

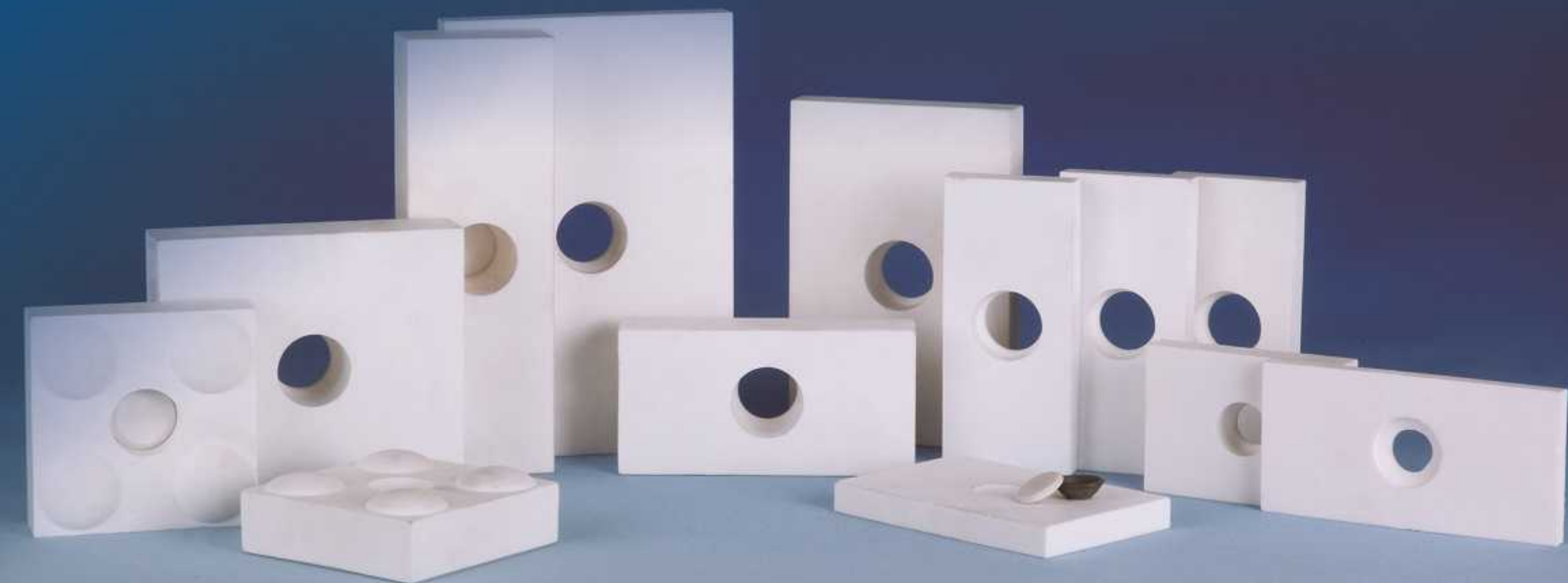


Tecera International Co., Ltd.

(Sub Company of Shandong Tecera Technology Co., Ltd.)



Tecera International Co., Ltd.
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About Tecera

Who we are?

- The sub-company of Shandong Crown Holding Group .
- The global well-known top quality wear resistant ceramic manufacturer.
- Over 17 years experience for wear protection ceramic research and production.
- Owning 3 automatic production lines with annual production capacity over 30000 MT wear resistant ceramics.
- The plant is occupying more than 30000m² with more than 300 employees worldwide.
- Enjoy excellent reputation in wear protection market in over 30 countries worldwide.
- An ISO9001 & ISO 14001 Certificated company.

What we provide?

- High quality wear resistant ceramic for various industries.
- Design and installation for wear protection project.
- Consulting for industrial wear protection solutions.
- Consulting for industry grinding to help customer save energy.
- Design and produce special requested catalyst and catalyst support media.
- Develop special ceramic as per customer specific requests.

What we produce ?

- Wear resistant ceramic tile/brick/mosaic mat/hex.mat/Cylinder with alumina content from 92% up to 99%. More than 2000 size and shapes are available.
- Alumina wear resistant ceramic tube, diameter from 40mm up to 500mm.
- Wear resistant ceramic & rubber combined panel with various sizes
- Ceramic lined wear resistant pipe
- Customized/pre-engineered alumina ceramic and wear resistant part upon request
- Alumina grinding ball/bead for material grinding/milling.
- Zirconia ceramic including grinding ball/beads and special shape ceramic.
- High quality catalyst support media including ball & Raschig ring with alumina content from 90% up to 99.5%.



■ Application

The products, which are of excellent wear-resistance, impact-resistance, easy operation are ideal surface wear-resisting material for material transfer equipment in mining, iron & steel works, thermal & power plants, mine, etc, and can extend operating life of equipment effectively. Theoretically the life time of the alumina ceramic is about 260 times longer than that of manganese steel and 170 times longer than that of chrome steel.

■ Performance Index

Products	TW92®	TW95®	TW97®	TW99®
Alumina Content(%)	≥92	≥95	≥97	≥99
Viker Hardness(Hv50)	≥1050	≥1150	≥1247	≥1500
Rate of Water Absorption(%)	≤0.01	≤0.01	≤0.01	≤0.01
Fracture Toughness(Mpa 0.5)	4.60	5.70	4.65	4.70
Bulk Density(g/cm3)	≥3.63	≥3.65	≥3.78	≥3.83
Grain Size(μm)	1-6	8-20	2-15	2-10
Wear Loss(cm3)(Sand-Blasting,30 degree)	0.358	0.351	0.244	0.216

