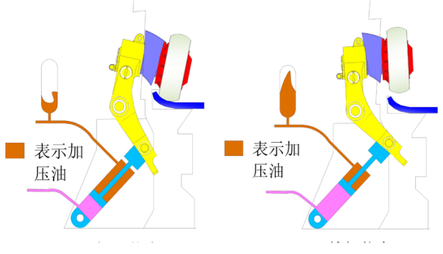


VRM 型立式磨结构

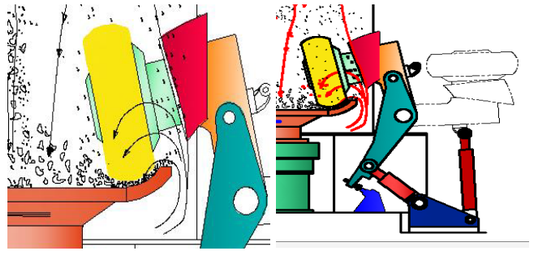
VRM 立式磨粉机主要有选粉机、磨辊装置、磨盘装置、加压装置、减速机、电动机、壳体等部分组成。配套设备有稀油润滑站、液压油站、干油站、主电动机、电器控制柜等。

Structure

VRM vertical mill mainly consists of separator, grinding roller device, grinding table device, pressure device, reducer, motor and shell. The supporting equipment includes thin oil lubrication station, hydraulic oil station, dry oil station, main motor and electrical control cabinet.



加压状态 Loading　　抬辊状态 No Loading



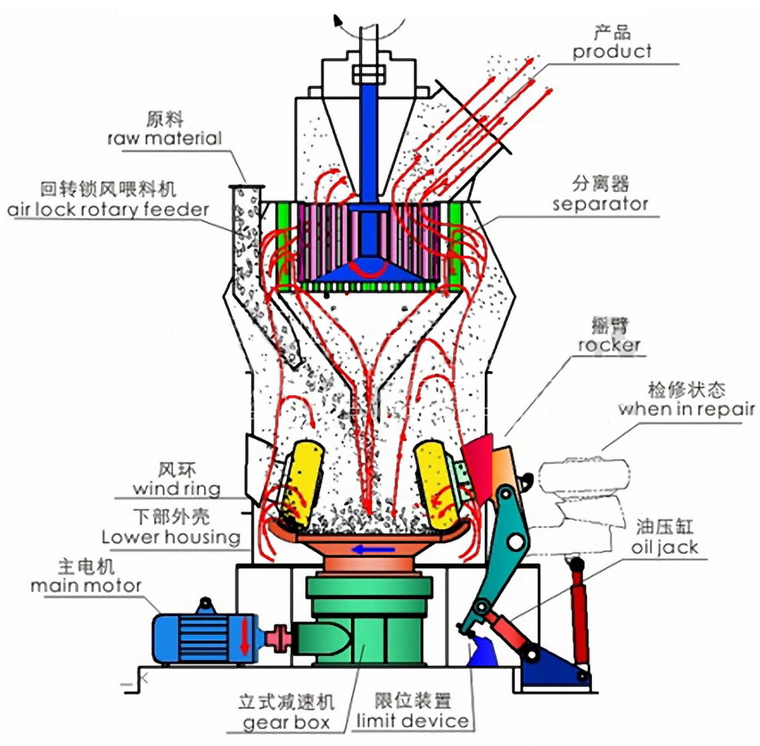
工作状态 Working　　检修状态 Maintenance

VRM 型立式磨工作原理

物料经锁风喂料器从进料口落在磨盘中央，同时热风从进风口进入磨内。电动机通过减速机带动磨盘转动，磨盘转动时，物料在离心力的作用下向磨盘边缘移动，经过磨盘环形槽时受到磨辊的碾压而粉碎，粉碎后的物料被风环高速气流带起，含有水分的物料在与热气体接触的过程中被烘干，大颗粒直接落到磨盘上重新粉磨，气流中的物料经上部分离器时，在旋转转子的作用下，粗粉从锥斗落到磨盘重新粉磨，合格细粉随气流一起出磨，通过收尘装置收集，即为产品。

Working principle

The material falls from the feeding opening to the center of the grinding table through the air-locking feeder, and the hot air enters into the grinding mill from the air inlet. Through the gear box, the motor drives the grinding table to rotate, then the material moves towards the edge of the grinding table under the action of centrifugal force. When it passes through the annular groove of the grinding table, it is crushed by the grinding roller, and the crushed material is picked up by the high-speed airflow in the air ring. The moisture-containing material is dried thanks to the contact with the hot gas. The large particles fall directly onto the grinding table and will be reground. When the material in the airflow enters the upper separator, under the action of the rotor, the coarse powder falls from the cone to the grinding table and is reground. The qualified fine powder gets out of the mill together with the airflow and collected by the dust collecting device which is the product.



