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钢铁行业用耐火材料

REFRACTORIES FOR STEEL INDUSTRY

郑州市才华窑炉砌筑安装有限公司

ZHENGZHOU CAIHUA KILN MASONRY INSTALLATION CO., LTD

GLOBLE REFRACTORY AND SOLUTION SUPPLIER

郑州市才华窑炉砌筑安装有限公司

郑州市才华窑炉砌筑安装有限公司位于郑州市西南美丽的新密市。这里附邻京广胧海两大铁路干线,从河南省会郑州到洛阳龙门石窟和蒿山少林寺观光旅游的必经之地。新密市交通运输方便,境内耐火原料、煤炭储存丰富。得天独厚的条件为耐火材料生产和发展提供了极其便利的条件。

郑州市才华窑炉砌筑安装有限公司始建于1984年,公司现有员工1281人,其中中级以上技术职称158人,高级技术职称38人。本公司技术力量雄厚,目前已同洛阳耐火材料研究院、郑州大学高温研究所、北京科技大学、东北大学、鞍山钢铁学院等科研单位和高等院校建立了稳定的技术合作关系,北京科技大学的生产、教学、科研基地。工艺装备先进,拥有先进的原料制备系统,配料采用电子配料车,混碾采用750型强制式混碾机,成型设备有:1000吨压砖机2台,630吨压砖机4台,400吨压砖机14台,315吨压砖机22台,160吨压砖机2台,60吨压砖机8台。烧成设备有:高温梭式窑1座,高温180米隧道窑2座,高温120米隧道窑1座,中温隧道窑1座。拥有全套的耐火材料常规检测设备。这一切为生产不同品种、不同材质的各种耐火材料奠定了基础。

郑州市才华窑炉砌筑安装有限公司主要生产冶金、焦化、建材、碳素、化工和一般工业窑炉所用耐火材料。年生产各种定型和不定型耐火材料12万吨,产品质量和企业规模位居全省同行业的前列,所生产的耐火材料行销全国各地并远销欧美,东南亚和非洲等地区。

郑州市才华窑炉砌筑安装有限公司的生产过程严格按照ISO9001国际质量体系标准进行生产。为了保证原料的高纯度,主要原材料的检选全部靠人工完成,每块料都要经过检选人员的手检选合格后方可流入下道工序。辅助材料经过检验合格后方可使用。

郑州市才华窑炉砌筑安装有限公司经过近三十年的发展,已初步形成自己独特的管理模式,以一切为用户着想为理念,生产、质量、市场、服务等环节上加大管理力度,合理配置资源,现已形成自己的优势:

● 售前服务

- 才华公司对项目的运作体系有着丰富的运做经验,将协助配合客户完成项目的前期准备工作。
- 才华公司有着充分的耐火材料现场管理经验,因此我们将把我们积累的经验通过与用户交流沟通,为以后现场管理奠定基础,根据项目的特点及要求为客户提供最佳的耐火材料配套建议。

● 售中服务

- 才华公司将派出3-5名服务人员驻扎现场协助解决现场的问题。配合客户做好产品分类、验收、存放等工作,技术人员无偿为用户提供现场技术服务,有问题现场解决。
- 如果施工现场条件不具备存放大量货物,我司可以作为一个临时仓库代为管理,并根据施工进度凭双方调拨手续随时调配发货,对此我们的现场服务人员将掌握工程进度及时与施工单位协调,确保工程进展。

● 售后服务

- 才华公司将以最快速度响应用户提出技术支持的需求,根据工作内容明确具体完成对用户技术支持的时间,满足用户的需求,确保客户设备的正常运转。
- 设立24小时售后服务专线,有专职人员值班跟踪服务,节假日照常值班,保证用户随叫随到。接到通知后,本省24小时以内,其它地区48小时以内我单位人员赶到现场解决问题。特殊情况下,我公司会12个小时内赶赴现场提供援助。
- 耐材行业的发展里程中, 我公司愿与社会各届真诚合作, 共铸我国耐火材料工业新的辉煌。

ZHENGZHOU CAIHUA KILN MASONRY INSTALLATION CO., LTD.

Zhengzhou caihua Kiln Masonry Installation Co., Ltd. is located in the beautiful Xinmi City, southwest of Zhengzhou City. Adjacent to the two main railway lines of Beij ing-Guangzhou-Longhai, it is an inevitable place for sightseeing from Zhengzhou, the capital of Henan Province, to Longmen Grottoes in Luoyang and Shaolin Temple in Songshan. Xinmi City has convenient transportation and abundant domestic refractory raw materials and coal storage. The unique conditions provide extremely convenient conditions for the production and development of refractory materials.

Zhengzhou caihua Kiln Masonry Installation Co., Ltd. was founded in 1984. The company currently has 1,281 employees, including 158 with intermediate and higher technical titles and 38 with senior technical titles. The company has strong technical strength. It has established stable technical cooperation relationships with Luoyang Refractories Research Institute, Zhengzhou University High Temperature Research Institute, Beij ing University of Science and Technology, Northeastern University, Anshan Iron and Steel Institute and other institutions of higher learning. Production, teaching and research base. Advanced technology and equipment, with advanced raw material preparation system, electronic batching vehicle for batching, 750 forced mixing mill for mixing, molding equipment: 2 sets of 1000 tons brick press, 4 sets of 630 tons brick press, 400 tons There are 14 brick presses, 22 315-ton brick presses, 2 160-ton brick presses, and 60-ton brick presses. The firing equipment includes: one high-temperature shuttle kiln, two high-temperature 180-meter tunnel kiln, one high-temperature 120-meter tunnel kiln, and one medium-temperature tunnel kiln. Has a full set of conventional refractory testing equipment. All these have laid the foundation for the production of various refractory materials of different varieties and materials.

Zhengzhou caihua Kiln Masonry Installation Co., Ltd. mainly produces refractory materials for metallurgy, coking, building materials, carbon, chemical and general industrial furnaces. Annual production of 120,000 tons of various shaped and unshaped refractory materials, product quality and enterprise scale rank among the top in the same industry in the province. The produced refractory materials are sold throughout the country and exported to European, South-east Asia, Africa and other regions.

Zhengzhou caihua Kiln Masonry Installation Co., Ltd. produces in strict accordance with the ISO9001 international quality system standards. In order to ensure the high purity of the raw materials, the selection of the main raw materials is completed manually. Each piece of material must pass the manual selection of the selection personnel before passing into the next process. The auxiliary materials can be used only after passing the inspection.

After nearly 30 years of development, zhengzhou caihua Kiln Masonry Installation Co., Ltd has initially formed its own unique management model, taking everything as the user's consideration as its philosophy, and increasing management in production, quality, market, service and other links, Reasonable allocation of resources has now formed its own advantages:

Pre-sale service

- Our company has rich experience in the operation of the project, and will assist customers to complete the preliminary preparation of the
 project.
- Our Company has sufficient on-site refractory management experience, so we will use our accumulated experience to communicate with
 users to lay the foundation for future on-site management, and provide customers with the best matching refractory recommendations
 based on the characteristics and requirements of the project.

Sale service

- We will send 3-5 service personnel to the site to help solve the problem on the site. Cooperate with customers to do product classification, acceptance, storage, etc., technicians provide users with on-site technical services for free, and solve problems on-site.
- If the conditions of the construction site are not sufficient to store a large amount of goods, our company can manage it as a temporary warehouse, and dispatch and dispatch at any time according to the construction procedures of both parties. For this, our field service personnel will master the project progress and coordinate with the construction unit in time. Ensuring project progress.

After-sales service

- Our company will respond to the user's request for technical support at the fastest speed, and clearly and specifically complete the technical support time for the user according to the work content. Meet the needs of users and ensure the normal operation of customer equipment.
- A 24-hour after-sale service line is set up, with full-time personnel on duty tracking services, and on duty during holidays to ensure that users are available on call. After receiving the notice, within 24 hours in our province, and within 48 hours in other areas, our unit personnel rushed to the scene to solve the problem. Under special circumstances, our company will rush to the scene to provide assistance within 12 hours.
- In the development of the refractory industry, our company is willing to cooperate sincerely with the society to create new glories for the
 refractory industry in China.

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钢铁行业用耐火材料

REFRACTORIES FOR STEEL INDUSTRY

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77 77 78



HONOR OF QUALIFICATION

资质荣誉 >>

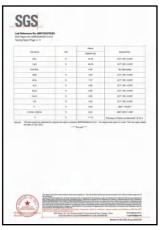
才华窑炉





































PRODUCTION EQUIPMENT

生产设备》











仓库一角 SHIPPING DEPARTMENT





原料场地 RAW MATERIAL SITE









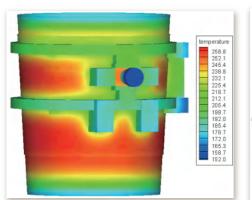
不定型生产车间 UNSHAPED PRODUCTION WORKSHOP

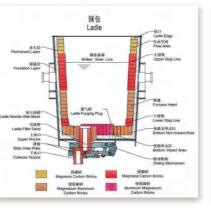


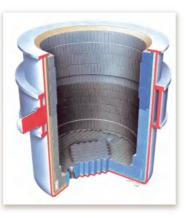


TECHNICAL CAPABILITIES SERVICE 技术能力及服务

钢包 The Ladle





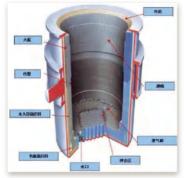


整体温度分布
OVERALL TEMPERATURE DISTRIBUTION

方案2 SCHEME 2

镁碳砖钢包方案 LADLE MGO-C LINING CONCE

技术介绍 INTRODUCTION



总体图 MASTER PLAN

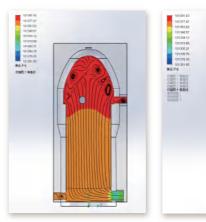
通过建立模型分析将对钢包耐火材料成本的降低、砌包作业难度的减轻产生积极的促进作用,准确把 握钢包各个部位耐材的模拟情况,根据模型的试运行情况,制定合理的钢包耐火材料的具体分布和详细的 材料改进方案。

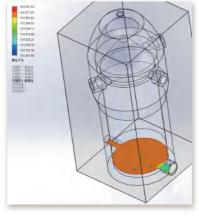
Through the establishment of model analysis, it will positively reduce the cost of ladle refractory and reduce the difficulty of masonry operation, accurately grasp the simulation of refractory materials in various parts of ladle, and formulate reasonable ladle refractory materials according to the trial operation of the model. Specific distribution and detailed material improvement programs.

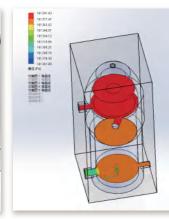
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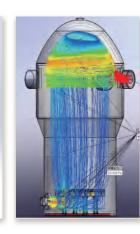
热风炉技术

Hot stove technology









剖面图 SECTION DIAGRAM

断面图 SECTION MAP

各部位切面图 SECTION OF EACH PART

3D流量模拟 SECTION OF EACH PART

技术介绍 INTRODUCTION

我司设计的热风炉能有效实现热风炉燃烧装置的快速而均匀的混合与高强度回流预热燃烧,有效提高了燃烧强度与燃烧的稳定性,可有效保证热风炉高热效率、高热强度与高送风温度状态下运行,继而达到节省燃料、节约投资、降低废气温度与有害气体的排放量、减少环境污染的良好效果。

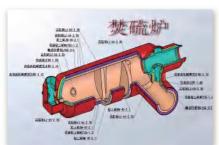
Our company designed the hot blast stove can effectively realize rapid and uniform mixing of the hot blast stove combustion device and high-intensity reflux preheating combustion, effectively improving the combustion intensity and combustion stability, and effectively ensuring the high heat efficiency, high heat strength and high air supply of the hot blast stove. Operation under temperature conditions, in turn, achieves good results in saving fuel, saving investment, reducing exhaust gas temperature and harmful gas emissions, and reducing environmental pollution.



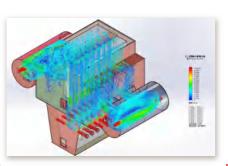
No.3

有色冶炼

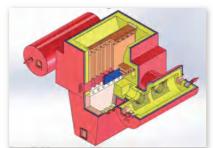
Colored Smelting





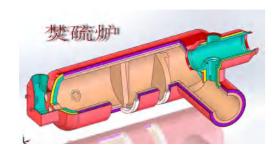


流体分析 fluid analysis



3D 模型 3D model

技术介绍 INTRODUCTION



焚硫炉 sulphur burning furnace

工业炉窑上采用这种低氮燃烧的燃烧装置,就能实现安全稳定燃烧的前提下合理控制燃烧温度与有效减少氮氧化物的排放量,实现节省燃料与节约投资的前提下减少对大气环境的污染。

By adopting such a low-nitrogen combustion combustion device on an industrial furnace, it is possible to properly control the combustion temperature and effectively reduce the emission of nitrogen oxides under the premise of achieving safe and stable combustion, thereby reducing fuel consumption and saving investment. Pollution to the atmospheric environment.

No.4

组合砖

Composite Brick





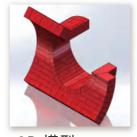


燃烧器组合砖 burner composite brick



热风炉组合砖 combination brick of blast stove

技术介绍 INTRODUCTION



3D 模型 3D model

Solidworks 建模的基础上,利用flow simulation 进行数值模拟,用其结果检验设计炉窑的性能优劣。高温工业窑炉等热设备的设计过程中设计方法、设计工具、及计算手段的有效而优化的相互结合的应用,就能为用户设计出结构合理、便于施工、管理方便、数据可信、表达准确的设计施工图纸并给出准确详尽的材料清单,公司效益提升的同时也为客户带去了完备的高质量的技术服务。

Based on the modeling of Solidworks, the flow simulation was used for numerical simulation, and the results were used to test the performance of the designed kiln. In short, in the design process of industrial furnaces and kiln and other thermal equipment, the design method, design tools, and the effective and optimized combination of calculation methods can design the user with reasonable structure, convenient construction, convenient management and reliable data. Expressing accurate design and construction drawings and giving accurate and detailed bills of materials, the company has brought complete and high- quality technical services to customers while improving the company's efficiency.





COOPERATION CASES

合作案例 >>







KOREAN CUSTOMERS 韩国客户









IRANIAN CUSTOMERS

伊朗客户



GERMAN CUSTOMERS

德国客户





低蠕变莫来石砖

Low creep mullite brick

该系列产品以特级铝矾土熟料为主要原材料,辅以特殊添加剂,经高压成型、高温烧成,具有蓄热能力大、蠕变率小等特点。适用于中小型高炉配套热风炉。

This series of products uses synthetic mullite as the main rawmaterial. After high pressure molding and high temperature firing, it has the advantages of stable volume and small creep rate under high temperature and high temperature conditions. Supporting hot air furnace for large and medium sized blast Furnaces.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	DRM72	DRM70	DRM65	DRM60	DRM56
Al₂O₃%≽	72	70	65	60	56
Fe₂O₃%≤	0.8	0.8	0.8	1	1
耐火度/°C refractoriness ≥	1830	1830	1790	1790	1790
显气孔率/% apparent porosity ≤	19 (21)	19 (21)	19 (21)	19 (22)	19 (22)
常温耐压强度/Mpa CCS ≥	70(60)	70(60)	70(50)	60(50)	60(50)
0.2Mpa 荷重软化温度 °C RUL ≥	1700	1650	1630	1600	1580
重烧线变化°C(1500*2h) Reheating linear change≤	±0.2	±0.2	±0.2	±0.2	±0.2
热震稳定性 (1100°C) /次 resistance/cycle≥	35	30	30	20	15
蠕变率% (Creep rate)≤	0.6 (1500°C *50h)	0.6 (1500°C *50h)	0.6 (1450°C *50h)	0.8 (1400°C *50h)	0.8 (1350°C *50h)

电炉顶专用浇注料

Special castable for arc furnace cap

电炉顶用耐火浇注料该产品由高铝矾土、电熔刚玉、超细粉及多种添加剂组成,具有原料组成合理,耐火度高,热震稳定性好、寿命长等特点。适用于大型LF精炼炉三角及相同条件的部位。

The refractory castable for electric furnace cap is composed of high alumina bauxite, fused corundum, ultrafine powder and various additives. It has the characteristics of reasonable raw material composition, high refractoriness, good thermal shockresistance stability and long service life. Applicable to the triangle area of large LF refining furnace and the same conditions parts.

