

TIMKEN

铁姆肯公司轴承应用 水泥行业

2012年铁姆肯公司中国授权经销商培训大会
2012 Timken China Authorized Distributor Training Conference

2012年8月
August , 2012



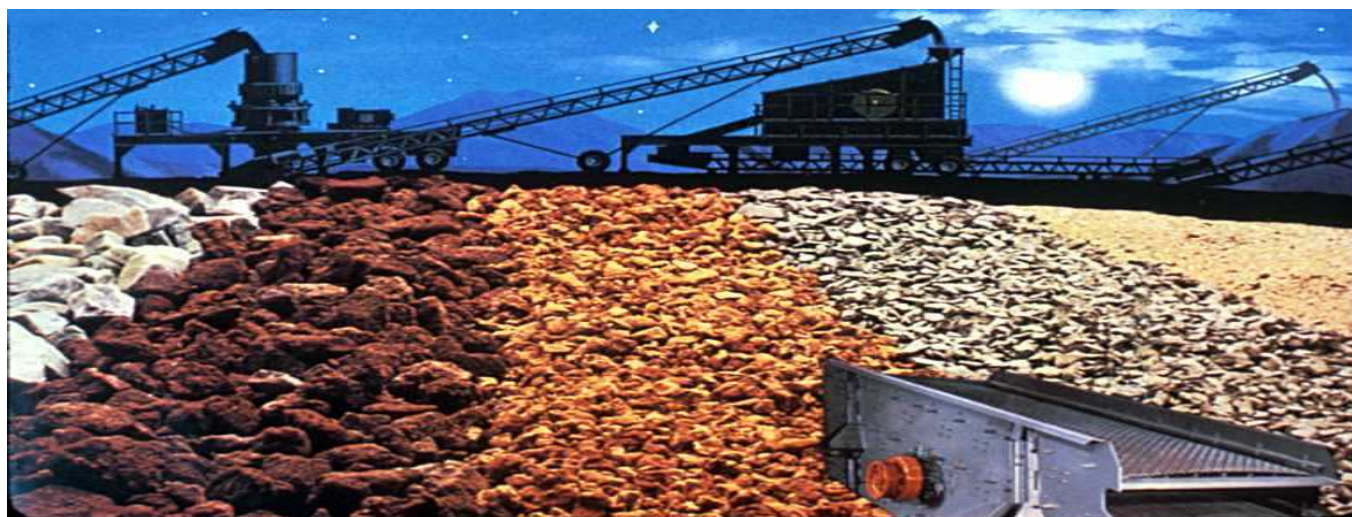
议程 **Agenda**

- 铁姆肯在水泥工业的历史及技术资源
Timken's Cement History
- 水泥设备中的轴承应用
Bearing in cement equipment
- 轴承新技术应用
New bearing technology in cement industry

铁姆肯在水泥工业的历史

Timken's Cement History

- 五十年以上的工程解决方案供应商 **50+ years providing engineered solutions**
- 现场应用测试 **On-site Application testing**
- 研发新设计 **Developed new design features**
- 持续改进 **Continues to benchmark and Improve**
- 重视水泥行业 **Consider Cement a Key growth Industry**





TIMKEN
Where You Turn

TIMKEN

Where You Turn

Torrington® Fafnir®

全面的产品线Comprehensive Product Line

目前铁姆肯公司可以提供在水泥行业设备中所需要的所有类型的轴承**Timken now provides a comprehensive product line meeting the needs of the Cement customer. This is made possible through the brand power of The Timken Company.**

