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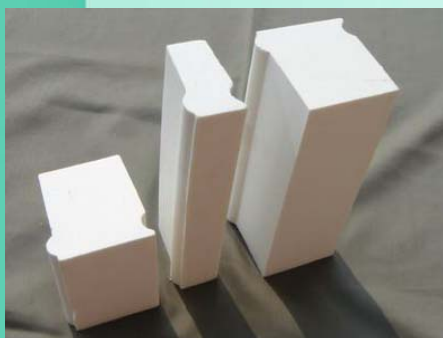
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Catalyst Support Media Ceramic Precision ball Artificial Pumice Stone Grinding Media



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1. Catalyst Support Media

Our two types of catalyst support spheres:

- Ceramic Ball Media : GCBM
- Alumina Ball Media : GABM

1.1 Ceramic Ball Media (GCBM)

1.1.1 Brief introduction

GCBM are specially designed for the best performance under the most demanding conditions. They are manufactured from high quality natural China-clay materials, which enables the products excellent stability, high mechanical strength and thermal shock resistance.



Fig 1. GCBM-18 & GCBM-23

1.1.2 Application

- Air drying
- Hydro-dealkylation
- Catalytic conversion
- Hydrogenation
- Catalytic cracking
- Hydro-treating
- Catalytic reforming
- Isomerisation
- Condensation
- Polymerisation,
- Dehydrogenation
- Sulphur recovery
- Desulphurisation
- Thermal cracking
- Hydro-cracking

1.2 Alumina Ball Media (GABM)

1.2.1 Brief introduction

GABM are made from high alumina, low-silica Alpha alumina powder. The high degree of purity and strength make the product ideal for high-temperature and steam applications where leached silica can coat downstream equipment or foul or poison the catalyst bed. GABM are the industry standard for secondary ammonia reformers.



Fig 2. GABM

1.2.2 Advantage

- Monolith structure eliminates in-service spalling and delamination, which prevents the incidence of fine chips and splinters plugging beds of catalyst.
- Maximum resistance to erosion and low attrition minimizes the possibility of catalyst contamination
- High thermal shock resistance

1.2.3 Application

- Ammonia production :
Temperatures can reach 1250°C with pressure as high as 3500 kPa
- Methanol and hydrogen production: primarily reforming
- Alkylation process using hydrogen fluoride at high temperatures
- Naphtha reforming
- Isomerization

1.3 Technical Data for our Catalyst Support Media

TYPE	GCBM-18	GCBM-23	GABM-60	GABM-80	GABM-90	GABM-95	
Al ₂ O ₃	16~20	20~26	50~70	70~85	85~92	92~99	
Fe ₂ O ₃	<1	<1	<1	<1	<1	<0.2	
K ₂ O+Na ₂ O	<4	<4	<4	<4	<3.5	<1	
Water absorption	<1	<1	<5	<5	<7	<9	
Moh's Hardness	6.5	7	7	7	7	7.5	
Acid resistance	>99.8	>99.8	>98	>98	>98	>98	
Alkali resistance.	>80	>80	>85	>90	>95	>96	
Max Working Temp	850	1100	1480	1500	1600	1700	
Crush Strength KN/ Particle	φ3	0.25	0.28	0.15	0.16	0.20	0.20
	φ6	0.5	0.54	0.44	0.48	0.50	0.52
	φ13	1.5	1.67	1.30	1.50	1.80	1.90
	φ19	4.15	4.21	2.30	2.80	3.20	3.30
	φ25	6.07	6.22	3.20	3.60	4.00	4.10
	φ38	8.52	8.92	5.00	5.50	6.00	6.20
	φ50	9.2	9.8	7.00	8.50	10.00	10.20
Bulk Density, kg/m ³	1380~1450	1380~1450	1500~1600	1600~1800	1800~2000	1900~2100	

Table 1. Technical Data for our Catalyst Support Media

1.4 None poisoning & Long service life

Maximum resistance to erosion and attrition of our Catalyst Bed Media minimizes the possibility of catalyst contamination. The long service life and optimum performance of GBCM Catalyst Bed Support Media translates into lower operating costs.

1.5 Available in all sizes

We produce balls in standard sizes ranging from 1/8" to 3" in diameter. Other sizes are available upon your specific request.