项目 Items	卑号 Brands	DLD75	DLD80	DLD90	DLD92
Al ₂ O ₃ %≥		75	80	90	92
体积密度 BD g/cm³ Bulk density ≽	110°C×24h	2.6	2.8	3.0	3.1
抗折强度 MOR MPa	110°C×24h	8	10	13	8
Flexural strength ≥	1100°C×3h	8	10	13	8
耐压强度 CCS MPa	110°C×24h	60	80	100	80
Compressive strength≥	1100°C×3h	80	100	100	80
线变化率 PLC %	1100°C×3h	-0.1~0.3	-0.1~0.3	-0.2	+0.2
Line rate of change	1500°C×3h	-	-	-0.2~0.6	+0.5
最高使用温度°C Maximum Ser	vice temperature	1450	1550	1610	1700

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低蠕变高铝砖

Low creep high alumina brick

该系列产品以特级铝矾土熟料为主要原材料,辅以特殊添加剂,经高压成型、高温烧成,具有蓄热能力大、蠕变率小等特点。适用于中小型高炉配套热风炉。

This series of products is characterized by special grade aluminum bauxite clinker as the main raw material, supplemented by special additives, high pressure forming and high temperature firing. It has the characteristics of large heat storage capacity and small creep rate. Applicable to small and medium sized blast furnace supporting hot blast stove.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	DRL70	DRL75	DRL80	DRL65	DRL85	DRL48
$Al_2O_3\% \geqslant$	70	75	80	65	85	48
耐火度/°C refractoriness ≥	1790	1790	1790	1790	1770	1750
显气孔率/% apparent porosity ≤	20	20	19	24	24	24
常温耐压强度/Mpa CCS≥	65	70	80	49	44.1	39.2
0.2Mpa 荷重软化温度°C RUL ≥	1500	1550	1650	1500	1470	1420
重烧线变化°C(1500*2h) Reheating linear change≤	1450°C*2h ±0.1	1550°C*2h ±0.1	1550°C*2h ±0.1	1550°C*2h ±0.1~0.4	1550°C*2h ±0.1~0.4	1450°C*2h ±0.1
常温蠕变率%(Creep rate at room temperature)≤	1 (1400°C *50h)	1 (1450°C *50h)	1 (1500°C *50h)	-	-	-

低蠕变红柱石砖

Low creep and alusite brick

该系列产品以莫来石和红柱石为原材料,经过高压成型、高温烧成,具有杂质含量低、气孔率低、体积密度小、高温强度大、高温条件下体积稳定、抗热冲击力好、蠕变率小等优点。适合用于大中型高炉的配套热风炉。

This series of products is made of mullite and andalusite as raw materials. It is subjected to high pressure molding and high temperature firing. It has advantages of low impurity content, low porosity, low bulk density, high temperature strength, stable volume under high temperature conditions, good thermal shock resistance and creep small variability. Suitable for hot air furnace for large and medium sized blast furnaces.

牌号 Brands 项目 Items	CHZ70	CHZ65	CHZ60	CHZ55
Al ₂ O ₃ %≥	70	65	60	55
Fe₂O₃%≤	1	1	1.3	1.3
耐火度/℃ refractoriness ≥	1810	1810	1790	1790
显气孔率/% apparent porosity≤	18(21)	19(21)	19(21)	19(21)
体积密度 g/cm³ bulk density≥	2.6	2.5	2.5	2.45
常温耐压强度/Mpa CCS≥	65(55)	65(55)	70(60)	70(60)
0.2Mpa 荷重软化温度°C RUL ≥	1650	1650	1630	1600
重烧线变化°C(1500*2h) Reheating linear change≤	0~+0.5	0~+0.5	0~+0.5	0~+0.5
热震稳定性 (1100°C) /次 resistance/cycle≥	30	25	25	20
蠕变率%(Creep rate)≤	0.8 (1500°C*50h)	0.8 (1450°C*50h)	0.8 (1400°C*50h)	0.8 (1400°C*50h)



高炉热风炉风口组合砖

Assembled brick for hot blast furnace tuyere

高炉热风炉孔口较多,且较大,工作条件也较恶劣,更成为热风炉砌体的薄弱环节。为提高孔口砌体寿命,提高稳定性,主要通过合理设计孔口砌体结构及砖形,使孔口砖相互锁紧,合理传递应力。

组合砖技术是对高温窑护或热工设备关键部位的耐火材料砌体进行总体设计,将简单几何体相贯而形成的复杂空间几何体解体成外形复杂的数十或数百种耐火砖。

这些复杂外形的耐火砖砌筑时互相锁嘴并合理传递应力,形成结构牢固稳定的砌体。热风炉系统接口孔洞部位的耐火砖易损部位,传统的设计和施工方法很堆满足高炉高风温的要求,使用组合砖技术可较好地解决这一难题。

热风炉组合砖是由几种简单几何体阳贯而形成的复杂空间几何体,其内含有数十种或数百种组合砖单体,这些组合砖互相锁紧,并均匀传递应力,结构十分牢固,从而获得较长使用寿命。

组合砖的制造方法:半干法;整体造型浇注离心法;切割法。

The blast furnace hot air protection hole amount is large and big, and the working conditions are also harsh, which becomes the weak link of the hot blast furnace masonry. In order to improve the life of the hole masonry and improve the stability, the hole bricks are interlocked and the stress is reasonably transmitted through reasonable design of the hole masonry structure and the brick shape.

The composite brick technology is a general design of refractory masonry for high-temperature kiln protection or thermal equipment, and the complex space geometry formed by the intersection of simple geometry is disintegrated into dozens or hundreds of refractory bricks with complex shapes.

These complex-shaped refractory bricks are interlocked with each other and reasonably transmit stress to form a solid and stable masonry.

The refractory bricks in the hole part of the hot blast stove system are vulnerable parts. The traditional design and construction methods are piled up to meet the requirements of high blast furnace high air temperature. The use of composite brick technology can better solve this problem.

The hot air stove combo brick is a complex space geometry formed by several simple geometries, which contains dozens or hundreds of combo bricks. These bricks are locked to each other and transmit stress evenly. The structure is very firm. To achieve a long service life.

Manufacturing method of composite brick:Semi-dry method; overall modeling casting centrifugation; cutting method.

牌号 Brands 项目 Items	刚玉-莫来石质 (GM-70) Corundum-mullite (GM-70)	莫来石质 (ML-60) Mullite(ML-60)	粘土质 (NT-45) Clay(NT-45)
$Al_2O_3\% \geqslant$	70	60	45
Fe₂O₃%≥	1.5	1.5	2
显气孔率/% apparent porosity≤	17	18	20
体积密度 g/cm³ bulk density≥	2.75	2.7	2.2
耐火度/°C refractoriness	1790	1790	1690
耐压强度/Mpa crushing strength≥	60	50	40
0.2Mpa 荷重软化温度℃ RUL ≥	1600	1550	1400
蠕变率%(°C*50h) greep rate	1.0(1450)	1.0 (1400)	1.0 (1150)
热震稳定性 (1100°C) /次 resistance/cycle≥	25	25	20
使用部位 application	高炉风口、出铁口、热风 出口、三叉口、围管风口、 上部入孔等 Blast furnace tuyere, taphole, hot air outlet, three forks, bustle pipe tuyere, upper inlet, etc.	燃烧室入口、上部入孔、 混风 出入口等。Combustion chamber inlet, upper inlet, mixed air inlet and outlet.	下部入孔。烟道管。混风管、转折管、变径管等Lower entrance hole. Flue tube. Mixing duct, turning tube, reducing pipe, etc.





>>> 硅线石砖 / Sillimanite brick

硅线石砖是以硅线石、红柱石和烧结莫来石为主要原材料,加入部分超微粉和结合剂,采用高压成型,以合理的烧成温度制得该制品。该制品具有气孔率低、强度高、抗热震稳定性好等特点。

The sillimanite brick is mainly composed of sillimanite, and alusite and sintered mullite. Some ultrafine powders and binders are added, and the product is obtained by high-pressure molding at a reasonable firing temperature. The product has the characteristics of low porosity, high strength, good thermal shock resistance and so on.

牌号/ Brands 项目 Items		SiO₂% ≽		/% 度 温度0.2Mpa Apparent CCS/Mp Load soften porosity a ≥ temperature RUL ≥		temperature°C	热震稳定性 (1100°C) /次 Resistance/ cycle≥	体积密度 Bulk density g/cm³ ≥	
CHGX-60	60-65	30-35	≤1.5	18	1550	30	30	2.45	

>>> 铝镁浇注料/Aluminum-magnesium castable

铝镁浇注料主要采用刚玉、镁砂及尖晶石等原料配制而成。材料具有高温强度大,抗侵蚀及热震性能好等特点。主要用于钢包及铁水包等高温窑炉的内衬。

The aluminum-magnesium castables are mainly prepared from raw materials such as corundum, magnesia and spinel. The material has the characteristics of high temperature strength, corrosion resistance and good thermal shock resistance. Mainly used for the lining of high temperature kiln such as ladle.

项目 Items	牌号 Brands	LMJZ90	LMJZ85	LMJZ80
Al ₂ O ₃ %+Mg	Al₂O₃%+MgO%≥		85	80
	体积密度 BD 110°C×24h g/cm³ Bulk density≥		2.85	2.8
耐压强度 CCS MPa ≥	110°C×24h	30	30	30
Compressive strength	1500°C×3h	60	60	60
线变化率 PLC % 1 Line rate of cha		0~+1.2	0~+1.2	0~+1.2

莫来石隔热耐火砖

Mullite insulating brick

本系列产品采用高纯原料及独特的制作工艺,最大限度地避免了杂质及结构缺陷对制品性能的影响,具有极其优良的高温体积稳定性和热震稳定性,且强度高,导热系数低,对各种炉型和各种环境具有广泛的适应性,可用于冶金、机械、陶瓷、化工等行业窑炉内衬(不受熔融液体侵蚀)及保温层。



This series of products adopts high-purity raw materials and unique production process to minimize the influence of impurities and structural defects on the performance of the product. It has excellent high temperature volume stability and thermal shock stability, high strength and low thermal conductivity. It has wide adaptability to various furnace types and various environments. It can be used in kiln lining (not eroded by molten liquid) and insulation layer in metallurgy, machinery, ceramics, chemical industry, etc.

牌号 Brands 项目 Items	JM23-0.6	JM23-0.8	JM23-1.0	JM26-0.6	ZJM26	JM26-1.0	JM28-1.0	JM28-1.2
体积密度 g/cm³ bulk density≥	0.6	0.8	1.0	0.6	0.8	1.0	1.0	1.2
耐压强度/Mpa CCS ≥	1.5	2.5	4.2	1.5	3.2	4.0	4.0	5
热震稳定性 (1100°C)/次 resistance/cycle ≥	10	20	20	10	20	20	20	20
重烧线变化不大于1%的试验温度 °C% The reheating line changes by no more than 1% of the test temperature≤	1300*12	1300*12	1300*12	1400*12	1400*12	1400*12	1500*12	1500*12
导热系数平均温度350±25 ℃(W/m.k) Thermal conductivity average temperature	0.2	0.23	0.33	0.2	0.25	0.33	0.35	0.4
Al ₂ O ₃ %≥	48	49	50	55	57	57	60	67
Fe₂O₃%	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.6



高铝质隔热砖

High alumina insulating brick

以先进独特的工艺制造的高铝隔热砖,具有耐压强度高、热震稳定性好等特点,使用后,可减少炉墙的热容量、提高窑炉的热效率。使用于砌筑工业窑炉以及其他热工窑炉以及其他热工设备的隔热层及炉内衬。

The high-aluminum heat-insulating bricks manufactured by advanced and unique technology have the characteristics of high compressive strength and good thermal shock resistance. After use, the furnace wall heat capacity can be reduced and the thermal efficiency of the furnace can be improved. Used in the insulation of masonry industrial furnaces and other thermal furnaces and other thermal equipment and furnace lining.







牌号 Brands	高铝质隔热砖 High aluminum insulation brick							
项目 Items	CH-LG0.6	CH-LG0.8	CH-LG1.0					
体积密度 g/cm³ bulk density≥	0.6	0.8	1					
耐压强度/Mpa CCS Compressive strength ≥	1.96	2.94	4					
重烧线变化不大于2%的试验温度°C% The reheating line changes by no more than 2% of the test temperature≤	1350	1400	1450					
导热系数平均温度 350±25°C(W/m.k) Thermal conductivity at average temperature	0.25	0.32	0.45					
0.1Mpa 荷重软化温度°C RUL 0.1Mpa load softening temperature≥	1300	1350	1380					
Al ₂ O ₃ %≥	48	48	48					
Fe ₂ O ₃ %	1.8	1.6	1.5					
最高使用温度°C Maximum service temperature	1300	1350	1380					

高铝砖

High alumina brick

该系列产品以特级铝矾土熟料为主要原材料,辅以特殊添加剂,经高压成型、高温烧成,具有蓄热能力大、蠕变率小等特点。适用于中小型高炉配套热风炉和其他工业窑炉。

This series of products is characterized by special grade aluminum bauxite clinker as the main raw material, supplemented by special additives, high pressure forming and high temperature firing. It has the characteristics of large heat storage capacity and small creep rate. Applicable to small and mediumsized blast furnace supporting hot blast stove and other industrial kiln.













牌号 Brands		1	指标	
项目 Items	CH-LZ75	CH-LZ65	CH-LZ55	CH-LZ48
Al ₂ O ₃ %≥	75	65	55	48
常温耐压强度/Mpa CCS Cold compressive strength≥	54	49	44	40
显气孔率/% apparent porosity≤	23	23	22	22
荷重软化温度°C RUL Load softening temperature≥	1520	1500	1470	1420
重烧线变化°C (1500°C,2h) Reheating linear change	+0.1 -0.4	+0.1 -0.4	+0.1 -0.4	+0.1 -0.4 (1450°C.2h)
耐火度/°C refractoriness ≥	1790	1790	1770	1750





耐火喷涂料

Refractory spray coating material

耐火喷涂料为铝硅系列耐火材料,可根据用户使用要求,选用轻质、中重质或重质。材料具有一定粘附性、回弹率低、强度高等特性。该产品主要应用于高炉、热风炉的本体等窑炉高温管道和烟道系统。

The refractory spray coating is an aluminum-silicon series refractory material, which can be light, medium or heavy according to user requirements. The material has certain adhesion, low rebound rate and high strength. This product is mainly used in high temperature pipelines and flue systems of kiln furnaces such as blast furnaces and hot blast stoves.