工程技术服务 Engineering Services and Technical Assistance

第一阶段 **Level One**

- 专注于该行业的工程师

Dedicated Engineering Staff

- 工程应用分析

Application Engineering Analysis

- 高素质的服务工程师团队

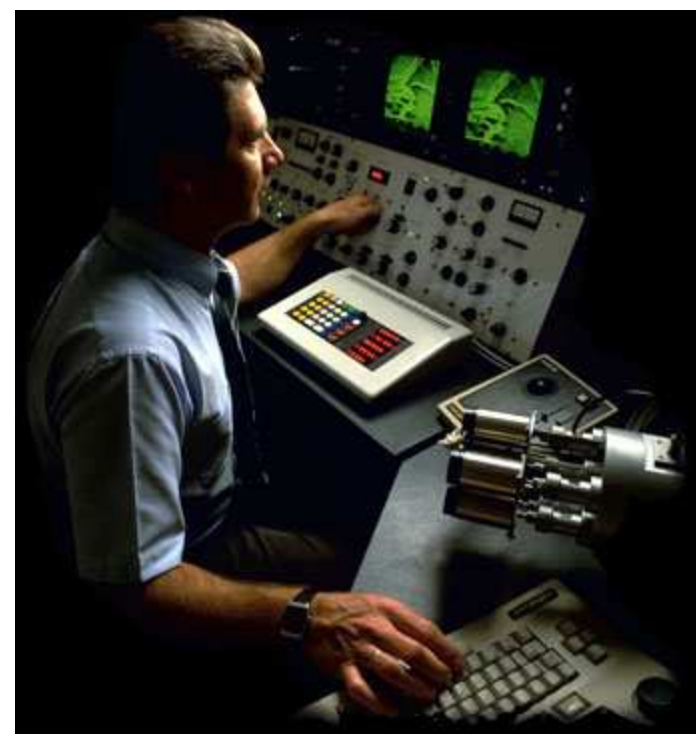
Qualified Service Engineers



工程技术服务 Engineering Services and Technical Assistance

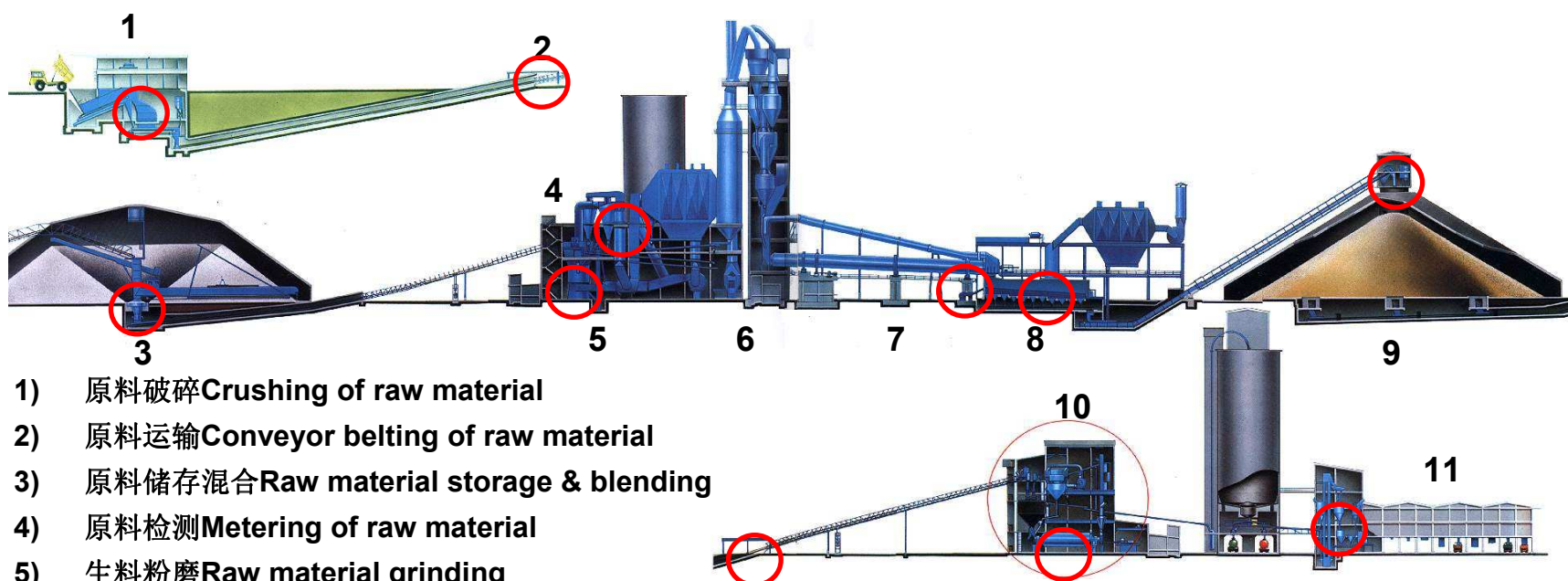
Level Two 第二阶段

- **Application testing** 应用测试
- **Metallurgical services** 冶金分析服务
- **Detailed Engineering Analysis** 深入的工程分析
- **Prototype manufacturing** 样机制造
- **Tribology and lubrication analysis** 表面处理和润滑分析



水泥制造过程

Cement Production Process

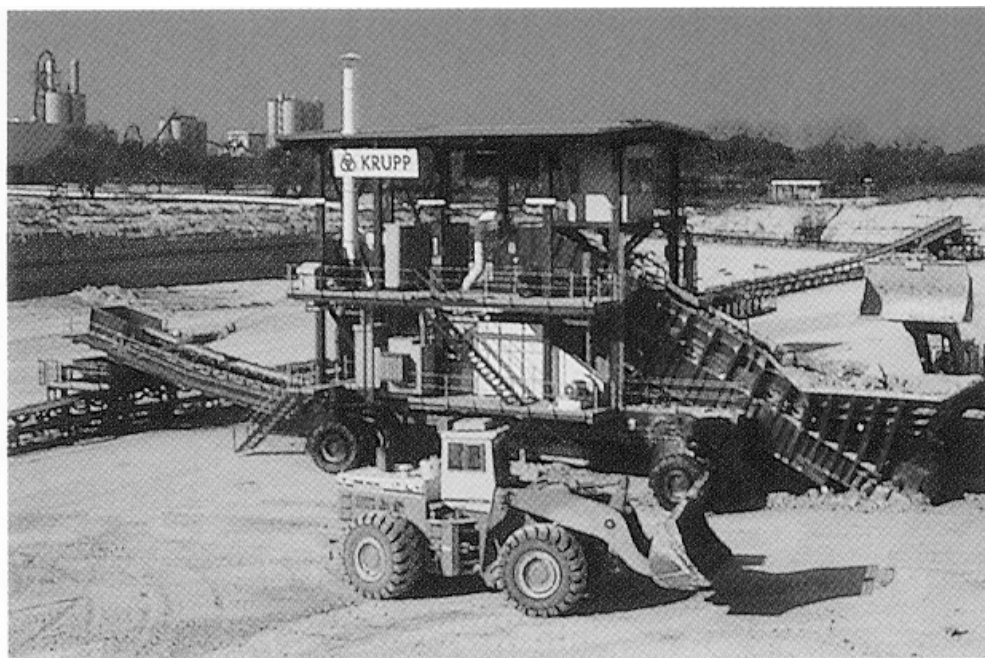


- 1) 原料破碎Crushing of raw material
- 2) 原料运输Conveyor belting of raw material
- 3) 原料储存混合Raw material storage & blending
- 4) 原料检测Metering of raw material
- 5) 生料粉磨Raw material grinding
- 6) 预加热Pre-heater
- 7) 回转窑烧结Clinker production in rotary kiln
- 8) 篦冷Clinker cooler
- 9) 储存Storage
- 10) 水泥粉磨Cement milling
- 11) 储存运输分装Storage / shipping / baggaging facility

