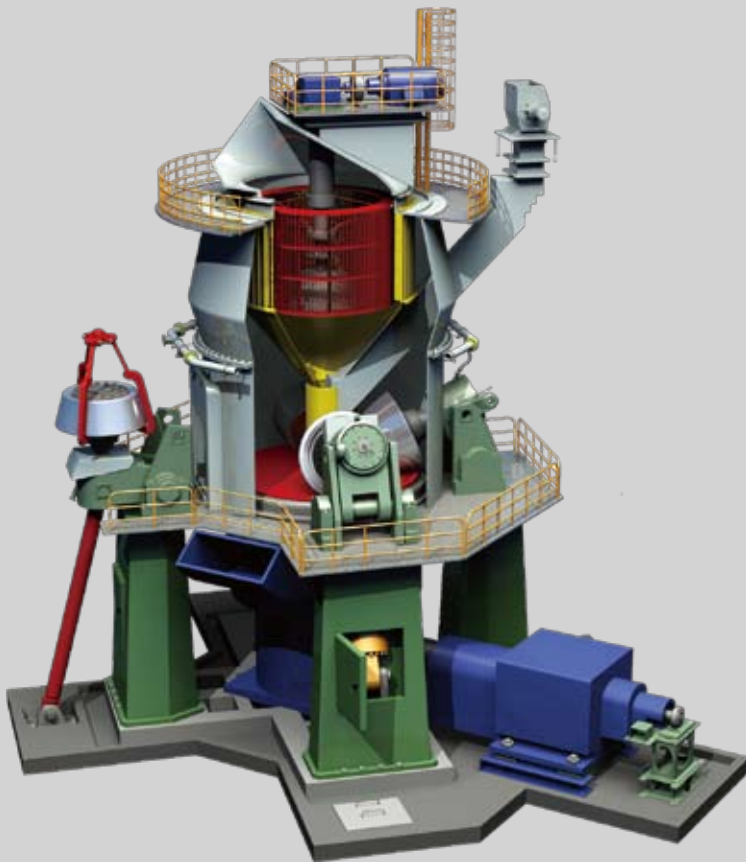


TRM型原料辊磨

TRM SERIES CEMENT VERTICAL ROLLER MILL



主要技术优势

Main technical advantage

- 磨辊可以自行抬落，实现空载启动；
- 磨机操作简单，运行平稳，振动小；
- 原料细度控制严格，调节灵敏；
- 设备运转率高，故障停机时间少；
- 磨辊可以靠油缸作用自动翻出机壳外，维修方便；
- 耐磨部件采用堆焊技术，维护方便。
- To be of automatic raise-up grinding roller for the no-load start-up;
- To be of simple operation, stable running and little vibration;
- To be of strict control of product fineness and flexible adjustment;
- To be of high availability and less defect stop;
- To be of automatic roller swing out system via hydraulic cylinder and easy for maintenance;
- To be of hardfacing of wear resistant part and easy for maintenance.

天津水泥工业设计研究院有限公司

Tianjin Cement Industry Design & Research Institute Co.,Ltd.

1 概况

Development of trm series cement vertical roller mill

TRM型原料辊磨（简称“原料辊磨”）是公司自主研发专门用于原料粉磨的新型设备，已经在不同规模的水泥生产线中得到了广泛的应用。

TRM型原料辊磨的开发经历了以下几个主要的阶段：

- 1985年，在江苏吴江水泥厂完成TRM型原料辊式磨的工业应用试验。
- 1988年，完成了1000t/d水泥生产线配套TRM2520原料辊式磨的开发。
- 1993年，第一台TRM2520原料辊式磨在河南新乡水泥厂投入运行。
- 1994年，TRM2520原料辊式磨及系统通过了国家部级鉴定。
- 2002年，完成了2500t/d水泥生产线配套TRM3641原料辊式磨的开发。
- 2002年，完成了3200t/d水泥生产线配套TRM3841原料辊式磨的开发。
- 2004年，第一台TRM3841原料辊式磨在华新阳新水泥厂投入运行。
- 2004年，第一台TRM3641原料辊式磨在陕西社会水泥厂投入运行。
- 2007年，完成了4000t/d水泥生产线配套TRM4541原料辊式磨的开发。
- 2007年，完成了5000t/d水泥生产线配套TRM5341原料辊式磨的开发。
- 2011年，完成了6500t/d水泥生产线配套TRM60.4原料辊式磨的开发，并同河北矿峰水泥有限公司签订立磨合同，该立磨目前是国内最大的原料立磨。