◇ 产品参数 | Product parameters

项目 Items	牌号 Brands	CH-PTL40	CH-PTL45	
Al ₂ O ₃ %≽		40	45	
体积密度 BD g/cm³ Bulk densi	(1300°C after burning)1.0	(1300°C after burning)1.95		
耐火度 Refractoriness °C	耐火度 Refractoriness ℃ ≥			
烧后线变化率 PLC % Line change rate	after burning	(1300°C×3h)±1.0	(1400°C×3h)±1.0	
抗折强度 MOR MPa	110°C drying	4.0	4.4	
Flexural strength ≥	热态 Hot form	(1300°C)0.5	(1400°C)0.5	
导热系数 TC W/m.k Thermal Cond	导热系数 TC W/m.k Thermal Conductivity≤			
使用温度 Application temp	使用温度 Application temp °C			

>>> 轻质硅砖 / Light weight silica brick

又称硅质隔热砖。二氧化硅91%以上,体积密度1.2G/CM³以下的轻质耐火材料。耐火度和荷重软化温度与成分相同的普通硅砖相差不大。但气孔很多,故而耐压强度、抗渣性、抗腐蚀性等不\(\)普通硅砖,而抗热震性能却有所提高。

采用细碎的硅石做原料,其临界粒度通常不超过1MM,而其中小于0.5MM的颗粒不少于90%。配料中加入易燃物质或采用气体发生法形成多孔结构,经烧成而制得。也可制成不烧制品。主要用于要求隔热或减轻自重而不与熔融物直接接触、不受侵蚀性气体作用、不遭受温度急变的窑炉各个部位。高温下使用,不能与碱性耐火材料接触。按材质不同,其最高使用温度1200~1550°C。

Also known as silicon insulation bricks. A lightweight refractory material having a silica content of 91% or more and a bulk density of 1.2 g/cm^3 or less. The refractoriness and load softening temperature are similar to those of ordinary silica bricks with the same composition. However, due to the large number of pores, the compressive strength, slag resistance, corrosion resistance, etc. are not as good as those of ordinary silica bricks, but the thermal shock resistance is improved.

The finely divided silica is used as a raw material, and the critical particle size thereof is usually not more than 1 mm, and the particles having less than 0.5 mm are not less than 90%. A flammable substance is added to the furnish or a porous structure is formed by a gas generating method, and is obtained by firing. It can also be made into unfired products. It is mainly used in various parts of the kiln that require heat insulation or light weight reduction without direct contact with the melt, no corrosive gas, and no temperature change. It can not be used in contact with alkaline refractories when used at high temperatures. According to the material, the maximum operating temperature is $1200 \sim 1550$ °C.

牌号 Brands	轻质硅砖 Light weight silica brick
项目 Items	CH-QZ1.2
SiO ₂ %	91
耐火度 Refractoriness≥	1670
荷重软化开始温度 (0.1Mpa)°C Load softening start temperature	1520
导热系数 W/m.k(350°C±10°C) Thermal Conductivity≤	0.7
常温耐压强度 Mpa Normal temperature compressive strength≥	5
体积密度 g/cm³ Bulk density	1.2



热风炉蓄热用耐火球

Refractory balls used for HBS regenerator

耐火瓷球耐火球以工业氧化铝和耐火高岭土为主要原料, 经科学配方、成形和高温慨烧制成的。

它具有 1.机械强度高,使用周期长; 2.化学稳定性好,不与物料发生化学反应; 3.耐高温性能好,耐火瓷球最高耐热温度可达到1900度。特别适用于化肥厂高低温变换炉、转化炉、加氢转化器、脱硫槽及甲院化炉中,起分散气液、并支撑、覆盖和保护催化剂的作用。耐火瓷球也可用于钢铁行业的热风炉和加热变换设备中。



The refractory porcelain ball refractory ball is made of industrial alumina and refractory kaolin as the main raw materials, scientifically formulated, formed and calcined at a high temperature.

It has 1. High mechanical strength and long service life; 2. Good chemical stability, no chemical reaction with materials; 3. High temperature resistance, refractory ceramic ball can reach 1900 degrees. It is especially suitable for high and low temperature shifting furnaces, reforming furnaces, hydroconverters, desulfurization tanks and methanation furnaces in fertilizer plants, which acts to disperse gas and liquid, and to support, cover and protect the catalyst. Refractory ceramic balls can also be used in hot blast stoves and heating converters in the steel industry.

牌号 Brands 项目 Items	A l₂O₃ %≽	Fe ₂ O₃ %≤	MgO %≽	Cr₂O₃ %	气孔率 /% Appare nt porosi ty≤	体积密 度 g/cm³ Bulk densit y≥	常温耐压强度 /Mpa CCS Normal temperature compressive strength≥	耐火度 /°C Refrac tor iness ≥	重烧线变	荷软 点°C <i>≫</i>	热震稳定 性次 Thermal shock stability ≥	蠕变率% (Creep rate) ≪
机制莫来石球 Mechanism mullite ballmachine-made mullite ball	75	-	-	-	22	2.4	16000	1790	0.1-0.4	1550	40	-
机制镁铝球 machine-made Mg-Al ball	5-10	-	8.5	-	18	2.85	18000	1790	-	1550	18	-
机制高强高密度高铝球 Mechanism high strength and high density high aluminum ball	75	1.5	-	-	23	2.55	20000	1790	-	1480	15	-
机制高铝 65 低蠕变球 Mechanism high aluminum 65 low creep ball	65	1.5	-	-	22	2.6	15000	1790	0.1-0.4	1500	-	1450°C *50h*0.2m pa<1.0
机制高铝 75 低蠕变球 Mechanism high aluminum 75 low creep ball	75	1.5	-	-	21	2.65	15000	1790	0.1-0.4	1520	-	1450°C *50h*0.2m pa<1.0
机制镁铝铬球 Mechanism magnesium aluminum chrome ball	5-10	-	55	2	20	2.8	15000	1790	-	1520	15	-
机制镁铬球 Mechanism magnesium chrome ball	-	-	80	2	20	2.6	20000	1790	-	1520	15	-
手工镁铝球 Manual magnesium aluminum ball	5-10	-	85	-	22	2.55	12000	1790	-	1510	15	-
手工高强铝球 Handmade high-strength aluminum ball	65	1.5	-	-	23	2.2	12000	1790	-	1480	-	-
手工低蠕变球 Manual low creep ball	75	1.5	-	-	22	2.55	12000	1790	-	1480	-	1450°C *50h*0.2 mpa<1.3

热风炉用硅砖、一般硅砖

Silica brick for HBS and common silica brick

主要由鳞石英、方石英以及少量残余石英和玻璃相组成的酸性耐火材料。二氧化硅含量94%以上。真密度2.35G/CM³。具有抗酸性渣侵蚀性能。较高的高温强度。荷重软化开始温度1620~1670℃。高温下长期使用不变形。热震稳定性低(水中热交换为1~4次)以天然硅石为原料,外加适量矿化剂,以促进坯体中的石英转化为鳞石英。还原气氛下经1350~1430℃缓慢烧成。加热到1450℃时约有1.5~2.2%的总体积膨胀,这种残余膨胀会使切缝密合,保证砌筑体有良好的气密性和结构强度。

An acid refractory consisting mainly of tridymite, cristobalite, and a small amount of residual quartz and glass phases. The silica content is 94% or more. The true density is 2.35g/cm³. With acid slag corrosion resistance. Higher high temperature strength. The load softening start temperature is 1620 to 1670 °C. Long-term use at high temperatures does not deform. The thermal shock stability is low (heat exchange in water for 1~4 times). Natural silica is used as raw material, and an appropriate amount of mineralizer is added to promote the conversion of quartz in the body into scaly quartz. It is slowly calcined at 1,350 to 1,430 °C under a reducing atmosphere. When heated to 1450 °C, there is about 1.5~2.2% of total volume expansion. This residual expansion will make the joints tight and ensure good air tightness and structural strength of the masonry.

❷ 产品参数 | Product parameters

牌号 Brands	一般硅砖	Common si	ica brick	热风炉用硅砖 Silica brick used for hot blast stove				
项目 Items	CH-GZ95	CH-GZ94	GZ-93	拱顶砖 Vault brick	格子砖 Checker brick			
SiO₂%≽	95	94	93	95	95			
耐火度/℃ refractoriness ≥	1710	1710	1690	-	-			
0.2Mpa 荷重软化温度°C RUL ≥	1650	1620	1620	-	-			
显气孔率/% apparent porosity≤	22	23	25	22	23			
常温耐压强度/Mpa CCS≥	29.4	24.5	19.6	35	30			
体积密度 g/cm³ Bulk density≥	2.37	2.38	2.39	2.	.35			
高温蠕变率%(0.2Mpa 1550°C,50h)high temperature Creep≤		-		0.8				
热膨胀率%(1500°C) thermal linear expansion <		-		1.26				



电炉顶预制件

Prefabricated block for EAF

预制块亦称为预制件,属于不定形耐火材料范畴。其原因不烧砖的原料组成、配制原则、结合剂和外加剂的使用,均与不定形耐火材料的基本相同,且为不烧或轻烧制品。该类制品,与现场施工的不定形耐火材料相比,具有外形尺寸准确、性能稳定、施工周期短和成本低廉等优点;与烧成耐火砖相比,制品成品率高,不用烧成窑炉,可节约能源,生产成本低和性能优良。

Prefabricated blocks, also known as prefabricated parts, belong to the category of amorphous refractories. The reason is that the raw material composition, the preparation principle, the binder and the use of the additive are not substantially the same as those of the amorphous refractory material, and are not burned or lightly burned. Compared with the unshaped refractory materials on site, this type of product has the advantages of accurate size, stable performance, short construction period and low cost. Compared with fired refractory bricks, the product yield is high, and there is no need to burn the kiln., energy saving, low production cost and excellent performance.







项目 Items	牌号 Brands	DLD-85	DLD-80
Al ₂ O ₃ %≥		85	80
Cr ₂ O ₃ %≥		-	2
体积密度 g/cm³ bulk density≥	110°C×24h	2.8	2.8
耐压强度/Mpa Crushing strength≥	110°C×24h	30	30
则企进度/Mpa Crushing Strengtil≥	1500°C×3h	60	60
燃烧后线变化/% Firing linear change	1500°C×3h	±0.3	±0.3

粘土、高铝质耐火泥浆

Clay, high alumina refractory mortar

耐火粘土火泥简称软质粘土。一种具有可塑性的耐火粘土。组成矿物主要高岭石、多水高岭石、水云母等。一般含 $Al_2O_3 \ge 22\% \sim 30\%$, $SiO_2 \ge 42\% \sim 73\%$,耐火度]1580~1670°C]。这种耐火粘土泡水中变软,和水后能做成各种形状,制作耐火材料的原料,作为粘结剂和于硬质耐火粘土中。根据软质耐火粘土的化学成分(有用组分、有害组分)、物理性能(耐火度、可塑性、烧失量等)可以划分为I、II、III 三个品级。适用于砌筑粘土砖和高铝砖。

Refractory clay mortar is referred to as soft clay. It is a refractory clay with plasticity. The constituent minerals are mainly kaolinite, kaolinite, and hydromica. Generally, it contains $Al_2O_3 \ge 22\% \sim 30\%$, $SiO_2 \ge 42\% \sim 73\%$, and the refractoriness is $1580 \sim 1670$ °C. The refractory clay foam is softened in water and can be made into various shapes after water, and is a raw material for making a refractory material, as a binder and in a hard refractory clay. According to the chemical composition (useful components, harmful components), physical properties (refractory degree, plasticity, loss on ignition, etc.) of soft refractory clay, it can be divided into three grades: I, II, and III. Suitable for masonry clay bricks and high alumina bricks.

项目 Items	牌号 Brands	CH-NN38	CH-NN42	CH-NN45	CH-LN55	CH-LN65	CH-LN75
Al_2O_3	%≥	38	42	45	55	65	75
耐火度/°C refra	ctoriness ≥	1630	1690	1710	1770	1770	1790
抗折强度 MOR	110°C×24h	1	1	1	1	1	-
MPa Flexural strength≥	°C×3h	1200 3	1200 3	1200 3	1400 5	1400 5	1400 5
粘结时间 Bonding time min 1~3							



氧化铝空心球制品

Aluminum bubble products

氧化铝空心球制品以氧化铝空心球、刚玉粉、慨烧粉等为原料,经均化、成型、高温烧结而成。 产品具有耐高温、耐酸碱侵蚀、导热系数低、隔热性能好、体积密度小等特性,主要用于陶瓷、电瓷、 砂轮、耐火材料等工业各种高温窑炉的工作内衬和隔热衬。

Our company aluminum bubble products are made from alumina bubble spheres, corundum powder, calcined powder, etc., which are homogenized, shaped and sintered at high temperature. The product has the characteristics of high temperature resistance, acid and alkali resistance, low thermal conductivity, good thermal insulation performance, and small bulk density. It is mainly used for working linings and thermal insulation of various high-temperature kiln in the ceramics, electric porcelain, grinding wheels, refractory and other industries lining.

牌号 Brands	氧化铝	空心球	Sialon 结合 Al₂O₃	空心球砖
项目 Items	CH-KXQ88	CH-KXQ98	CH-KXQ98	-
最高使用温度°C(Maximum use temperature)	1650	1800	2000-2200	1600
Al ₂ O ₃ %≥	88	99	-	70
ZrO₂%≽	-	-	9.8	-
SiO₂%≤	-	0.2	0.2	-
Fe 2O3%≤	0.3	0.15	0.2	N≥5
体积密度(BD)g/cm³	1.30~1.45	1.40~1.65	≤ 3.0	≤ 1.5
常温耐压强度,(CCS)MPa,≥	10	9	8	15
荷重软化温度,°C(RUL)(0.2MPa,0.6%)≥	1650	1700	1700	1700
重烧线变化率 (Reheating linear change)% 1600°C×3hrs	±0.3	±0.3	±0.2	-
热膨胀系数,(Thermal expansion coefficient)×10 (cdd -1300°C)	~8.0	~8.6	-	热震稳定性,次 (1100°C水冷)≥15
导热系数,W/(m.K),(at 800°C)≤	0.9	1.0	0.5	1.1
应用 application	用作石化工业炭黑耐火材料等高温箱 used as the he lining of ca furnace in pe industry, and th high tempera such as cer refract	於的内衬。(It is eat insulation rbon black etrochemical e inner lining of ture furnaces ramics and	用于烧制硬质、超硬质合金真空中频超高温炉内衬、隔热层,也可用于其它2000~2200°C的超高温炉的内衬Used for firing hard and super hard alloy vacuum intermediate frequency ultra-high temperature furnace lining and heat insulation layer, and also can be used for other 2000~2200°C ultra-high temperature furnace lining	用作1400~1600°C陶 瓷窑炉极其它高温窑 炉的热面内衬。 (Used as the hot surface lining of 1400~1600 °C ceramic kiln and other high temperature kiln.)

优质镁砖

High grade magnesia brick

优质镁砖采用一级镁砂、高纯镁砂为原料,经过高压成型、高温烧成而制得的一种产品,该产品 具有优良的耐高温性能和较高的抗碱性渣的侵蚀性能。

High-quality magnesia brick is a product made of high-grade molding and high-temperature firing using first-gradeand high-purity magnesia as raw materials. The product has excellent high temperature resistance and high resistance to alkali slag erosion.

项目 Items	牌号 Brands	MZ-90	MZ-92	MZ-95	MZ-97
MgO%	ó≽	90	92	95	97
SiO ₂ %	ó≤	-	-	2.50	1.20
CaO%	′o≤	3.0	2.50	2.0	1.50
体密 B.D g	g/cm³≥	2.9	2.92	2.95	3.0
显气孔率 A	P% ≤	20	18	18	18
耐压强度 CC	耐压强度 CCS MPa ≥		50	50	50
0.2MPa 荷重软化温 ≥).2MPa 荷重软化温度 R.U.L°CT0.6 ≥		1550	1600	1650





>>> 粘土隔热砖 / Clay insulating brick

以先进独特的工艺制造的粘土隔热砖,具有耐压强度高、热震稳定性好等特点,使用后,可减少 炉墙的热熔量、提高窑炉的热效率。使用于砌筑工业窑炉以及其他热工窑炉以及其他热工设备的 隔热层及炉内衬。

The clay heat-insulating bricks made by advanced and unique technology have the characteristics of high compressive strength and good thermal shock resistance. After use, the hot melt amount of the furnace wall can be reduced and the thermal efficiency of the furnace can be improved. Used in the insulation of masonry industrial furnaces and other thermal furnaces and other thermal equipment and furnace lining.





