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KAIYUAN REFRACTORIES
凯元耐材

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GULF MARKETS
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KAIYUAN REFRACTORIES
凯元耐材

Refractory for the Aluminium Industry

铝行业用耐火材料

郑州凯元耐火材料有限公司

ZHENGZHOU KAIYUAN REFRACTORIES CO.,LTD

公司简介

COMPANY PROFILE

郑州凯元耐火材料有限公司是一家集研发生产、窑炉方案、工程施工为一体的高温窑炉整体解决方案服务商。我公司总部位于河南省新密市，职工200人，其中专业技术人员30人，公司拥有1条铝硅系列耐火材料生产线，一条散装耐火材料生产线，两条保温砖生产线。年生产能力约10万吨，其中铝硅系列3万吨/年，保温砖1万吨/年，不定形耐材6万吨/吨。

我公司产品广泛应用于钢铁、水泥、有色金属、玻璃、石化、陶瓷等行业。主要生产有粘土砖、高铝砖、硅砖、莫来石砖、红柱石砖、刚玉砖、硅线石砖、碳化硅砖、磷酸盐砖、堇青石砖、保温砖、浇注料、火泥、捣打料等。产品畅销全国各地，并出口至海外多个国家（英国、德国、意大利、奥地利、俄罗斯、乌兹别克斯坦、埃及、巴林、阿联酋、印度、日本、韩国等）。

凯元公司的发展，离不开新老朋友的关心和帮助，凯元人将坚守“诚实守信”的做人理念和“诚信、品质、服务、创新”的经营理念，与更多的朋友进行更广泛深入的合作，一起同舟共济，共创未来。

Zhengzhou Kaiyuan Refractory Co., Ltd. is a high-temperature kiln overall solution service provider integrating R&D, production, kiln solutions, and engineering construction. We have around 200 employees, including 30 professional and technical personnel. The company has one aluminum-silicon series refractory production line, one unshaped refractory material production line, and two insulation bricks production lines. The annual production capacity is 100,000 tons, including 30,000 tons/year of aluminum-silicon series refractory bricks, 10,000 tons of insulation bricks, and 60,000 tons/ton of unshaped refractory materials.

Our products are widely used in iron & steel, cement, non-ferrous metals, glass, petrochemical, ceramics and other industries. The main products are clay bricks, high alumina bricks, silica bricks, mullite bricks, andalusite bricks, corundum bricks, sillimanite bricks, silicon carbide bricks, phosphate bricks, cordierite bricks, thermal insulation bricks, castables, mortar, ramming mix, etc. The products sell well domestic and are exported to many overseas countries (UK, Germany, Italy, Austria, Russia, Uzbekistan, Egypt, Bahrain, United Arab Emirates, India, Japan, South Korea, etc.).

The development of Kaiyuan Company is inseparable from the care and help of old and new friends. Kaiyuan people will adhere to the philosophy of "honesty and trustworthiness" and the business philosophy of "integrity, quality, service and innovation", and will continue to improve with more friends. Extensive and in-depth cooperation, together in the same boat, to create a better future.



钢铁、水泥、有色金属、玻璃、石化、陶瓷等
Industry of iron & steel, cement, non-ferrous metal, glass, petrochemical, ceramic, etc

粘土砖、高铝砖、硅砖、莫来石砖、红柱石砖、刚玉砖、硅线石砖
Fireclay brick, high alumina brick, silica brick, mullite brick, andalusite brick, corundum brick, sillimanite brick

碳化硅砖、磷酸盐砖、堇青石砖、保温砖、浇注料、火泥、捣打料等
silicon carbide brick, phosphate bond brick, cordierite brick, insulation brick, castable, mortar, ramming mix, etc

企业目标 • 致力于为国内外客户提供优质产品和技术服务

Enterprise goal: Committed to providing high-quality products and technical services to domestic and foreign customers

企业宗旨 • 为客户实现价值 为员工提供机会 为社会承担责任 为公司持续发展

Enterprise purpose: Realize value for customers, Provide opportunities for employees Taking responsibility for the society, Sustainable development

企业精神 • 诚实守信 服务创新 和谐共赢

Entrepreneurial spirit: Honesty and trustworthiness, Service innovation, Harmony and win-win

