



金刚股份
JIN GANG INC.

HIGH-PERFORMANCE ALUMINA CERAMIC PRODUCTS

高性能氧化铝陶瓷制品

金刚新材料股份有限公司
JINGANG NEW MATERIALS CO., LTD.

SCIENCE AND TECHNOLOGY

金刚——专业专注、至诚至信、精益求精、共创辉煌

Jingang—Professional, Concentration, Sincerity, Honesty, Constant Striving for Improvement, Mutual Glory



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SCIENCE & TECHNOLOGY ORIENTED, MARKET BASED, TAKE ON ENVIRONMENTAL PROTECTION RESPONSIBILITY, HONESTY ROOTED

金刚——以科技为先导，以市场为基础，以环保为己任，以诚信为根本





金刚新材料股份有限公司是山东华星环保集团的子公司，坐落于鲁中新城邹平，是一家研究开发和生产销售高性能特种氧化铝陶瓷新材料、高纯度超细 α -氧化铝粉体及石油压裂支撑剂的高新技术企业。金刚公司下设山东璞泰矿业有限公司、山东金璞新材料有限公司、钻石支撑剂公司（美国）、淄博金刚贸易有限公司四个子公司。

Jingang New Materials Co., Ltd., a holding subsidiary of Shandong Huaxing Environmental Protection Corporation located in Zouping, is a provincial high-tech enterprise engaging in the research, development, production and sales of high-performance special alumina ceramic new materials, high purity and ultrafine α -alumina powder and oil fracturing proppant. Jingang company under the Shandong Putai Mining Co. Ltd., Shandong Jin Puxin Materials Co., Ltd. Diamond proppant Ltd.(USA), Zibo Jingang Trade Co., Ltd. four companies.

公司现有员工3000余人,占地面积468000平方米,拥有26台全自动干袋等静压压机、37台干压成型机、2台湿袋法压机,60多台自动液压机、50多台自动滚制成球机,形成9条可独立运行的陶瓷制品生产线,3条氧化铝粉体生产线,14条石油压裂支撑剂生产线;具备年产20万吨高温煅烧氧化铝粉体、年产15万吨氧化铝陶瓷制品及年产70万吨石油压裂支撑剂的生产能力。公司有三大类九大系列上千个品种的产品,包括微晶耐磨氧化铝球石、氧化铝衬砖、氧化铝衬板、氧化铝管件、马赛克、高纯氧化铝填料、氧化铝异形件、高温煅烧 α -氧化铝粉体、石油压裂支撑剂(陶粒支撑剂)等。公司所有产品采用专利技术生产,在规模、产量和创新能力方面,稳居行业龙头地位。产品广泛应用于建筑陶瓷、卫生陶瓷、钢铁、水泥、耐火材料、化工、涂料、造纸、医药、热电、油气田开采等行业,在中国、北美、欧盟、东南亚、澳大利亚等国家和地区具有稳固的市场占有率。

At present, the Company owns 3,000 employees, covers an area of 468,000m², has 26 full-automatic dry bag isostatic pressing machines, 37 compression molding presses, 2 wet-bag presses, more than 60 automatic hydraulic presses and more than 50 automatic rolling pelletizers, forms nine ceramic product production lines available for independent running, three alumina powder production lines and 14 oil fracturing proppant production lines, and has the production capacity of 200,000t high-temperature calcined alumina powder, 150,000t alumina ceramic products and 700,000t oil fracturing proppant. The Company has nearly 1,000 products in three categories and nine series, including microcrystalline wear-resistant alumina ceramic ballstone, alumina lining brick, alumina liner, alumina fittings, mosaic, high-purity alumina fillers, alumina irregular parts, high-temperature calcined α -alumina powder, oil fracturing proppant (ceramsite proppant), etc. All our products are produced with patent technologies and occupy the first rank in the industry in aspect of scale, output and creative ability. Our products are widely applied to architectural pottery, sanitary ware, steel and iron, cement, refractory, chemistry, paint, papermaking, medicine, thermoelectricity, oil and gas field exploitation and other industries and have steady market shares in China, North America, EU, Southeast Asia, Australia and other countries and regions.

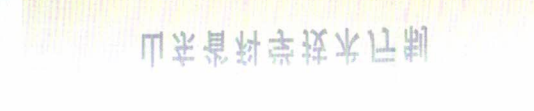
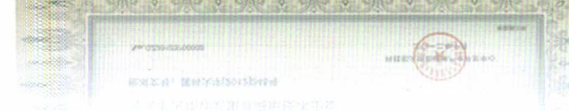
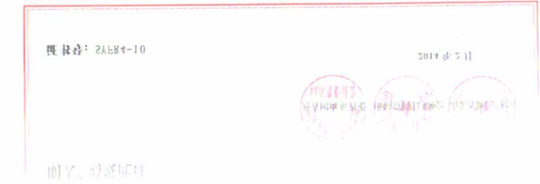
公司先后建立了山东省环保陶瓷工程技术研究中心、山东省企业技术中心、山东省环保陶瓷材料工程实验室等研发机构,与清华大学、山东大学、中国地质大学等科研院所建设了良好的合作关系,成为清华大学“产学研”教育实验基地和山东大学材料实验基地。公司配备了包括德国蔡司扫描电子显微镜、日本理学X射线衍射仪、英国马尔文粒度仪等国际尖端测试设备,拥有行业配备最全、规模最大的氧化铝陶瓷产品、氧化铝粉体、石油压裂支撑剂产品研发中试车间,开展科研开发。截止目前,金刚拥有氧化铝陶瓷研磨介质、内衬防护材料、高性能填料、催化剂载体、低钠细晶氧化铝粉体等产品研发、生产技术,共获授权专利58项,取得重大科技成果7项,承担国家重点新产品、国家火炬计划等多项国家项目,被山东省政府评定为2011年第一批战略性新兴产业。

The Company has successively built Shandong provincial environment-friendly ceramic engineering technology research center, provincial enterprise technology center, provincial environment-friendly ceramic material engineering laboratory and other research and development institutions, successively built good cooperation relationships with Tsinghua University, Shandong University, China University of Geosciences and other scientific research institutes, and become the “production, learning and research” educational experiment base of Tsinghua University and the material experiment base of Shandong University. Moreover, the Company equips international top-grade test equipment including Zeiss scanning electron microscope, Rigaku X-ray diffractometer and Malvern particle size analyzer, and owns the pilot workshop for the research and development of alumina ceramic products, alumina powder and oil fracturing proppant with most complete equipment and largest scale in the industry to conduct the scientific research and development. By now, Jingang has had the R&D and production technology of alumina ceramic grinding media, lining protection material, high-performance filler, catalyst carrier, low sodium fine alumina powder, etc., won 58 licensed patents, realized 7 significant scientific and technological achievements and undertaken several national projects including national key new product project and national Torch Plan project. The Company was awarded the title of one of the 2011 first batch of strategic emerging enterprises by the People’s Government of Shandong Province.