VRM系列立式辊磨机

VRM Series
Vertical Roller Mill



立式磨机命名

•VRM

V 代表 Vertical　R 代表 Roller

M 代表 Mill

•VRM　□　□

举例：VRM　1300　K

1300　磨盘中径 1300mm

K 表示：非金属矿石

M 表示：煤类

Y 表示：预粉型

S 表示：矿渣类

X 表示：细粉类

N 表示：难磨类

Nominations of different models

•VRM　V is Vertical, R is roller and M is mill.

•VRM　□　□

e.g.　VRM　1300 K

1300 is for grinding table middle diameter

K: non-metallic ore

M: coal-based materials

Y: Pre-grinding

S: Slag type material

X: Fine powder vertical mill

N: Materials hard to grind

VRM 型原料立式磨技术参数
Technical data of VRM for raw material

• 应用：水泥生料、公路和建筑石灰石粉

Application: cement raw materials, limestone powder for construction and road

型号规格 Model	VRM1900	VRM2200	VRM2400	VRM2800	VRM3400	VRM3700	VRM4200	VRM4800
产量 Capacity (t/h)	60-80	85-110	95-130	120-160	190-240	240-300	320-400	440-550
最大喂料粒度 Max. Feeding size(mm)	30	35	35	40	45	50	55	60
原料水分 Moisture of raw material	<10%							
生料细度 Final finesse (%，R0.08)	≤ 12	≤ 12	≤ 12	≤ 12	≤ 14	≤ 14	≤ 14	≤ 15
生料水分 Final moisture (%)	≤ 1							
主电机功率 Power of main motor(kW)	500	800	900	1250	1800	2800	3350	4500

注：原料易磨性（Bond）指数≤ 12kwh/t。

Note: The raw material grindability index (bond) is ≤12kwh/t.

VRM 型水泥立式磨技术参数
Technical data of VRM for cement

• 应用：水泥熟料的粉磨，生产 P.O、P.S.A/P.S.B、P.C、P.P、PI/PII 水泥。

Application : grinding of cement clinker, to produce P.O、P.S.A/P.S.B、P.C、P.P、PI/PII cement.

型号规格 Model	VRM1900	VRM2200	VRM2400	VRM2800	VRM3400	VRM3700	VRM4200	VRM4800
产量 Capacity (t/h)	15-20	20-25	30-35	70-80	96-110	130-150	150-170	200-230
最大喂料粒度 Max. Feeding size(mm)	30	35	35	40	40	45	45	50
原料水分 Moisture of raw material	＜ 3%							
产品细度 Product finesse	比表面积≥ 350 ㎡ /kg Specific surface area ≥ 350 ㎡ /kg							
产品水分 Final moisture	≤ 1%							
主电机功率 Power of main motor(kW)	450	630	900	1800	2500	3350	3800	5300

注：原料易磨性（Bond）指数≤ 18kwh/t。

Note: The raw material grindability index (bond) is ≤18kwh/t.

VRM 型煤立式磨技术参数（1）
Technical data of VRM for coal powder production

• 应用：水泥和冶金回转窑的烟煤和无烟煤的煤粉生产、活性炭、煤化工、焦炭、石油焦

Application: Bituminous coal and anthracite powder production for cement and Metallurgical rotary kiln; activated carbon, coal chemical industry, coke, petroleum coke.

型号规格 Model	VRM1300M	VRM1400M	VRM1500M	VRM1700M	VRM1900M	VRM2200M	VRM2400M	VRM2800M
产量 Capacity (t/h)	10-15	12-17	16-22	20-28	26-35	40-45	45-55	60-110
原煤水分 Moisture of raw coal	<10%							
煤粉细度 Final finesse (%,R0.08)	R0.08，筛余 5%-12% R0.08, 5%-12% residue							
煤粉水分 Final moisture	≤ 1%							
主电机功率（kW） Power of main motor	185-220	200-280	250-315	315-450	400-560	500-710	710-900	800-1250

注：1. 原煤哈氏可磨指数≥ 55；2. 可用于粉磨无烟煤，煤粉细度（R0.08）≤ 3%。

Note: 1. Raw coal HGI index ≥ 55; 2. Can be used for grinding anthracite, fineness of coal powder (R0.08) ≤ 3%.