■ Specifications

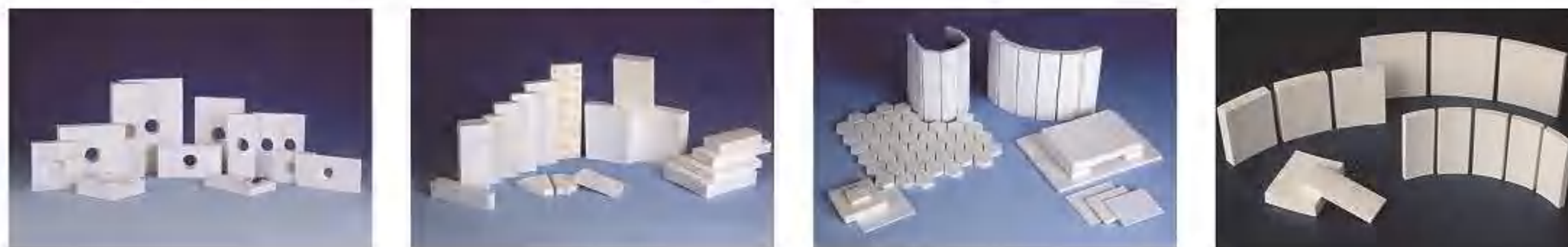
Size(mm)	Length(mm)	Width(mm)	Thickness (mm)	Shape
10X10	10	10	1.5-10	Mosaic/Hex. Tile
11.55X11.55	11.55	11.55	3-12	Mosaic/Hex. Tile
12X12	12	12	3-12.7	Mosaic/Hex. Tile
17.5X17.5	17.5	17.5	4-10	Mosaic/Hex. Tile
20X20	20	20	5-15	Mosaic/Hex. Tile
23.7 x23.7	23.7	23.7	5-15	Mosaic/Hex. Tile
25X25	25	25	5-15	Mosaic/Hex. Tile
50X25	50	25	5-10	Plain Tile(Without Hole)
50X50	50	50	5-15	Plain Tile(Without Hole)
100X100	100	100	6.5-15	Plain Tile(Without Hole)
120X80	120	80	6-20	Weld-able Tile (With Hole)
150X60	150	60	10-25	Plain Tile(Without Hole)
150X100	150	100	12-100	Plain Tile/weld-able Tile
200X100	200	100	25-100	Plain Tile/ weld-able Tile
300X300	300	300	25-100	Plain Tile/ weld-able Tile

Remark:More than 2000 sizes and shapes are available upon customer requests

■ Packaging In carton box or PP-bag , packed in fumigated wooden pallet with net weight 20-25MT/20'FCL.

■ Key benefits

- Excellent anti-wear and corrosion resistance.
- Longer life than that of traditional wear protection material.
- Avoid shutdown time and maximize the productivity .



■ Application

The TC Series alumina ceramic cylinder can be combined with high quality rubber to be used as wear protection material in mining industry, power plant, steel plant etc. The alumina cylinder boned rubber wear panel has excellent impact resistant performance against other wear resistant material. Thanks to the excellent wear and impact resistance performance, the alumina cylinder can help to expend the life time of the equipment effectively. The TC Series alumina ceramic cylinder also can be used as grinding media in ball mill to increase the grinding efficiency as well.

■ Performance Index

Products	TC85®	TC92®	TC95®	TC97®	TC99®
Alumina Content(%)	(+ZrC2)≥85	≥92	≥95	≥97	≥99
Moh' s Hardness(Mohs)	9	9	9	9	9
Rate of Water Absorption(%)	≤0.01	≤0.01	≤0.01	≤0.01	≤0.01
Fracture Toughness(n/mm)	38	40	42	44	48
Bending Strength(Mpa)	235	255	275	285	300
Bulk Density(g/cm3)	≥3.30	≥3.63	≥3.68	≥3.73	≥3.83

■ Specifications

Shape	Size(mm)						
	Cylinder	Dia.15*9.75	Dia.16*16	Dia.25*9.75	Dia.30*30	Dia.32*16	Dia.32*32
Dia.20*9.75		Dia.20*20	Dia.25*25	Dia.31*31	Dia.32*24	Dia.40*40	Dia.50*50
Dia.40*42		Dia.25*30	Dia.21*21	/	/	/	/
Semi-Cylinder	Dia.20*20	Dia.21*21	Dia.32*32	/	/	/	/

Remark: Any other sizes are available upon customer' s requests.

■ Packaging

In carton box or PP-bag , packed in fumigated wooden pallet with net weight 20-25MT/20'FCL.

■ Key benefits

- Excellent anti-wear and corrosion resistance.
- Excellent impact resistance.
- Avoid shutdown time and maximize the productivity of your plant.



Application

TAT® Series Wear Resistant Ceramic Tube are mainly used as the lining in the pipeline of conveying ore fines, cement, coal and other hard material. Compared with alumina ceramic tile, the installation cost is much lower and the life is much longer.

Regular sizes

Specifications(mm)	Outer Diameter(mm)	Inner Diameter(mm)	Thickness (mm)
Φ25	Φ25	Φ10	7.5
Φ30	Φ30	Φ15	7.5
Φ40	Φ40	Φ20	10
Φ50	Φ50	Φ37	6.5
Φ65	Φ65	Φ52	6.5
Φ80	Φ80	Φ67	6.5
Φ100	Φ100	Φ84	8
Φ125	Φ125	Φ109	8
Φ150	Φ150	Φ134	8
Φ200	Φ200	Φ184	8
Φ250	Φ250	Φ230	10

Remark: the biggest OD is up to 500mm and the wall thickness is from 6mm up to 50mm.

Remark: Other sizes are available upon request.

Technical Specification

Technical Index	TAT92®	TAT95®
Al ₂ O ₃ Content(%)	≥92	≥95
Fe ₂ O ₃ Content(%)	≤0.2	≤0.15
Hardness(Mobs)	9	9
water Absorption(%)	≤0.02	≤0.02
density(g/cm ³)	≥3.60	≥3.65

Packaging

In wooden box with net weight 20-24MT/20'FCL.