水泥轴承应用 Cement Applications

轴承类型 Bearing Type	立磨 Vertical Roller Mills	辊压机 Hydraulic Roller Presses	球磨 Ball Mills	回转窑 Kilns	齿轮箱 Gear Drives	振动筛 Screens	初级破碎 Primary Crushing	运输 Material Handling	泵 Pumps
SRB	X	X	X	X	X	X	X	X	X
CRB	X	X			X	X	X		
TRB	X				X		X	X	
Thrust Bearings		X			X				
Large BB	X								
Pillow Blocks			X	X	X				
Angular BB									X
Radial BB								X	X
Wide Inner Ring								X	
Spherical Plain	X								

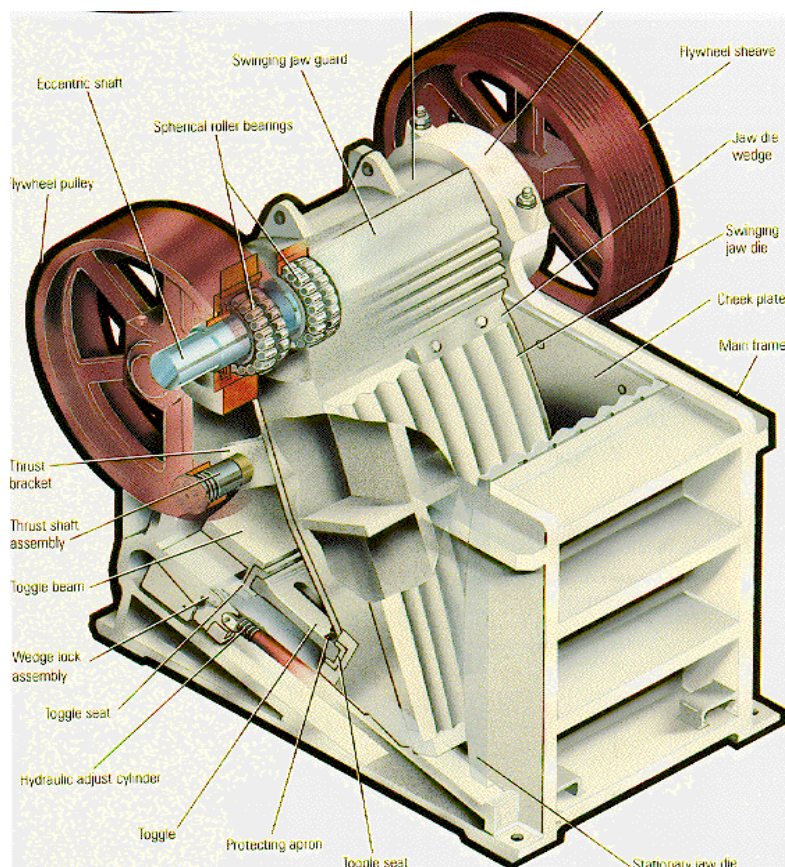
初级破碎 **Primary Crushing**



轴承应用 Bearing Applications:

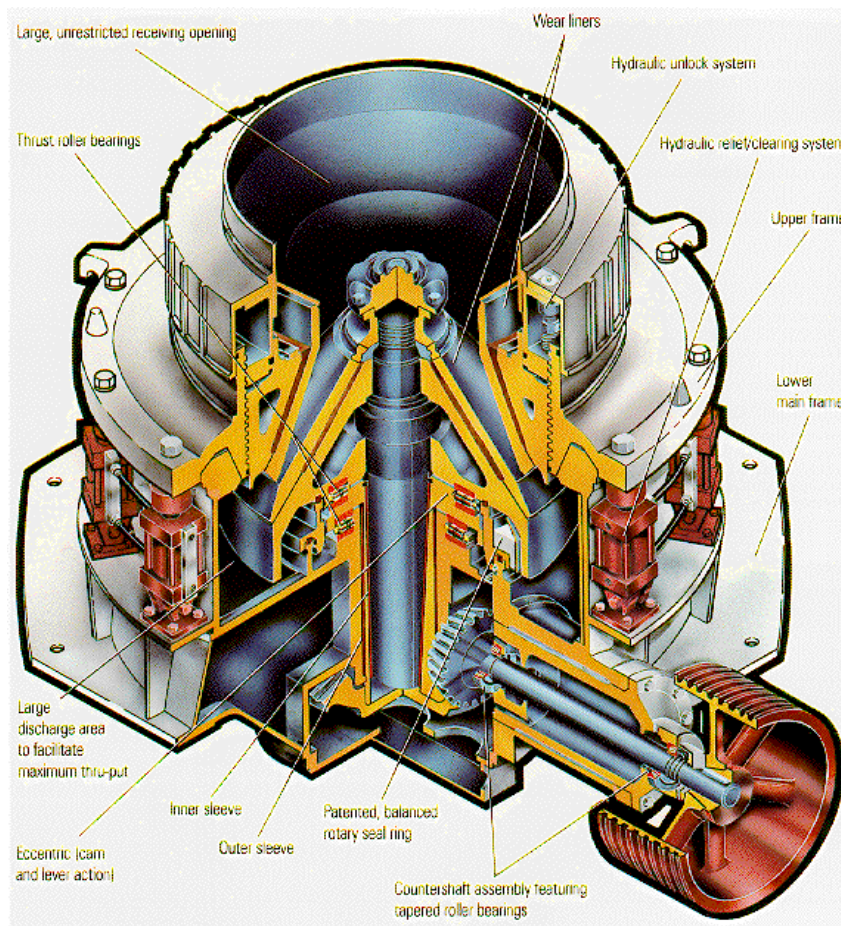
颚式破碎机、旋
回式破碎机、
冲击式破碎机
Jaw Crushers,
Cone Crushers,
Impact Crushers