牌号 Brands		粘土	隔热砖	
项目 Items	NG-0.5	NG-0.6	NG-0.8	NG-1.0
体积密度 g/cm³ bulk density ≥	0.5	0.6	0.8	1
耐压强度/Mpa CCS Compressive strength≥	1.5	2	2.5	3.4
重烧线变化不大于 2%的试验温度°C% The reheating line changes by no more than 2% of the test temperature≤	1250	1300	1350	1350
导热系数平均温度 350±25°C(W/m.k) Thermal conductivity average temperature	0.18	0.25	0.35	0.5
0.1Mpa 荷重软化温度°C RUL 0.1Mpa load softening temperature≥	1160	1250	1280	1300
Fe₂O₃%	2.5	2.5	2	2
最高使用温度°C Maximum use temperature	1150	1200	1280	1300

>>> 粘土砖 / Fire clay brick

粘土砖的矿物组成主要由高岭石 $(Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O)$ 和6%~7%的杂质 (钾、钠、钙、钻、铁的氧 化物)。粘土砖的烧成过程,主要是高岭石不断失水分解生成莫来石(3Al₂O₃·2SiO₂)结晶的过程。粘土 砖中的SIO2和Al2O3烧成过程中与杂质形成共晶低熔点的硅酸盐,包围在莫来石结晶周围。

粘土砖属于弱酸性耐火制品,能抵抗酸性熔渣和酸性气体的侵蚀,对碱性物质的抵抗能力稍 差。粘土砖的热性能好,耐急冷急热。

The mineral composition of clay bricks is mainly kaolinite (Al₂O₃ · 2SiO₂ · 2H₂O) and 6%~7% impurities (oxides of potassium, sodium, calcium, titanium and iron). The firing process of clay bricks is mainly due to the continuous dehydration of kaolinite to form crystallization of mullite (3Al₂O₃·2SiO₂). SiO₂ and Al₂O₃ in the clay brick form a eutectic low- melting silicate with impurities during the firing process, surrounding the mullite crystal.

Clay bricks are weakly acidic refractory products that are resistant to attack by acidic slag and acid gases and are less resistant to alkaline substances. Clay bricks have good thermal properties and are resistant to rapid cooling.







项目 Items			指标 Index									
		N-1	N-2a	N-2b	N-3a	N-3b	N-4	N-5	N-6			
耐火度/°Crefractor iness ≥		1750	1730	1730	1710	1710	1690	1670	1580			
0.2Mpa 荷重软化温度℃ RUL ≥ 0.2Mpa load softening temperature		1400	1350	-	1320	-	1300	-	-			
重烧线变化 ℃ (1500 ℃	1400°C,2h	+0.1 -0.4	+0.1 -0.5	+0.2 -0.5	-	-	-	-	-			
,2h) Reheating linear change	1350°C,2h	-	-	-	+0.2 -0.5	+0.2 -0.5	+0.2 -0.5	+0.2 -0.5	-			
显气孔率/% apparent p	oorosity≤	22	24	26	24	26	24	26	28			
常温耐压强度/Mpa CCS Normal temperature compressive strength≥		30	25	20	15	15	20	15	15			

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酸性捣打料

Silica ramming mass for Induction furnace

酸性捣打料为炉衬料系预混干式捣打料,选用精制高硅、低铁石英砂、石英粉,并添加适量熔融石英砂作为耐火层原料,使该产品具体具有较高的耐火度,其特点为不挂渣,不裂纹,受潮不失效,修补炉方便,及耐侵蚀,特别能提高炉龄,显著提高经济效益。



The silica ramming material is pre-mixed dry ramming

material for furnace lining, using refined high silicon, low iron quartz sand, quartz powder, and adding appropriate amount of fused silica sand as raw material of refractory layer, so that the product has higher refractoriness. It is characterized by no slag, no crack, no moisture, no convenient repair, and corrosion resistance, especially to increase the age of the furnace and significantly improve economic efficiency.

◆ 产品参数 | Product parameters

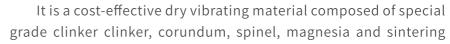
	牌号 Brands	DDL-1	DDL-2	DDL-3	DDL-4
项目 Items		Silica	Quartz	Silica-SiC	Quartz-SiC
SiC	0 ₂ %≥	98	98	98.5	98.5
Sic	% ≥	-	-	5	5
1450°C×3h	抗折强度 Flexural strength	15	15	16	16
烧后 (Mpa)≥	耐压强度强 Strong compressive strength	55	55	60	60
	变化率,% er change rate≤	-0.3	~0.5	-0.5^	-0.7
体积密度 (g/cn	n³) Bulk density	1.95	1.9	1.95	1.9
耐火度,°C Re	fractoriness≥	1700	1750	1700	1750
熔炼产品品种 Smel	ting product variety		き铜 Copper, norus brass	Copper, tin-pho	铜、青铜、钢铁 osphorus brass, e, steel

中性干式振动料

Neutral dry vibrating material

一种性价比高的干式振动料,由特级矾土熟料、刚玉、尖晶石、 镁砂、烧结剂等组成。适用于碳钢、合金钢、不锈钢及高锰钢的熔炼, 寿命高,性价比高。

该料经很多铸造企业使用,效果很好,实现低成本、高寿命。





agent. It is suitable for the melting of carbon steel, alloy steel, stainless steel and high manganese steel, with high service life and high cost performance.

The material is used by many foundry companies, and the effect is very good, achieving low cost and long life.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	铝矾土-尖晶石 Bauxite-spinel CH-RAM85A	典型值 Typical value
Al ₂ O ₃ %≽	≥85	85.25
MgO%≽	≥ 7	7.56
体密, g/cm³ Bulk density	≥2.95	2.95
正常使用温度℃ Normal use temperature	1600~1650	1600~1650
使用温度上限 (短时间)°C , Use upper temperature limit (short time)	1700	1700
最大粒度,mm Maximum granularity	5	5

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转炉、钢包喷涂料

Gunning mix for converter and ladle

转炉、钢包喷涂料主要原料为镁砂。材料高温下能够与本体有良好的结合性,具有抗侵蚀、耐冲刷等特点,能够显著延长转炉及钢包的使用寿命。

The main raw material for converter and ladle gunning mix is magnesia. The material has good bonding with the body at high temperature, and has the characteristics of corrosion resistance and erosion resistance, which can significantly prolong the service life of the converter and the ladle.

◇ 产品参数 | Product parameters

项目 Items	牌号 Brands	PBL70	PBL80	PBL85
MgO%≽		70	80	85
体积密度 BD g/cm³ Bul	k density ≥	2.3	2.4	2.5
抗折强度 MOR MPa	110°C×24h	3	4	5
Flexural strength≥	1500°C×3h	6	6	7
耐压强度 CCS MPa	110°C×24h	5	10	11
Compressive strength≥	1500°C×3h	20	28	32
附着铝 Adhesive qua	ality % ≽	85	85	85
临界颗粒 Critical gra	nule mm	3	3	3

高炉用非水系压入修补料

Water-free patching mixes for blast furnace

本产品以高温电慨无烟煤、优质矾土熟料为主要原料,以酚醛树脂为结合剂,添加特种固化剂制成,用于填充高炉冷却壁与炉壳之间、炉底封板下与炭质捣打料之间的缝隙,具有易施工、填充饱满、整体性好、强度高等特点。

Using electric calcined anthracite, high quality bauxite as the main materials, bonded by phenolic resin, the water-free patching mixes have been developed to repair and fill up the gap between refractory lining and the furnace shell, and the gap between the bottom cover plate and carbonaceous ramming. These products are characterized with easy to construct, easy filling up, good integrity and high strength.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-WYLB	CH-WYLD
Al ₂ O ₃ %	≥92	-
Fe ₂ O ₃ %	€2	-
C%	-	≥80
体积密度/g/cm³ Bulk density	≥2.2 (110°C, 24h)	≥1.3(110°C,24h)
耐压强度/Mpa Cold crushing strength	≥10(110°C, 24h)	≥10(110°C, 24h)
抗折强度/MPa Modulus of rupture	≥4(110°C, 24h)	-
流动值/% Flowability	≥140	≥140
粒度/% Grain size	100 (-1.5mm)	100 (-1.0mm)
应用 Application	用于高炉冷却壁与炉壳之间填 充 To fill up the gap between refractory lining and the furnace shell	炉底封板下与碳素捣打料之 间填充 To fill up the gap between the bottom cover plate and carbonaceous ramming



出铁沟免烘烤捣打料

Firing free ramming mixes for iron runner

我公司研制、生产的出铁沟免烘烤捣打料以刚玉、优质矾土和碳化硅等主要材料,以树脂、焦油为结合剂制成,采用捣打方式施工,施工体无需烘烤,可直接使用。产品具有粘结性好、抗熔渣侵蚀能力强、抗热震稳定性高、不粘渣等特点,适用于1000M³以下高炉出铁沟的砌筑和修补。

This series of products are made of corundum, high quality bauxite and silicon carbide, and bonded by resins and tar. Installation can be done by ramming. The products are easy to be installed, pre-firing free, good slag erosion resistance and excellent thermal shock resistance. They can be applied to install and repair the iron runner of the blast furnace under 1000m³.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-TGD-50	CH-TGD-55	CH-TGD-65
Al ₂ O ₃ %	≥50	≥55	≥65
SIC+C%	≥20	≥15	≥15
体积密度/g/cm³ Bulk density	≥2.3 (200°C, 24h)	≥2.4 (200°C, 24h)	≥2.5 (200°C, 24h)
耐压强度/Mpa	≥8(200°C,24h)	≥10 (200°C, 24h)	≥15 (200°C, 24h)
Cold crushing strength	≥8(1450°C,3h)	≥10(1450°C,3h)	≥15(1450°C, 3h)
拉红理 庄 (MDa Madulus of vuntura	≥3(200°C, 24h)	≥4(200°C, 24h)	≥5(200°C,24h)
抗折强度/MPa Modulus of rupture	≥3(1450°C, 3h)	≥4(1450°C, 24h)	≥3(1450°C, 24h)
烧后线变化/% Permanent linear change	±1.0 (1450,3h)	±0.8 (1450,3h)	±0.8 (1450,3h)
应用 Application	小型高炉渣沟 Slag trough of small size blast furnace	小型高炉铁沟、铸铁沟 iron runner of small size blast furnace	中小型高炉主沟 iron runner of middle or small size blast furnace

出铁沟浇注料

Castables for iron runner

该系列产品以致密刚玉、棕刚玉、优质矾土和优质SIC等为主要原材料,采用低水泥、超低水泥 浇注料技术制成,具有抗热霞稳定性好、抗侵蚀和冲刷能力强等特点,广泛应用于大中型高炉出铁 沟,可现场浇注施工,也可预制成型,一次通铁量高,使用效果良好。

This series of products use dense corundum, brown corundum, high-quality rock, and high-quality SiC as the main raw materials. They are made of low-cement and ultra-low-cement castable technology. They have the characteristics of good heat resistance, strong erosion and erosion resistance. It can be widely used in the iron ditch of thousands of large and medium- sized blast furnaces, which can be cast on site or prefabricated. The iron flux is high at one time and the use effect is good.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-TGKJ-70	CH-TGKJ-65A	CH-TGKJ-65	CH-TGKJ-60
$Al_2O_3\%$	≥70	≥65	≥65	≥60
SIC+C%	≥15	≥20	≥8	≥15
体积密度/g/cm³ Bulk density	≥2.8(110°C, 24h)	≥2.8(110°C, 24h)	≥2.85(110°C, 24h)	≥2.7(110°C, 24h)
耐压强度/Mpa	≥5(110°C, 24h)	≥5(110°C, 24h)	≥5(110°C, 24h)	≥5(110°C,24h)
Cold crushing strength	≥8(1450°C,3h)	≥8(1450°C,3h)	≥8(1450°C,3h)	≥6(1450°C,3h)
抗折强度/MPa Modulus of	≥25(110°C, 24h)	≥30(110°C,24h)	≥30(110°C,24h)	≥20(110°C, 24h)
rupture	≥25(1450°C,3h)	≥35(1450°C, 3h)	≥30(1450°C,3h)	≥25(1450°C,3h)
烧后线变化/% Permanent linear change	±0.8 (1450,3h)	±0.8 (1450,3h)	±0.8 (1450,3h)	±0.8 (1450,3h)
应用 Application	主沟、撇渣器 iron runner, slag skimmer	主沟渣线 Slag line of iron runner	支铁沟、铁沟 Branch of iron runner	渣沟 Slag runner



沟盖浇注料

Castables for runner cover

郑州才华窑炉砌筑安装有限公司生产的沟盖浇注料强度高,抗热震稳定性好,耐剥落。应用于大型高炉铁沟、渣沟,保温效果好,可防止铁水和熔渣飞溅,安全性好。

The castables are developed by CH Refractories kiln masonry installation Co.,ltd according to the service condition of iron and slag trough cover, and are characterized with high strength, excellent thermal shock resistance and spalling resistance. They are widely applied as the cover for large blast furnace iron runner, slag through, and play the roles of insulation, preventing hot metal and slag from splashing.

牌号 Brands 项目 Items	CH-TGG50	CH-TGG55	CH-TGG65
Al ₂ O ₃ %	≥50	≥55	≥65
SIC+C%	-	-	≥15
体积密度/g/cm³ Bulk density	≥2.2 (110°C, 24h)	≥2.4 (110°C, 24h)	≥2.60 (110°C, 24h)
耐压强度/Mpa Cold crushing strength	≥15(110°C, 24h)	≥20(110°C, 24h)	≥25 (110°C, 24h)
抗折强度/MPa Modulus of	≥3(110°C,24h)	≥4 (110°C, 24h)	≥5 (110°C, 24h)
rupture	≥5(1450°C, 3h)	≥5(1450°C, 3h)	≥8(1450°C, 3h)
烧后线变化/% Permanent linear change	±0.5 (1100°C,3h)	±0.5 (1100°C,3h)	±0.5 (1100°C,3h)
应用 Application	渣沟盖 Slag trough cover	支沟盖 Branch trough cover	主沟盖 iron runner cover

无水炮泥

Waterless taphole clay

该系列产品采用刚玉、硅酸铝质材料、SIC和焦粒等材料及有机结合剂配制而成,具有铁口填充性好、易施工、易烧结、易开口、抗冲刷、耐侵蚀等特点,使用效果好。

This series of products are developed with corundum, Al_2O_3 -SiO₂ based materials, SiC and coke as the main raw materials, and bonded by resin. They are characterized with good filling up, easy installation, easy sintering, easy being open, and good erosion resistance and thermal shock resistance, and gain good performance.