Key benefits

- (1) Superior wear resistance compared with other material.
- (2) Excellent wear resistance against acid and alkali.
- (3) Excellent resistance against big hard material without breakage.
- (4) Smooth surface makes excellent flow speed and avoid blacking the pipe system.
- (5) Reduce the frequency of maintenance to the facility, so as to reduce the cost and labor expense.
- (6) Excellent thermal shock resistance, the pipe can be used at the temperature up to 800 °C.

TAT® Wear Resistant Ceramic Bend/Elbow



Integrated Alumina Ceramic Bends/Elbows

The coal will bring great impact to the equipment during transportation in the coal handling system of power station, so the alumina ceramic tiles is not available and they will fall off by large area.

The valve in the desulfurization system can change the follow during the switching process, so the slurry with grain at high speed will wear out the pipe at the ends of valves. The liquid in the tube contains much sulfite which is very corrosive, so usually nonmetallic pipes like rubber tubes and pvc pipes are used to avoid corrosion, but the wear resistance of these tubes are poor that the straight pipe at the ends of valves always worn out. The integrated alumina pipes which resist abrasion and corrosion are developed to well solve the problems of abrasion.

Because the lined ceramic tube is one piece, the slurry couldn't permeate through it, moreover, the alumina tube has high hardness and the process by isostatic pressing dry powder is favorable to the uniformity of ceramic crystal structure, so its wear resistance is better than ceramic tile's with the same material.

The weakest place is the gap between each stucked tiles during material handling. The material grains not only wear the pipe but also have impact on it. This is why the pipelines lined by tiles are easily worn out and fallen off.

The experiment shows that the service life of ceramic tube is at least 5 times longer than ceramic tiles of the same thickness.



■ Application

The wear resistant pipe is an excellent wear protection pipe used in all industry where need wear resistance. The high alumina ceramics are installed onto the internal surface of the pipe properly by welding, pasting or inter-locking system. With the brilliant properties of resistance to wear, corrosion and heat, the pipe is widely used in material handling of coal industry, electric power, metallurgy, mining and chemical industry and it is one ideal wear-resistant pipe.

■ Regular sizes

Nominal Diameter	50~800	Make detailed specifications based on site conditions.
Thickness of Wear-resistant Liner(mm)	3~50	
Thickness of Steel pipe	4~8	



■ Key benefits

- (1)Great Hardness: The Mohs hardness is 9 which is only inferior to diamond but far exceeding wear-resistant steel and stainless steel.
- (2)Good Abrasion Resistance:The alumina ceramic abrasion resistance is 260 times that of manganese steel and 170 times that of high chromium iron. According to the follow-up survey for the customer, the service life of pipes can be prolonged more than 10 times under the same working condition.
- (3)Corrosive Resistance:As an inorganic oxide, high alumina ceramics has extreme stable molecular structure and no electrochemical corrosion, which can resist the corrosion from various solutions such as acid, alkali, salt and organic solvent.
- (4) High Self-lubrication:High alumina ceramics has the properties of excellent self-lubrication and non-adhesive. Its roughness is just 1/6 that of steel pipe, causing smaller flow-resistance. Compared to that of steel pipe, its inner diameter could be reduced by 15.4%.
- (5)Light Weight:Density of 3.6g/cm³ is only 50% that of steel, which highly lowers the dead weight of the pipe.
- (6)Convenient Connection:Apply flange connection in principle, but we also use quick connector according to the requirements from customers.



■ Application

Wear Resistant Rubber Ceramic Panels is new generation composite panels, a combination of wear resistant alumina ceramic cylinders/ceramic tiles vulcanized in resilient rubber base. The alumina ceramic surface provides exceptional resistance to wear, while the elastic property of the rubber effectively dampens the impact forces which can crack the ceramics. Rubber also helps to substantially reduce the vibrations, sounds, and the impact shock generated from impacting rocks. Laid out in zigzag and brick pattern, ceramic tiles/cylinders is an excellent feature for handling large material volumes at different angles without developing a wear pattern. As excellent impact and wear resistant material, The panel is suitable for feeders, chutes, bins, transfer points, in conveyor systems, screen feed plates, mill discharge chutes, bunker etc. The major applicable industries are Coal fired power plants, cement plants, blast furnace plants and host of other industries which requires high impact abrasion resistant surfaces.

Alumina Ceramic Type: TW92® or TW95®,SiSiC bonded rubber also available.

■ Specifications of the Rubber

Item		Data
Rubber	Tensile Strength	16MPa
	Break Extension	450-500%
	Shore Hardness	60±5
	Break permanent deformation	30%
	Main composition	Natural Rubber+SBR
Peel strength between rubber and ceramic/rubber and steel		6MPa
Bonding Strength between rubber and ceramic		4MPa

[Bonding Agent] The bonding agent imported from Germany—"Chemlok", which is best quality of bonding agent produced by LORD.

■ Regular sizes

Panel Size	200×200、250×250、400×400、500×500、600×600
Remark	Ceramic tiles are available from 10x 10 mm to 100 x 150 mm; thickness of ceramic tile can be from 1.5 mm to 50 mm.
Alloy Steel Size	alloy steel plate with thickness ranging from 3 mm to 10 mm
Rubber Thickness	Depends upon the impact stress expected.
Ceramic size	metal+rubber+ceramic / rubber+ceramic plain surface or spherical surface. The steel bolt also available upon requests

Remark: Other sizes are available upon request.

■ Key benefits

- The combination is ideal for sliding/impact abrasions
- Installation friendly therefore reduces downtime
- Excellent sound insulation



■ Application

Ceramic-lined flexible hoses are ideal for use in highly aggressive services where conventional rubber hose, expansion joints, or bellows connections require frequent replacement. Ceramic lined hoses may also be used to isolate mechanical vibration or to connect non-stationary equipment.

It is widely used in thermal power plants, cement plants, ore dressing plant, chemical corrosion resistance, coal powder and the slurry delivery system and also used for port and river dredging suction sand, concrete pump vehicle and so on.