颚式破碎机Jaw Crusher



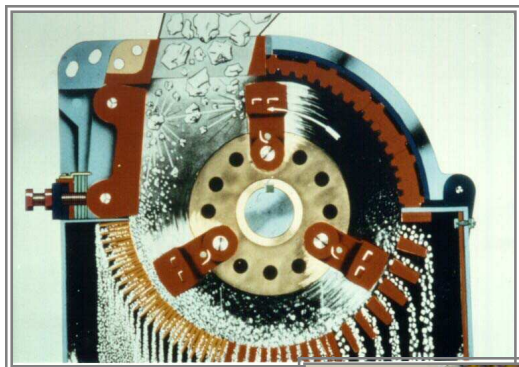
- **主轴轴承Main Bearing Position**
 - 浮动端及固定端Fixed and Float Side
 - **22, 23, 33系列的SRB 22, 23, or 32 Series SRB**
 - 直孔或锥孔配锥型套Straight or Tapered Bore w/ push type sleeve
 - 内径尺寸100-500mm Bore Size Ranges from 100-500 mm
- **偏心轴轴承Eccentric or Pitman Bearing**
 - 浮动端及固定端Fixed and Float Positions
 - **31或32系列SRB 31or 32 Series SRB**
 - 直孔安装Straight Bore Mount
 - 内径尺寸100-500mm Bore sizes range from 100-500 mm

旋回式(锥式)破碎机Cone Crushers



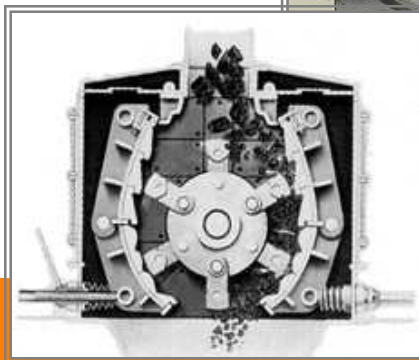
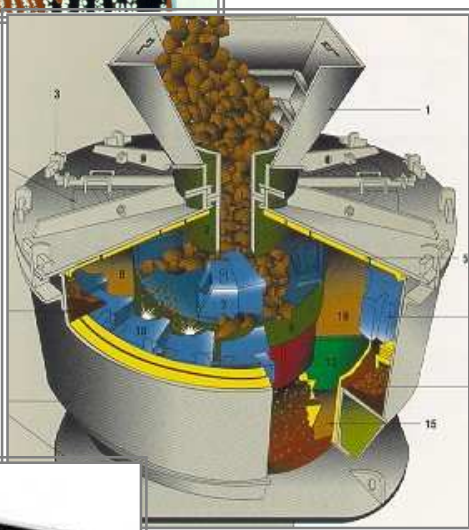
- 两个CRB 2 Radial Cylindrical Roller Brg
- 内径尺寸8-34英吋Bore sizes ranges from 8-34 inches
- 两个止推CRB,内径尺寸12-48英吋2 Cylindrical Thrust Roller Brgs, Bore sizes range from 12-48 inches

反击式破碎机Impact Crushers

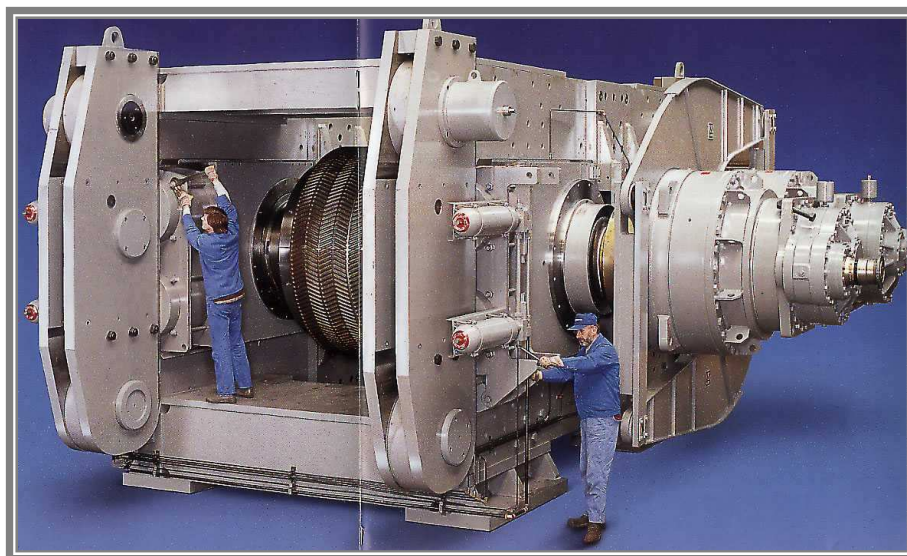


锤式破碎机Hammer Mills

- 23系列调心滚子轴承
22 or 23 Series SRB 22,
- 直孔或锥孔Straight or Tapered Bore
- 100-500 mm Bore Sizes
- 外圈有油槽及油孔W33
Outer Ring Lube Holes & Groove
- 间歇式油润滑
Predominantly Oil Lube Based



辊压机Roll Presses



- 高性能水平辊压High Capacity Two-Roll Horizontal Presses
- 大孔径41, 23或32系列 SRB Large Bore 41, 23, or 32 Series SRB
- 锥孔以便安装Tapered Bore for Ease of Installation
- 孔径300-1000mm Bore Sizes Range From 300 to 1000 mm