人才观念 • 以人为本 共同成长

Talent concept: People-oriented, Grow together

经营理念 • 诚信 品质 服务 创新

Business Philosophy: Integrity, Quality, Service, Innovation

资质荣誉

QUALIFICATION AND HONOR



工厂实景

FACTORY REAL SCENE



生产设备

PRODUCTION FACILITIES

自动配料系统

Auto-mixing system



成型车间

Shaping Workshop



2条保温砖生产线

2 Production lines of insulation brick



隧道窑

Tunnel kilns for the refractory dense bricks



保温砖切磨设备

Cutting and grinding equipment for the insulation brick



雷蒙磨

Raymond Mill



破碎设备

Crushing Equipment



不定形耐材生产设备
Production facilities
for monolithic
refractory

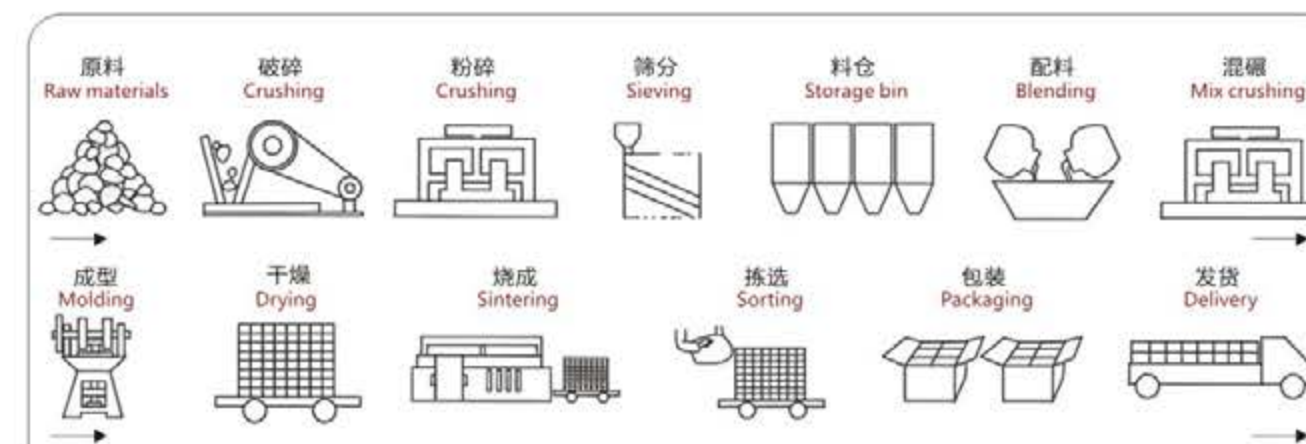
不定形耐材自动配料系统

Auto-mixing and packing equipment for monolithic refractory



生产流程图

Production Flow Control



质量检测中心

Quality Test Centre



包装以及运输

Packaging & Delivery



客户 Customers



铝加工业

Aluminum processing industry



电解槽
Electrolysis Workshop



碳素焙烧炉
Carbon Baking Furnace

阳极焙烧炉

Anode Baking Furnace



焙烧炉示意图

Schematic diagram of the baking furnace



特种粘土砖

Special Fireclay Brick

我公司生产的特种粘土砖是以优质三级高铝熟料和蓝晶石为主要原材料，经过高压成型，高温烧成而制得的一种产品。该产品具有较好的高温蠕变性能和耐压强度，是碳素焙烧炉横墙和炉底用耐火材料中较好的一种选择。

The special fireclay brick is made of high-quality grade three high-alumina clinker and kyanite as the main raw material, through high-pressure molding and high-temperature firing. It has good high-temperature creep performance and compressive strength, which is the preferred refractory for the application of the cross wall and the bottom of the baking furnace.



项目Items	单位Unit	粘土砖 Fireclay brick KYH-02
Al ₂ O ₃	%	≥42
Fe ₂ O ₃	%	≤2.0
体密Bulk density	g/cm ³	≥2.25
显气孔率Apparent porosity	%	≤19
耐压强度Cold crushing strength	MPa	≥40
荷重软化温度 Refractoriness under load 0.2Mpa 0.6%	℃	≥1420
热膨胀系数 Thermal expansion (20℃~1000℃)	%	≤0.7
用途Application	横墙和炉底cross wall & bottom	

特种低蠕变粘土砖

Special Low Creep Fireclay Brick

我公司生产的特种低蠕变粘土砖是以优质三级高铝熟料、焦宝石和蓝晶石为主要原材料，经过高压成型，高温烧成而制得的一种产品。该产品具有较好的高温蠕变性能和抗侵蚀能力，是碳素焙烧炉火道墙和横墙用耐火材料中较好的一种选择。

The special low cree high alumina brick is made of high-quality grade three high-alumina clinker, flint clay and kyanite as the main raw material, through high-pressure molding and high-temperature firing. It has good high-temperature creep performance and anti-corrosion, which is the preferred refractory for the application of the flue wall and cross wall of the baking furnace.