■ Features

- (1) Wear resistant: Ceramic lining is 12 times more wear-resistant than stainless steel.
- (2) Impact resistant – virtually impossible to destroy the ceramic segments.
- (3) Flexible – minimum bend radius is roughly 12 times the hose I.D.
- (4) Corrosion-resistant – compatible with most chemicals found in slurries.
- (5) Wide variety of end-connections.
- (6) Purchase any continuous length up to 65 feet



■ Specifications

(1) Available Dimensions

Internal Diameter(mm)	Outer Diameter(mm)	Max Length(Meter)	Min Bend Radius(mm)
25	42	10	500
32	50	10	635
38	56	10	760
51	72	10	1020
68	94	10	1360
76	105	10	1520
83	120	10	1630
102	140	10	2040
152	190	10	3040
194	235	10	3880
245	290	10	4900
299	350	10	5980

Remark: Size can also make according to customer's requirements.

(2) Standard End-Connections



Remark: Additional End-connections also available, please contact us for any custom requirements.

■ Technical Parameters

- (1) Size range from 1" till 24" length till 20 meters.
- (2) Maximum Operating Pressure 150Psig
- (3) Maximum Operating Temperature 250oF

■ Application

Ceramic embedded rubber conveyor belt is a combination of abrasion resistant alumina ceramic mosaic with or without dimples tiles vulcanized in resilient rubber base. For well over a decade, Tecera has been developing the most innovative and durable abrasion resistant ceramic products combined with other materials. The ceramic embedded pulley lagging products has been widely improved the durability of the conveyor belt. Our continued research, involving the mechanics of how and why ceramic lagging drives a belt, has ensured that our ceramic lagging outlasts and provides more grip than any other ceramic lagging on the market. The ceramic pulley lagging has been widely used in mining industry, coal industry,..etc.

Alumina Ceramic Type: TW92® or TW95®

■ Specifications of the Rubber

Item	Data	
Rubber	Tensile Strength	16MPa
	Break Extension	450-500%
	Shore Hardness	60±5
	Break permanent deformation	30%
	Main composition	Natural Rubber+SBR
Peel strength between rubber and ceramic/rubber and steel		6MPa
Bonding Strength between rubber and ceramic		4MPa

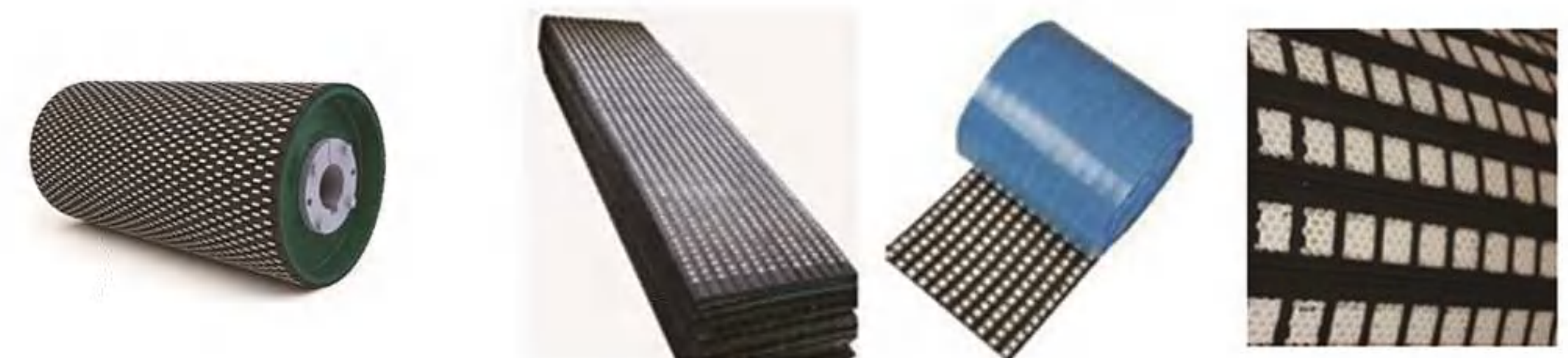
■ Regular sizes

Thickness	Width	Max Length	Ceramic Type	Rubber Compound
15mm	250mm,500mm, 800mm	3660mm	Dimpled ,smooth	SBR,MSHA
20mm	250mm,500mm, 800mm	3660mm	Dimpled Smooth	SBR,MSHA
25mm	250mm,500mm, 800mm	3660mm	Dimpled smooth	SBR, MSHA

Remark: Other sizes are available upon request.

■ Key benefits

- Higher Friction Values
- Improved Belt Tracking Sheds
- Water and Dirt Easy Installation
- Less Pulley Wear Minimize Downtime



Application

Zirconia based ceramics are excellent material for impact and wear resistant application. They are widely used as liner in mining, power plant, steel plant, petrol chemical plant etc

Performance Index

Products	Zirconia Toughed Alumina		Zirconia Based Alumina	Y2O3 Stabilized Zirconia
	ZTA-400	ZTA-430	ARZ	YTZP
Zirconia Content(%)	≥15%	≥20%	≥80%	94.6%-ZrO2+5.4%Y2O3
Alumina Content(%)	≤85%	≤80%	≤20%	/
Viker Hardness(Hv50)	≥1400	≥1300	≥1200	≥1100
Bending Strength(Mpa)	≥480	≥500	≥800	≥1000
Fracture Toughness(Mpa ^{0.5})	≥6.0	≥7.0	≥8.0	≥8.0
Bulk Density(g/cm3)	≥4.0	≥4.3	≥5.3	≥6.02

Regular Sizes

Size(mm)	Length(mm)	Width(mm)	Thickness (mm)	Shape
10X10	10	10	1.5-10	Mosaic/Hex. Tile
11.55X11.55	11.55	11.55	3-12	Mosaic/Hex. Tile
12X12	12	12	3-12.7	Mosaic/Hex. Tile
17.5X17.5	17.5	17.5	4-10	Mosaic/Hex. Tile
20X20	20	20	5-15	Mosaic/Hex. Tile
23.7 x23.7	23.7	23.7	5-15	Mosaic/Hex. Tile
25X25	25	25	5-15	Mosaic/Hex. Tile
50X25	50	25	5-10	Plain Tile(Without Hole)
50X50	50	50	5-15	Plain Tile(Without Hole)
100X100	100	100	6.5-15	Plain Tile(Without Hole)
120X80	120	80	6-20	Weld-able Tile (With Hole)
150X60	150	60	10-25	Plain Tile(Without Hole)
150X100	150	100	12-100	Plain Tile/weld-able Tile

Remark: Remark: More than 2000 sizes and shapes are available upon customer requests.