截至目前，已经开发出涵盖1000~6000t/d水泥生产线配套的原料辊磨，TRM型原料辊磨成为广大水泥生产企业制备生料的理想设备。

TRM series Raw Vertical Roller Mill is the specialized equipment for raw material grinding independently developed by us. Presently, it has been widely applied in cement production lines of different capacity.

The followings are the main steps of the development of TRM Series Raw Vertical Roller Mill.

- Year of 1985, to complete the industrial experiment and research of raw vertical roller mill in Jiangsu Wujiang Cement Plant;
- Year of 1988, to complete the engineering design and development of TRM2520 Raw Vertical Roller Mill equipped for 1000 t/d cement production line;
- Year of 1993, the initial TRM2520 Raw Vertical Roller Mill was operated in He'nan Xinxiang Cement Co., Ltd;
- Year of 1994, TRM2520 Raw Vertical Roller Mill System was passed technical appraisalment by competent authorities;
- Year of 2002, to complete the engineering design and development of TRM3641 Raw Vertical Roller Mill equipped for 2500 t/d cement production line;
- Year of 2002, to complete the engineering design and development of TRM3841 Raw Vertical Roller Mill equipped for 3200 t/d cement production line;
- Year of 2004, the initial TRM3841 Raw Vertical Roller Mill was operated in Huaxin Yangxin Cement Co., Ltd;
- Year of 2004, the initial TRM3641 Raw Vertical Roller Mill was operated in Shaanxi Shehui Cement Co., Ltd;
- Year of 2007, to complete the engineering design and development of TRM4541 Raw Vertical Roller Mill equipped for 4000 t/d cement production line;
- Year of 2007, to complete the engineering design and development of TRM5341 Raw Vertical Roller Mill equipped for 5000 t/d cement production line;
- Year of 2011, to complete the engineering design and development of initial TRM60.4 Raw Vertical Roller Mill, and enter into supply contract with Hebei Kuangfeng Cement Co., Ltd. Such vertical roller mill is the biggest one for raw material grinding available in China.

Up to now, it has developed Raw Vertical Roller Mill equipped for cement production lines (1000~6000t/d).

2 TRM型原料辊磨的特点

Characterisitics of trm series cement vertical roller mill

TRM型原料辊磨在结构、使用、维护等方面的特点主要有以下几点：

- 研磨部分采用水平磨盘加锥形磨辊。
- 分选部分采用动静态结合的组合式高效笼型选粉机。
- 每个磨辊相对独立的对磨盘上物料的施压。
- 磨辊润滑为稀油循环方式。
- 磨辊轴承密封采用三道氟橡胶骨架油封。
- 风环面积和挡料圈高度可以根据情况调整。
- 磨辊可以自行抬落，实现空载启动。
- 磨机操作简单，运行平稳，振动小。
- 原料细度控制严格，调节灵敏。
- 设备运转率高，故障停机时间少。
- 磨辊可以靠油缸作用自动翻出机壳外，维修方便。
- 耐磨部件采用堆焊技术，维护方便。

The followings are the main characteristics of TRM series Raw Vertical Roller Mill in aspect of structure, operation and maintenance.