2. Ceramic Precision Ball

Our mainly introduces three major products:

- Zirconia Precision Ball : GPB-ZR
- Silicon Nitride Precision Ball : GPB-SN
- Alumin Oxide Precision Ball : GPB-AL

2.1 General Introduction

As a rule, ceramic precision balls resist corrosion and abrasion extremely well. They also have low thermal conductivity, and a high resistance to heat. These qualities make ceramic balls useful for flow control, metering, and bearing applications.

We produce ceramic balls from zirconia (ZrO_2), silicon nitride(Si_3N_4), alumina oxide(Al_2O_3), Silicon Carbide and ZAT. The general applications:

- Check Valves -As check valves, ceramic balls are extremely hard, resistant to abrasion, and immune to furnace atmospheres. Choose a ceramic ball where heat, corrosion, and/or abrasion resistance is needed.
- Flow meters -Some ceramics are used on flow meters where the ball position on a scale indicates rate of flow.
- Bearings -The low coefficient of thermal expansion makes ceramics attractive alternatives to metals in certain bearing applications. Compared to steel, their coefficient of thermal expansion is just 25% making them less likely to increase bearing friction as heat increases. Additionally, since ceramic balls absorb less heat, cooling requirements for ceramic bearings are much lower .

Ball Grade table:

Grade	DIA. tolerance (Vdws) μm	Spherical tolerance (ΔSph) μm	Roughness (Ra) μm
G3	0.08	0.08	0.012
G5	0.13	0.13	0.02
G10	0.25	0.25	0.025
G16	0.4	0.4	0.032
G20	0.5	0.5	0.04
G28	0.7	0.7	0.05
G40	1	1	0.08
G60	1.5	1.5	0.1
G100	2.5	2.5	0.125
G200	5	5	0.2

Table 2. Ball Grade

Sizes we can offer:

Size (inch)	Size (mm)	Size (inch)	Size (mm)
1/16 "	1.588	3/32 "	2.381
1/8 "	3.175	5/32 "	3.969
3/16 "	4.763	7/32 "	5.556
1/4 "	6.35	9/32 "	7.144
5/16 "	7.938	11/32 "	8.731
3/8 "	9.525	13/32 "	10.319
7/16 "	11.112	15/32 "	1.906
1/2 "	12.7	17/32 "	13.494
9/16 "	14.288	19/32 "	15.081
5/8 "	15.875	21/32 "	16.669
11/16 "	17.463	23/32 "	18.256
3/4 "	19.05	25/32 "	19.844
13/16 "	20.638	7/8 "	22.225
15/16 "	23.812	1 "	25.4
1/16 "	1.588	3/32 "	2.381
1/8 "	3.175	5/32 "	3.969

Table 3. Sizes we can offer

2.2 Zirconia Precision Ball (GPB-ZR)

2.2.1 Sample



Fig 3. GPB-ZR

2.2.2 Benefit

- High strength and fracture toughness
- High resistance to heat
- High hardness and density
- Stability, wear and corrosion resistance
- Ultra-smooth surface, low friction coefficient
- Modulus of elasticity and thermal expansion Coefficient similar to steel

2.2.3 Technical Parameter

Property	Typical Values
ZrO ₂ [%]	95
Density [g/cm ³]	6.0
Hardness [Kg/mm ²]	>1250
Elastic Modulus[Gpa]	210
Thermal Conductivity [W/m.k]	3 [20 to 400°C]
Thermal Expansion Coefficient [10 ⁻⁶ K ⁻¹]	9-11
Compressive Strength [MPa]	3000
Fracture Toughness [Mpa√m]	6-10
Max. Useful Temperature [°C]	800

Table 4. Typical Technical Data for GPB-ZR

2.3 Silicon Nitride Precision Ball (GPB-SN)

2.3.1 Sample



Fig 4. GPB-SN

2.3.2 Brief introduction

Our Silicon nitride balls offer many improvements to bearings that traditionally use steel. The material stiffness, light weight, and inertness lower the bearing heat generation while providing stiffer and higher speed bearing capabilities. The surface finish and geometry of silicon nitride balls lowers the bearing vibration and spindle noise as well as improving the speed and life of the bearing. Hybrid bearings with silicon nitride balls

clearly set the standard of higher performance machining, longer life, and lower total operating costs.