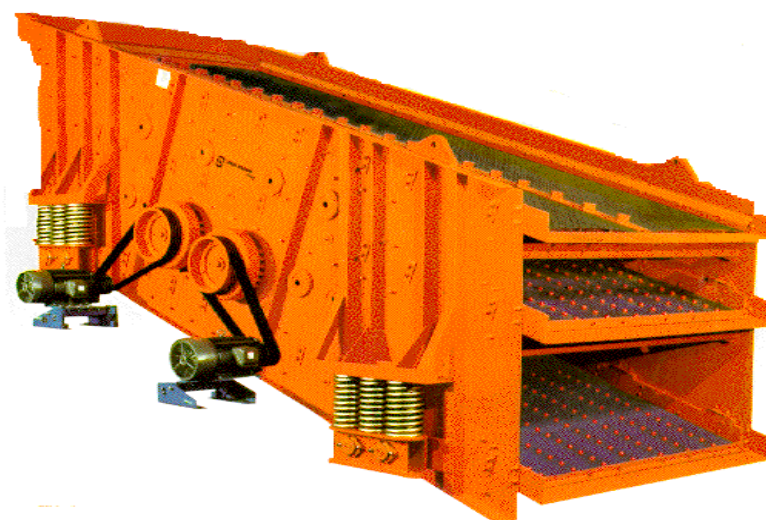
振动筛Vibrating Screens

振动筛的四种形式Vibrating Screens have a possibility of 4 arrangements:

- 单轴双轴承式Single Shaft- Two Bearings
- 双轴四轴承式Double Shaft- Four Bearings
- 单轴四轴承式Single Shaft- Four Bearings
- 三轴六轴承式Triple Shaft- Six Bearings

大型振动筛使用The Larger Screens Use:

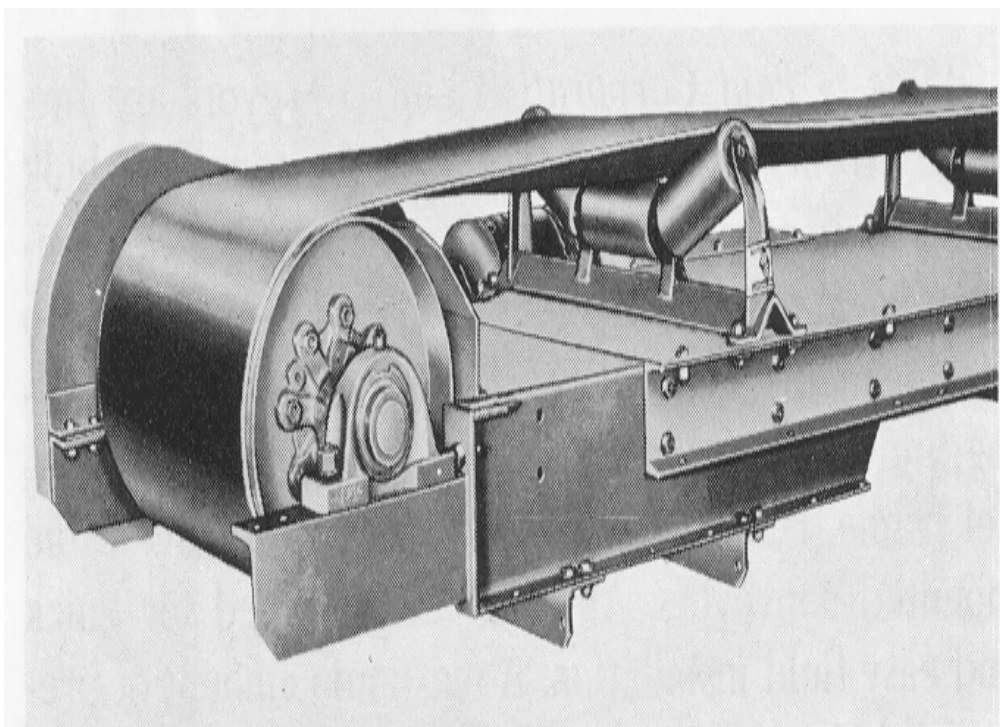
- 直孔SRB Straight bore SRB
- 23或33系列 23 or 33 Series
- 铜保持架Bronze cage (YM style)
- W800后缀 W800 mod code (内径,外圆公差小 close bore and OD tolerance)
- C4游隙 C4 internal clearance



小型振动筛使用Smaller Screen Use:

- 圆柱滚子轴承Cylindrical Roller Brgs
- 固定端及浮动端Fixed and float positions
- 特殊法兰设计Specific flange features

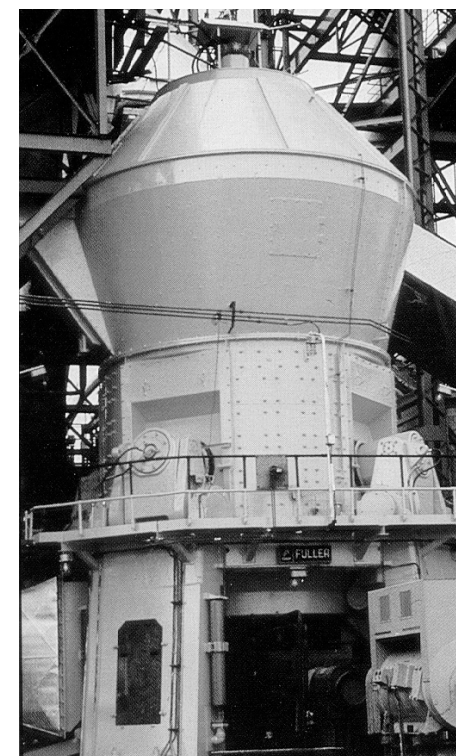
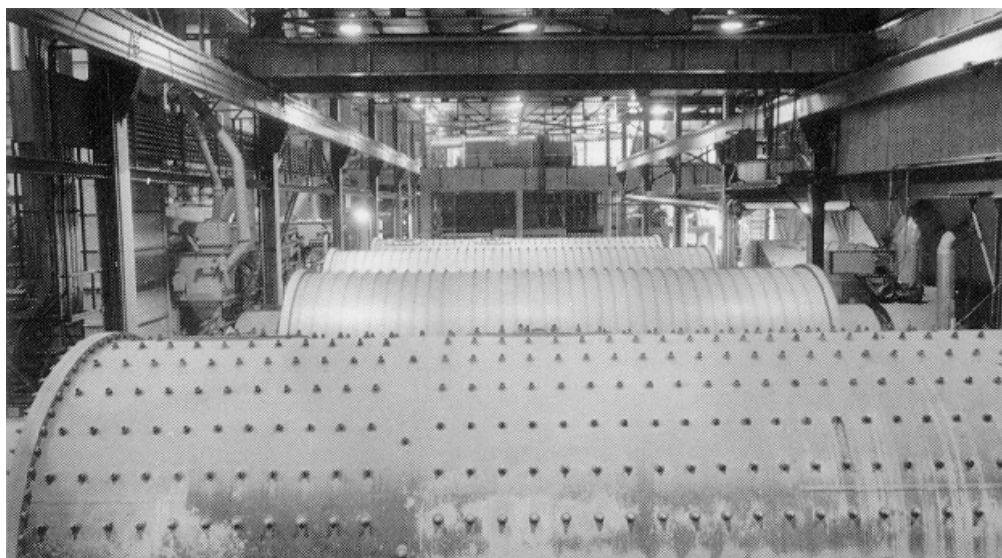
原材料输送 **Material Handling**