牌号 Brands 项目 Items	CH-PN20	CH-PN25	CH-PN30	CH-PN35
Al ₂ O ₃ %	≥20	≥25	≥30	≥35
SIC+C%	≥25	≥25	≥25	≥25
体积密度/g/cm³ Bulk density	≥1.8 (200°C,	≥1.95 (200°C,	≥2.00 (200°C,	≥2.10 (200°C,
	24h)	24h)	24h)	24h)
耐压强度/Mpa	≥2(1350°C,埋	≥2(1350°C,埋	≥3(110°C,	≥3(110°C,
Cold crushing strength	炭)	炭)	24h)	24h)
烧后线变化/% Permanent	±1 (1350℃,	± 1 (1350℃,	±1 (1350℃,	±1 (1350℃,
linear change	埋炭)	埋炭)	埋炭)	埋炭)

应用 Application

中、小高炉铁口 Middle or small size blast furnace tapping hole

大、中高炉铁口 Large or middle size blast furnace tapping hole





环保型炮泥、无水炮泥、有水炮泥

Environmental friendly taphole clay, waterless taphole clay, water taphole clay

用于堵塞出铁口的炮泥,对保障高炉稳定高产、改善炉前作业强度和环境、延长高炉使用寿命 发挥着不可替代的作用。郑州市才华窑炉砌筑安装有限公司根据炉容、操作习惯、技术要求不同开 发出有水炮泥、无水炮泥和环保型炮泥。本公司炮泥具有填充性好、易开口、炉前环境改善、铁口稳 定等特点,保证了高炉高产顺行,降低炉前作业强度。

The mud used to block the taphole plays an irreplaceable role in ensuring stable and high production of the blast furnace, improving the working strength and environment before the furnace, and prolonging the service life of the blast furnace. CH Refractories Kiln Masonry Installation Co., Ltd.has developed water tapehole clay mud, waterless tapehole clay mud and environmentally friendly taphole clay according to different furnace capacity, operating habits and technical requirements. The company's gun mud has the characteristics of good filling, easy opening, improved environment in front of the furnace, stable iron mouth, etc., ensuring high-yield blast furnace and reducing the working intensity before the furnace.

牌号 Brands 项目 Items	环保型炮泥 Environmentally friendly tape hole clay	无水炮泥 Waterless tape hole clay	有水炮泥 Water tape hole clay
结合剂 Binding agent	树脂 Resin	焦油 Tar	水 Water
$Al_2 O_3\%$	≥27.00	≥25.00	≥25.00
SIC+C%	≥30.00	≥30.00	>25.00
水分 (%) Moisture	<0.5	<0.5	18.0
体积密度/g/cm³ Bulk density	1.60~2.20	1.60~2.20	1.40~1.80
耐压强度 (MPa) 1350°C×3h Compressive strength	≥8.0	≥10.0	≥6.0
显气孔率 (%) Apparent porosity	≤35.0	≤32.0	≪40.0

铁水包用铝碳化硅浇注料

Al₂O₃-SiC castables for iron ladle

该系列产品以特级矾土、电熔刚玉、碳化硅为主要原料,采用溶胶结合技术制成,具有施工性能 好、热震稳定性好、抗冲刷、抗侵蚀等特点。

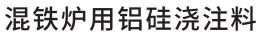
These castables are developed with high quality bauxite, corundum and SiC as the main raw materials, and bonded by sol. They are characterized with good installation, excellent slag erosion resistance and thermal shock resistance, and gain good performance.

产品参数 | Product parameters

牌号 Brands 项目 Items	CH-TBJ-L55	CH-ASCL60	CH-ASCL70
$Al_2O_3\%$	≥55	≥60	≥70
SIC+C%	≥8	≥8	≥8
体积密度/g/cm³ Bulk density	≥2.4	≥2.50	≥2.65
74 C 78 C 74	≥20(110°C, 24h)	≥25(110°C, 24h)	≥30(110°C, 24h)
耐压强度/Mpa Cold crushing strength	≥30(1000°C,3h)	≥35(1000°C,3h)	≥40(1000°C,3h)
	≥40(1400°C,3h)	≥45(1400°C, 3h)	≥50(1400°C,3h)
烧后线变化/% Permanent linear change	±0.5(1400°C,3h)	±0.5(1400°C, 3h)	±0.5(1400°C,3h)
应用 Application	普通铁水包 common ladle		脱硫铁水包 Desulfurized hot iron ladle

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Al₂O₃-SiC castable for iron mixer

该系列产品以特级矾土、板状刚玉、碳化硅等为主要原料,采用低水泥、超低水泥浇注料技术制 成。产品具有施工整体性好、热震稳定性好、抗冲刷、抗侵蚀等特点,使用效果良好。

These castables are developed with high quality bauxite, corundum and SiC as the main raw materials, and bonded by low cement or ultra-low cement. They are characterized with good volume stability, excellent slag erosion resistance and thermal shock resistance, and gain good.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-HTJ-L70	CH-HTJ-L65	CH-HTJ-L55
Al ₂ O ₃ %	≥70	≥65	≥55
SIC%	≥12	≥12	≥10
体积密度/g/cm³ Bulk density	≥2.6	≥2.50	≥2.4
耐压强度/Mpa	≥30(110°C, 24h)	≥25(110°C, 24h)	≥40(110°C, 24h)
Cold crushing strength	≥60(1400°C,3h)	≥55(1400°C, 3h)	≥60(1400°C, 3h)
烧后线变化/% Permanent linear change	±0.4(1400°C,3h)	±0.5(1400°C,3h)	±0.6(1400°C,3h)
应用 Application	炉墙和炉底 Working lining at sid		炉顶和兑铁口等 Top and tapping hole

鱼雷罐工作层用铝碳化硅碳质砖 Al₂O₃-SiC-C brick for torpedo ladle

该系列产品以电熔刚玉、红柱石、鳞片石墨和碳化硅等 为主要原料,以酚醛树脂为结合剂,经混炼、高压成型、低温 热处理制成。产品具有抗渣侵蚀能力强、抗热震稳定性好、 抗冲刷及磨损能力强等特点,使用效果良好。



This series of bricks are developed with corundum, and alusite, flake graphite and SiC as the main raw materials, and bonded by phenolic resin. After being mixed, high pressure pressed, and firing treatment, the products are characterized with excellent slag erosion resistance, thermal shock resistance, abrasion resistance and gain good performance.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-ASC18A	CH-ASC18B	CH-ASC20A	CH-ASC20B
Al ₂ O ₃ %	≥65	≥65	≥65	≥60
SIC+C%	≥18	≥18	≥20	≥20
体积密度/g/cm³ Bulk density	≥2.85 (200°C, 24h)	≥2.75 (200°C, 24h)	≥2.85 (200°C, 24h)	≥2.80 (200°C, 24h)
显气孔率/% Apparent porosity	≤10(200°C,24h)	≤10(200°C, 24h)	≤10(200°C, 24h)	≤10(200°C,24h)
耐压强度/Mpa Cold crushing strength	≥50(200°C, 24h)	≥40(200°C, 24h)	≥40(200°C, 24h)	≥40(200°C, 24h)
烧后线变化/% Permanent linear change	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)
应用 Application	铁水区 Sidewall	顶部 Top	冲击区 Impact area	渣线 Slag line

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铁水包用铝碳化硅碳质砖

Al₂O₃-SIC-C brick for iron ladle

该系列产品以特级矾土、电熔刚玉、叶腊石、优质石墨和碳化硅等为主要原料,以酚醛树脂为结合剂,添加复合抗氧化剂,经混炼、高压成型、低温热处理制成。产品具有抗渣侵蚀能力强、抗热震稳定性好、抗冲刷及磨损能力强等特点,使用效果良好。

This series of bricks are developed with high quality bauxite, corundum, pyrophyllite, flake graphite and SiC as the main raw materials, and bonded by phenolic resin. After being mixed, high pressure pressed, and firing treatment, the products are characterized with excellent slag erosion resistance, thermal shock resistance, abrasion resistance and gain good performance.

◇ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-ASCL14	CH-ASCL16	CH-ASCL18A	CH-ASCL18B
Al ₂ O ₃ %	≥55	≥60	≥60	≥65
SIC+C%	≥14	≥16	≥18	≥18
体积密度/g/cm³ Bulk density	≥2.55(200°C, 24h)	≥2.60(200°C,24h)	≥2.65(200°C, 24h)	≥2.75(200°C, 24h)
显气孔率/% Apparent porosity	≤10 (200°C, 24h)	≤10 (200°C, 24h)	≤8 (200°C, 24h)	≤8 (200°C, 24h)
耐压强度/Mpa Cold crushing strength	≥40(200°C, 24h)	≥35(200°C,24h)	≥35(200°C, 24h)	≥35(200°C, 24h)
烧后线变化/% Permanent linear change	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)	0-+1.0(1400°C, 3h)
应用 Application	铁水区 Sidewall	铁水区 Sidewall	渣线、包底 Slag line, bottom	渣线、包底 Slag line, bottom

镁碳砖

Magnesia carbon Brick

电炉工作层用镁碳砖以大结晶高纯电熔镁砂和高纯鳞片石墨为主要原料,以树脂结合并加入复合抗氧化剂,经高压成型,具有气孔率低、高温强度高、抗侵蚀和抗剥落能力强等特点,可根据冶炼条件分别对渣线、热点部位及出钢口选择不同牌号的镁碳砖。

This series of products is made from high-purity, large crystal magnesite and high-purity flake graphite as raw materials. They have been widely used in steelworks worldwide and show the features of high strength, excellent resistance against slag, good thermal shock resistance, and good performances.

牌号 Brands 项目 Items	CH-MT14A	CH-MT14B	CH-MT10A	CH-MT5A
MgO%	≥76	≥74	≥80	≥85
C/%	≥14	≥14	≥10	≥5
显气孔率/% Apparent porosity	≪4	≤ 5	≪4	≤ 6
体积密度/g/cm³ Bulk density	≥2.95	≥2.90	≥2.95	≥2.95
常温耐压强度/ MPa Cold crushing strength	≥40	≥35	≥40	≥30
高温抗折强度/ MPa 1400°C ×30min High temperature bending strength	≥12	≥8	≥5	≥8





出钢槽预制件

Precast block for EAF steel pouring spout

出钢槽以刚玉莫来石浇注料整体浇注,或采用预制块、铝一碳化硅一碳机压制品组装而成,具有抗钢水冲刷能力强、耐侵蚀、抗热震性好、使用寿命长等特点。

CH Refractories can provide mono-cast tapping spout block and Al203-SiC-C bricks tapping spout block. These products have good erosion resistance, good thermal shock resistance and long service life.

牌号 Brands 项目 Items	CHDCAMT-80	CHDCY-85
MgO+ Al ₂ O ₃ %	≥80	-
$Al_2O_3\%$	-	≥85
SIC+C%	≥8	-
体积密度/g /cm³ Bulk density	≥2.80	≥2.80
常温耐压强度/ MPa Cold crush- ing strength	≥35	≥40

>>> 出钢口填料 / Filler for EAF tap-hole

根据出钢条件,按不同比例选用优质镁砂、镁橄榄石、石英质材料配以合适添加剂混合而成,填料具有施工简便、烧结性适宜、防止钢水渗透能力强、不漂浮、自开浇率高、使用安全等的特点。

These products are made from high quality magnesite and Fe₂0₃-CaO magnesite, and show the features of excellent resistance against steel penetration, superior erosion resistance, easily-sintering, high bulk density and easy installation. The products are ideal choices for HP/UHP EAF bottom.

牌号 Brands 项目 Items	CH-DCT90	CH-DCT75	CH-DCT25
MgO/%	F	≥10	≥55
SiO ₂ /%	90~95	≥75	≥25
Fe ₂ O ₃ %	-	-	3~8
粒度/mm Grain size	2~6	2~6	2~6

>>> 电炉喷补料 / Gunning mixes for EAF

公司生产的电炉喷补料选用电熔镁砂并加入复合结合剂生产而成,具有附着性好、回弹率低、易烧结、耐冲刷和抗侵蚀等特点,适用于电炉渣线、炉坡部位的喷补、维护。

Using high quality magnesia as the main materials, by adding compound binding additives, the series of gunning mixes for EAF feature high adhesive strength, low rebound rate, good sintering, good erosion resistance, and can be used as cold or hot repair materials at slag line and side wall.

カラス	CHDPB-87	CHDPB-75	CHDPB-65
MgO/%	≥87	≥75	≥65
CaO/%	-	≦ 10	≦ 30
体积密度/g/cm³ Bulk density	≧2.60	≥2.40	≥2.30
常温耐压强度/ MPa Cold	≧15 (110°C, 24h)	≧15 (110°C, 24h)	≧15 (110°C, 24h)
crushing strength	≥25 (1500°C, 3h)	≥20 (1500°C, 3h)	≧20 (1500°C, 3h)
线变化率/% Permanent linear change	0~-1.5(1500°C, 3h)	0~-2.5(1500°C, 3h)	0~-3.0(1500°C, 3h)





>>> 出钢口砖 / Tapping hole block

出钢口砖采用优质电熔镁砂、高纯鳞片石墨为主要原料,经高压成型或等静压成型,具有气孔率低、高温强度高、抗侵蚀和抗冲刷能力强、抗氧化性好、使用寿命长等特点。

This series of products is made from high quality magnesite and high-purity flake graphite as raw materials by high-pressure or isostatic pressing molding, and have the features of low porosity, high strength, excellent slag erosion resistance, good thermal shock resistance, and long service life.

牌号 Brands 项目 Items	CHDLC-14	CHDLC-10
MgO%	≥78	≥82
C/%	≥14	≥10
显气孔率/% Apparent porosity	≦5.0	≦5.0
体积密度/g/cm³ Bulk density	≥2.85	≥2.90
耐压强度/ MPa Cold crushing strength	≥50	≥50
高温抗折强度/ MPa High-temperature bending strength	≥12 (1450°C,20min)	≥10 (1450°C,30min)

>>> 镁质火泥 / Magnesia mortar

以优质镁砂为主要原料,加入化学结合剂,具有良好的施工性能和粘结强度,能有效抵抗高温钢水的侵蚀和渗透。

The product is Made from high-quality magnesite, the mortar performs well in use with excellent work ability, desirable hardening time, high adhesive strength, and good corrosion resistance under high temperature.

牌号 Brands	MgO-Al ₂ O ₃ /%	粒度/mm	粘结时间/s	粘结强度/MPa
项目 Items		Grain size	Hardening time	Adhesive strength
CH-DHN	≥90	0~0.2	60~180	≥1

炉底干式捣打料

Dry ramming mixes for EAF bottom

电炉底干式捣打料根据颗粒最紧密堆积原理,选用高纯镁砂、优质镁钙铁合成料及添加剂制成,具有施工简便、烧结性好、整体性强、抗钢水渗透性强、耐侵蚀、不漂浮、使用寿命长等特点,高功率、超高功率电炉炉底的理想材料。

These products are made from high quality magnesite and Fe_2O_3 -CaO magnesite, and show the features of excellent resistance against steel penetration, superior erosion resistance, easily-sintering, high bulk density and easy installation. The products are ideal choices for HP/UHP EAF bottom.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-DLD85	CH-DLD80	CH-DLD68
MgO/%	≥85	≥80	≥68
CaO/%	6-8	6-9	18-25
Fe ₂ O ₃ %	4~5	5~9	3~5
SiO ₂ /%	≦ 1.5	≦ 1.5	≦ 1.5
常温耐压强度/ MPa Cold crushing	≥10 (1300°C, 3h)	≥10 (1300°C,3h)	≥10 (1300°C,3h)
strength	≥30 (1600°C, 3h)	≥30 (1600°C,3h)	≥30 (1600°C,3h)
体积密度/g/cm³ Bulk density	≥2.45 (1600°C, 3h)	≥2.45 (1600°C , 3h)	≥2.40(1600°C, 3h)





工作层预制砖 (块)

Pre-cast shapes for working layer

该系列产品以刚玉、镁铝尖晶石、电熔镁砂等为主要原料,采用微粉结合技术,生产厂家预制成砖块,现场砌筑,具有抗侵蚀、耐冲刷和抗热震性好、使用寿命长等特点,主要应用于大、中型钢包包壁、包底工作层(渣线部位使用镁碳砖),用于冶炼低碳钢、超低碳钢。

This series of products are made from high purity corundum, magnesium aluminate spinel and fused MgO as main aggregates, superfine powder bonding technology and appropriate add 巾ves. Those products are pre-casted into desired shapes and featured with high strength,

better corrosion and abrasion resistance and thermal shock resistance. The products are mainly used for bottom and sidewall lining of large- and medium-size ladles together with MgO-C brick for slag zone especially low and ultra-low carbon steel production.