VRM 型煤立式磨技术参数（2）
Technical data of VRM for coal powder production

• 应用：用于冶金行业高炉喷煤、发电和供热锅炉用煤粉、立窑的煤粉制备、煤化工。

Application: coal powder for metallurgical industry blast furnace, power generation and heating boiler, vertical kiln or coal chemical industry.

型号规格 Model	VRM800M	VRM1100M	VRM1250M	VRM1300M	VRM1500M	VRM1700M	VRM1900M	VRM2200M
产量 Capacity (t/h)	3-5	5-8	9-13	13-17	18-22	22-30	30-40	40-50
最大喂料粒度 Max.Feeding size(mm)	15	20	25	25	30	30	35	40
原煤水分 Moisture of raw coal (%)	<10							
煤粉细度 Final finesse	200 目通过率 80% 200 mesh, 80% passing rate							
煤粉水分 Final moisture (%)	≤ 1							
主电机功率（kW） Power of main motor	55-75	110-132	132-160	185-220	250-280	315-280	400-560	500-710

注：原煤哈氏可磨指数≥ 55。

Note: Raw coal HGI index ≥ 55.

VRM 型高细立式磨技术参数
Technical data of VRM for ultra-fine powder production

• 应用：电厂脱硫石灰石粉制备

Application: Limestone powder for power plant desulfurization

型号规格 Model	VRM1250X	VRM1300X	VRM1500X	VRM1700X	VRM1900X	VRM2200X	VRM2400X	VRM2800X
产量 Capacity (t/h)	6-9	12-13	18-25	25-30	25-35	30-40	40-50	50-55
最大喂料粒度 (mm) Max. Feeding size	0-20	0-25	0-35	0-35	0-40	0-40	0-40	0-45
入磨物料水分 Moisture of raw material	<5%							
产品细度 End product finesse	325 目（44μm）90% 通过，（10-40μm） 325 mesh(44μm) 90% passing rate, (10-40μm)							
产品水分（%） Final moisture (%)	≤ 1							
主电机功率（kW） Main motor power	132	200	280	355	450	560	710	900

注：石灰石易磨性（Bond）指数≤ 13kwh/t。

Note: The raw limestone grindability index (Bond) is ≤13kwh/t.

VRM 型非金属矿立式磨技术参数
Technical data of VRM for non-metallic mineral grinding

• 应用：用于各类非金属矿物粉磨，如石灰石、石灰、碳酸钙、方解石、硫酸钡、石膏、滑石、叶腊石、石英、长石、重晶石等非金属矿行业。

Application: For various types of non-metallic mineral grinding, such as limestone, calcium carbonate, calcite, barium sulfate, gypsum, talc, pyrophyllite, quartz, feldspar, barite, etc.

型号规格 Model	VRM800K	VRM1100K	VRM1250K	VRM1300K	VRM1500K	VRM1700K	VRM1900K	VRM2200K
产量 Capacity (t/h)	0.5-3	1-6	1.5-9	2-13	7-25	10-30	15-35	18-45
最大喂料粒度 (mm) Max. Feeding size	0-15	0-20	0-20	0-25	0-35	0-35	0-40	0-40
入磨物料水分 Moisture of raw material (%)	<10							
产品细度 End product finesse	80-325 目，任意调节 80-325 mesh, adjustable							
产品水分 Final moisture (%)	≤ 1							
主电机功率 Main motor power (kW)	45	110	132	180	250	355	450	600

注：以上技术指标以莫氏硬度 3-4 的物料为基准。

Note: The above technical indicators are based on materials with Mohs hardness of 3-4.

VRM 型矿渣立式磨技术参数
Technical data of YRM for slag grinding

• 应用：钢厂高炉水渣、钢渣、电厂炉渣、磷矿渣等固废再生利用。

Application: Steel plant blast furnace slag, steel slag,power plant slag, phosphorus slag and other solid waste recycling.

型号规格 Model	VRM2200S	VRM2400S	VRM2800S	VRM3400S	VRM3700S	VRM4200	VRM4500	VRM4800
产量 Capacity (t/h)	15-20	24-28	50-70	70-85	90-110	110-140	130-150	150-200
最大喂料粒度 Max.Feeding size	1-10 mm							
矿渣水分 Slag moisture (%)	<15							
产品比表面积（㎡/kg) Specific surfacearea	≥ 420							
产品水分 (%) Final moisture (%)	＜ 1							
主电机功率 (kW) Main motor power	630	900	1800	2500	3350	3800	4500	5400

注：水渣易磨性（Bond）指数≤ 25kwh/t ；钢渣易磨性（Bond）指数≤ 30kwh/t ；粉磨钢渣微粉时产量约下降 30-40%。

Slag grindability index (Bond) ≤25kwh/t ; Steel slag grindability index (Bond) ≤30kwh/t ; The capacity will decrease 30-40% when grinding steel slag.