传送带 **Conveyors**

- 驱动轮常用调心滚子轴承及带座轴承 **SRB and Pillow Blocks** support large drive portions
- 支撑辊常用带座球轴承 **Ball Bearing housed units** support conveyor rolls

生料磨Raw Grinding Mill

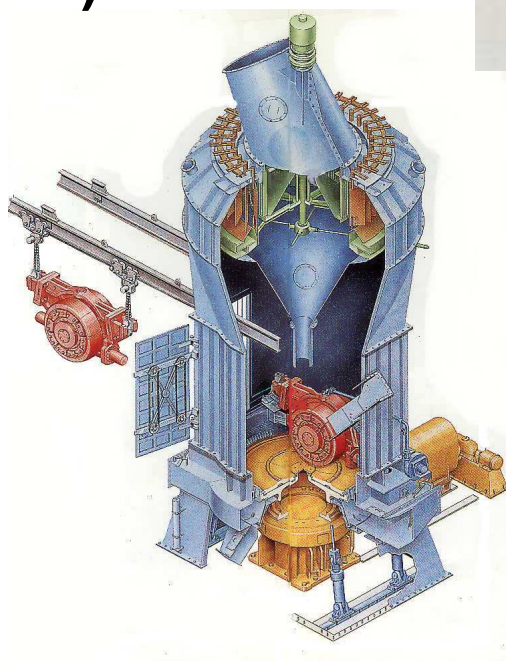
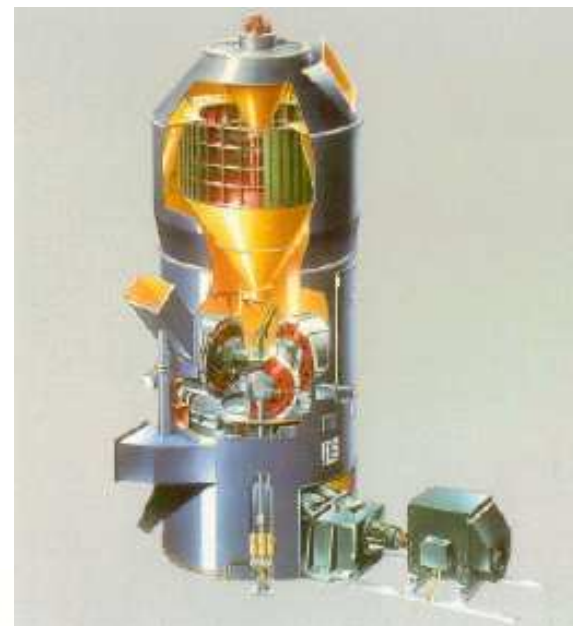


轴承的应用：立式磨,球磨机,泵,传送系统

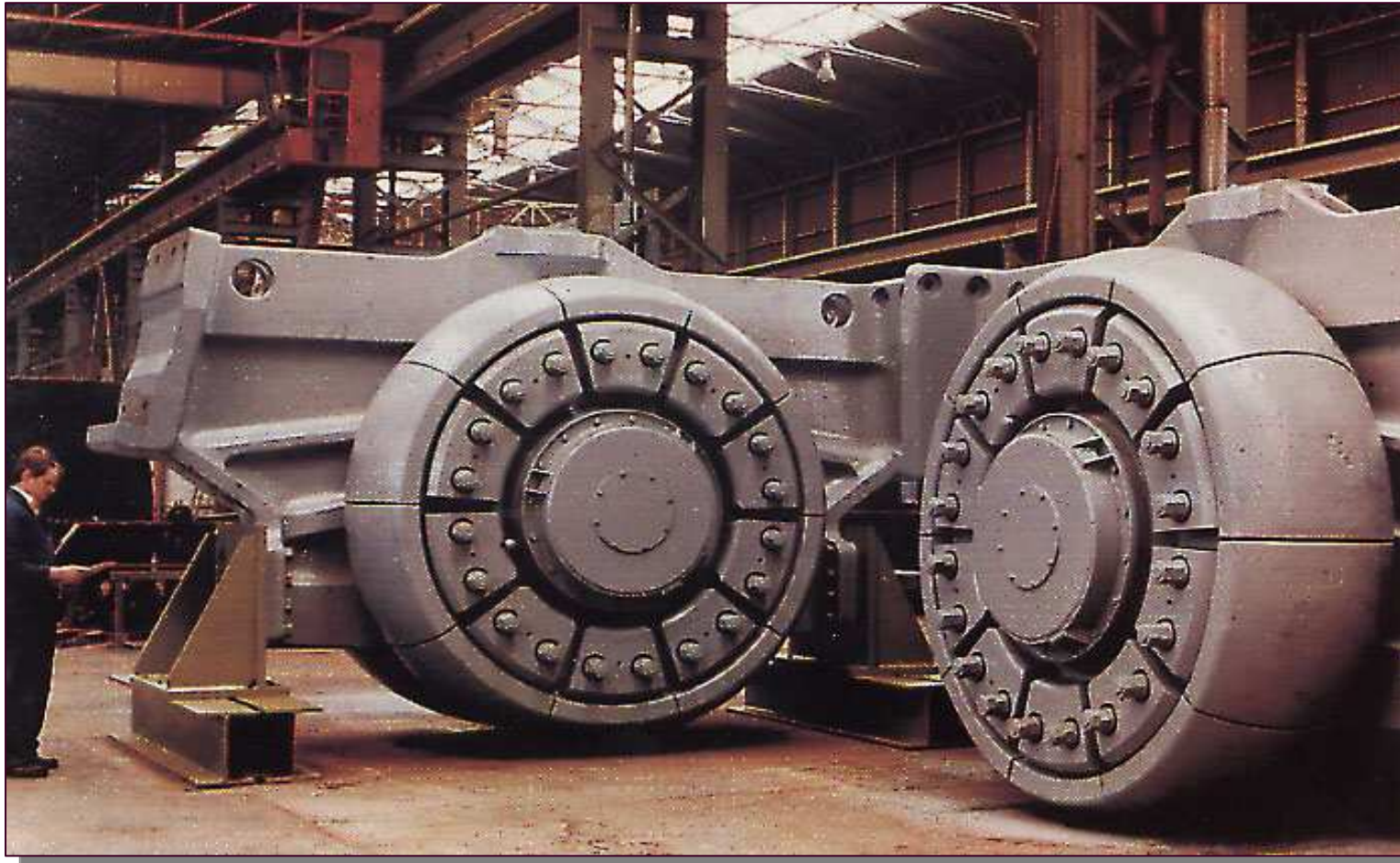
**Bearing Applications: Vertical grinding mills,
Ball or Rod Mills, Pumps, Conveyors**