■ **Packaging** In carton box , packed in fumigated wooden pallet with net weight 20-25MT/20'FCL

Key benefits

- Excellent impact resistant performance.
- Excellent wear resistant performance



Application

The Reaction Bonded Silicon Carbide Ceramic (RSIC/SISIC) is an ideal wear resistant material, which is especially suitable for the strong abrasive, coarse particles, classification, concentration, dehydration and the other operations. It is widely used in mining industry, steel industry, coral processing industry, chemical industry, raw material-making industry, mechanical sealing, surface sandblasted treatment and reflector etc. Thanks to the excellent hardness and abrasive resistance, it can effectively protect the part where need wear protection, so as to prolong the service life of the equipment.

Specifications

Item	Unit	Data
Temperature of application	°C	1380°C
Density	G/cm3	>3.00
Open porosity	%	<0.1
Bending strength	Mpa	250 (20°C)
	MPa	280 (1200°C)
Modulus of elasticity	GPa	330 (20°C)
	GPa	300 (1200°C)
Thermal conductivity	W/m.k	45 (1200°C)
Coefficient of thermal expansion	K-1 ×10-6	4.5
Rigidity		13
Acid-proof alkaline		excellent

Available Shape and sizes

Thickness: from 6mm up to 25mm

Regular Shape: SISIC Plate, SISIC Pipe, SiSiC Three Links, SISIC Elbow, SISIC Cone Cyclone.

Remark: Other sizes and shape are available upon requests.

Packaging

In carton box, packed in fumigated wooden pallet with net weight 20-24MT/20'FCL.

Key benefits

- Excellent wear resistance, impact resistance and corrosion resistance;
- Excellent flatness and excellent temperature resistance up to 1350°C
- Easy installation;
- Longer service life (is about 5 times more than that of alumina ceramic and 6 times more than that of polyurethane)



Products List of Ceramic Glue

Working Temperature	Code	Ratio of Mixing	Status	Operation Time(25 °C)	Initial Solidifying Time(25 °C)	Complete Solidifying Time	Package
-60 ~ 100°C	TG8080K	4:1	Flowable	40min	1h	24hrs	5kg/suiteX4suite=20kg/Carton (one suite include 2 boxes)
	TG8080-1	4:1	Thixotropic paste	40min	90min	24hrs	5kg/suiteX4 suite= 20kg/Carton (one suite include 2 boxes)
	TG8100M	1:1	Thixotropic paste	60min	70min	24hrs	Including A&B, Packed separately A=5kg/pcX5pc=25kg/Carton B=5kg/pcX5pc=25kg/Carton
	TG8100-2	1:1	Thixotropic paste	45min	60min	24hrs	Including A&B, Packed separately A=5kg/pcX5pc=25kg/Carton B=5kg/pcX5pc=25kg/Carton
-60 ~ 200°C	TG8180	4:1	Flowable	40min	50min	24hrs	5kg/suiteX4 suite= 20kg/Carton (one suite include 2 boxes)
	TG8180-3	4:1	Thixotropic paste	40min	50min	24hrs	5kg/suiteX4suite=20kg/Carton (one suite include 2 boxes)
-60 ~ 280°C	TG8280	Non-mixing	Thixotropic paste	<20min	24hrs	48hrs	310ml/pcX40pc/carton 400g/pcX40pc/carton=16000g

■ Size of the Carton

- (1) for TG8280, size of the carton 43cmx27cmx25cm
- (2) Size of box of other type of glue : 55cmx45cmx21cm

■ Customers are required to send the working condition of the glue, we will recommend the proper glue as per our experience.

■ We are in the position to develop the glue specially as per the working condition in customer's site.



Alumina Ceramic Application in Power Plant



System	Application Area
Coal-Conveying System	coal-conveying pipeline
	belt joint hopper
	coal hopper
	raw coal hopper
	coal feeder
Coal Pulverizing System	coal mill drum
	chute and hopper lining
	outlet pipeline
	primary air pipe and elbow
	pulverized coal pipe and elbow
Dust Removing System	burner pipeline
	dust removing pipe and elbow
Dust Disposing System	fine fly ash pipe
	slag removal
	dry ash pipe



Alumina Ceramic Application in Mineral Processing Industry



System	Application Area
Material Conveying System	concentrate pipeline
	tailing pipeline
	backfill mineral
Grinding System	chute and hopper lining
	outlet pipeline
	vibrating chute
Mineral Processing System	cyclone
	entrifugal dehydrator

Alumina Ceramic Application in Steel Industry

System	Application Area
Material Conveying System	hopper
	bunker lining
	mixing bin
Compounding Ingredients System	primary mixing drum
	secondary mixing drum
Sintered Materials Conveying System	mineral processing hopper under vibrating screen
	long distance mineral processing hopper and bunker
Dust Removal and Discharge System	dust removing pipe
	dust collecting pipe
	machine tail dust removing pipe