VRM 型预粉立式磨（制砂或粗粉）技术参数
Technical data of VRM for pre-grinding (coarse particle or sand making)

• 应用：水泥熟料预粉磨、矿渣预粉磨、石英砂、长石砂、玄武岩和石灰石机制砂

Application: Pre-grinding for cement clinker, slag, sand making for quartz sand, feldspar sand, basalt and limestone.

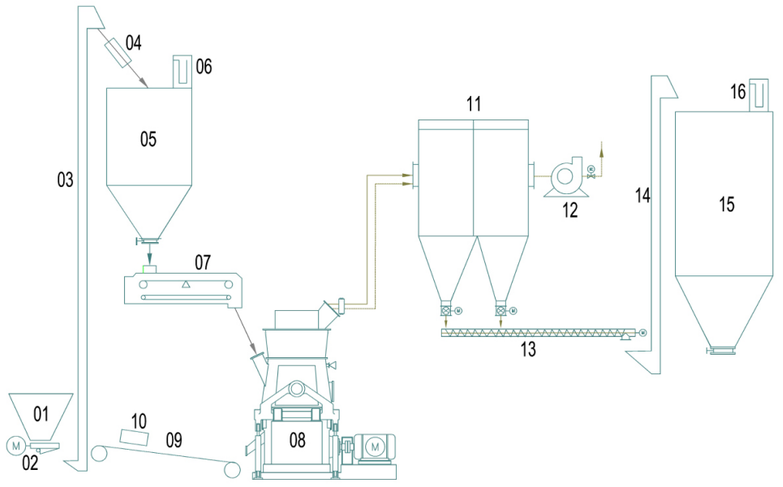
型号规格 Model	VRM1250Y	VRM1300Y	VRM1500Y	VRM1700Y	VRM1900Y	VRM2200Y	VRM2400Y	VRM2800Y
产量 Capacity (t/h)	10-15	15-30	30-45	45-65	65-90	90-110	110-140	140-200
最大喂料粒度 (mm) Max. Feeding size	0-25	0-30	0-35	0-40	0-45	0-50	0-50	0-60
入磨物料水分 Feeding moisture	<5 %							
产品细度 Product finesse	预粉磨工艺：20% ，1-4mm；≤ 1mm，80% ；制砂工艺：40% ，1-4mm；≤ 1mm，60% Pre-grinding : 20%, 1-4mm；≤1mm，80% ; sand making design : 40%, 1-4mm; ≤1mm, 60%							
产品水分 Final moisture (%)	≤ 1							
主电机功率 (kw) Main motor power	132	200	280	355	450	560	710	900

系统工艺流程 System Process

• 单脉冲除尘器开路系统
Single pulse dust collector open circuit system

本系统原料通过斗式提升机提升到需要的高度，在经过除铁后物料进入中间仓堆放，在事先设定的给料量的情况下，封闭式定量给料机称量物料并把物料喂入立磨进行粉磨。立磨粉磨合格的产品用一台箱式脉冲布袋除尘器来完成收集，减少了设备台数，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。此系统的特点是结构简单，所用设备甚少，设备投资少，没有烘干热源，运行成本低，适用物料比较干燥（水分＜6%），不需在系统中进行烘干作业的情况。

The raw materials of the system are raised to the required height by the bucket elevator. After the iron removal, the materials are placed in the intermediate hopper. The feeding quantity is preset, the closed quantitative feeder weighs the materials and feeds them into vertical mill for grinding. The qualified powder product is collected by a box-type pulse bag filter. The number of equipment is reduced and the system configuration is simplified. After the collection of the product, it is fed into the finished silo by a bucket elevator through a screw feeder. The system is of simple structure, less equipments and less equipment investment, the drying heat source is not needed, operating cost is low, so it is adaptable to dry materials (water content <6%), and drying is not required.