主要的立磨设计 Key Vertical Mill designs

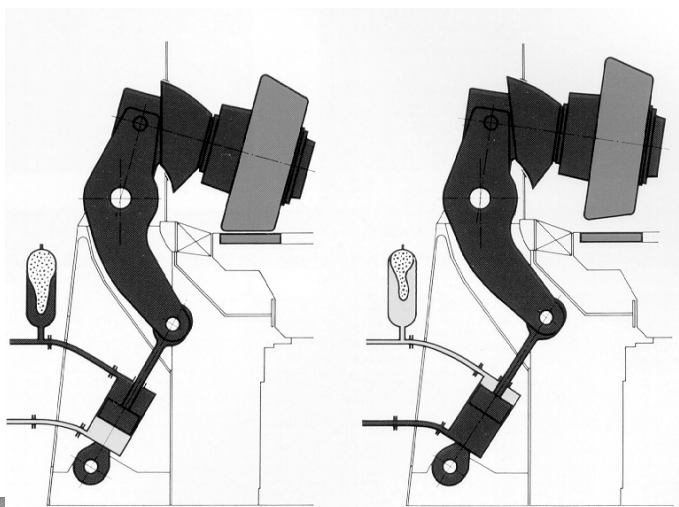
- FRM Mills (Loesche Mills)
- Fuller (USA F.L. Smidth)
- Atox Mills (F.L. Smidth)
- OK Mills (F.L. Smidth)
- Krupp Polysius
- TCDRI (天津院)
- CITIC (中信重机)



磨辊 Typical Wheels



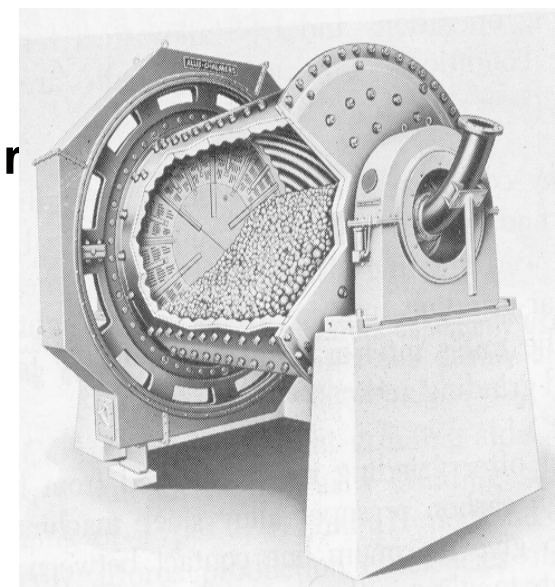
磨辊 **Roller Mill Wheels**



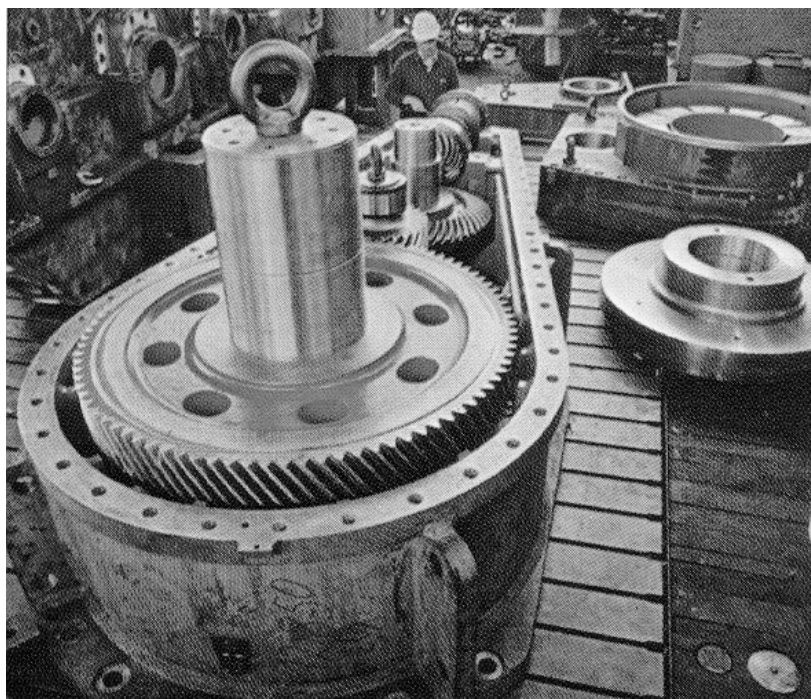
- 轴静止，轮转动 **Stationary shaft with rotating wheels**
- 滚轮部位的载荷决定其常用多列轴承 **Wheel loading necessitates use of multiple bearing configurations**
 - 固定端SRB, 浮动端CRB
SRB in fixed; CRB in float
 - 固定端TDI, 浮动端CRB
TDI 2-row taper fixed; CRB in float
 - 大锥角 T S 做固定端止推或非止推轴承，浮动端用双列 T R B
Steep angle single-row TRB in thrust, steep angle single-row TRB in non-thrust, and 2-Row TRB in the float position