金刚新材料股份有限公司秉承“以科技为先导,以市场为基础,以环保为己任,以诚信为根本”的经营理念,奉行“以市场为导向,以经济效益为中心,突出重点产品,全方位拓展国际、国内两个市场”的经营战略,发扬“开拓进取、以人为本、艰苦创业、求真务实”的企业精神,深入贯彻“做大做强、做精做响”的企业宗旨,以环保产业为主营,以节能减排为中心、以高新技术为依托、以资本运营为纽带,将提供更优产品,最优服务,争做行业领先者,实现企业与客户的共赢,齐发展。

Jingang New Materials Co., Ltd. persists in the operation concept of “Science & Technology Oriented, Market Based, Take on Environmental Protection Responsibility, Honesty Rooted”, pursues the management strategy of “Market Oriented, Economic Benefit Guided, Highlight Key Product, Expand International and Domestic Markets”, promotes the enterprise spirits of “Make Pioneering Efforts, People Oriented, Hard Work and Perform Pragmatically” and further carries out the enterprise tenet of “Become Stronger and Become Famous”. We, focusing on environmental protection industry energy conservation and emission reduction, will provide better products and best services, strive for being front runner of the industry and realize mutual benefit and joint development by high technology and capital operation.

金刚科研荣誉资质
Honors and Qualifications



金刚发展历程

Development Course of Jingang

2007年4月

金刚新材料股份有限公司破土动工
In April 2007, Jingang New Materials Co., Ltd. started to be constructed

2007年5月

成为清华大学“产学研”基地
In May 2007, Jingang became the "production, learning and research" base of Tsinghua University

2007年8月

山东华星集团有限公司正式成立
In August 2007, Shandong Huaxing Environmental Protection Group was officially founded

2007年11月

“微晶耐磨氧化铝衬板”通过山东省科技成果鉴定，产品及工艺技术达到国际先进水平
In November 2007, the "microcrystalline wear-resistant alumina liner" passed the identification of Shandong scientific and technological achievements, and the product and the technology had reached international advanced level

2007年12月

获得“山东省级高新技术企业”称号
In December 2007, Jingang won the honor of "Shandong Provincial High-tech Enterprise"

2009年

获得“十佳民营企业”、“科技创新型企业”
In 2009, Jingang was awarded the titles of "Top Ten Private Enterprises" and "Scientific Innovation Enterprise"

2009年5月

“烟气脱硫浆液雾化氧化铝陶瓷喷嘴和输送管道”通过山东省科技成果鉴定，产品及工艺技术达到国际先进水平
In May 2009, the "alumina ceramic nozzle and delivery pipe for atomization of slurry for flue gas desulfurization" passed the identification of Shandong scientific and technological achievements. The products and process technology have reached international advanced level

2009年11月

“烟气脱硫浆液雾化氧化铝陶瓷喷嘴和输送管道”获得滨州市科技进步三等奖

In November 2009, the "alumina ceramic nozzle and delivery pipe for atomization of slurry for flue gas desulfurization" won the third prize for progress in science and technology in Binzhou

2011年

被山东省政府评定为2011年第一批战略性新兴产业

In 2011, Jingang was awarded the title of one of the 2011 first batch of strategic emerging enterprises by the People's Government of Shandong Province

2011年

公司完成股份制改革，整体变更为股份有限公司
In 2011, Jingang finished shareholding system reform, and converted the company to a limited liability company

2011年7月

“超低磨损微晶氧化铝耐磨材料低温烧成制备技术研究”“低纳细晶 α -氧化铝粉体制备技术研究”通过山东省科技成果鉴定

In July 2011, the "research on low-temperature sintering and preparation technology of ultralow-wear microcrystalline alumina wear-resistant materials" and the "research on low sodium fine α -alumina powder preparation technology" passed the identification of Shandong scientific and technological achievements

2011年8月

山东省级企业技术中心获批建立
In August 2011, the Shandong provincial enterprise technology center was approved for construction

2012年

已获授权发明专利数十项
取得重大科技成果6项

In 2012, Jingang has won tens of licensed invention patents and realized 6 significant scientific and technological achievements

2007

2008

2009

2010

2011

2012

2013

2014

2015

2008年5月

“高性能细晶氧化铝托辊”通过山东省科技成果鉴定
In May 2008, the "high-performance fine alumina roller" passed the identification of Shandong scientific and technological achievements

2008年7月

山东省科技厅批准建设“山东省环保陶瓷工程技术研究中心”
In July 2008, Department of Science & Technology of Shandong Province approved to construct "Shandong Provincial Environment-friendly Ceramic Engineering Technology Research Center"

2008年8月

国际贸易部成立，实现自营进出口业务
In October 2008, the International Trade Department was founded to realize self-governed import and export businesses

2008年10月

通过ISO9001、ISO14001、GB/T28001质量管理体系认证
In October 2008, Jingang passed ISO9001, ISO14001 and GB/T28001 Management System Certification

2008年12月

荣膺“中国专利山东明星企业”称号
In December 2008, Jingang won the honor of "China Patent Shandong Star Enterprise"

2010年1月

“微晶耐磨氧化铝衬板”获得山东省科技进步三等奖
In January 2010, the "microcrystalline wear-resistant alumina liner" won the third prize for progress in science and technology in Shandong

2010年5月

承担国家级火炬计划项目“年产5万吨氧化铝陶瓷材料”
In May 2010, Jingang undertook the Torch Plan project of "producing 50,000t alumina ceramic materials per year"

2010年

“年产20万吨高性能陶瓷新材料”项目获得省发改委项目备案
In 2010, the project "producing 200,000t high-performance ceramic new materials per year" was recorded by Shandong Development and Reform Commission

2013年1月25日

微晶耐磨氧化铝制品获“山东省名牌产品”称号

The microcrystalline wear-resistant alumina products won the title "shandong famous brand product" on 25th JAN 2013

2013年6月

与山东璞泰矿业有限公司实现战略重组
Implementation of the strategic restructuring with Shandong Putai Mining Co., Ltd.

2013年10月

成立山东金璞新材料有限公司
The establishment of the Shandong JinPu new Materials Co. Ltd.

2013年11月

成立钻石支撑剂公司（美国）
The establishment of Diamond support agent company (USA)
成立淄博金刚贸易有限公司
The establishment of the Zibo Jingang Trading Co., Ltd.

