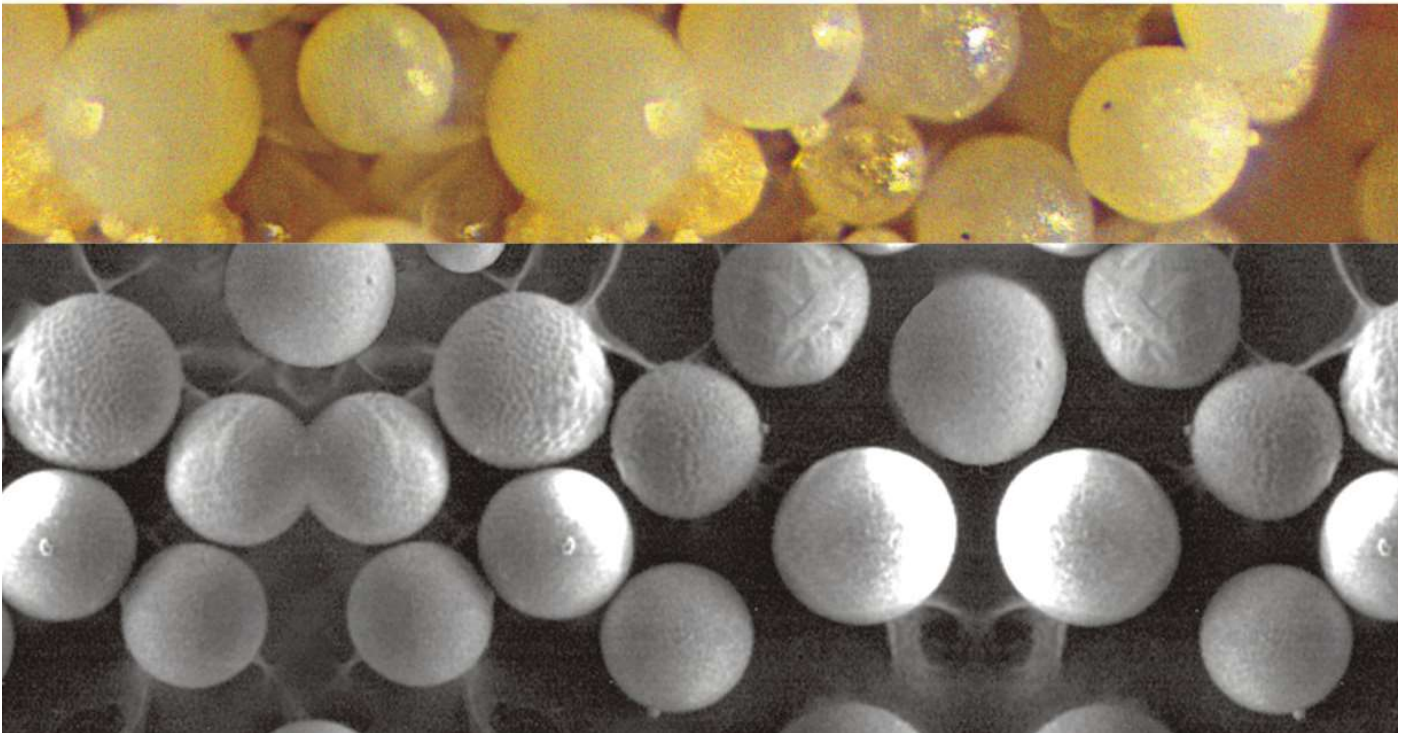


KAILIN CERAMIC SAND

LUOYANG CHINA





COMPANY PROFILE

Founded in 1999, Luoyang Kailin Foundry Material Company is an innovative, progressive and energetic company, a professional company specialized in providing efficient auxiliary foundry materials research, production and technology services. Now our company has developed to be the world leading ceramic sand supplier and has extended the ceramic sand applications from cast iron to cast steel, from RCS to EPC process and so on.

Kailin is the largest ceramic sand manufacturer in China and the inventor of ceramic sand. Now, our ceramic sand has been exported to more than 15 countries, and the share of market is about 25% of the world.