项目Items	单位Unit	低蠕变粘土砖 Low Creep Fireclay Brick KYH-01
Al ₂ O ₃	%	≥52
Fe ₂ O ₃	%	≤1.8
CaO+MgO	%	≤0.7
Na ₂ O+K ₂ O	%	≤0.8
体密Bulk density	g/cm ³	≥2.3
显气孔率Apparent porosity	%	≤18
耐压强度Cold crushing strength	MPa	≥50
荷重软化温度 Refractoriness under load 0.2Mpa 0.6%	℃	≥1480
蠕变率Creep rate (1280℃,0.2Mpa,25h)	%	0.40
高温抗折强度 Hot Modulus of rupture	1200℃	MPa ≥10
	1350℃	MPa ≥4
热膨胀系数Thermal expansion (20℃~1000℃)	%	≤0.70
热震Thermal shock resistance (1000℃水冷water)	次cycle	≥20
用途Application	火道墙&横墙Flue wall & cross wall	

致密粘土砖

Medium duty fire brick for hot face lining of floor for metal transer crucible



项目Items	Unit	粘土砖 Dense refractory brick KYH-42
Al ₂ O ₃ ≥	%	42
SiO ₂ 约approx	%	52
Fe ₂ O ₃ ≤	%	1.5
体密Bulk density ≥	g/cm ³	2.20
耐火度Refractoriness	SK	34
显气孔率Apparent porosity ≤	%	15
耐压强度Cold compressive strength ≥	Mpa	50
永久线变化Permanent linear change 1400℃	%	-0.1

特种低蠕变莫来石砖

Special Low Creep Mullite Brick

我公司生产的特种低蠕变莫来石砖是以合成莫来石和硅线石为主要原材料，经过高压成型，高温烧成而制得的一种产品。该产品具有较好的高温蠕变性能和抗侵蚀能力，是碳素焙烧炉火道墙和横墙用耐火材料的首选产品。

The special low creep mullite brick is made of high-quality synthetic mullite and sillimanite as the main raw material, through high-pressure molding and high-temperature firing. It has good high-temperature creep performance and anti-corrosion, which is the preferred refractory for the application of the flue wall and cross wall of the baking furnace.



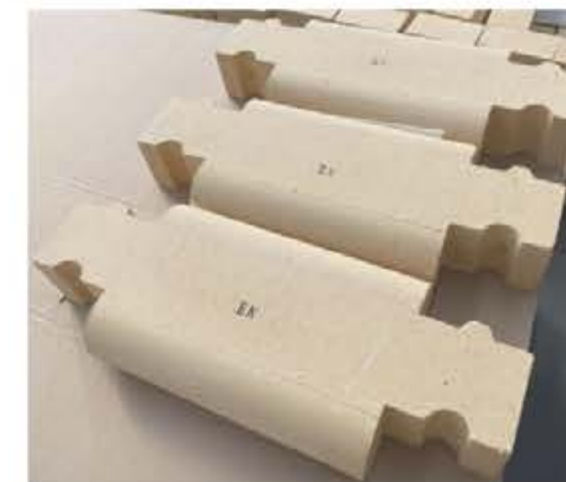
项目Items	单位Unit	莫来石砖 Low Creep Mullite Brick KYMLS-55
Al ₂ O ₃	%	≥55
Fe ₂ O ₃	%	≤1.5
CaO+MgO	%	≤0.7
Na ₂ O+K ₂ O	%	≤0.8
体密Bulk density	g/cm ³	≥2.3
显气孔率Apparent porosity	%	≤18
耐压强度Cold crushing strength	MPa	≥60
荷重软化温度 Refractoriness under load 0.2Mpa 0.6%	℃	≥1480
蠕变率Creep rate (1280℃,0.2Mpa,25h)	%	0.35
高温抗折强度 Hot Modulus of rupture	1200℃	MPa ≥12
	1350℃	MPa ≥6
热膨胀系数Thermal expansion (20℃~1000℃)	%	≤0.65
热震Thermal shock resistance (1000℃水冷water)	次cycle	≥20
用途Application		火道墙&横墙Flue wall & cross wall