- To be of horizontal and inclined grinding table integrating cone type grinding roller;
- To be of static and dynamic combined high efficiency cage type separator for mill internal classifying;
- To be of relative independently pressing to the material by each grinding roller;
- To be of oil lubrication system for grinding roller;
- To be of triple fluororubber framework oil seal for bearing of grinding roller;
- To be of adjustable gas ring area and dam ring height;
- To be of automatic raise-up grinding roller for the no-load start-up;
- To be of simple operation, stable running and little vibration;
- To be of strict control of product fineness and flexible adjustment;
- To be of high availability and less defect stop;
- To be of automatic roller swing out system via hydraulic cylinder and easy for maintenance;
- To be of hardfacing of wear resistant part and easy for maintenance;

3 TRM型原料辊磨系统

Trm series raw vertical roller mill system

TRM型原料辊磨采用带旋风收尘器和循环风机的流程，磨机有物料外循环系统。混合料由喂料皮带经三道锁风阀（或回转下料器）喂入辊磨，在辊磨中物料随着磨盘的旋转从其中心向边缘运动，同时受到磨辊的挤压而被粉碎。粉碎后的物料在磨盘边缘处被从风环进入的热气体带起，粗颗粒落回到磨盘再粉磨；较细颗粒被带到选粉机进行分选，粗粉也返回到磨盘再粉磨，合格细粉被带入旋风收尘器收集作为成品。部分难磨的大颗粒物料在风环处不能被热风带起，通过吐渣口进入外循环系统，并与新喂物料一起入磨。经旋风收尘器收集的成品通过空气输送斜槽、提升机等设备送入到生料库中。

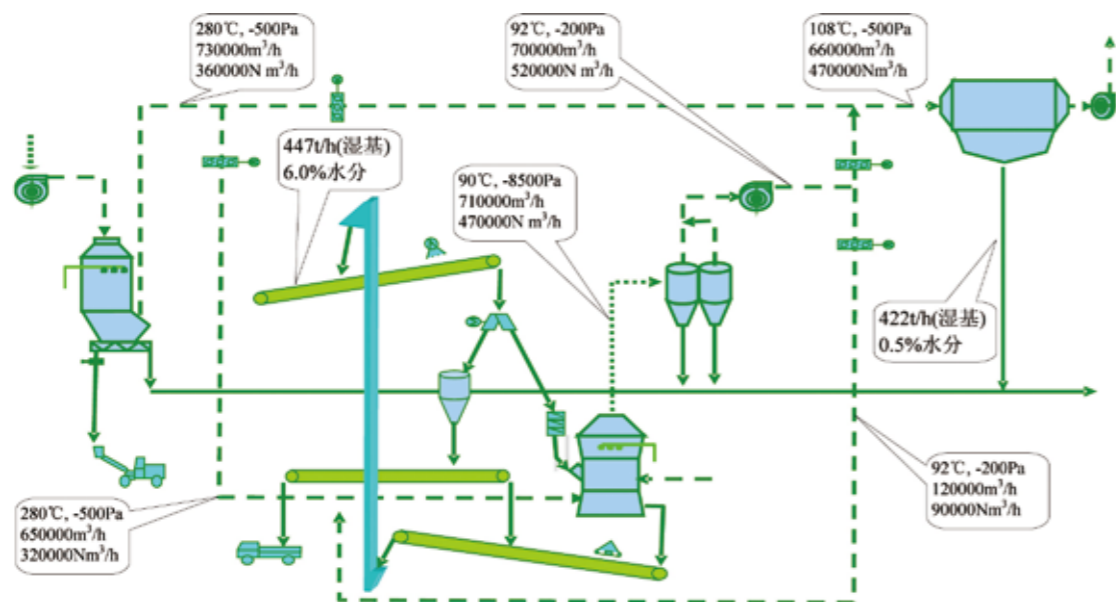
磨机烘干需要的热量风由窑尾废气提供，热风通过管道进入磨机，出磨气体通过旋风收尘器净化后由循环风机送出，一部分进入废气处理系统，另一部分循环入磨。物料在磨内粉磨的同时被烘干，由于辊磨的通风量大，烘干能力很强，在不另外增加烘干设备的情况下可以烘干7%的水分。

典型的TRM型原料辊磨系统如下图所示。

TRM Series Raw Vertical Roller Mill System includes cyclone filter, Circulation fan and material external circulation. The mixed material is fed to vertical roller mill via belt conveyor and air lock valve. Material in mill internal was moved from center to grinding table edge when grinding table rotates. In the meanwhile, it is stressed and crushed by grinding roller. Crushed material at table edge was brought out by hot gas. Coarse particles were recirculated in the system. However the fine particles were brought to separator for classifying, among which some coarse particles were recirculated back grinding table. Qualified fine powder will be collected by bag filter. Partial hard to grind coarse material not being able to brought by hot gas will be rejected to external circulation. It will, together with new material, fed to vertical roller mill for grinding. Collected fine product will be sent to raw meal homogenization silo through air slide and bucket elevator.