Main products:

1. Ceramic sand Production capability: 60,000 tons a year
2. Foundry coatings Production capability: 10,000 tons a year
3. KaiLin golden sand
4. Ceramic Fiber Insulation
5. Ceramic Sand Flour
6. Riser covering flux
7. High-silica fiberglass mesh filter



World leading ceramic sand supplier.

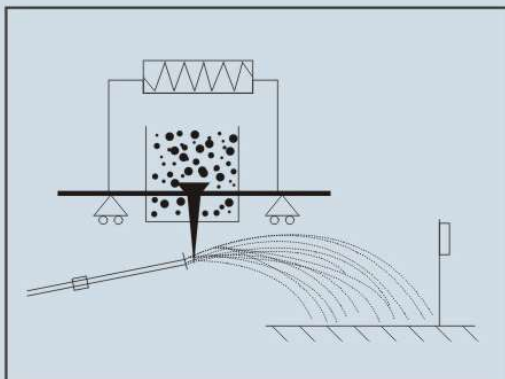
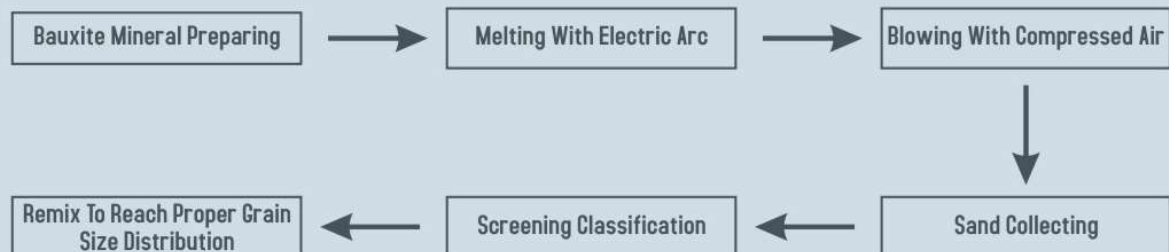
To create new era of environment friendly foundry process.

KAILIN CERAMIC SAND

spherical ceramic sand for foundry

In order to reduce waste emissions and health hazards to people in classic foundry process, as well as to improve foundry efficiency, Luoyang Kailin Foundry Material Company has developed a new special foundry sand, ceramic sand.

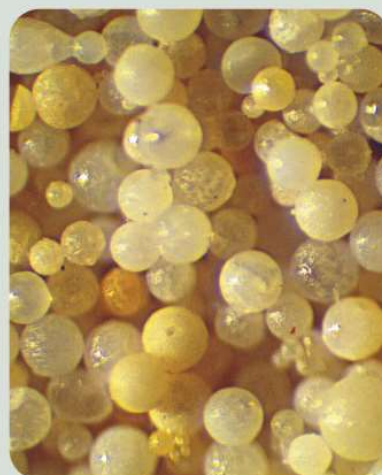
Due to ceramic sand outstanding properties, Kailin ceramic sand has been widely used in most types of foundry process as an upgrade substitution of silica sand and special foundry sands.



KAILIN CERAMIC SAND

Anti Burn-on
High Reclamation Yield
Thermal Expansion Control
Wide Choice of Particle Size
Reduced Waste and Health Hazard
Good Flowability and Heat Conductivity
Low Resin Consumption and Gas Defects

Main Chemical Component	Al ₂ O ₃ : 70~85%, Fe ₂ O ₃ ≤5%, TiO ₂ : 3~4%, SiO ₂ : 12~25%
Shape	Good spherical
Angularity Factor	≤ 1.1
Particle Size	0.053mm~2.50mm
Bulk Density	1.95~2.051 (g/cm ³)
Refractoriness	> 1800℃
Thermal Expansion	0.13% (10 minutes at 1000℃)



Properties(compare with other foundry sand)