特种红柱石砖

Andalusite Brick

我公司生产的特种红柱石砖是南非红柱石为主要原材料，经过高压成型，高温烧成而制得的一种产品。该产品具有较好的高温蠕变性能和热震性能，是碳素焙烧炉火道拉墙砖和火道墙砖的首选。

The special andalusite brick is made of South Africa imported andalusite as the main raw material, through high-pressure molding and high-temperature firing. It has good high-temperature creep performance and thermal shock resistance performance, which is the preferred refractory for the application of the flue walls of the baking furnace.



项目Items	单位Unit	红柱石砖 Andalusite Brick HA-60
Al ₂ O ₃	%	≥60
Fe ₂ O ₃	%	≤1.4
CaO+MgO	%	≤0.5
Na ₂ O+K ₂ O	%	≤0.6
体密Bulk density	g/cm ³	≥2.55
显气孔率Apparent porosity	%	≤17
耐压强度Cold crushing strength	MPa	≥60
荷重软化温度 Refractoriness under load 0.2Mpa 0.6%	℃	≥1580
蠕变率Creep rate (1280℃,0.2Mpa,25h)	%	0.3
高温抗折强度 Hot Modulus of rupture	1200℃	MPa ≥14
	1350℃	MPa ≥7
热膨胀系数Thermal expansion (20℃~1000℃)	%	≤0.58
热震Thermal shock resistance (1000℃水冷water)	次cycle	≥30

预制炉面块

Precast Top Blocks(ABF/CBF)



项目Items	单位Unit	炉面块 Fireclay refractory Top Block
Al ₂ O ₃ >	%	42
CaO <	%	3
Fe ₂ O ₃ <	%	3
最高使用温度Max service temperature >	℃	1450
粒度Grain size 95% <	mm	8
耐压强度Cold crushing strength >	Mpa	30
抗折强度Modulus of rupture >	MPa	5
永久线变化Permanent linear change 1400℃ 5hrs <	%	0.5

硅藻土保温砖

Diatomite Insulating Brick



项目Items	KY-1.0	KY-0.9	KY-0.8	KY-0.7	KY-0.6
体密Bulk density g/cm ³ ≤	1.0	0.9	0.8	0.7	0.6
耐压强度Cold crushing strength MPa ≥	3.5	3.0	2.5	1.0	0.8
导热系数Thermal conductivity 350℃ (W. /M.K)	0.50	0.40	0.35	0.35	0.25
永久线变化 ≤2% °C Test temperature at which PLC less than 2%	1350	1300	1250	1250	1200

高铝聚轻隔热砖

High Alumina Insulation Brick



项目Items	GL-1.0	GL-0.8	GL-0.7	GL-0.6
体密Bulk density g/cm ³ ≤	1.0	0.8	0.7	0.6
常温耐压强度Cold crushing strength Mpa ≥	4.0	3.0	2.5	2.0
重烧线变化不大于2% Permanent linear change no more than 2% °C	1400	1400	1350	1350
导热系数(350 ± 25℃) Thermal conductivity W/m.k	0.35	0.30	0.25	0.20

莫来石隔热砖

Mullite Insulation Brick



项目Items	牌号Brand No.	KY-JM23	KY-JM26	KY-JM28	KY-JM30
温度Classification temperature °C		1260	1430	1540	1650
体密Bulk density g/cm ³ ≤		0.6	0.8	0.9	1.05
抗折强度Modulus of rupture Mpa ≥		0.7	1.1	1.5	1.8
耐压强度Cold crushing strength Mpa ≥		1.0	2.0	2.2	2.3
重烧线变化Permanent linear change °C	%	0.3	0.4	0.5	0.6
	°C × 8h	1230	1400	1510	1620
导热系数Thermal conductivity w/m.k ≤	350℃	0.15	0.28	0.32	0.35
Al ₂ O ₃ % ≥		37	46	58	68
Fe ₂ O ₃ % ≤		1.0	1.0	0.8	0.7