Hot gas required for drying is sourced from preheater system. Hot gas goes into vertical mill via hot as duct. Gas at mill outlet shall go through cyclone filter and vented by circulation fan. Partial of them will go into waste gas treatment system, and the other part will be recirculated to the mill. In the meanwhile, material was dried when grinding. Owing to high gas flow, it is of strong drying capacity. Generally, without specific drying equipment, it can dry off 7% moisture.

Typical TRM Series Raw Vertical Roller Mill System shows as the following.



4 TRM型原料辊磨的型谱

Spectrum of trm series cement vertical roller mill

磨机规格 Model	TRM25	TRM31	TRM36	TRM38	TRM40	TRM42	TRM45	TRM53	TRM56	TRM60
磨盘直Do,mm Table Diameter	2500	3100	3600	3800	4000	4200	4500	5300	5600	6000
配用功率kW Installed Power	800	1250	2000	2240	2500	2800	3150	4000	4500	5000
产品品种 Type of Cement	水泥原料, R _{80um} =12% Cement raw material, R _{80um} =12%									
产量,t/h Capacity	80~100	120~140	200~230	220~250	250~280	280~300	320~360	400~450	450~500	500~560
系统电耗,kWh/t Power Consumption of System	15~18									

表中产量基于中等易磨性的物料。

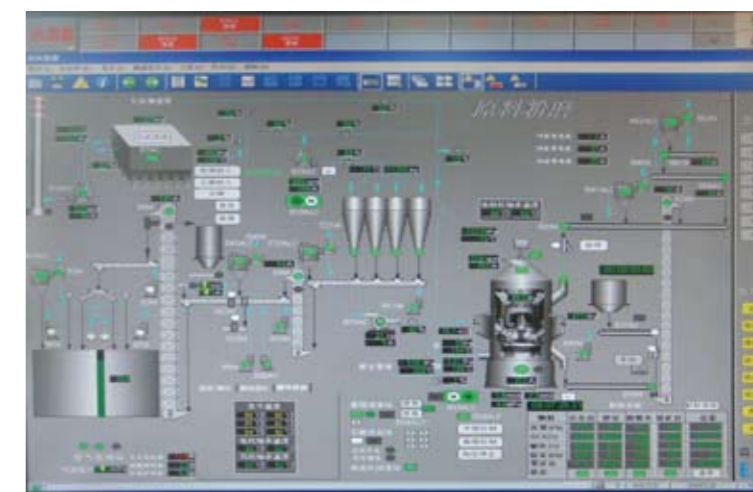
Medium grindability is assumed for the Capacity shown in table above.

5 TRM型原料辊磨的应用

Application of TRM series cement Vertical roller mill



●河北燕赵TRM53.4磨机的外形
Outline of TRM53.4 Of Hebei Yanzhao cement co., Ltd



●河北燕赵TRM53.4磨机中控操作画面
CCR operation mimic of Hebei Yanzhao cement co., Ltd

●大型原料辊磨（5000tpd配套）销售业绩表

Sales reference of large raw vertical roller mill (5000t/d)