2014年

董事长荣获“山东优秀发明人”荣誉称号
The chairman was awarded the honorary title of "Shandong outstanding inventor" honorary title
董事长荣获市科学技术最高奖
The chairman won the highest prize in Science and Technology

2014年4月

我公司举行校企联合研究生培养基地签约
Our company held the signing ceremony for the school enterprise joint postgraduate training project

INTRODUCTION TO PRODUCTION PROCESS OF ALUMINA PRODUCTS

氧化铝制品生产工艺流程

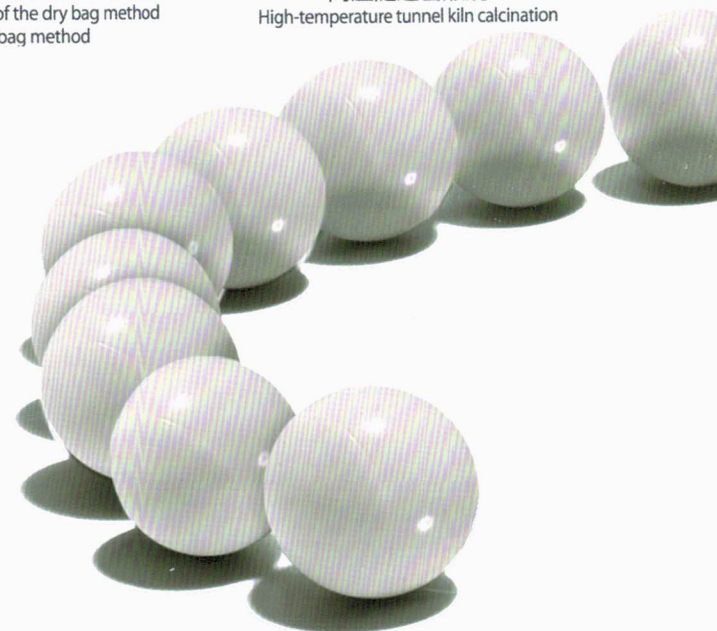
高纯超细 α -氧化铝粉体
为主要原料
High-purity ultrafine α -alumina powder
As the main raw material

球磨机研磨
Ball mill grinding

离心或喷雾干燥塔进行造粒
Centrifugation or spray drying tower granulation

干袋法、湿袋法等静压成型
Isostatic pressing of the dry bag method
the wet bag method

高温隧道窑煅烧
High-temperature tunnel kiln calcination





高质量 高科技 高效率

High quality, High technology, High efficiency

国际先进的生产设备与工艺技术

金刚以“高科技、高质量、高效率”为生产理念，联合科研企事业单位共同开发，不断升级生产设备，改进产品技术，始终保持生产与技术的领先应用，为生产高品质产品奠定坚实基础。

International advanced production equipment and technology

Based on the production concept of "high technology, high quality, high efficiency", Jingang cooperates with scientific research enterprises and institutions to jointly conduct innovative research and development, constantly upgrades the production equipment and technological process and takes the lead in applying advanced production mode and technology, which provides a solid foundation for producing high-quality products

专业品质源于贯彻始终的质量意识和一丝不苟的专业精神

金刚建立了一流的分析测试中心，设施完善，配备有扫描电子显微镜（SEM）、激光粒度分析仪（PSA）、X射线衍射仪（XRD）等先进的测试分析设备。为实现“顾客满意”，在产品生产过程中，坚持全面质量管理理念，不断完善ISO9001标准，形成了科学、严密、高效的质量保证体系。

Professional quality stems from the persistent quality awareness and meticulous professional spirit

Jingang has built the first-class analysis & test center with complete facilities including SEM, PAS, XRD and other advanced test and analysis equipment. To realize the commitment of "customer satisfied", we persist in comprehensive quality management concept, insist on adopting and perfecting ISO9001 standards, and have formed scientific, tight and high-efficiency quality assurance system.

专业化服务

工艺、机械、设备、技术等各专业人员，能够提供售前、售中、售后及时完善的服务，以专业的职业素养满足不同客户的需求，成就品牌价值。

Professional service

The technicians in process, machinery, equipment, technology, etc. could provide timely and perfect pre-sales, in-sales and after-sales services, meet the demands of different customers with their professional qualities and create the brand value.

微晶耐磨氧化铝制品性能指标 Performance Indexes of Microcrystalline Wear-resistant Alumina Products

耐磨氧化铝制品理化性能指标 Physical and Chemical Indexes

| 产品 Product | Al ₂ O ₃ 含量% Al ₂ O ₃ content | Fe ₂ O ₃ 含量% Fe ₂ O ₃ content | 体积密度g/cm ³ Volume density g/cm ³ | 吸水率% Water absorption% | 耐冲击性 Shock Resistance | 莫氏硬度 Moh's hardness |
|-------------------|--|--|---|---------------------------|--------------------------|------------------------|
| 75系列 75 series | ≥75 | ≤2 | ≥3.20 | ≤0.02 | | ≥8 |
| 90系列 90 series | ≥90 | ≤0.2 | ≥3.58 | ≤0.01 | 无裂痕 无破碎 | ≥9 |
| 92系列 92 series | ≥92 | ≤0.2 | ≥3.60 | ≤0.01 | | ≥9 |
| 95系列 95 series | ≥95 | ≤0.15 | ≥3.65 | ≤0.01 | No crack No crush | ≥9 |
| 99系列 99 series | ≥99 | ≤0.1 | ≥3.85 | ≤0.01 | | ≥9 |

小球耐磨系数指标 Index of Wear Resistance Coefficient of Small Ball

| 产品规格mm Specification mm | 耐磨系数 Wear Resistance Coefficient g / (kg · h) | | | | | | | | | |
|----------------------------|---|----------|------|----------|------|----------|------|----------|------|----------|
| | 75系列 | 75series | 90系列 | 90series | 92系列 | 92series | 95系列 | 95series | 99系列 | 99series |
| 15<Φ≤20 | | ≤0.20 | | ≤0.12 | | ≤0.12 | | ≤0.10 | | ≤0.10 |
| 10<Φ≤15 | | ≤0.25 | | ≤0.15 | | ≤0.15 | | ≤0.12 | | ≤0.12 |
| 8<Φ≤10 | | ≤0.30 | | ≤0.20 | | ≤0.20 | | ≤0.15 | | ≤0.15 |
| 6<Φ≤8 | | ≤0.40 | | ≤0.25 | | ≤0.25 | | ≤0.20 | | ≤0.20 |
| 5<Φ≤6 | | ≤0.50 | | ≤0.30 | | ≤0.30 | | ≤0.25 | | ≤0.25 |
| Φ≤5 | | ≤0.80 | | ≤0.65 | | ≤0.65 | | ≤0.50 | | ≤0.50 |