◇ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-GBY88	CH-GBY85		
$Al_2O_3\%$	≧88	≧85		
MgO/%	3~10	3~10		
体积密度/g/cm³ Bulk density	≥3.05	≥3.00		
耐压强度/Mpa	≧40 (110°C, 24h)	≧40 (110°C, 24h)		
Cold crushing strength	≧65(1550°C,3h)	≧65(1550°C,3h)		
烧后线变化率/% Permanent Linear Change	0~+1.0(1550°C,3h)	0~+1.0(1550°C,3h)		
应用 Application	大中型钢包包壁、包底 Bottom and sidewall of large-and medium-size ladle			

钢包工作层无碳机压砖

Carbon-free brick for ladle working layer

该系列产品以刚玉、镁铝尖晶石、电熔镁砂等为主要原料,生产厂家以机压方式成型,现场砌筑,用于钢包包壁、包底部位,具有抗侵蚀、抗渗透、抗冲刷、抗剥落和使用寿命长等特点,产品处于国内领先水平。

High purity corundum, magnesium aluminate spine and fused MgO are selected as main aggregates for this series of bricks. Those products are used for the bottom and sidewall of ladle and featured with high corrosion resistance, better penetration resistance, good antispalling and abrasion resistance. The quality and performance of those products are the benchmark in China.

牌号 Brands 项目 Items	CH-LM85	CH-LM88	CH-LM90	
MgO/%	5~10	3~6	3~6	
$Al_2O_3\%$	≧85	≧88	≧90	
显气孔率/% Apparent porosity	≦12	≦12	≦12	
体积密度/ g/cm³ Bulk density	≧2.95	≧3.00	≧3.10	
耐压强度/MPa Cold Crushing Strength	≥35	≥40	≥45	
线变化率/% Permanent Linear Change	0~+1.5 (1550°C,3h)	0~+1.5 (1550°C,3h)	0~+1.5 (1550°C,3h)	
应用 Application	大中型钢包包壁、包底 Bottom and sidewall of large-and medium-size ladle			



热修补料

Hot repairing mix

电炉热修补炉料包括含碳补炉料和无碳补炉料两种。含碳补炉料具有流动性好、附着性好、使用寿命长等特点;无碳补炉料采用无机结合剂,与含碳修补料相比,具有环保、烧结时间短、流动性好、污染小等特点。

CH Refractories can supply carbon contained and carbon free repairing mixes. The carbon contained repairing mix is characterized with good flowabity, good adhesion and long service life. Compared with the carbon contained repairing mix, carbon free repairing mix features more environment friendly, shorter sintering time and better flowability.

牌号 Brands 项目 Items	CH-DDB78	CH-DDB65	CH-DDB85	CH-DDB78	CH-DDB92
材质 Materials	镁硕 MgO-C		镁质 MgO based	镁碳质 MgO-C based	镁质 MgO based
MgO/%	≧78	≧65	≧85	≧78	≧92
C/%	5~7	5~7	-	5~7	-
体积密度/g/cm³ Bulk density	≧2.2(800°C, 0.5h)	≧2.2(800°C, 0.5h)	≧2.4(800°C, 0.5h)	≧2.2(800°C, 0.5h)	≧2.6(800°C, 0.5h)

工作层浇注料

Castables for working layer

该系列产品以刚玉、镁铝尖晶石、电熔镁砂等为主要原料,采用微粉结合技术,通过添加合适外加剂制成,具有施工性能好、强度高、体积稳定性好、抗侵蚀、耐冲刷和抗热震性好、使用寿命长等特点,用于大、中型钢包包壁、包底工作层(渣线部位使用镁碳砖),也可用于中小型钢包整体浇注。若采用套浇技术,可延长包衬寿命,降低耐火材料消耗,一种实现节约资源、降低消耗的有效途径。

This series of products is made from high purity corundum, magnesium aluminate spinel and fused MgO as main aggregates, superfine powder bonding technology and appropriate additives. Products are featured with good placement properties, high strength, better volume stability, better corrosion and abrasion resistance and thermal shock resistance and designed for bottom and sidewall lining of large- and medium-size ladles together with MgO-C brick for slag zone. It can also be used in slag zone of small-size ladle. In case of re-lining technique is applied, the life of ladle lining can be further prolonged and refractory consumption per ton steel produced can be further reduced, which is proven to be an effective way for low specific refractory consumption and resource saving.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-GBJ88	CH-GBJ85	CH-GBJ80	CH-GBJ75
Al ₂ O ₃ %	≧88	≧85	≧80	≧75
MgO/%	3~10	3~10	5~15	6~18
体积密度/ g/cm³ Bulk density	≧3.05	≧3.00	≧2.90	≧2.80
耐压强度/MPa	≧40(110°C,24h)	≧40(110°C,24h)	≧35(110°C,24h)	≧35(110°C,24h)
Cold Crushing Strength	≧65(1550°C,3h)	≧65(1550°C,3h)	≧60(1550°C,3h)	≧60(1550°C,3h)
烧后线变化率/% Permanent Linear Change	0~+1.0 (1550°C,3h)	0~+1.0 (1550°C,3h)	0~+1.0 (1550°C,3h)	0~+1.0 (1550°C,3h)
应用 Application	大中型钢包包壁、包底 Bottom and sidewall of large-and medium-size ladle		Sidewall bottom	壁、包底和渣线 and Slag zone of ize ladle



钢包工作层喷补料

Ladle working layer gunning mix

该产品以刚玉、镁铝尖晶石等为主要原料,无碳钢包包壁工作衬表面喷补后使用,具有以下特点:

- 1)采用湿法喷补技术,对环境没有污染,无碳钢包生产和使用过程中无CO₂、CO等气体产生,属于无碳环保、环境友好型工艺。
- 2)该钢包喷补内衬材料可无限循环喷补使用,降低了耐火材料消耗和废弃物的产生,对钢包连续安全使用起到关键作用。
- 3)该钢包喷补内衬材料对钢水无污染,与目前包衬材料相比,寿命长,成本低,施工自动化程度高、节能环保,国内钢企推广潜力巨大。

Main raw materials of this kind of product are corundum and magnesium aluminate spinel, after spraying use on the working layer surface in carbon-free ladle, characteristic appear as follow:

- 1)Wet spraying technique has no pollute to environment and no CO₂, CO when using in carbon-free ladle, and it's geared to the carbon free and environment- protected and environment friendly technique.
- 2) This spraying mix could be endlessly cycle used to lower the refractory materials consumption and waste appearance and work with key role on the ladle continue and safety use.
- 3)This spraying mix has no pollute to the molten steel, and, compared with the current lining materials, it has the characteristic that long lifetime, low cost, high construction automaticity, and energy conservation and environment protection. High potential value among the inland steel enterprise.

牌号 Brands 项目 Items	CH-GBP85	CH-GBP88
$Al_2 O_3\%$	≧85	≧88
显气孔率/% Apparent porosity	≦12	≦11
体积密度/g/cm³ Bulk density	≧2.80	≧2.90
耐压强度/MPa Cold Crushing Strength	≧60	≧70
线变化率/% Permanent Linear Change	0~+1.5 (1550°C,3h)	0~+1.5 (1550°C,3h)

低碳镁碳砖

Low carbon MgO-C brick

该系列产品以电熔镁砂和鳞片石墨为主要原料,经高压成型、低温热处理制成,主要用于冶炼低碳钢、超低碳钢的无碳钢包和低碳钢包的渣线部位,具有强度高、抗侵蚀好和热震性优良等特点。

Base on high quality magnesite and graphite as main raw materials, a series of products are produced via pressing and low temperature pre-baking and mainly used in slag zone of ladle lined with low carbon or carbon-free refractories for low and ultra-low steel production. The products have high strength, good corrosion resistance and excellent thermal shock resistance.

♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-MT5A	СН-МТ5В	CH-MT5C	СН-МТЗА	СН-МТЗВ	СН-МТЗС
MgO/%	≧85	≧84	≧82	≧86	≧85	≧83
C/%	≦ 5	≦ 5	≦5	≦ 3	≦3	≦3
显气孔率/% Apparent porosity	≧5	≧6	≧7	≧8	≧9	≧10
体积密度/g/cm ³ Bulkdensity	≧3.00	≧2.98	≧2.96	≧3.03	≧3.00	≧2.98
耐压强度/MPa Cold Crushing Strength	≧40	≧40	≧35	≧40	≧40	≧35

应用 Application

钢包渣线、包壁工作层,用于冶炼低碳钢 The slag line and sidewall of ladle working lining for low carbon steel production





低碳刚玉尖晶石砖系列

Low carbon corundum-spinel brick

该系列产品以电熔刚玉、尖晶石、电熔镁砂和鳞片石墨为主要原料,经高压成型、低温热处理制成,主要用于冶炼低碳钢、超低碳钢的钢包包壁和包底部位,具有强度高、抗侵蚀好和热震性优良等特点。

Fused alumina, magnesium aluminate spinel, fused MgO and graphite are the main raw materials in use for those bricks. This series of products, featured with high strength, better corrosion resistance and thermal shock resistance, are mainly used in the bottom and sidewall for low and ultra-low carbon steel production.

◇ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-LMT80	CH-LMT85	CH-LMT88			
Al ₂ O ₃ %	≧80	≧85	≧88			
MgO/%	≧5	≧4	≧3			
C/%	≦ 5	≦ 5	≦5			
显气孔率/% Apparent porosity	≦8	≦8	≦8			
体积密度/g/cm³Bulk density	≧2.90	≧2.95	≧3.0			
耐压强度/MPa Cold Crushing Strength	≧35	≧ 40	≧45			
应用 Application	钢包包壁、包底工作层,用于冶炼低碳钢 The sidewall and bottom of ladle working lining for low carbon steel production					

铝镁碳砖系列

Al₂O₃-MgO-C brick

该系列产品以刚玉、尖晶石、特级矾土、优质镁砂和鳞片石墨为主要原料,以酚醛树脂为结合剂,采用机压方式制成,主要用于钢包包壁、包底部位,具有抗冲刷、耐侵蚀和抗耐剥落等特点。

This series of products are made from corundum, magnesium aluminate spinel, supergrade bauxite, high quality MgO and graphite as main raw materials and phenolic resin as binder. The products are mainly used in the bottom and sidewall of ladle with better corrosion and erosion resistance as well as good anti spalling performance.

◇ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-LMT60	CH-LMT65A	CH-LMT65B	CH-LMT70A			
Al ₂ O ₃ %	≧60	≧65	≧65	≧70			
MgO/%	≧16	≧12	≧12	≧4			
C/%	≧8	≧8	≧8	≧8			
显气孔率/% Apparent porosity	≦8	≦8	≦8	≦8			
体积密度/g/cm³ Bulk density	≧2.90	≧2.95	≧2.90	≧3.00			
耐压强度/MPa Cold Crushing Strength	≧40	≧40	≧40	≧40			
应用 Application	钢包包壁、包底工作层,用于冶炼普碳钢 The sidewall and bottom of ladle working lining for common carbon steel production						





永久层整体浇注料

Monolithic castables for ladle safety layer

该系列产品以刚玉、优质矾土、微粉等为主要原料,以浇注方式现场施工,具有施工性能好、强度高、体积稳定、使用寿命长等特点。应用于大、中、小型钢包包壁、包底永久层,使用寿命长,安全性好。

This series of castables are composed of corundum, high quality bauxite, superfine powder and other ingredients and featured with good workabty on site casting, high strength, high volume stab ty and long life span. Those products can be used for the permanent lining of ladle of all sizes and proven to be better on service life and saf steelmaking operation.

牌号 Brands 项目 Items	CH-J-65	CH-JZ70	CH-JZ75	CH-JZ80	CH-JZ85
Al ₂ O ₃ /%	≧65	≧70	≧75	≧80	≧85
体积密度/g/cm³	≧2.40	≧2.50	≧2.60	≧2.70	≧2.85
Bulk density	(110°C,24h)	(110°C,24h)	(110°C,24h)	(110°C,24h)	(110°C,24h)
耐压强度/MPa	≧35	≧40	≧40	≧40	≧45
	(110°C,24h)	(110°C,24h)	(110°C,24h)	(110°C,24h)	(110°C,24h)
Cold Crushing Strength	≧45	≧45	≧50	≧55	≧60
	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)
线变化率/%	±0.5	±0.5	±0.5	±0.5	±0.5
Permanent Linear Change	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)	(1500°C,3h)
施工加水量/% Water demand for casting	6~7	6~7	6~7	5~6	5~6

透气砖

Purging plug

可根据用户要求设计制造直通孔型、定向狭缝型、定向迷宫型、内装整体式与外装分体式等各种类型的透气砖以及相配套的透气砖锁紧机构,透气流量可根据用户要求设计,可调范围大,吹开率高。

Various types of ventilated bricks such as through-hole type, directional slit type, directional labyrinth type, internal integral type and external split type can be designed and manufactured according to user requirements, and the matching ventilation block locking mechanism can be designed according to user requirements. Large adjustable range, high blow-off rate.

♥ 产品参数 | Product parameters

项目 Items	透气砖 Purging plug			I	座砖 Well-blo	ck
牌号 Brands	CH-TQ1	CH-TQ2	CH-TQ3	CH-TZ1	CH-TZ2	CH-TZ3
Al ₂ O ₃ /% +MgO/%+Cr ₂ O ₃ /%	≧96.0	≧94.0	≧92.0	≧96.0	≧92.0	≧92.0
体积密度/g/cm³ Bulk density	≧3.15	≧3.15	≧3.10	≧3.15	≧3.10	≧3.10
常温耐压强度/MPa Cold Crushing Strength	≧120	≧100	≧90	≧60	≧60	≧50
透气量/Nm³.h-1 Gaspermeability (0.1~1MPa)	20-50	20-50	20-50	-	-	-





不烧滑板系列

Unburned slide gate plate

不烧滑板系列产品以刚玉、莫来石、优质矾土熟料为主要原料,加入鳞片石墨、碳化硅和金属硅粉,经高 压成型、低温热处理及磨制后制成。该系列产品中、高温强度高,抗氧化性强,抗热震稳定性好,滑动面磨损 小、注孔扩径小,能够充分满足浇铸工艺要求,使用效果良好。

The Unburned slide gate plates series products are made of corundum, mullite, and high-quality clinker clinker. They are made by adding flake graphite, silicon carbide, and silicon metal powder, which are made by high-pressure molding, low-temperature heat treatment and grinding. This series of products has high medium and high temperature strength, strong oxidation resistance, good thermal shock resistance, small sliding surface wear and small injection hole expansion diameter, which can fully meet the requirements of the casting process and have a good use effect.

牌号 Brands 项目 Items	CH-MS65	CH-MS75	CH-MS80	CH-MS85
$Al_2O_3\%$	≧65	≧75	≧80	≧85
C/%	≧5	≧5	≧5	≧2
体积密度/ g/cm³ Bulk density	≧2.90	≧2.90	≧2.95	≧3.00
显气孔率/% Apparent porosity	≦ 10	≦ 10	≦ 8	≦ 8
耐压强度/MPa Cold Crushing Strength	≧70	≧80	≧90	≧100

高温烧成滑板

Firing slide gate plate

公司研制、生产的高温烧成滑板系列产品采用高速混练设备混料、高吨位压砖机成型、真空加压浸油、整 体热锥制成,产品质量稳定,杂质含量低,强度高,抗冲刷,热震稳定性好,可多次连滑,具有良好的使用效果。 我公司可根据不同炼钢条件设计铝碳质、铝锥碳质、镁尖晶石质系列产品,满足浇铸不同钢种的需要。

Various types of ventilated bricks such as through-hole type, directional slit type, directional labyrinth type, internal integral type and external split type can be designed and manufactured according to user requirements, and the matching ventilation block locking mechanism can be designed according to user requirements., Large adjustable range, high blow-off rate.