序号 No	规格 Model	规模 Equipped for	数量 Q' ty	使用厂家 Name of Client	磨机产量,t/h Capacity
1	TRM53	5000t/d	1	辽阳恒威水泥有限公司 Liaoyang Hengwei Cement Co., Ltd	420
2	TRM53	5000t/d	1	台湾幸福水泥有限公司 Taiwan Lucy Cement Co., Ltd	420
3	TRM53	5500t/d	1	河北鹿泉燕赵水泥有限公司 Hebei Luquan Yanzhao Cement Co., Ltd	420
4	TRM53	5000t/d	1	台湾幸福水泥有限公司 Taiwan Lucy Cement Co., Ltd	420
5	TRM53	5000t/d	1	郑州同力水泥有限公司 Zhengzhou Tongli Cement Co., Ltd	420
6	TRM53	5000t/d	1	黑龙江浩良河水泥有限责任公司 Heilongjiang Haolianghe Cement Co., Ltd	420
7	TRM53	5000t/d	1	赛德水泥（贵州）管理有限公司 Saide Cement (Guizhou) Management Co., Ltd	420
8	TRM53	5000t/d	1	湖北永兴集团 Hubei Yongxing Group	420
9	TRM53	5000t/d	1	中材甘肃水泥有限公司 Sinoma Gansu Cement Co., Ltd	420
10	TRM53	5000t/d	1	曲阳金隅水泥有限公司 Quyong Jinyu Cement Co., Ltd	420
11	TRM53	5000t/d	1	内蒙古同达水泥有限公司 Inner Mongolia Tongda Cement Co., Ltd	420
12	TRM53	5000t/d	2	甘肃祁连山水泥有限公司 Gansu Qilianshan Cement Co., Ltd	420
13	TRM53	5000t/d	1	洛阳黄河同力水泥有限责任公司 Luoyang Huanghe Tongli Cement Co., Ltd	420
14	TRM53	5000t/d	1	驻马店市豫龙同力水泥有限公司 Zhumadian Yulong Tongli Cement Co., Ltd	420
15	TRM53	5000t/d	1	赞皇金隅水泥有限公司 Zanhuang Jinyu Cement Co., Ltd	420
16	TRM53	5000t/d	1	费县沂州水泥有限公司 Fei Yizhou Cement Co., Ltd	420
17	TRM53	5000t/d	1	河北太行水泥有限公司 Hebei Taihang Cement Co., Ltd	420
18	TRM53	5000t/d	1	梅州油坑建材有限公司 Meizhou Youkeng Cement Co., Ltd	420
19	TRM53	5000t/d	1	衢州上方豪龙水泥有限公司 Quzhou Shangfang Haolong Cement Co., Ltd	420
20	TRM53	5000t/d	1	马来西亚HUME水泥有限公司 Malaysia Hume Cement Co., Ltd	420
21	TRM53	5000t/d	1	南雄市彤置富水泥建材投资有限公司 Nanxiong tongzhifu Cement Co., Ltd	420
22	TRM53	5000t/d	1	河南锦荣水泥公司 He'nan Jinrong Cement Co., Ltd	420
23	TRM53	5000t/d	1	贵州六盘水豪龙项目 Guizhou Liupanshui Haolong Cement Co., Ltd	420
24	TRM53	5000t/d	1	华润水泥（长治）有限公司 China Resources Changzhi Cement Co., Ltd	420
25	TRM60	6500t/d	1	河北矿峰水泥有限公司 Hebei Kuangfeng Cement Co., Ltd	520
26	TRM53	5000t/d	1	中材装备马来西亚马口项目 Sinoma Malaysia Makou Cement Project	420
27	TRM53	5000t/d	1	广东金圆水泥有限公司 Guangdong Jinyuan Cement Co., Ltd	420



TRM型原料辊磨
TRM SERIES RAW MT VERTICAL ROLLER MILL



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联系我们 Contact Us

天津

地址: 天津市北辰区引河里北道1号
邮编: 300400
电话: 0086(22)26915233
传真: 0086(22)26915452
网址: [Http://www.sinoma-tcdri.cn](http://www.sinoma-tcdri.cn)

Tianjin

Address: No.1, Yinheli Bei Road, Beichen District,
Tianjin P.R. China
Post code: 300400
Tel: 0086(22)26915233
Fax: 0086(22)26915452
Website: [Http://www.sinoma-tcdri.cn](http://www.sinoma-tcdri.cn)

北京

地址: 北京市经济技术开发区隆庆街7号
邮编: 100176
电话: 0086(10) 67285071
传真: 0086(10)67285001
网址: [Http://www.cbmi.com.cn](http://www.cbmi.com.cn)

Beijing

Address :7th, LONGQING Road, Beijing Economic and Technological
Development Area, P.R. China
Post code: 100176
Tel: 0086(10) 67285071
Fax: 0086(10)67285001
Website: [Http://www.cbmi.com.cn](http://www.cbmi.com.cn)