Typical

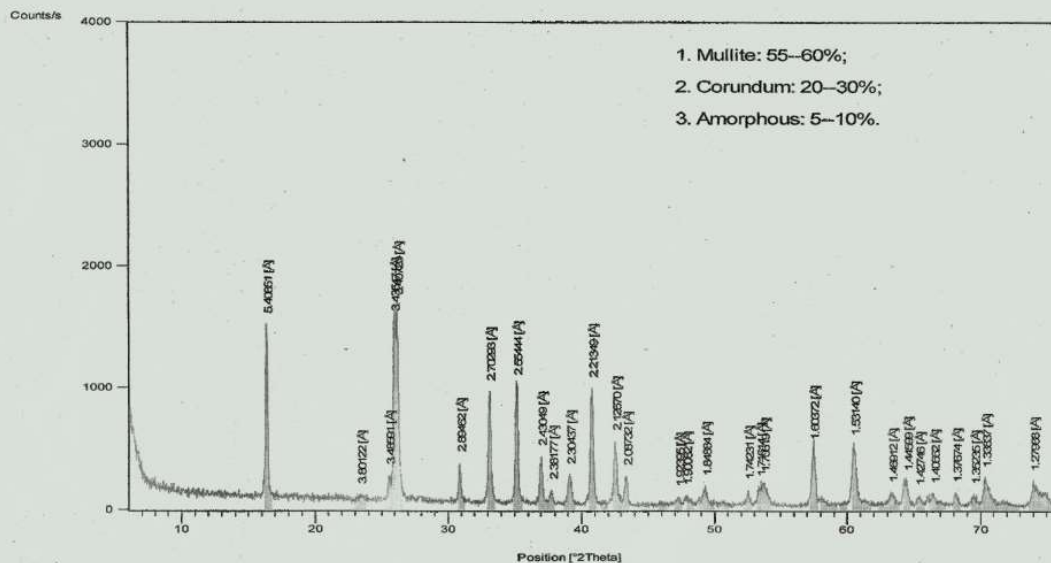
	Ceramic sand	Quartz sand	Chromite	Zircon	Cerabeads
Refractoriness	1800℃/3272°F	1730℃/3146°F	1880℃/3416°F	1825℃/3317°F	1825℃/3317°F
Bulk density (g/cm ³ /lb/ft ³)	2/124	1.58/99	2.81/175	2.95/187	1.69/106
pH	7.3	6.6	7.9	5.7	7.2
Thermal conductivity (100~1000℃)	0.35 ~ 0.50(W/mK)	0.255(W/mK)	0.258(W/mK)	0.305(W/mK)	0.223(W/mK)
Lin. exp. coeff. (20~600℃,10 ⁻⁶ ×K ⁻¹)	7.2	23	7.5	4.1	4.0
Mohs' hardness	6.5~7.5	6.0~7.0	5.5~6.0	7.0~8.0	5.0~5.5
Mineralogical composition	Mullite+Corundum	Quartz +Feldspar	Chromite	Zircon	Mullite (sintered mullite)
Grain shape	Spherical	Angular	Angular	Semi-angular	Spherical

KAILIN GOLDEN SAND FOR 3D PRINTING

KaiLin Golden Sand, a newly developed special artificial sand especially to meet the demand for 3D printing sand molds and cores, has a golden, brilliant appearance and good spherical shape. Those 3D printing company who uses this kind of sand, may take the advantages, such as: reduced resin (binder) consumption, high strength, fast curing and excellent sand mold (core or shell) surface quality. KaiLin golden sand will be the best choice for sand mold 3D printing.



Sand Core Made By 3D Printing



Why Ceramic Sand

1. Prevention of sand expansion defects, especially finning/veining
2. Elimination of gas-forming additives
3. Prevention of reactions between metal and moulding sand
4. Prevention of metal penetration
5. Reduction of core weight
6. Improved flowability of moulding sand
7. Influence on the formation of microstructure
8. Pouring of thin-walled castings

Ceramic Fiber Insulation

Kailin Ceramic Fiber Insulation is a by product of ceramic sand manufacturing .It exhibits high temperature stability for continuous use at temperature up to 1430°C.It also has the following characteristics:

Low thermal conductivity ,low heat storage, excellent thermal resistance, light weight and superior corrosion resistance.