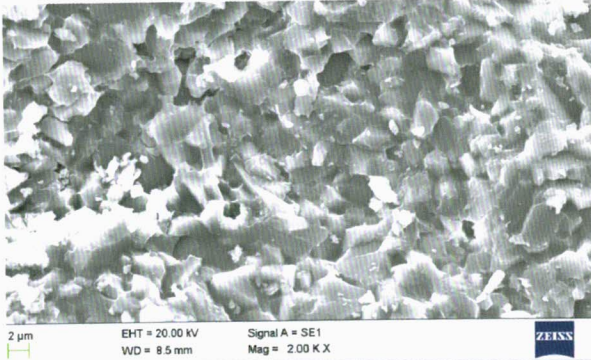
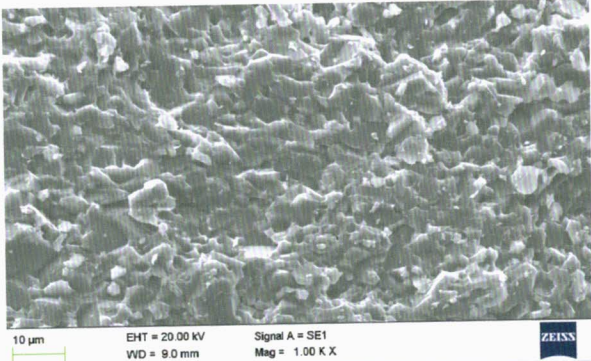
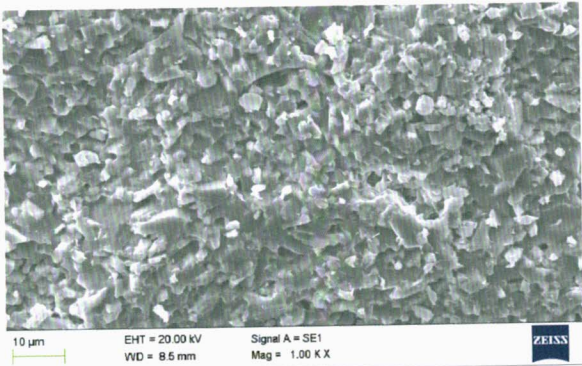
大球耐磨系数指标 Index of Wear Resistance Coefficient of Large Ball

| 分类 Classification | | 75系列 75 series | 90系列 90 series | 92系列 92 series | 95系列 95 series | 99系列 99 series |
|----------------------|--|-------------------|-------------------|-------------------|-------------------|-------------------|
| 当量磨耗‰ EWT | | ≤0.30 | ≤0.20 | ≤0.18 | ≤0.15 | ≤0.15 |

(注)磨耗按建材行业标准JC/T848.1—2010试验方法检验。

Note: (1) The wear is tested by the method in JC/T848.1—2010, standards of building material industry.

微晶耐磨氧化铝微观电镜图
Microscopic Pictures of Products



MICROCRYSTALLINE WEAR-RESISTANT ALUMINA BALLSTONE

采用精选优质原料，先进成型技术，经过高温隧道窑
煅烧而成的高品质磨介

微晶耐磨氧化铝球石

Microcrystalline Wear-resistant Alumina Ballstone

微晶耐磨氧化铝球石采用精选优质原料，先进成型技术，经过高温隧道窑煅烧而成的高品质磨介。产品具有密度高，硬度高，磨耗低，抗震稳定性好，耐腐蚀等特点，是釉料、坯料及各种矿粉加工最理想的研磨介质。产品广泛应用于陶瓷、水泥、涂料、耐火材料、无机矿物粉料等行业。

The microcrystalline wear-resistant alumina ballstone is a high-quality grinding medium made of selected high grade materials, advanced molding technology and calcined in high-temperature tunnel kiln. Possessed with high density, high hardness, low wear, good seismic stability and good corrosion resistance, the products are the most ideal medium for grinding glaze, blank and mineral powder processing, and are used as the grinding medium of ball mill in ceramics, cement, paint, refractory, inorganic mineral powder and other industries.

可根据客户要求制作不同规格的产品。

It's able to make the products in different specifications as customers' requirements.

微晶耐磨氧化铝球石常用规格 General Specifications of Microcrystalline Wear-resistant Alumina Ballstone

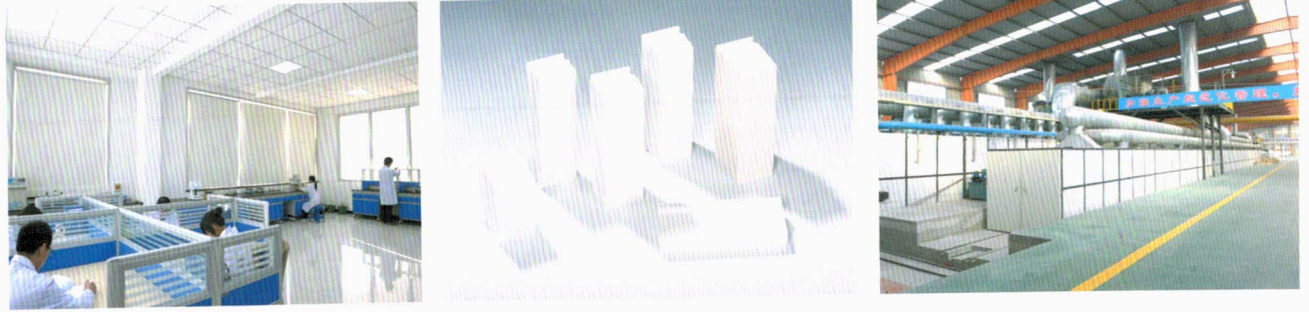
| | | | | | | | | | | | | | |
|-----|------------------|--------|--------|--------|--------|--------|--------|-----|------|------|------|-----|-----|
| 压制球 | Pressed Ball | Φ30 | Φ40 | Φ50 | Φ60 | Φ70 | Φ80 | Φ90 | Φ100 | Φ110 | Φ120 | | |
| 滚制球 | Rolled Ball | Φ0.5 | Φ1.0 | Φ2 | Φ3 | Φ6 | Φ8 | Φ10 | Φ13 | Φ20 | Φ25 | Φ30 | Φ40 |
| 柱状球 | Cylindrical ball | Φ20×20 | Φ25×25 | Φ30×30 | Φ40×40 | Φ50×50 | Φ60×60 | | | | | | |



MICROCRYSTALLINE WEAR-RESISTANT ALUMINA LINING BRICK

广泛应用于陶瓷、石油、化工、矿山、水泥等行业中
物料输送设备内外表面，可有效延长设备的使用周期





微晶耐磨氧化铝衬砖

Microcrystalline Wear-resistant Alumina Lining Brick

微晶耐磨氧化铝衬砖按形状分为：矩形砖、梯形砖、异形砖。产品具有高硬度、密度大、磨耗低、规整度好、耐腐蚀等特点，用于球磨机耐磨内衬，广泛应用于陶瓷、水泥、油漆、颜料、化工、医药、涂料等行业，能有效提高研磨效率，降低研磨成本，减小产品污染。
可根据客户要求制作不同规格的产品。

The microcrystalline wear-resistant alumina lining brick can be divided into rectangular brick, trapezoidal brick and irregular brick as shape. The product has the high hardness, density, wear low, the neat degree good, anti-corrosion, used for ball mill wear-resisting lining, widely used in ceramic, cement, paint, paint, chemical, pharmaceutical, coating, etc, and can effectively improve the grinding efficiency, reduce the grinding cost, reduce product pollution.
It's able to make the products in different specifications as customer's requirements.