◆ 产品参数 | Product parameters

项目 Items	铝碳质 Al₂O₃-C based				项目 Items 铝矾			d	铝锆碳质	₹ Al ₂ O ₃ -ZrO ₂	-C based
牌号 Brands	CH-LT70	CH-LT75	CH-LT80	CH-LT85	CH-LGT70	CH-LGT75	CH-LGT80				
Al ₂ O ₃ /%	≧70	≧75	≧80	≧85	≧70	≧75	≧80				
C/%	≧4	<u>≧</u> 4	≧2	≧2	≧4	≧3	≧3				
ZrO ₂ /%	-	-	-	-	≧4	≧4	≧4				
体积密度/g/cm³ Bulkdensity	≧2.85	≧2.95	≧3.00	≧3.05	≧3.00	≧3.05	≧3.10				
显气孔率/% Apparent porosity	≦12	≦ 10	≦ 10	≦10	≦ 10	≦10	≦10				
耐压强度/MPa Cold Crushing Strength	≧80	≧90	≧100	≧110	≧100	≧110	≧120				

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上下水口及水口座砖

Nozzle and well block

公司研制生产的钢包上、下水口以刚玉、尖晶石为主要原料,以酚醛树脂为结合剂制成。产品热震稳定性好、高温强度高、抗钢水冲刷能力强。

生产的刚玉质、刚玉尖晶石质、铬刚玉质水口座砖高温性能优良,与水口配套使用,抗侵蚀和冲刷能力强,使用寿命长。

Upper and lower nozzles are resin bonded products based on corundum, magnesium aluminate spinel and graphite as main raw materials. The products have excellent thermal shock resistance, high temperature strength and good corrosion and erosion resistance.

Well blocks of corundum based, corundum-spinel based and corundum-chrome based have excellent high temperature properties, which can ensure longer service life in use together with nozzles as part of slide gate system.

♥ 产品参数 | Product parameters

项目 Items	上、下水口 Upper and lower nozzle							
牌号 Brands	CH-SK70	CH-SK75	CH-SK80	CH-SK85				
Al ₂ O ₃ %	≧70	≧75	≧80	≧85				
C/%	≧3	≧3	≧3	≧3				
体积密度/ g/cm³ Bulk density	≧2.70	≧2.85	≧2.85	≧2.90				
显气孔率/% Apparent porosity	≦ 10	≦ 10	≦ 10	≦ 10				

项目 Items	水口座砖 Well block						
牌号 Brands	LR-SKZ70	LR-SKZ80	LR-SKZ85				
Al ₂ O ₃ %	≧70	≧80	≧85				
C/%	≧5	≧3	-				
体积密度/ g/cm³ Bulk density	≧2.80	≧2.85	≧2.95				
显气孔率/% Apparent porosity	≦ 12	≦ 12	≦ 18				
耐压强度/MPa Cold Crushing Strength	≧40	≧40	≧50				

钢包引流砂

Filling sand for ladle tapping hole

可根据客户炼钢环境和要求提供硅质和铬质系列钢包引流砂产品,其中硅质引流砂以石英砂为主要原料,加入润滑剂、烧结剂等材料制成;

铬质引流砂以南非铬铁矿料为主要原料,通过添加适量的润滑剂、助烧结剂、还原剂等材料制成,具有较高的自开率,可达95%以上。

本系列产品适用于各类普通钢包、精练钢包,具有开浇率高、使用方便和安全可靠等优点。

Zhengzhou Caihua can supply silica-based and Chrome-based filler according to customer's requirement. Silica based filler use quartz sand as raw materials, mixed with lubricant and sintering aid.

Chrome-based filler use South-Africa Chrome ore as raw materials, mixed with lubricant, sintering aid, deoxidizer and etc. features good self-flow rate, normally above 95%;

Caihua series of fillers for ladle tapping hole can be used for kinds of ladle, LF ladle, show the features of non-floating, high self-open rate, easy installation and safety.

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-YL80	CH-YL50	CH-YL40	CH-YL30	CH-YL20
SiO ₂ /%	≧80	≦50	≦ 40	≦30	≦20
$Cr_2O_3/\%$	-	≧25	≧30	≧35	≧40
Fe ₂ O ₃ /%	-	≦21	≦24	≦27	≦ 30
Al ₂ O ₃ /%	-	≦12	≦13	≦ 15	≦ 16
C/%	≦3	≦3	≦3	≦3	≦3
粒度/mm	0.2~3.0	0.1~2.5	0.1~2.5	0.1~2.5	0.1~2.5
水分/%	≦0.5%	≦0.5%	≦0.5%	≦0.5%	≦0.5%

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耐火泥浆

Refractory mortar

公司生产的刚玉质、铬刚玉质、高铝质、铝镁质系列火泥具有良好的施工性能,粘接时间适中,粘接强度高,高温性能好,能够抵御高温液体的侵蚀与冲刷,使用效果良好。

Various kinds of refractory mortars are available at CH Refractories, which include corundum based, corundum Cr2O3based,high alumina based and Al2O3-MgO based. The mortars perform well in use with excellent Workability, desirable hardening time, high adhesive strength, high strength and corrosion resistance under high temperature.

❷ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-GA88	CH-GACr88	CH-GM85	CH-GMCr85	CH-GT85	CH-GT80	CH-GT70
Al ₂ O ₃ /%	≧88	-	-	-	≧85	≧80	≧70
$Cr_2O_3+Al_2O_3\%$	-	≧88	≧85	-	-	-	-
MgO+ Al ₂ O ₃ %	-	-	-	≧85	-	-	-
耐火度/°C Refractoriness	≧1690	≧1690	≧1690	≧1690	≧1690	≧1600	≧1500
粘接时间/s Hardening time	60~180	60~180	60~180	60~180	60~180	60~180	60~180
抗折粘接强度/MPa Adhesive strength	≧1	≧1	≧1	≧1	≧1	≧1	≧1
应用 Application	用于钢包上水口、滑板、 透气砖等耐火制品的砌 筑 Upper nozzle, slide gate and porous plug installation		用于钢包工作层 耐火 制品的砌筑 Brick installation for ladle working lining installation		用于钢包永久层、 保温层耐火制品的砌筑 Permanent lining and insulation layer installation		

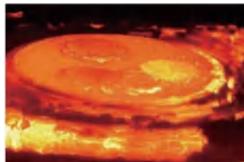
LF精炼炉三角区预制件

Pre-cast shapes for electrode area of LF furnace

以刚玉、电熔尖晶石、电熔莫来石为主要原料,采用低水泥浇注料生产的LF精炼炉三角区预制件具有强度高、抗热震性能好、耐侵蚀、抗冲刷、质量稳定、使用寿命长等特点。

This product employees corundum, fused spinel, fused mullite as raw materials, and show the features of high strength, excellent thermal shock resistance and erosion resistance, and long-service life.







♥ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-LFY80	CH-LFY85	CH-LFY90	CH-LFY92
MgO+ $Al_2O_3\%$	≧80	≧85	≧90	≧92
$Cr_2O_3/\%$	-	-	-	≧2
体积密度/g/cm³ Bulk density	≧2.75 (110°C, 24h)	≥2.90 (110°C,24h)	≧3.05 (110°C, 24h)	≧3.0 (110°C, 24h)
常温耐压强度/MPa	≧40(110°C, 24h)	≧40(110°C, 24h)	≧40(110°C, 24h)	≧40(110°C, 24h)
Cold crushing strength	≧60 (1500°C, 3h)	≧60 (1500°C, 3h)	≧60 (1500°C, 3h)	≧60 (1500°C, 3h)
线变化率/% Permanent linear change	±0.5 (1500°C, 3h)	± 0.5 (1500°C, 3h)	± 0.5 (1500°C, 3h)	± 0.5 (1500°C, 3h)





RH精炼耐火材料

Refractories for RH refining

我司根据RH炉不同部位的使用特点,研制开发了具有荷重软化温度高、抗侵蚀性好、强度高、抗热震稳定性好的系列镁铬砖、浸渍管及相应配套耐火材料,包括合金加料溜槽用氮化硅结合碳化硅砖、刚玉尖晶石浇注料、耐火泥浆、捣打料、修补料等系列产品,具备RH精炼炉耐火材料整体承包能力。

CH Refractories has the capability to design and manufacture full range of refractories used for RH furnace and can supply general refractory contractors. These materials are characterized with high refractoriness under load, high strength, good erosion resistance and thermal shock resistance.

♥ 产品参数 | Product parameters

项目 Items	刚玉尖晶石浇注料 Corundum spinel castable		镁铬质耐火泥浆 Magnesia chrome mortar		捣打料/修补料 Ramming /repair mix	
牌号 Brands	CH-MAC80	CH-MAC90	СН-МСМ20	СН-МСМ10	CH-MD50	CH-MD90
MgO+ Al ₂ O ₃ %	≧80	≧90	-	-	-	-
MgO/%	-	-	≧55	≧60	45	87
$Cr_2O_3/\%$	-	-	≧18	≧8	-	-
耐压强度/MPa Cold Crushing Strength	≧30	≧60	-	-	≧30	≧30
线变化率/%Permanent linear change	0~+0.8	0~+0.8	-	-	-0.5~+0.5	-0.5~+0.5
粘结时间/min bonding time	-	-	1~3	1~3	-	-
粘结强度/MPa Bonding strength	-	-	≧1.5	≧1.5	-	-
主要应用部位 main application	热弯管部分 tube	The Dinning Apply to install the Apply to till be		Apply to install the		fill brick

镁铬砖系列

Magnesia chrome brick

项目 Items	电熔再结合镁铬砖 Fused re-boned MgO-Cr₂O₃ bricks		电熔半再结合镁铬砖 Fused semi re-boned MgO-Cr ₂ O ₃ bricks		直接结合镁铬砖 Direct-boned MgO-Cr ₂ O ₃ bricks	
牌号 Brands	CH-MCr- D26	CH-MCr-D2 0A	CH-MCr-B2 0A	CH-MCr-B1 6A	CH-MCr-Z1 2A	CH-MCr-Z8 A
MgO/%	≧53	≧50	≧50	≧55	≧65	≧70
Cr ₂ O ₃ /%	≧26	≧20	≧20	≧16	≧12	≧8
SiO ₂ /%	≦1.5	≦1.5	≦1.5	≦1.5	≦1.5	≦ 1.5
显气孔率/% Apparent porosity	≦ 16	≦ 16	≦ 16	≦ 16	≦ 18	≦ 16
耐压强度/MPa	≧40	≧40	≧40	≧40	≧40	≧40
0.2MPa 荷重软化温度/℃ Refractoriness under lode	≧1700	≧1700	≧1700	≧1700	≧1700	≧1700
主要应用部位 Main application	环流管、下部槽等 侵蚀严重的部位 circulation tubes, bottom grooves and other erosion serious parts	插入管、下 位 dipping	部槽、中部槽、上g tube,bottom rough, the uppe and so on	部位 upp hypo-v	Z工作层等 per tube, vorking ing	



CAS-OB精炼用耐火材料

Refractories for CAS-OB refining

郑州才华窑炉公司对CAS罩结构具有独特的设计,耐火材料以刚玉、尖晶石、莫来石等为主要原料,采用低水泥浇注料制成。产品具有结构稳定性好、不开裂、热震稳定性好、抗熔渣侵蚀、抗剥落等特点,具有较高的使用寿命。

CH Refractories has unique design on CAS cover. The refractories are developed by ultra-low cement castables with corundum, spinel and mullite as the main raw materials. They have good performance on stable quality, high strength, good erosion resistance, good spalling resistance and long service life.







CAS罩 CAS COVER

	CH-CAS88	CH-OB90
MgO+ Al ₂ O ₃ %	≧88	≧90
体积密度/g/cm³ Bulk density	≧2.95(110°C, 24h)	≧3.0(110°C, 24h)
常温耐压强度/MPa Cold	≧50(110°C, 24h)	≧40(110°C, 24h)
crushing strength	≧55(1500°C, 3h)	≧50(1500°C, 3h)
烧后线变化率/%Permanent linear change	0~+1(1500°C,3h)	-0.5~+0.5(1500°C,3h)
应用 Application	CAS 罩 CAS cover	OB 氧 OB oxygen gun

镁质、镁钙质、镁橄榄石质系列干式料

MgO, MgO-CaO and Forterite based dry masses

该系列产品具有使用寿命长、残衬解体容易、施工便捷等优点,深受用户欢迎。

This series of products are easy to install and dismantle after use and perform well with extended service life, which are highly appreciated by steel mills.

项目 Items		镁钙质 MgO-CaO based			
牌号 Brands	CH-GM70	CH-GM80	CH-GM85	CH-GM88	CH-GMG15
MgO/%	<70	≧80	≧85	≧88	≧70
CaO/%	-	-	-	-	10-20
体积密度/g/cm³ Bulk density	1.8-2.2 (220°C, 24h)	2.1-2.3 (220°C, 24h)	2.1-2.4 (220°C, 24h)	2.1-2.4 (220°C, 24h)	2.0-2.2 (220°C, 24h)
烧后线变化/% Permanentlinear change	-2.5~0(1500°C ,3h)	-2.5~0(1500°C ,3h)	-2.0~0(1500°C ,3h)	-1.5~0(1500°C ,3h)	-3.0~0(1500°C ,3h)
커叮紹安/MD- C-l-l	≥2 (220°C, 3h)	≥5 (220°C, 3h)	≥6 (220°C, 3h)	≥7(220°C, 3h)	≥5 (220°C, 3h)
耐压强度/ MPa Cold crushing strength	≥3 (1500°C, 3h)	≥3 (1500°C, 3h)	≥4 (1500°C, 3h)	≥5 (1500°C, 3h)	≥5 (1500°C, 3h)



新型无碳环保型干式料

Carbon-free and environmental friendly dry masses

新型无碳环保型干式振动料是为了解决传统干式料的施工、烘烤过程中释放出刺激性有害气体,使用过程中会对钢水增碳、增氢等问题而开发出的一种优质干式料。它以环保型无机盐为结合剂和烧结剂,不含有机结合剂,因而施工和烘烤过程中不会释放出烟气,不污染环境;由于不含有机物,包衬材料不含残碳,不会释放出含氢挥发份,因而使用过程中不会对钢水增氢、增碳,可满足浇铸高品质钢对包衬材料的要求,是一种优质、环保型绿色耐火材料新产品。

In order to solve the problem of toxic and irritating gases generation during installation and pre-firing and C as well as H pick up in secondary refining, carbon-free and environmental friendly dry mass was developed to replace traditional dry masses. The new product, which contains inorganic binder and sinter aid, does not generate toxic gases during installation and pre-firing which is environmental friendly and does not increase C or H content of steel which can meet the requirement for high grade steel production. As an innovative, high quality and green materials.