Alumina Ceramic Application in Power Plant



System	Application Area
Limestone crushing and raw fuel preblending system	chute
	hopper
raw fuel grinding ,homogenization and storage system	vertical mill feed chute
	vertical mill air -intake lining board
	vertical mill scraper plate
	separator
	cyclone
	fan impeller and shell
	mill outlet elbow and expansion joint
Firing System	tertiary air duct
	elbow of the inlet or outlet of humidifier tower
	elbow from grate cooler to electrostatic precipitator
	kiln head electrostatic precipitator tail air pipe elbow
	discharge
cement grinding system	vertical mill feed chute
	mill outlet elbow and expansion joint



Alumina Ceramic Application in Coal Preparation Industry



System	Application Area
Conveying system	medium conveying pipeline
	coal washery equipments feeding pipeline
	coal washery equipments discharge pipeline
	Non-pressure gravity flow pipeline
	coal washery conveying pipeline
Mining equipment	horizontal screen bowl centrifuge
	horizontal vibratory screen centrifuge
	horizontal coal slurry scroll/screen centrifuge
	Automatic flocculent make-up system
	Cyclone



Application

High Purity Alumina balls, also known as inert balls or catalyst support media are very important component in the catalytic process in the refinery, gas processing and petrochemical industry. It is commonly used to support catalyst and adsorbents products in the vessel or reactor. Its main function is to act as packing material and at the same time to support the catalyst bed in order to prevent breakthrough or loss of catalyst or adsorbent materials downstream of the reactor vessels due to the high pressure and temperature inside the reactor vessels during the operation. Ceramic balls come in different sizes, which include 1", 3/4", 1/2", 1/4" and 1/8". These sizes are arranged layer by layer at the top and bottom of the vessel or reactor. Typical application include:

- (1) Ammonia Production (2)Methanol and hydrogen production (primarily reforming) (3)Alkylation process using hydrogen fluoride at high temperature (4)Naphtha reforming (5)Isomerization (6)Desiccant dryer (7)Hydrocracker (8) Petrochemical reaction

Chemical Composition and Physical Properties (TP90-TP995)

Specification	Products	TP90®	TP95®	TP99N®	TP99D®	TP99.5®
Al ₂ O ₃ (%)		≥90	≥95	≥99	≥99	≥99.5
SiO ₂ (%)		≤6	≤2	≤0.2	≤0.2	≤0.15
Fe ₂ O ₃ (%)		≤0.3	≤0.15	≤0.12	≤0.12	≤0.1
Compressive Strength N/ C 13		≥2000	≥2000	≥5000	≥10000	≥15000
Water Absorption(%)		≤3	≤3	2-4	<1	<0.5%
Bulk Density(g/cm ³)		≥2.8	≥3.1	3.2-3.5	>3.4	3.2-3.8
Packing Desntiy(g/cm ³)		≥1.7	≥1.9	1.9-2.0	2.1-2.2	>2.2
Crushing Strength		Excellent	Excellent	Excellent	Excellent	Excellent
Color		White	White	White	White	White

Remark: Low and medium alumina inert ceramic ball also are available upon requests as attached specification below

Regular Size (mm)

Available Size offer range: from 3mm up to 100mm, forming method can be by rolling or by pressed.

Advantages

- (1)Excellent impact resistance.
- (2)Excellent Temperature resistance
- (3)Excellent acid-alkali corrosion resistance.
- (4)Excellent thermal shock resistance

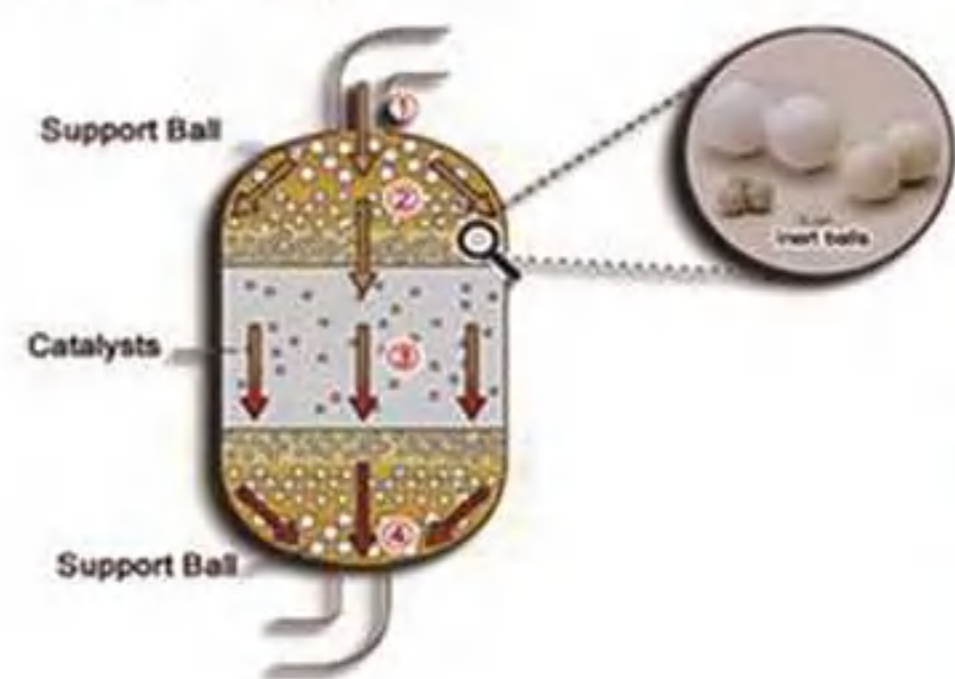
Packaging

By standard woven bag, other package like steel drum,jumbo-bag etc are available upon requests.