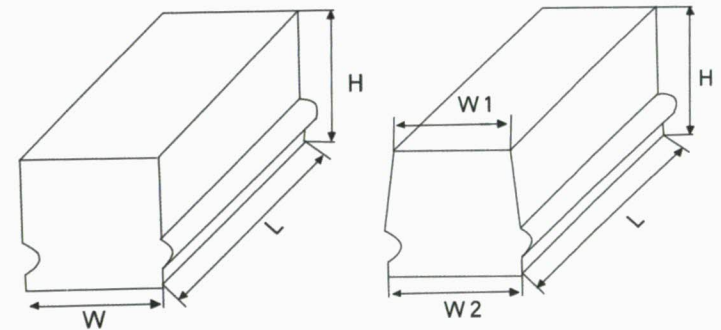
微晶耐磨氧化铝衬砖常用规格

General Specifications of Microcrystalline Wear-resistant Alumina Lining Brick

| 产品规格mm Specification | 长度(L) Length | 厚度(H) Height | 宽度 (W) Width | | | |
|-------------------------|-----------------|-----------------|----------------------|----------------------|------------------|--------------------------------|
| | | | 斜(W1/W2) Inclined | 直(W1=W2) Straight | 薄(W1=W2) Thin | 斜薄(W1/W2) Inclined and Thin |
| H40 | 150 | 40 | 45/50 | 50 | 25 | 22.5/25 |
| H50 | 150 | 50 | 45/50 | 50 | 25 | 22.5/25 |
| H60 | 150 | 60 | 45/50 | 50 | 25 | 22.5/25 |
| H70 | 150 | 70 | 45/50 | 50 | 25 | 22.5/25 |
| H80 | 150 | 80 | 45/50 | 50 | 25 | 22.5/25 |
| H90 | 150 | 90 | 45/50 | 50 | 25 | 22.5/25 |
| H100 | 150 | 100 | 45/50 | 50 | 25 | 22.5/25 |

微晶耐磨氧化铝衬砖外观尺寸示意图

Schematic Diagram of Outline Dimensions of Microcrystalline Wear-resistant Alumina Lining Brick



MICROCRYSTALLINE WEAR-RESISTANT ALUMINA LINER

广泛用于钢铁、电力、煤炭、水泥等行业中物料输送设备及选粉设备内外表面，可有效延长设备使用寿命

微晶耐磨氧化铝衬板

Microcrystalline Wear-resistant Alumina Liner

微晶耐磨氧化铝衬板是经过干压成型，高温焙烧而成的特种耐磨陶瓷，其洛氏硬度为HRA80-90，硬度仅次于金刚石。产品具有耐磨性好、抗冲击、施工方便等特点，其理论耐磨性能相当于锰钢的260倍，铬钢的170倍。产品广泛用于钢铁、电力、煤炭、水泥等行业中物料输送设备及选粉设备内外表面，可有效延长设备使用寿命。

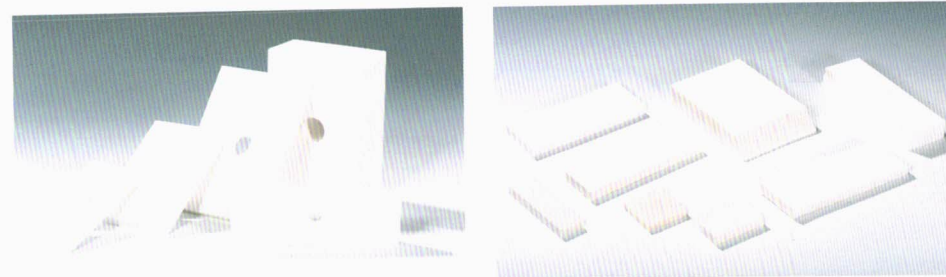
可根据客户要求制作不同规格的产品。

微晶氧化铝衬板常用规格

General Specifications of Microcrystalline Alumina Liner

| 规格 Specification | | 长度(L) Length (L) | 宽度(W) Width | 厚度(H) Height |
|---------------------|----------------|---------------------|----------------|-----------------|
| 平板衬板 | Plate Liner | 50-200 | 25-150 | 6-50 |
| 焊接衬板 | Welding Liner | 50-150 | 30-150 | 8-30 |
| 管道衬板 | Pipeline Liner | 50-150 | 20-150 | 8-30 |

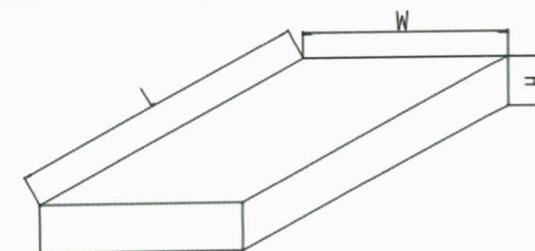
单位: mm (Unit: mm)



Microcrystalline wear-resistant alumina liner is a kind of special wear-resistant ceramics molded by drying pressing at the high temperature, whose Rockwell hardness is HRA80-90, ranking only second to diamond. The products have the features of good wear resistance, shock resistance, convenient construction, etc., and its theoretical wear resistance performance is 260 times of manganese steel and 170 times of chromium steel. The products are widely applied to the internal and external surfaces of material conveying equipment and powder separators in steel and iron, thermoelectricity, coal, cement and other industries.

微晶耐磨氧化铝衬板外观尺寸示意图

Schematic Diagram of Outline Dimensions of Microcrystalline Wear-resistant Alumina Liner

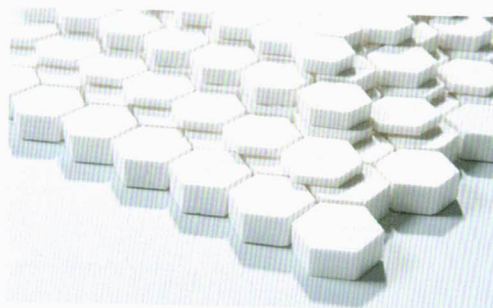


马赛克

Mosaic

金刚生产马赛克制品的硬度仅次于金刚石，远远超过耐磨钢和不锈钢的耐磨性能。采用耐热强力胶粘贴在设备内壁后，在350℃下可长期运行不老化。而其密度仅为钢铁的一半，可大大减轻设备负荷。因此，在火电、钢铁、冶炼、机械、煤炭、矿山、化工、水泥、港口码头等行业的输煤、输料系统、制粉系统、排灰、除尘系统等一切磨损大的机械设备上，均可根据不同的需求选择不同类型的马赛克产品。

Jingang production of products of the Mosaic is second only to diamond hardness, far more than wear-resisting steel and stainless steel wear-resisting performance. The powerful adhesive posted on heat equipment after wall, in 350 °C can be working for a long time not aging. And the density of the steel is only half, can reduce equipment load. Therefore, in thermal power, steel, metallurgy, machinery, coal, mining, chemical, cement, port of industries such as coal, lose transporting system, system powder system, discharging, dust removal system and all wear big machine, all can choose according to the different needs of different types of Mosaic products.