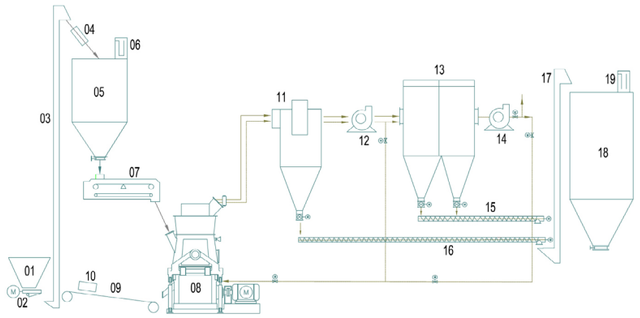
1. 原料仓 Raw material hopper
2. 给料机 Feeder
3. 提升机 Bucket elevator
4. 除铁器 Iron remover
5. 中转料仓 Transfer silo
6. 仓顶除尘器 Dust filter on top hoppe
7. 皮带秤 Belt weight feeder
8. 立磨 Vertical mill
9. 带式输送机 Belt conveyor
10. 除铁器 Iron remover
11. 袋式除尘器 Bag filter
12. 风机 Fan
13. 螺旋输送机 Screw conveyor
14. 提升机 Bucket elevator
15. 成品料仓 Final product hopper
16. 仓顶除尘器 Dust filter on top hoppe

• 旋风加脉冲除尘器闭路系统

Cyclone and pulse dust filter close circle system

本系统与单脉冲除尘器开路系统区别在于产品收集用一组旋风除尘器来完成，引风机将大部分气体引入磨机进行循环利用，可降低系统的工作负压，减少通过收尘器的气体量，最终除尘设备可用脉冲除尘器。

The difference between this system and single-pulse filter is that powder collecting is finished by one set of cyclone filter. Most of the air in the draft fan is pulled into mill to cyclic utilization which reduce the system negative pressure and the air through dust filter, and the final equipment can use pulse filter.



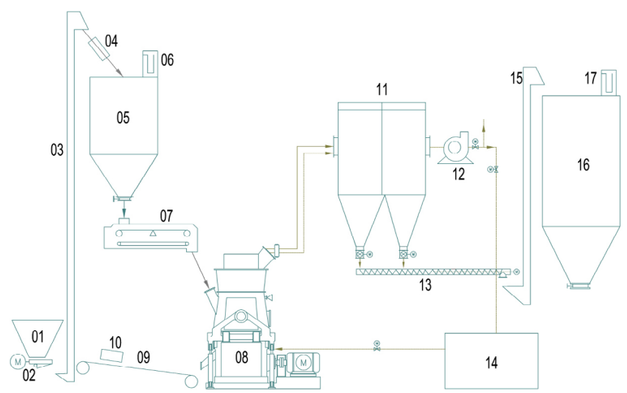
1. 原料仓 Raw material hopper
2. 给料机 Feeder
3. 提升机 Bucket elevator
4. 除铁器 Iron remover
5. 中转料仓 Transfer silo
6. 仓顶除尘器 Dust filter on top hopper
7. 皮带秤 Belt weigh feeder
8. 立磨 Vertical mill
9. 带式输送机 Belt conveyor
10. 除铁器 Magnet separator
11. 旋风集粉器 Cyclone dust collector
12. 风机 Fan
13. 袋式除尘器 Bag filter
14. 风机 Fan
15. 螺旋输送机 Screw conveyor
16. 螺旋输送机 Screw conveyor
17. 提升机 Bucket elevator
18. 成品料仓 Final product hopper
19. 仓顶除尘器 Dust filter on top hopper

• 单脉冲除尘器闭路系统（烘干）

Single pulse dust collector closed circuit system (with drying)

本系统与单收集器系统区别在于系统中有热源（热风炉），产品可以在粉磨的同时得到烘干，为需要烘干的客户节省一台烘干机，并且部分携带热量的尾气可以得到循环利用，节省了大量燃料费用。

The main difference of this process, is that heating system is provided, so that the material could be dried while grinding. But the same time, a dryer is saved, and some of the exhaust gas carrying heat can be recycled, a lot of fuel costs are saved



1. 原料仓 Raw material hopper
2. 给料机 Feeder
3. 提升机 Bucket elevator
4. 除铁器 Magnet separator
5. 中转料仓 Transfer silo
6. 仓顶除尘器 Dust filter on silo top
7. 皮带秤 Belt weight feeder
8. 立磨 Vertical roller mill
9. 带式输送机 Belt conveyor
10. 除铁器 Magnet separator
11. 袋式除尘器 Bag filter
12. 风机 Fan
13. 螺旋输送机 Screw conveyor
14. 热风炉 Hot gas generator
15. 提升机 Bucket elevator
16. 成品料仓 Final product silo
17. 仓顶除尘器 Dust filter on silo top