❷ 产品参数 | Product parameters

项目 Items	镁质/镁橄t MgO/For ste	镁钙质 MgO-CaO based	
牌号 Brands	CH-GK80	CH-GK70	CH-GK65
MgO/%	≥80	≥70	<65
体积密度/g/cm³ Bulk density	2.0-2.2(220°C, 24h)	1.9-2.2(220°C, 24h)	1.8-2.1(220°C, 24h)
烧后线变化/% Permanent linear change	-1.5~0(1500°C,3h)	-2.0~0(1500°C,3h)	-3.0~0(1500°C,3h)
耐压强度/ MPa Cold	≥4 (220°C, 3h)	≥3 (220°C, 3h)	≥2 (220°C, 3h)
crushing strength	≥2 (1500°C, 3h)	≥4 (1500°C, 3h)	≥3 (1500°C, 3h)

VD炉防溅盖

Splash isolation cover for VD furnace

VD炉防溅盖以优质刚玉为主要原料,采用钢纤维增强低水泥浇注料制成,具有抗热震性好、抗侵蚀、耐冲刷、不剥落等特点,使用效果良好。

The refractory is made by steel fibre reinforced ultra-low cement castables with corundum as main materials, and characterized as good thermal shock resistance, erosion resistance, and no spalling in use.





VD炉炉盖 VD FURNACE FURNACE COVER

VD炉防溅罩 VD FURNACE SPLASH GUARD

◆ 产品参数 | Product parameters

牌号 Brands 项目 Items	CH-VD85	CH-VD90	CH-VD92
MgO+ Al ₂ O ₃ %	≧85	≧90	≧92
$Cr_2O_3/\%$	-	-	≧2
体积密度/g/cm³ Bulk density	≧2.90	≧3.05	≧3.0
耐压强度/MPa Cold	≧40(110°C, 24h)	≧40(110°C, 24h)	≧40(110°C, 24h)
crushing strength	≧60(1500°C, 3h)	≧60(1500°C, 3h)	≧60(1500°C, 3h)
烧后线变化率/%Perma- nent linear change	±0.5(1500°C, 3h)	±0.5(1500°C, 3h)	±0.5(1500°C, 3h)





镁质、镁钙质、镁橄榄石质系列喷涂料/涂抹料

MgO,MgO-C,forsterite based gunning mixes/ trowelling mixes

该系列产品以优质镁砂、镁钙砂、镁橄榄石为主要原料,通过加入适宜的结合剂、防爆剂、减水剂、增塑剂 和粘附剂,使得材料具有良好的施工、烘烤、使用和解体性能,可用机械喷涂或手工涂抹施工,是浇注不锈钢、 合金钢首选包衬材料。

This series of products are made of high purity MgO, sintered MgO-CaO aggregate and forsterite incorprated with appropriate binder, anti-spalling agent, dispersant, plasticiser and adhesiveness enhancer. The products are easy to install, pre-firing and dismantle after use. Installation can be done by gunning or manuel trowelling. It is recognised as the preferrable working life for tundish especially for stainless and alloy steel production.

产品参数 | Product parameters

项目 Items	镁质/镁林 MgO/For ste	镁钙质 MgO-CaO based	
牌号 Brands	СН-ТМ70	СН-ТМ80	CH-TMG15
MgO/%	60-70	≥80	≥65
CaO/%	-	-	10-20
体积密度/g/cm³ Bulk density	1.6-2.0(110°C, 24h)	1.9-2.3(110°C, 24h)	2.0-2.2(110°C, 24h)
烧后线变化/% Permanent linear change	-3.0~-0.5(1500°C, 3h)	-3.0~-0.5(1500°C, 3h)	-2.0~-0.5(1500°C, 3h)
抗折强度/ MPa Cold	≥1.0 (110°C, 24h)	≥1.0 (110°C, 24h)	≥1.5 (110°C, 24h)
crushing strength Modulus of rupture	≥3.0 (1500°C, 3h)	≥2.5 (1500°C, 3h)	≥3.5 (1500°C, 3h)
耐压强度/ MPa Cold	≥2 (110°C, 24h)	≥3 (110°C, 24h)	≥3 (110°C, 24h)
crushing strength	≥10 (1500°C, 3h)	≥10 (1500°C, 3h)	≥10 (1500°C,3h)

中间包永久层用浇注料

Castable for tundish permanent lining

才华公司研制、生产的钢纤维增强中间包永久衬用超低水泥浇注料流动性好,施工方便,具有良好的抗 爆裂性能和抗热震性能,能满足中间包循环使用的苛刻条件;同时,该浇注料具有良好的抗中间包渣和钢水 的侵蚀、渗透能力,以及良好的抗热剥落和结构剥落性能。

The steel fibre reinforced ultra-low cement castables devloped and produced by caihua are characterized with good flow ability, easy installation, good anti-spalling and thermal shock resistance, which can meet the needs for quick installation and circulation of tundish. The products also perform well on slag and molten steel corrosion and penetration as well as thermal and structural spalling resistance, which ensure long service life and safe steel casting.

牌号 Brands 项目 Items	CH-JZ-60	CH-JZ-65	CH-JZ-70	CH-JZ-75	CH-JZ-80
Al ₂ O ₃ /%	≥60	≥65	≥70	≥75	≥80
体积密度/g/cm³	≥2.35(220°C,	≥2.40(220°C,	≥2.50(220°C,	≥2.60(220°C,	≥2.70(220°C,
Bulkdensity	24h)	24h)	24h)	24h)	24h)
烧后线变化/%	±0.5(1500°C,	±0.5(1500°C,	±0.5(1500°C,	±0.5(1500°C,	±0.5(1500°C,
Permanentlinear change	3h)	3h)	3h)	3h)	3h)
耐压强度/ MPa Cold	≥35 (110°C,	≥35 (110°C,	≥40 (110°C,	≥40 (110°C,	≥40 (110°C,
	24h)	24h)	24h)	24h)	24h)
crushing strength	≥40 (1500°C,	≥45 (1500°C,	≥45 (1500°C,	≥50 (1500°C,	≥55 (1500°C,
	3h)	3h)	3h)	3h)	3h)

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>>> 长水口 / Ladle shroud

我司可根据现场使用要求设计生产预热型和免预热型两种长水口。

我司可提供裸烧免预热型长水口,该产品采用特殊工艺烧制成微孔脱碳层,可使用过程中形成温度梯度,具有良好的隔热效果,既保证制品的抗热震稳定性,又具有抗冲刷性。特别适合于浇铸低碳钢、超低碳钢、洁净钢。

CH Refractories can design and produce pre-heating required and heating-free shrouds according to the site needs and condition of steel mill.

CH Refractories can also provide non-protective fired and pre-heating free shroud. Under special firing process, the shroud generates a de-carbonized layer with micropores, which can give better thermal insulation and also create favorable temperature gradient for better thermal shock resistance and also abrasion resistance. This product is mostly suitable for low and ultra-low steel and alloy steel production in particular.

项目 Items	预热型 Pre-heating type				免预	热型 Pre-h	eating free	e type
牌号 Brands	CH-C	ZT-H	CH-C	LT-H	CH CZT		CH CLT	
部位 Part	本体 Body	渣线 Slag line	本体 Body	渣线 Slag line	本体 Body	渣线 Slag line	本体 Body	渣线 Slag line
材质 Material	铝碳质 Al ₂ O ₃ -C	锆碳质 ZrO₂-C	铝碳质 Al ₂ O ₃ -C	铝碳质 Al ₂ O ₃ -C	铝碳质 Al ₂ O ₃ -C	锆碳质 ZrO₂-C	铝碳质 Al ₂ O ₃ -C	铝碳质 Al ₂ O ₃ -C
Al ₂ O ₃ /%	≥50	-	≥50	≥60	≥45	-	≥45	≥60
C+SIC/%	≥22	≥20	≥22	≥20	≥26	≥20	≥26	≥20
ZrO ₂ /%	-	≥50	-	-	-	≥50	-	-
体积密度/g/cm³ Bulkdensity	≥2.40	≥3.4	≥2.40	≥2.50	≥2.35	≥3.40	≥2.35	≥2.50
显气孔率/% Apparent porosity	≤18	≤18	≤18	≤18	≤18	≤18	≤18	≤18
耐压强度/ MPa Cold crushing strength	≥22	≥20	≥22	≥20	≥20	≥20	≥20	≥20
抗折强度/ MPa Modulus of rupture	≥6	≥5	≥ 6	≥ 6	≥ 6	≥6	≥ 6	≥6
抗热震稳定性/次 Themal shock resistance /cycle	≥5				≽	5		

>>> 整体塞棒 / Monoblock-stopper

我司可根据钢厂连铸工艺需要设计吹氯和不吹氯两种形式整体塞棒。整体塞棒的头部,根据浇注钢种的不同可以设计为铝碳质、镁碳砖、尖晶石质或锆碳质材质,棒身及渣线部位采用铝碳质材质。

我司研制、生产的整体塞棒具有控流稳定、抗侵蚀性好、抗热震性能好、抗氧化性能优、高温强度高等特点,小方还连铸机使用寿命最高达35小时以上,板还连铸机上最高达20小时以上。产品适用千普碳钢、低碳钢、超低碳钢、高猛钢、高氧钢、易切削钢等钢种。

CH Refractories can design and produce argon purging and non-purging mono-stoppers as per the conditions of continuous casting processes in steel mills. The nose of mono-stopper can be Al_2O_3 -C , MgO-C,Spinel or ZrOi-C based according to the types of steel to cast.

The body and slag zone of mono-stopper are Al_2O_3 -C based The mono-stoppers from CH Refractories can provide stable control of molten steel casting, good corrosion resistance, desired thermal shock resistance and high tenperature strength. It can last more 35 hours used for billet caster and more than 20 hours for slab caster. It is suitable for almost all steel casting from normal carbon steel, low carbon steel, ultra-low carbon steel, high Mn steel to high O steel.

牌号 Brands	CH-SLT		CH-SMT		CH-SZT		CH-SMAT	
项目 Items	铝碳质 Al₂O₃-C		镁碳质 MgO-C		锆碳质 Zr0₂-C		尖晶石碳质 Spinel-C	
部位 Part	棒头 Nose	棒身 Body	棒头 Nose	棒身 Body	棒头 Nose	棒身 Body	棒头 Nose	棒身 Body
$Al_2 O_3\%$	≥72	≥50	-	≥50	-	-	≥55	≥50
C+SIC/%	≥11	≥23	≥11	≥23	≥12	≥20	≥11	≥23
ZrO ₂ /%	-	-	-	-	≥60	≥50	-	-
MgO/%	-	-	≥65	-	-	-	≥10	-
体积密度/g/cm³ Bulk density	≥2.80	≥2.45	≥2.65	≥2.45	≥3.40	≥3.40	≥2.70	≥2.45
显气孔率/% Apparent porosity	≤17	≤17	≤17	≤18	≤17	≤17	≤17	≤17
耐压强度/ MPa Cold crushing strength	≥25	≥22	≥20	≥20	≥20	≥22	≥25	≥22
抗折强度/ MPa Modulus of rupture	≥8	≽ 7	≥5	≽ 7	≥5	≥ 7	≥ 7	≥ 7
抗热震稳定性/次 Themal shock resistance /cycle	≥	5	≥	5	≥	5	≽	5





中间包上水口

Tundish upper nozzle

提供普通上水口、快换上水口以及透气上水口等不同产品;水口碗部可根据浇注钢种的不同设计为铝碳质、镁碳质或尖晶石质材料,本体采用铝碳材质。

We can provide ordinary, quick exchangeable and gas purging upper nozzles. The bowl part of the nozzle is available with Al_2O_3 -C,MgO-C and spinel-C based and the main body is Al_2O_3 -C based.

牌号 Brands	CH-SK-L70		CH-SK-L70		CH-SK-MA55		
项目 Items	铝碳质 Al₂O₃-C			镁碳质 MgO-C		碳质 el-C	
部位Part	本体 Body	碗部 Bowl	本体 Body	碗部 Bowl	本体 Body	碗部 Bowl	
$Al_2O_3\%$	≥40	≥72	≥40	-	≥40	≥50	
C+SIC/%	≥18	≥10	≥18	≥11	≥18	≥11	
MgO/%	-	-	-	≥65	-	≥10	
体积密度/g/cm³ Bulk density	≥2.35	≥2.80	≥2.35	≥2.65	≥2.35	≥2.70	
显气孔率/% Apparent porosity	≤18	≤17	≤18	≤17	≤18	≤17	
耐压强度/ MPa Cold crushing strength	≥22	≥25	≥22	≥20	≥22	≥25	
抗折强度/ MPa Modulus of rupture	≥ 7	≥8	≥ 7	≥5	≥ 7	≥ 7	
抗热震稳定性/次 Themal shock resistance /cycle	≽	≥5		≥5		≥5	

浸入式水口

Submerged entry nozzle

可提供外挂浸入式水口,快换浸入式水口、整体浸入式水口、薄板和连铸用浸入式水口及防堵塞浸入式水口等不同产品。该系列产品具有良好的抗侵蚀性和抗冲刷性,以及良好的抗热震性能。

We can provide outside stationed, quick exchangeable, monolithic submerged nozzles, nozzle for thin slab casting and anti-clogging submerged nozzles. This series of products are proven to be better on corossion and erosion reistance and on thermal shock resistance.

牌号 Brands		CH-RS				
项目 Items		Al ₂	熔融石英 Fused silica			
部位Part	本体 Body	渣线 Slag line	出钢口 Steel-tapping hole	碗部 Bowl	滑板面 Upper surface	-
$Al_2O_3\%$	≥45	-	≥55	-	≥65	-
ZrO ₂ /%	-	≥70	-	-	-	-
MgO/%	-	-	-	≥65	-	≥99
SiO ₂ /%	-	-	≤ 8	-	-	-
C+SIC/%	≥28	≥13	≥18	≥11	≤15	-
体积密度/g/cm³ Bulk density	≥2.40	≥3.50	≥2.35	≥2.65	≥2.80	≥1.75
显气孔率/% Apparent porosity	≤18	≤17	≤18	≤17	≤16	≤18
耐压强度/ MPa Cold crushing strength	≥22	≥20	≥22	≥20	≥25	≥25
抗折强度/ MPa Modulus of rupture	≥6	≥5	≽ 7	≥5	≽ 7	-





Zirconium sizing nozzle

可根据客户需求提供镶嵌式锆质定径水口、快换水口及透气式定径水口。产品质量指标达到了国内先进水平;产品外观规整,同心度高,热震稳定性好、不炸裂、抗侵蚀好、耐冲刷、扩径速率小、连浇时间长。

According to customers' needs, we can provide mosaic zicornium sizing nozzle, quick exchangeable and gas purging upper nozzles. The bowl part of the nozzle is available with Al_2O_3 -C,MgO-Cand spinel-C based and the main body is Al 203-Cbased.

锆芯部分

Zirconium core

♥ 产品参数 | Product parameters

牌号 Brands	CH-DJX											
项目 Items	X1	X2	Х3	Х4	Х5	Х6	Х7	Х8	Х9	X11	X12	X13
ZrO ₂ /%	70	75	80	85	90	93	93	93	93	95	95	95
体积密度/g/cm³ Bulk density	3.8	3.9	4	4.1	4.3	4.5	4.7	4.9	5.1	5.1	5.2	5.5
显气孔率/% Apparent porosity	22	22	20	20	20	20	18	15	13	13	10	8
抗热震稳定性/次(1100°C,水冷) Themal shock resistance /cycle(1100°Cwater Wuenching)	5	5	5	5	5	5	5	5	5	5	5	5

水口外套

coat

♥ 产品参数 | Product parameters

牌号 Brands	CH-DJW								
项目 Items	W1	W2	W3	W4	W5	W6			
ZrO ₂ /%	≥65	≥65	≥70	≥70	≥75	≥75			
C/%	-	-	-	≥ 3	-	≥5			
体积密度/g/cm³ Bulk density	≥2.3	≥2.6	≥2.6	≥2.7	≥2.7	≥2.85			
显气孔率/% Apparent porosity	≤24	≤15	≤22	≤20	≤20	≤15			