2.3.3 Benefit

- Lower thermal expansion
- Higher hardness, Lighter weight
- Increased corrosion resistance
- High resistance to heat
- Ultra-smooth surface, low friction co-efficiency

2.3.4 Technical Parameter

Property	Typical Values
Si ₃ N ₄ [%]	98
Density[g/cm ³]	3.2
Hardness[HV]	1500
Elastic Modulus [GPa]	320
Thermal Expansion Coefficient[10 ⁻⁶ K ⁻¹] [RT to 800°C]	2.9
Compressive Strength [MPa]	2800
Max. Useful Temperature [°C]	1000
Fracture Toughness [Mpa \sqrt{m}]	5-7
Surface Finish Grade 5 [micron]	0.005

Table 5. Typical Technical Data for GPB-SN

2.4 Alumina Oxide Precision Ball (GPB-AL)

2.4.1 Sample



Fig 5. GPB-AL

2.4.2 Benefit

- High strength and High hardness
- High resistance to heat
- Stability, wear and corrosion resistance

2.4.3 Technical Parameter

Property	Typical Values
Al ₂ O ₃ [%]	99.2
Density [g/cm ³]	>3.86
Hardness [HV]	1800
Elastic Modulus [Gpa]	380
Thermal Expansion Coefficient [10 ⁻⁶ K ⁻¹]	5-7
Fracture Toughness [Mpa√m]	3-4
Compressive Strength [MPa]	1000
Max. Useful Temperature [°C]	1200

Table 6. Typical Technical Data for GPB-AL

3. Artificial Pumice Stone

We have developed one types :

- Artificial Pumice Stone : GAPS

3.1 Artificial Pumice Stone : GAPS

3.1.1 Introduction

Our artificial pumice stone is an advanced ceramic product. It preserves all the advantages of the natural pumice stone. Moreover, these particles are relatively lightweight and are 20~30 times more abrasive; since it's artificial, we can control the density, mechanical strength, shape and cell size. Artificial pumice stone has wide application prospects while keeping the minimum cost. Take stone wash for example (an important process in making the garments): because the excellent abrasiveness of artificial pumice stone, its consumption only 1/20 of natural pumice stone. What's more important: the garment factory can save 19/20 of water consumption, which translates into great profits. According to our trial experience in the garment factory, the garment appears smoother and brighter color.

The value of artificial pumice stone is huge. Huge enough to be a part of people's daily life. They help you remove corns, callouses and hard skin. They help you wash your pets and fix their nails. When your toilet becomes yellow, they help you get rid of the dirt.

BOSNAX CO.,LTD. welcome friends from all over the world to inquire and explore more applications of artificial pumice stone.



Fig 6. Artificial Pumice Stone

4. Grinding Media

We have developed five types of grinding media:

- Alumina Grinding Balls : GAGB
- High-Alumina Ladder Brick : GLB-HA
- Medium-Alumina Ladder Brick : GLB-MA
- High-Alumina Rectangular Brick : GRB-HA
- Medium-Alumina Rectangular Brick : GRB-MA

4.1 General Introduction

Our grinding media is used in various milling or grinding operations, to reduce the particle size of a particular material. Basically, ceramic raw materials such as feldspar and silica are ground down to more usable and uniform sized particles. The paint industry also has to grind their paints to get a good quality finish.

Grinding is very important for the preparation of ceramic tile bodies and glazes, since homogenization of all the ingredients and good particle size distribution is vital. This is to ensure constant and controllable melting characteristics and uniform colors.