Specification of Inert Alumina Ceramic Ball (TP20® -TP70®)

Products	TP20®	TP30®	TP40®	TP70®
AL2O3%	20-30	30-45	45-70	70-90
Water Absorption%	≤3	≤3	≤3	≤3
Acid Resistance%	≥98	≥98	≥98	≥98
Alkali Resistance%	≥80	≥82	≥85	≥90
Thermal Shock Resistance	No broken for more than 3 times	No broken for more than 3 times	No broken for more than 3 times	No broken for more than 3 times
Compressive Strength KN/pc	Φ3	≥0.12	≥0.14	≥0.15
	Φ6	≥0.40	≥0.42	≥0.44
	Φ8	≥0.48	≥0.52	≥0.60
	Φ10	≥0.60	≥0.70	≥0.80
	Φ12	≥1.00	≥1.10	≥1.30
	Φ16	≥1.50	≥1.60	≥1.80
	Φ20	≥1.80	≥2.00	≥2.30
	Φ25	≥2.50	≥2.80	≥3.20
	Φ30	≥3.00	≥3.20	≥3.50
	Φ50	≥6.00	≥6.50	≥7.00
Packing Density (kg/m ³)	1.3~1.4	1.4~1.5	1.5~1.6	1.6~1.8

Reactor
(Vertical Long Tank)


■ Application

In heterogeneous catalysis, bulk material catalysts are used to convert gaseous or liquid reactants. On an industrial scale, fixed bed reactors are generally used for these types of reactions. The actual catalyst—i.e. the active catalytic substance—may be used alone or on a carrier. Carriers are used in situations where high demands are placed on the mechanical strength of the catalyst, the active catalytic substance must be present in a thin layer or there is a need to conserve valuable catalyst substances. A variety of materials are used to create catalyst carriers, during which ceramic catalyst carriers are an important group of carrier materials in heterogeneous catalysis

■ Chemical Composition

Al ₂ O ₃	SiO ₂	Fe ₂ O ₃	CaO	MgO	TiO ₂	Na ₂ O	K ₂ O
>99%	<0.2%	<0.12%	<0.1%	<0.1%	<0.06%	<0.2%	<0.2%

■ Physical Properties

Size(mm)	Shape	Water Absorption	Compressive Strength(KN)	Color
16x10x7	Seraphim Ring	13%-16%	>0.4	White
16x16x7	Seraphim Ring	13%-16%	>0.5	White
38x38x14	Seraphim Ring	13%-16%	>4	White
25x25x4.5	Seraphim Ring with 4 holes	16%-20%	>1.65	White
31x31x5	Seraphim Ring with 4 holes	16%-20%	>1.7	White
80x85x35	Multi-wing ring	13%-16%	>6	White

Remark: Other sizes and shapes are available upon requests.

■ Advantages

- Chemical inertness
- Mechanical strength and stability
- Low surface profile
- Bulk material uniformity

■ Packaging

By standard woven bag, other package like steel drum, jumbo-bag etc are available upon requests.

■ Quality Control

- Shape and size
- Water absorption
- Drop test
- Crush Strength
- Chemical Analysis
- Thermal shock crush strength test
- Leachable Iron
- other test upon customer's request





The catalyst carrier used as the carrier for sulfur salvage, hydrogenation Catalyst, High Temperature Desulfurizing Agent, Dechlorinating Agent, Naphtha Steam Pre-reforming Catalyst, Natural Gas Steam Pre-reforming Catalyst, Refinery Gas Steam Pre-reforming Catalyst, Hydrocarbons Steam Reforming Catalyst, Methanation Catalyst, Methanol Steam Reforming Catalyst, ...etc.

Application

The thermal storage ceramic ball is specially utilized as the packing in thermal storage equipment. It is used in the air separation process and functions as a kind of heat exchange medium. It's specially applied as thermal storage packing in heat accumulator of air separation equipment, heating stove of blast furnace gas in the steel industry. During the process of steel rolling, if thermal storage ball is installed, it can preheat both air and gas so as to ensure burning temperature achieve the requirement quickly required by heating of billet during steel rolling.

Specifications

Item	TT65	TT70	TT75	TT85
Al ₂ O ₃ (%); ≥	65	70	75	85
Specific Gravity (g/cm ³); ≥	2.2	2.3	2.5	2.8
Unit Weight (Kg/ m ³)	1550 ~ 1600	1600 ~ 1650	1600 ~ 1750	1650 ~ 1700
Specific Surface Area (m ² / m ³)	200 ~ 220			
coefficient of thermal expansion (3)(×10 ⁻⁶ /°C); ≥	6.0	6.5	7	8
specific heat capacity (×10 ³ /Kg K)	1.1	1.1	1.0	1.0
1100°C Water Cooling (Times); ≥	30	30	30	20
Applicable Temperature (°C); ≤	1450	1550	1650	1750

Remark: custom product is available upon requests. Please feel free to contact for future information.

Regular Size (mm)

From 3mm up to 100mm are available.

Package

In standard 1 ton big bag with wooden pallet

Advantages

- Smooth surface
- High mechanical strength
- High abrasion resistance
- High thermal conductivity & thermal capacity,
- Excellent thermal stability & heat endurance.

■ Application

The TB® Series Alumina grinding ball is used as grinding media for ceramic body and glaze preparation, Thanks to the excellent wear resistance and hardness, it is suitable for both wet and dry grinding in both continuous ball mill and batch ball mill.

■ Performance Index

Specification	Products	TB92S®	TB92D®	TB92U®	TB95®	TB97®
Al ₂ O ₃ (%)		≥92	≥92	≥92	≥95	≥97
Moh' s hardness		9	9	9	9	9
Rate of Water Absorption(%)		≤0.01	≤0.01	≤0.01	≤0.01	≤0.01
Bulk Density(g/cm ³)		≥3.60	≥3.58	≥3.63	≥3.68	≥3.73
Self-Wearing Loss(%-24 hours)		≤0.0075	≤0.01	≤0.0025	≤0.010	≤0.010
Application		Wet grinding	Dry grinding	Wet grinding Dry grinding	Wet grinding Dry grinding	Wet grinding Dry grinding
Raw Materials		Part of imported alumina powder	Part of imported alumina powder	Imported alumina powder		

Remark: Regular size range from Dia.10 Dia.20 Dia.30 Dia.40 Dia.45 Dia.50 Dia.60 Dia.70.