Its typical applications include:

- Corrosion resistance
- Furnace repair
- Thermal insulation feeder in foundry
- Investment mold wrapping
- High Temperature insulation for Kiln and furnaces
- Thermal reactor insulation

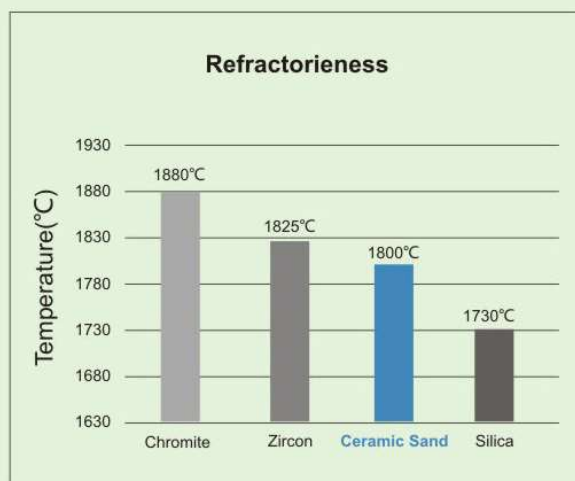
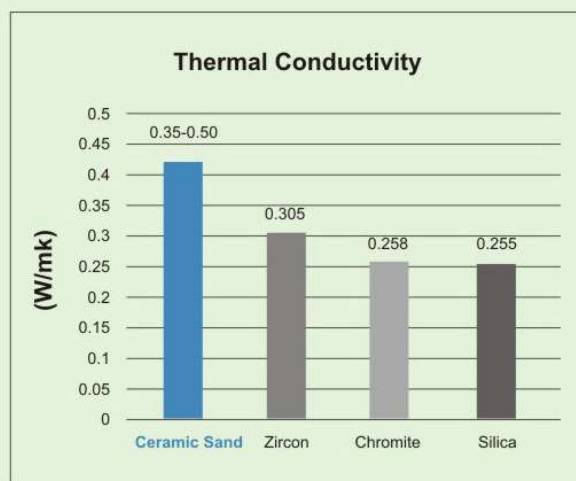


Ceramic Sand Flour

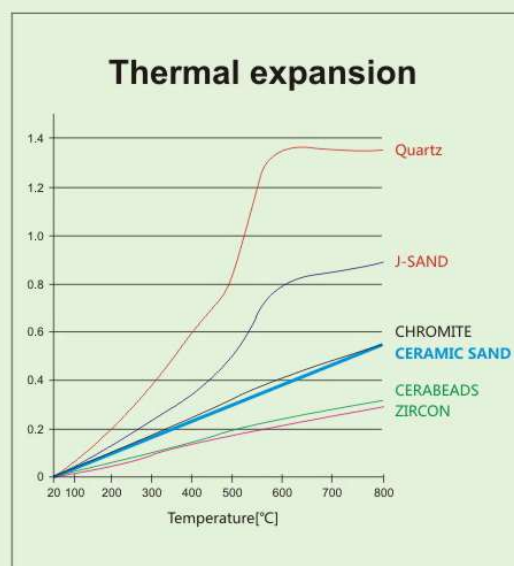
A spherical ceramic sand flour with fine particle size below 0.075mm(below 200 mesh) . It has excellent properties as described previously ,and has been popularly used as :

- 3D printing material
- Refractory fillers of coatings

Properties(compare with other foundry sand)