球磨机 **Ball and Rod Mills**

- 直齿或斜齿轮驱动 **Driven by a single helical or spur gear arrangement**
 - 用有**SRB**的轴承座作输入轴支撑 **SRB mounted in a pillow block supports the input shaft**
 - 内径**200-400 mm** **200-400 mm bore**
 - 锥孔或直孔 **straight or tapered bore**
- **Mill Drum bearings support the weight of the drum**
 - 磨筒支撑可用大尺寸调心滚子轴承或油膜轴承 **Either large bore SRB in pillow blocks or hydrodynamic/static oil film bearings**
- 减速机及输入轴 **Gear reducer coupled to input pinion**
 - 中等尺寸的 **CRB,SRB Moderate size taper, spherical, or cylindrical roller brgs.**

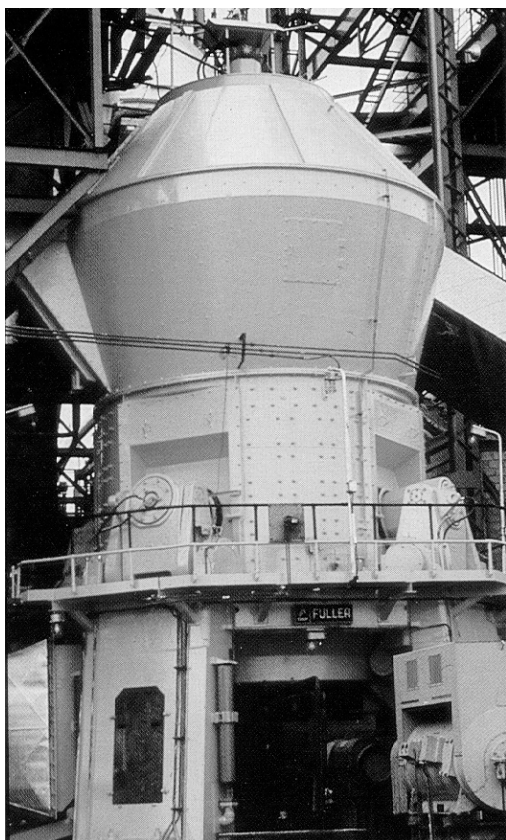


立磨齿轮箱 **Roller Mill Gearbox**



- 常用轴承**All gear shafts are supported with anti-friction bearings**
 - **SRB, CRB, TRB, or SRTB**
- 输出轴需止推轴承承受机体的作用力**The output shaft also needs a thrust bearing to support the high forces or moment loads generated on the table**
 - 圆柱止推轴承，圆锥止推轴承或油膜轴承**Cylindrical roller thrust, Tapered roller thrust or Hydrodynamic/static bearing**
- 循环油润滑**Almost all circulating-oil lubricated**
- 轴承的损坏常由油封损坏或缺油引起**Bearing replacement is a function of the sealing and lubrication adequacy.**

磨煤机 **Fueling the Kiln**



采用煤做燃料的回转窑，需要配备磨煤机。其尺寸比立磨略小。磨煤机中的磨辊轴承，齿轮箱轴承

- **Kilns can be fueled by coal and the coal has to be crushed before burning. A smaller roller mill is used to crush the coal chunks into fine particles that can be air swept into the furnace. The bearing sizes are small but again we are well positioned on these sizes also.**

新技术与产品创新

New technology & product Innovations

- 抗磨粒轴承
- 工程表面技术——有选择的改变部件的表面质量来提高抗磨损，抗疲劳和抗摩擦性能
- Engineered surfaces – selectively changing a component's surface to enhance its wear, fatigue and frictional properties



Questions???

Question 1:

- 铁姆肯公司在水泥行业的产品线范围？

Answer

- 铁姆肯公司可提供水泥行业所需的包括调心滚子轴承，圆锥滚子轴承，圆柱滚子轴承和球轴承在内的全系列轴承产品

Question 2

- 水泥工业的主要设备？

Answer

- 立磨，辊压机，回转窑，破碎机

Question 3:

立磨中的主要轴承应用部位？

Answer

- 磨辊，齿轮箱

Question 4:

水泥行业中使用量最大的轴承类型？
在哪些设备中使用？

Answer

- 调心滚子轴承。用于立磨，辊压机，破碎机，回转窑，齿轮箱，振动筛，球磨，运输设备，泵等设备

Question 5:

水泥工业中的恶劣工况如何？铁姆肯公司有何针对性的技术解决方案？

Answer

- 环境恶劣，粉尘多，负载重
- 根据需要，铁姆肯可提供抗磨粒轴承用于这些场合，提高抗磨损，抗疲劳和抗摩擦性能。

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Thanks!