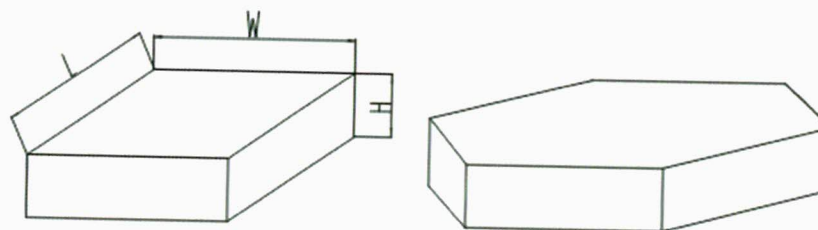
马赛克常用规格 General Specifications of Mosaic

| 规格 Specification | | 长度(L) Length (L) (mm) | 宽度(W) Width (W) (mm) | 厚度(H) Thickness (H) (mm) |
|---------------------|--------------------------|--------------------------|-------------------------|-----------------------------|
| 方形衬片 | Square lining disk | 10-25 | 10-25 | 4-20 |
| 六边形衬片 | Have hexagon lining disk | 12.5-20 | 12.5-20 | 3-10 |

可根据客户要求制作不同规格的产品。

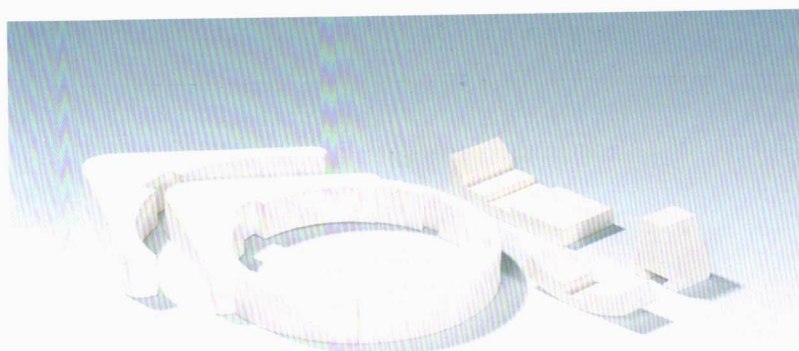
Note: It's able to make the products in different specifications as customer's requirements.

微晶耐磨氧化铝—马赛克外观尺寸示意图
Schematic Diagram of Outline Dimensions of Microcrystalline
Wear-resistant Alumina—Mosaic



氧化铝异形件

Microcrystalline Wear-resistant Alumina Irregular Parts



氧化铝异形件常用规格，按类型分为整体管件、弯头管件、锥形管件、切割件、陶瓷零件。产品具有耐磨、耐蚀、耐热、抗冲击、施工方便等特点，产品广泛用于矿山、电力、冶金、煤碳、化工等行业作为输送砂石、煤粉、灰渣、铝液等磨削性颗粒物料和耐腐蚀性介质。可根据客户要求制作各种氧化铝异形耐磨件。

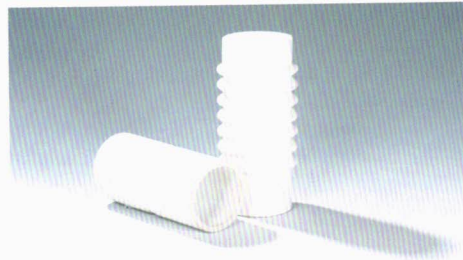
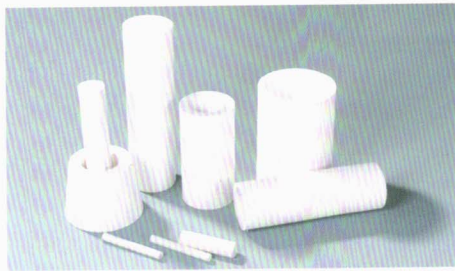
Alumina irregular parts are divided into integral pipe fittings, elbow pipe fittings, tapered pipe fittings, cutting parts, ceramic parts, etc. as type. The products have the features of wear resistance, corrosion resistance, heat resistance, shock resistance, convenient construction, etc. and are widely applied in mining, electric power, metallurgy, coal, chemistry and other industries.

It's able to make various alumina irregular wear-resistant parts as customer's requirements.

MICROCRYSTALLINE WEAR-RESISTANT ALUMINA PIPE FITTINGS

一种理想的耐磨耐腐蚀输送工具材料，具有很好的耐
磨损、耐腐蚀、耐热性能

微晶耐磨氧化铝管道 Microcrystalline Wear-resistant Alumina Pipe Fittings



微晶耐磨氧化铝管道采用等静压成型技术，产品致密度高，经表面精细打磨抛光后，与其它管道复合组装，是一种理想的耐磨耐腐蚀输送防护材料。可广泛应用于矿山、冶金、化工、电力等行业的煤粉、灰渣、铝液等物质的输送防护过程。

耐磨性好：其莫氏硬度可达到9.0，可延长矿山、煤炭等行业矿粉输送设备的使用寿命。
耐腐蚀性好：广泛应用于不同管道形成内衬陶瓷刚玉层，具有耐酸碱腐蚀、防结垢特点。
耐高温与耐冲击性能好：产品有良好的热稳定性，可在800°C以下的专业环境中长期使用。
使用成本低：陶瓷内衬钢管价格低，用焊接法兰连接，使用工程造价低寿命长。
安装施工方便：管道重量轻，法兰连接安装方便，降低安装费用。

氧化铝陶瓷管产品规格 Product Specifications of The Alumina Ceramic Tube

外径 OD: $\Phi 25-600\text{mm}$

壁厚 Thickness: $\geq 5\text{mm}$

高度 Height: 可根据客户要求制作

Microcrystalline wear-resisting alumina pipeline in the isopressing technology, the product of high density, the fine grinding surface polishing, and other composite pipe assembly, is a kind of ideal resistant to wear and corrosion protection material conveying. Can be widely used in mining, metallurgy, chemical, electric power industries of coal powder, ash, liquid aluminum etc material conveying protection process.

Good wear resistance: the Moh's hardness is up to 9.0, which helps to prolong the service life of mineral powder conveying equipment in mining, coal and other industries.
Good corrosion resistance: it's widely applied to different pipelines to form lined ceramic corundum layer, and has the features of acid-base resistance and fouling resistance.
Good temperature resistance and good heat shock resistance: the products have good thermal stability and could be used for a long time in the professional environment with temperature lower than 800
Low use cost: the ceramic lined steel pipes are cheap and connected with welded flanges. The engineering cost of the products is low but the service life is long.
Convenient for installation and construction: the pipe is light, and the flange is convenient for connection and installation, all of which reduce the installation cost.