Our grinding media is basically high density, fused alumina balls which have a very high specific gravity (very dense and compacted) and are hard wearing. A combination of sizes is usually used to obtain optimum grinding efficiencies

The general applications:

- Silica sand manufacturing
- Decorative ceramic tile manufacturing
- White cement manufacturing
- Non-metallic mineral grinding
- Rods and media balls for wear-resistant applications
- Inert tower packing for chemical processing
- Filler material for plastic and paper products

4.2 Alumina Grinding Ball (GAGB)

4.2.1 Brief introduction

Our Grinding Ball have five different types:

- GAGB-75 75% Al_2O_3
- GAGB-80 80% Al_2O_3
- GAGB-85 85% Al_2O_3
- GAGB-90 90% Al_2O_3
- GAGB-92 92% Al_2O_3



Fig 7. GAGB

4.2.2 Technical Parameter

TYPE	GAGB-75	GAGB-80	GAGB-85	GAGB-90	GAGB-92
Al_2O_3	75	80	85	90	92
Fe_2O_3	0.5	0.4	0.35	0.30	0.25
Water absorption	0.1				
Specific gravity, g/cm^3	3.20	3.30	3.40	3.50	3.55
Abrasion Loss	<0.035	<0.030	<0.025	<0.020	<0.020
Standard Diameter of Alumina grinding balls : $\phi 25$, $\phi 30$, $\phi 40$, $\phi 50$, $\phi 60$, $\phi 70$					

Table 7. Typical Technical Data for Our Grinding Balls

4.3 Lining Brick (GLB)

4.3.1 Brief introduction

Our Grinding Brick have four different types:

- GLB-HA (GUIDE High-Alumina Ladder Brick)
- GRB-HA (GUIDE High-Alumina Rectangular Brick)
- GLB-MA (GUIDE Medium-Alumina Ladder Brick)
- GRB-MA (GUIDE Medium-Alumina Rectangular Brick)

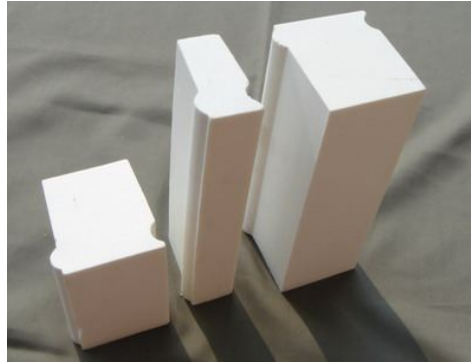


Fig 8. GLB_HA

4.3.2 Technical Parameter

Product	Length(L) mm	Width(Wa) mm	Width(Wi) mm	Width(Wi) mm
GLB-HA (High-Alumina Ladder Brick)	150	50	45	60
GRB-HA (High-Alumina Rectangular Brick)	150	50	45	60
GLB-MA (Medium-Alumina Ladder Brick)	150	50	45	60
GRB-MA (Medium-Alumina Rectangular Brick)	150	50	45	60

Table 8. The standard specification for Our Grinding Bricks

4.4 Quantity Proposal

4.4.1 The Lining Brick and Grinding balls used in Ball Mill

Spec.of Ball Mill	Grinded material (ton)	Grinding balls (ton)
1.5ton	1.5-2	2.5-3
3ton	3-4	5-6
5ton	5-7	8-10
8ton	8-10	12-15
15ton	15-18	23-25
20ton	20-23	28-32
30ton	30-36	45-48
36ton	36-42	50

Table 9. The quantity of micro-crystal medium-Alumina balls used in ball mill

5. Benefits

5.1 Prompt Delivery

We have maintained in stock of standard sizes for immediate shipment at competitive prices. Moreover, We are proud of having a round-clock order management system and a team of professional shipping clerk, which will ensure you prompt and guaranteed delivery.

5.2 Economical packaging

In order to provide you the most convenient and economical packaging in terms of manual handling charge on site, GUIDE will propose you the advice on the best way of packaging.

We now offer:

- One cubic foot bags, 40~50bags per pallet.
- One cubic foot paper boxes.
- One cubic meter supersack.
- 55 Gallon steel drums, four drums per pallet.
- Other packagings are available upon your request.

5.3 Quick Shipment on Short Notice

We preserve high stock levels on standard items, your request will be immediately handled by our IT department, and the order system will automatically transfer the order to our relative staff by email and SMS. You will receive our confirmation within 24 hours. Our system will work literally 24 hours a day, seven days a week. We also have a team of sophisticated shipping staff who used to work in the forwarding company and will guarantee you professional delivery schedule.

5.4 Technical Support

We had been in this industry for more than 25 years. We have maintained a group of competent ceramic material experts. If our standard products don't meet your needs, Our technical support will work with your company to develop the products which meet your specific application requirements.