半硅砖

Semi-silica Brick



项目Items		半硅砖 Brick Refractory Ordinary BGZ-35
Al ₂ O ₃ %		18-35
体密Bulk density g/cm ³ >		1.95
显气孔率Apparent porosity % <		23
真比重True density g/cm ³ >		2.6
耐压强度Cold crushing strength Mpa >		20
永久线变化Permanent linear change % >		-1
耐火度Refractoriness °C >		1500
导热系数	200 °C	1.1
Thermal conductivity W/m.k <	600 °C	1.5

耐火泥浆

Refractory Mortar



项目Items		高铝火泥 High alumina mortar HN-65	粘土火泥 Fireclay mortar HN-48	粘土火泥 Fireclay mortar HN-38
Al ₂ O ₃ % ≥		≥65	≥48	≥38
耐火度Refractoriness °C		1750	1710	1620
凝结时间 秒 Setting time seconds		60~120	60~120	60~120
抗折强度 MOR Mpa ≥	110 °C × 24h	≥1.0	≥1.0	≥0.5
高温抗折强度MOR Mpa ≥		≥3.0 (1450 °C × 3h)	≥2.0 (1350 °C × 3h)	≥0.8 (1200 °C × 3h)
粒度 Particle size %	>0.5mm	≤1	≤1	≤1
	<0.076mm	≥50	≥50	≥50

碳化硅火泥

Silicon Carbide Mortar



项目Items	单位Unit	碳化硅火泥 Silicon carbide mortar SiC-75
SiC ≥	%	75
SiO ₂ ≤	%	13
Fe ₂ O ₃ ≤	%	2
抗折强度Modulus of rupture 1400 °C ≥	Mpa	18
粒度Particle size ≤	Microns	250
体密Bulk density ≥	g/cm ³	1.9
最高使用温度Max service temperature ≥	°C	1000

高温胶泥

Ready-use Refractory Mortar



项目Items		加胶型 Add glue type	加水型 Add water typ	耐火胶泥 Refractory mortar RM-45	耐火胶泥 Refractory mortar RM-42
Al ₂ O ₃ ≥		65	60	45	42
耐火度Refractoriness °C		1780	1780	1700	1650
凝结时间秒Setting time S		60~120	60~120	60~120	60~120
抗折强度 Modulus of rupture ≥	110 °C × 24h	5	2	1.0	1.0
	1100 °C × 3h	8	5	3.0(1250 °C)	2.5(1250 °C)
	1300 °C × 3h	10	8	--	--
粒度Particle size %	>0.5mm	≤1	≤1	≤1	≤1
	<0.076mm	≥50	≥50	≥50	≥50
最高使用温度Max service temp °C		1500	1500	1500	1400

铝电解槽防渗料

Dry barrier powder refractory for aluminum electrolysis cell

防渗料系列产品具有强度高、低导热、抗渗透能力强等特性，防止铝液与电解质的渗透、侵蚀，从而延长电解槽的使用寿命，同时又防止了因电解质进入耐火隔热层使得其导热系数增大导致电解槽耗电量加大。防渗料施工方便快捷，主要用于电解槽槽底以替代耐火砖及 Al_2O_3 层作抗渗层。

The anti-seepage material series products have the characteristics of high strength, low thermal conductivity, and strong anti-penetration performance, which can extend the service life of the electrolytic cell and prevent electrolytic cell from consuming more power owing to the increasing thermal conductivity of electrolyte when the electrolyte penetrates into the insulation layer. The anti-seepage materials are convenient and easy to construct the electrolytic cell tank bottom as the anti-seepage layer instead of refractory brick and Al_2O_3 .