高纯氧化铝填料 High-purity Alumina Fillers

高纯氧化铝填料主要有：陶瓷填料球、陶瓷拉西环等。

产品采用氧化铝超细微粉为主要原料，经先进成型工艺和高温隧道窑烧制而成。广泛用于石油、化工等行业作为塔填料球、催化剂载体，为石油化工厂、化纤厂、烷基苯、乙烯厂、天然气厂等加氢精制装置、催化重整装置、异构化装置、脱甲基装置等作垫底填充材料。它具有耐高温、高压、吸水率低、化学性能稳定的特点，能经受强酸碱及其它有机溶剂的腐蚀，并能适应不同温度变化。

陶瓷填料球具有高强度，耐高温、耐高压、耐强酸碱腐蚀、热震性能好的特点。主要用于石油化工行业高温、高压、腐蚀性强的工作环境，是广大石油、化工行业中转化炉、反应炉、填料塔中最为理想的填料。

陶瓷拉西环是一种散堆填料，其高度与直径尺寸相等。拉西环具有优异的耐酸耐热性能，可用于各种强腐蚀、高温低温环境。拉西环应用范围十分广泛，可用于化工、冶金、煤气、制氧等行业的干燥塔、吸收塔、冷却塔、再生塔等。

High-purity alumina fillers mainly contain ceramic filler ball and ceramic rasching ring. The products adopt alumina ultrafine powder as main materials and are sintered with advanced molding process and high-temperature tunnel kiln, which are widely applied to petroleum, chemistry and other industries as tower filler ball and catalyst carrier, and are used as bottom filling materials of hydrofining devices, catalytic reforming devices, isomerization devices and demethylation devices in petrochemical plant, chemical fiber plant, alkybenzene and ethylene plant, natural gas plant, etc. It has the features of high temperature resistance, high pressure resistance, low water absorption and steady chemical performance and could bear the corrosion of strong acid, strong base or other organic solvents and adapt to different temperature changes.

Possessed of high strength, high temperature resistance, high pressure resistance, strong acid-base resistance and good thermal shock property, ceramic filler balls are mainly used in the high-temperature, high-pressure and strong corrosive working environment of petrochemical industry as the most ideal fillers for reformer, reaction furnace and packed column in petroleum and chemical industry.

Ceramic rasching rings are a kind of random packing with height same to diameter. Rasching rings have excellent acid resistance and heat resistance and could be applied to strong corrosive, high-temperature and low temperature environments. Rasching rings have very wide application fields and could be applied to drying tower, absorption tower, cooling tower, regeneration tower, etc. in chemistry, metallurgy, gas, oxygen making and other industries.

高纯氧化铝填料性能指标 Performance Indexes of Fillers



典型性能指标 Performance Indexes of Fillers

| 产品/项目 | Product/Item | 45系列 45 series | 70系列 70 series | 80系列 80 series | 90系列 90 series | 95系列 95 series | 99系列 99 series |
|------------------------------------|---|-----------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|
| AL ₂ O ₃ (%) | AL ₂ O ₃ (%) | ≥42 | ≥70 | ≥80 | ≥90 | ≥95 | ≥99 |
| Fe ₂ O ₃ (%) | Fe ₂ O ₃ (%) | ≤0.6 | ≤0.3 | ≤0.3 | ≤0.2 | ≤0.15 | ≤0.1 |
| 体积密度 (g/cm ³) | Volume Density | 2.0-2.5 | 2.2-2.8 | 2.5-2.8 | ≥2.8 | ≥3.1 | 3.3-3.7 |
| 吸水率 (%) | Water Absorption | ≤5 | ≤5 | ≤5 | ≤5 | ≤5 | ≤5 |
| 单颗抗压强度φ13mm\ (N) | Compressive Strength of Single Particle | ≥1000 | ≥1200 | ≥1500 | ≥2000 | ≥3500 | ≥6000 |
| 抗冲击强度 | Shock Strength | 优良 Excellent | 优良 Excellent | 优良 Excellent | 优良 Excellent | 优良 Excellent | 优良 Excellent |
| 色泽 | Color | 浅白色 白色 Light white White | 浅白色 白色 Light white White | 白色 White | 白色 White | 白色 White | 白色 White |

99氧化铝填料球性能指标 Performance Indexes of 99 Alumina Chemical Filler Ball

| 产品名称 | Name of Product | 99氧化铝填料球 99 Alumina Filler Ball | | |
|------|-------------------------|--------------------------------------|-----------------------|--|
| 规格型号 | Specification and Model | Φ5-Φ30mm | | |
| 序号 | Serial No. | 理化指标 Physical and Chemical Index | 计量单位 Metering Unit | 检测结果(单值) Detection Result(Single Value) |
| 1 | | Al ₂ O ₃ | % | ≥99 |
| 2 | | SiO ₂ | % | <0.2 |
| 3 | | Fe ₂ O ₃ | % | <0.1 |
| 4 | | Na ₂ O | % | <0.3 |
| 5 | | 灼减Loss of weight on ignition | % | / |
| 6 | | 颗粒表观密度Apparent density of particle | T/m ³ | 3.3-3.7 |
| 7 | | 疏松堆积密度Loose bulk density | T/m ³ | 1.6-2.2 |
| 8 | | 吸水率/显气孔率absorption/apparent porosity | % | 0.2-6 |
| 9 | | 抗压强度Φ6Compressive strength | N/颗 N/piece | ≥1500 |
| 10 | | 耐热性Heat resistance | Up to 0°C | 1700 |

产品规格 Product Specification

单位: mm

| 直径 | Diameter | Φ3 | Φ6 | Φ8 | Φ10 | Φ13 | Φ19 | Φ25 | Φ50 | Φ70 | Φ90 |
|----|----------|----|----|----|-----|-----|-----|-----|-----|-----|-----|
|----|----------|----|----|----|-----|-----|-----|-----|-----|-----|-----|

可根据客户要求制作不同规格的产品。

Note: It's able to make the products in different specifications as customer's requirements.