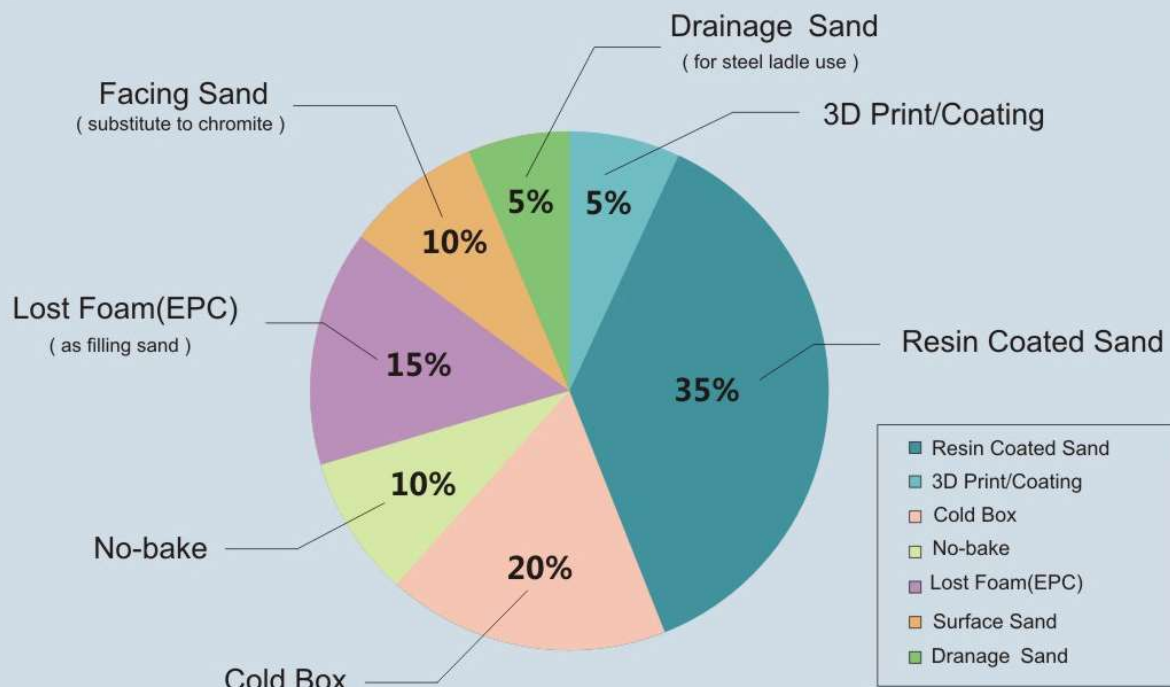
Properties(compare with other foundry sand)















Parts of particle size distribution

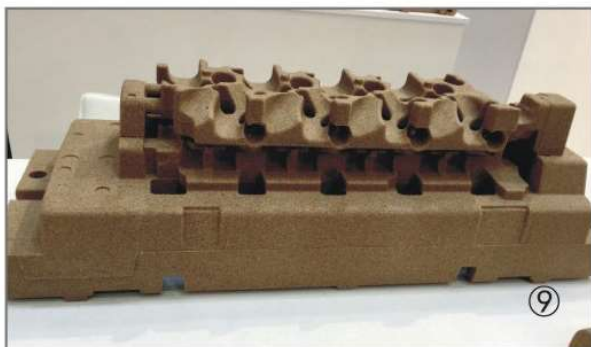
spec.		AFS30	AFS40	AFS50	AFS60	AFS65	AFS75	AFS100	AFS125	AFS150
mesh	micron									
18	850	≤5								
26	600	15~30	≤5	≤5						
36	425	30~50	20~40	10~25	≤10	≤5				
50	300	20~35	25~40	25~35	15~35	10~25	≤10			
70	212	≤10	10~30	25~35	25~35	15~30	10~30	≤3	≤2	
100	150	≤5	≤10	5~25	25~35	25~40	25~45	10~30	0~20	≤5
140	106		≤5	≤10	5~20	≤25	20~40	35~55	30~50	5~25
200	75			≤2	≤5	≤5	≤10	15~35	25~45	40~60
281	53			≤1	≤1	≤1	≤5	≤10	0~20	25~35
PAN	PAN			≤0.5	≤0.5	≤0.5		≤2	≤5	≤15
AFS average finess range		25~35	35~45	45~55	55~65	60~70	70~80	95~110	120~135	145~165