项目Items	FSL-40	GFS-60
Al_2O_3 %	38	42
体密Bulk Density g/cm^3	2.2	2.45
耐压强度Cold crushing strength Mpa	30	50
导热系数Thermal conductivity $350^\circ C \pm 25W/m.k$	0.5	0.65

项目Items	指标Index	FS-80	FS-85
$SiO_2 + Al_2O_3$ % $\geq$		80	85
振实容重Packed volume-weight g/cm^3		1.90~2.05	1.95~2.05
电解质反应率Rate of reaction of electrolyte % <		12	11
耐火度Refractoriness $^\circ C$ >		1650	1700
导热系数Thermal conductivity $350^\circ C \pm 25W/m.k$		0.55	0.52

高强度耐火浇注料

Refractory Castable



项目Items		KYJ-45	KYJ-65
Al_2O_3 % $\geq$		45	65
体密Bulk Density g/cm^3		2.4	2.6
抗折强度Modulus of rupture Mpa $\geq$	110 $^\circ C$ x 24h	5	6
	1500 $^\circ C$ x 3h	8	10
耐压强度 Cold crushing strength Mpa $\geq$	110 $^\circ C$ x 24h	55	60
	1500 $^\circ C$ x 3h	60	80
最高使用温度Max service temp $^\circ C$		1450	1500

氧化铝空心球浇注料

Alumina Bubble Refractory Castable

该产品导热系数低(0.65~0.8 W/m.k $350 \pm 25^\circ C$), 使用在连通火道时, 能明显降低筒体温度, 同时红柱石、莫来石的引入, 增加了产品的热震稳定性和荷重软化温度, 延长了炉衬的使用寿命等特点, 流动值好, 适用于不规则形状的沟槽施工。

In order to better serve the carbon industry and extend the service life and decrease the energy consumption of the carbon furnace, the castable can be used for connecting the fire tunnel of the furnace. It is with low thermal conductivity (0.65~0.8W/m.k $350 \pm 25^\circ C$), good thermal stability, high refractoriness temperature and good flow value.



项目Items		KYCAS-90	KYCAS-65
Al_2O_3 % $\geq$		90	65
体积密度Bulk Density $g/cm^3 \leq$		1.6	1.8
抗折强度Modulus of rupture Mpa $\geq$	110 $^\circ C$ x 24h	5	5
	1500 $^\circ C$ x 3h	7	8
耐压强度 Cold crushing strength Map $\geq$	110 $^\circ C$ x 24h	25	15
	1500 $^\circ C$ x 3h	35	25
最高使用温度Max service temp $^\circ C$		1800	1600

不沾铝浇注料

Non-Stick Aluminum Refractory Castable BZL-80



项目Items		不沾铝浇注料 Non-stick aluminum refractory castable BZL-80
Al ₂ O ₃ %	≥	80
永久线变化Permanent linear change	1500℃ × 3h	-0.1
耐压强度Cold crushing strength Mpa >	110℃ × 24h	45
	1300℃ × 16h	50
体密Bulk density g/cm ³ 110℃ × 24h		2.7
最高使用温度Max service temperature °C		1400
加水量Water added %		5-6

感应炉硅质捣打料

Silicon dry lining material for induction furnace



项目Items	单位Unit	感应炉内衬捣打料 Refractory silicon dry lining material
SiO ₂	%	98-99
Fe ₂ O ₃	%	≤0.5
体密Bulk density	g/cm ³	≥2.1
最高使用温度 Max service temperature °C	°C	1700
粒度Grain size	mm	0-4

保温浇注料

Insulation Castable



项目Items	单位Unit	KYIC-01	KYIC-04
温度Temperature Classification	°C	≥ 1100	≥ 1250
体密Bulk Density after Drying at 110° C	g/cm ³	≤ 1.5	≤ 1.6
最大粒度Maximum Grain Size	mm	4	10
耐压强度Cold Crushing Strength (10hr)	MPa	≥ 8.0 1000℃	≥ 1.0 800℃
热膨胀系数Thermal Expansion 20° C - 1000° C	%	≤ 0.6	≤ 0.65
永久线变化Permanent Linear Change 600° C - 1000° C	%	- 1.0 to + 0.5	-1 to +0.5
加水量Water added/100kg	升liter	15-24	18-24
Al ₂ O ₃	%	≥ 24	≥ 25
Fe ₂ O ₃	%	≤ 9.5	≤ 6.0

耐火可塑料

Plastic Refractory



项目Items	单位Unit	KYMR-01
温度Temperature Classification	°C	≥ 1300
体密Bulk Density after Drying at 110℃	g/cm ³	≥2.0
最大粒度Maximum Grain Size	mm	6
耐压强度Cold Crushing Strength (5 hours at 1200℃)	MPa	≥ 10
加水量Water added/100kg	liter	15-18
Al ₂ O ₃	%	≥ 44
Fe ₂ O ₃	%	≤ 2.0