氧化铝制品检测方法

Detection Method of Alumina Products

| 检测成分 | Detected Composition | 国标测定方法 International Detection Method |
|------------------------------------|----------------------------------|---|
| Al ₂ O ₃ 含量% | Al ₂ O ₃ % | 遵照GB/T6900-2006中第9章氧化铝的测定进行 Conducted as the alumina detection in Chapter 9 of GB/T6900-2006 |
| Fe ₂ O ₃ 含量% | Fe ₂ O ₃ % | 遵照GB/T6900-2006中第10章氧化铁的测定进行 Conducted as the iron oxide detection in Chapter 10 of GB/T6900-2006 |
| 体积密度g/cm ³ | Volume Density | 体积密度按GB/T2997-2000中规定的方法检测：取外观质量检验、尺寸偏差合格的产品，大球取3个或3组（每组约重100g） 小球取3组（每组约重100g），其它制品取3组（每组约重100g） Volume density is detected as the method specified in GB/T2997-2000: take the products with qualified appearance inspection and qualified size deviation, take three or three groups of large balls (each group is of 100g), three groups of small balls (each group is of 100g) and three groups of other products (each group is of 100g) |
| 吸水率% | Water Absorption | 遵照GB/T8488-2001中第5章试验方法规定的方法检测：取外观质量检验、尺寸偏差合格的产品，大球取3个或3组（每组约重100g），小球取3组（每组约重100g），其它制品取3组（每组约重100g） Water absorption is detected as the method specified in Chapter 5 Test Method in GB/T8488-2001: take the products with qualified appearance inspection and qualified size deviation, take three or three groups of large balls (each group is of 100g), three groups of small balls (each group is of 100g) and three groups of other products (each group is of 100g) |
| 耐冲击性、磨耗 | Shock Resistance and Wear | 遵照JC/T848.1-2010中附录A中规定进行 Conducted as the provisions in Appendix A in JC/T848.1-2010 |
| 莫氏硬度 | Moh's hardness | 按EN101-1991规定的方法检测 Detected as the method specified in EN101-1991 |
| 外观质量的检验 | Appearance Inspection | 外观质量检验从样本中随机抽取10个样品，用精度为0.02mm的游标卡尺检测 Select 10 samples randomly from the samples and then detect the selected samples with 0.02mm vernier caliper |
| 球形度的测定 | Sphericity Detection | 取外观质量检验及尺寸偏差合格的10个压制球，用精度为0.02mm的游标卡尺测量， 每个球测径向尺寸、纬向尺寸、径向尺寸和纬向尺寸的差值与规格尺寸的比值 Take 10 pressed balls with qualified appearance inspection and qualified size deviation, then measure the radial size, zonal size and the ratio between the difference between radial size and zonal size and specified size of each ball with 0.02mm vernier caliper |

检测证书

Pictures of Detecting Certificates



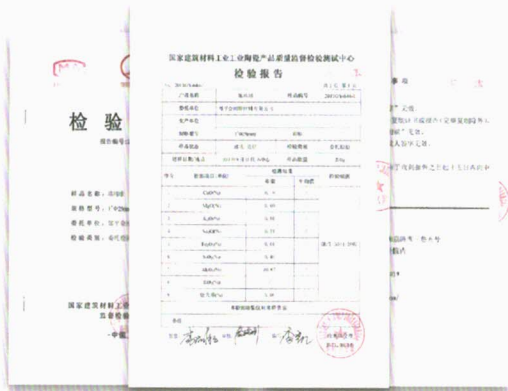
微晶耐磨氧化铝衬板
Microcrystalline Wear-resistant Alumina liner



微晶耐磨氧化铝陶瓷材料
Microcrystalline Wear-resistant Alumina Products



氧化铝管道
Alumina wear-resistant fittings



高纯氧化铝填料球
High-purity alumina filler



高纯氧化铝填料球
High-purity alumina filler



微晶耐磨氧化铝球
Microcrystalline wear-resistant alumina ballstone

应用领域

Application Fields of Products

| 产品主要用途 Main Usage of Products | 卫生陶瓷 Sanitary ceramics | 非金属矿 Nonmetal Ore | 耐火材料 Refractory | 水泥 Cement | 钢铁 Steel and Iron | 涂料 Paint | 化工 Chemical industry | 油气田 Oil and Gas Fields | 热电 Thermoelectricity | 煤炭 Coal | 玻璃 Glass | 陶瓷 Ceramics | 磨料 Abrasives | 光学材料 Optical Materials | 瓷器 Porcelain | 催化剂 助熔剂 Catalyst and Fluxing Agent |
|---|---------------------------|----------------------|--------------------|--------------|----------------------|-------------|-------------------------|---------------------------|-------------------------|------------|-------------|----------------|-----------------|---------------------------|-----------------|---------------------------------------|
| 微晶耐磨氧化铝球石 Microcrystalline wear-resistant alumina ballstone | ■ | | ■ | ■ | | ■ | | | | | | | | | | |
| 微晶耐磨氧化铝衬砖 Microcrystalline Wear-resistant Alumina Lining Brick | | ■ | | | ■ | | ■ | | ■ | | | | | | | |
| 微晶耐磨氧化铝衬板 Microcrystalline Wear-resistant Alumina liner | | ■ | | | ■ | | | | ■ | ■ | | | | | | |
| 氧化铝马赛克 Alumina mosaic | | | | | ■ | | | | ■ | | | | | | | |
| 氧化铝异形件 Alumina irregular parts | | ■ | | | | | ■ | ■ | ■ | ■ | | | | | | |
| 高纯氧化铝填料 High-purity alumina filler | | ■ | | | | | ■ | ■ | | | | | | | | |
| 氧化铝耐磨管件 Alumina wear-resistant fittings | | ■ | | | ■ | | | | | ■ | | | | | | |
| 氧化铝细粉 Fine alumina powder | ■ | | ■ | | | | | | | | ■ | ■ | ■ | | ■ | ■ |
| 氧化铝粗粉 Alumina cribble | ■ | | ■ | | | | | | | | | ■ | ■ | ■ | ■ | ■ |
| 低钠氧化铝粉体 Low sodium alumina powder | | | | | | | | | | | | | | | | |

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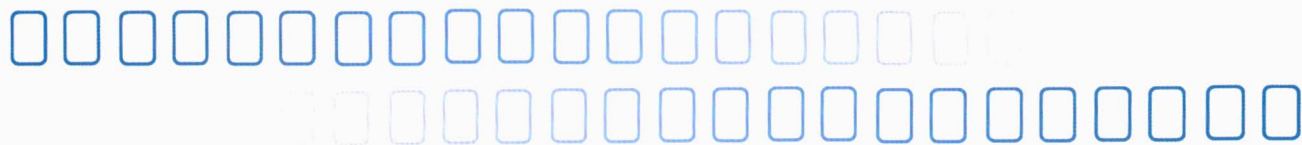
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地 址：山东省邹平县明集经济开发区邹魏路 5 号

邮 编：256216

销售部：0543—4580555

国贸部：0543—4585799

市场部：0543—4585935

传 真：0543—4585935

E-mail: scb@sdhx.com

www.sdhx.com www.sdhxmart.com

ADD: Mingji Economic Development Zone, Zouping , Shandong

Z I P: 256216

Sales Department: 0543—4580555

International Trade Department:0543—4585799

Marketing Department: 0543—4585935

Fax: 0543—4585935

E-mail: scb@sdhx.com

www.sdhx.com www.sdhxmart.com



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