Kailin Ceramic Sand Application

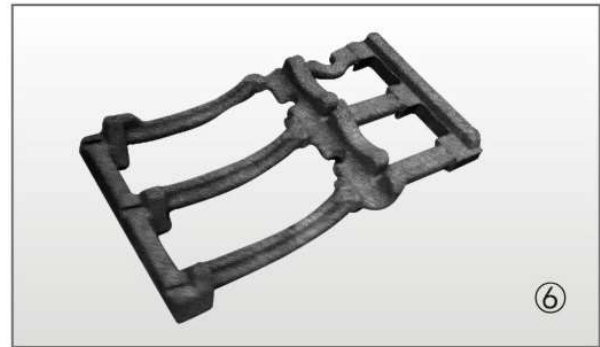


Primary Customers Abroad

Foundry process	Type of metals	Castings weight	Sand spec.	Technical purpose	Country	
Phenolic urethane no-bake	Low alloy steel, carbon steel	0.5~4 tons	AFS 85	Replacing zircon	America	
Ester cured phenolic no-bake	Stainless steel, carbon steel	100 tons	AFS 85	Replacing zircon	Japan	
Alpha-set molding line	Carbon steel, low alloy steel	0.5~15 tons	AFS 55~70	Replacing zircon/silica sand	Korea	
Shell	Ductile iron	10~40 kgs	AFS 85	Replacing zircon/silica sand	America	
Cold box/shell/hot box	Grey cast iron	20~300 kgs	AFS 50~95	Replacing silica sand	Germany	
Alpha-set molding line	Carbon steel, low alloy steel	50~400 kgs	AFS 65	Replacing zircon/silica sand	Japan	
Cold box/shell/hot box	Grey cast iron	10~200 kgs	AFS50~65	Replacing silica sand	Italy	
Furan no-bake molding/shell/hot box(RCS)	Grey cast iron	20~400 kgs	AFS 55~115	Replacing silica sand	UK	
Furan no-bake molding/core making	Grey cast iron	100~500 kgs	AFS 50	Replacing silica sand	South Africa	
Furan no-bake molding/core making	Grey cast iron/Ductile iron	50~400 kgs	AFS 40	Replacing silica sand	Austria	
Lost foam(EPC)	Grey cast iron/Ductile iron	30~3000 kgs	AFS 15~25	Replacing silica sand	Korea	
Furan no-bake molding	Grey cast iron (Machine tool parts)	0.5~30 tons	AFS 25~40	Replacing silica sand	Thailand	



- | | |
|--|---|
| ① Mold and Cores (alpha-set) | ⑥ Pouring(EPC process) |
| ② Valve Casting (low alloy steel) | ⑦ Ceramic Sand used as Facing Sand by Sodium Silicate Process |
| ③ Cylinder Head Core (hot box) | ⑧ Stainless Steel Component Made By Shell Method |
| ④ Cores/molds By 3D Printing | ⑨ Cylinder Head Cores Assembly |
| ⑤ Core of Complicated Water Channel(hot box) | |



① Compressor Case(alloyed cast Iron, 90kg)

② Water Jacket Core of Cylinder Block (cold box)

③ Moulding By Furane No-bake Process

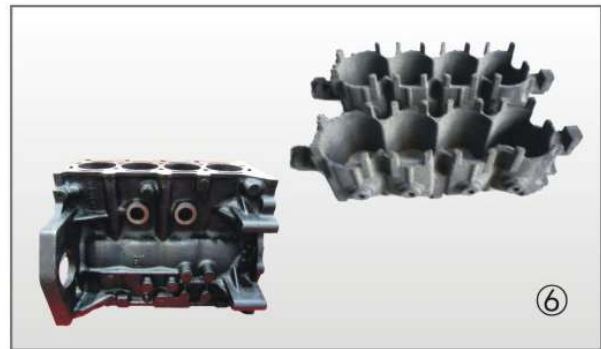
④ Fuel Filter Head (aluminum alloy)

⑤ Combustion Gas Turbine(the world's large-scale high-end castings used contender)

⑥ A Main Oil Channel Core by Cold-box Process

⑦ V20 Cylinder Block

⑧ Shell Process Production Line



- ① Turbocharger Housing
- ② Lost Foam
- ③ Cylinder Head
- ④ Turbine Wheel
- ⑤ Shell Mold Casting
- ⑥ Cylinder Block
- ⑦ Cores Assembled to be Cast (Shell Method)
- ⑧ Intake Manifold Cores
- ⑨ Work Shop Overall View (Lost Foam)

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