■ Packaging

25kg net in PP-bag or big bag of 500 or 1000kg net. 20-24MT/20' FCL.

■ Key benefits

- Extremely cost effective
- Improves grinding efficiency and energy costs
- Longer service time due to low wear rate
- Contamination-free to the color and composition of the ground material
- Technical support provided to optimize milling conditions



■ Application

TAB® Series Alumina Grinding Beads is suitable for both wet and dry superfine grinding of alumina, zirconia silicate, feldspar, quartz, kaolin clay, glaze, inks and ceramics in Stirred and Ball Mill.

■ Performance Index

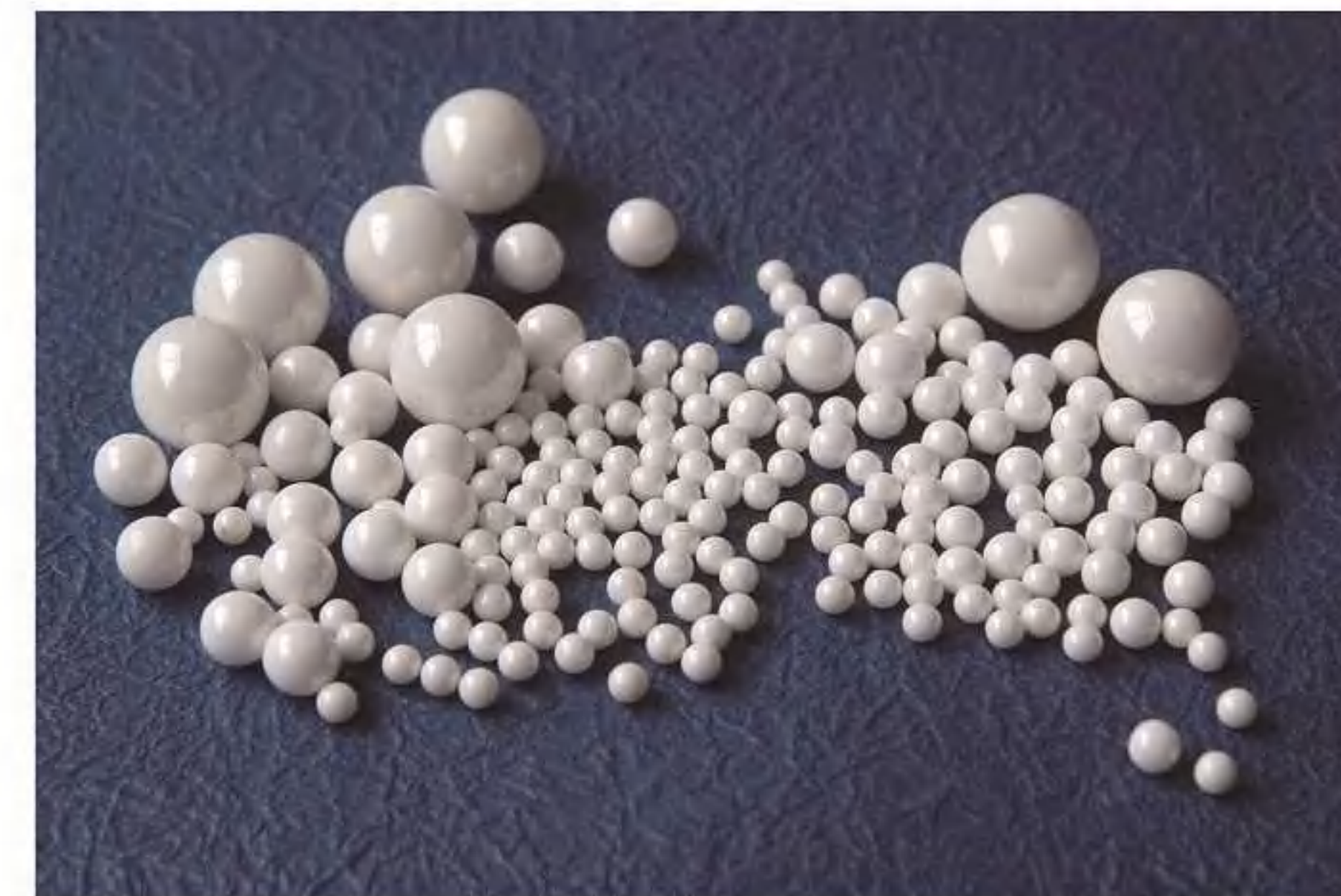
Specification	Products	TAB92®	TAB92S®	TAB95®	TAB97®
Al ₂ O ₃ (%)		≥92	≥92	≥95	≥97
Fe ₂ O ₃ (%)		≤0.3	≤0.3	≤0.2	≤0.1
Moh' s hardness		9	9	9	9
Rate of Water Absorption(%)		≤0.01	≤0.01	≤0.01	≤0.01
Bulk Density(g/cm ³)		≥3.60	≥3.60	≥3.65	≥3.70

■ Packaging

25kg net in PP-t ag or big bag of 500 or 1000kg net. 20-24MT/20'FCL.

■ Key benefits

- High grinding efficiency for superfine grinding.
- Fine chemical stability & contamination-free to the grinded material.
- Extremely low wear rate .
- Excellent combination of toughness and hardness .
- Technical support provided to optimize milling



■ Application

Type	Application
TZS320®	<ol style="list-style-type: none"> 1. Non-metallic minerals like Calcium Carbonate, kaolin clay, zirconium silicate, TiO2 and other minerals; 2. Metallic minerals like copper, silver, nickel, gold, zinc etc; 3. White pigments, coatings, paints, inks etc; 4. Recommend to be used in stirred mill and ball mill.
TZS360®	<ol style="list-style-type: none"> 1. Non-metallic minerals like Zirconium Silicate, Calcium Carbonate, kaolin clay; 2. Ceramic glazes and frits; 3. Coatings, paints, inks etc; 4. Metallic minerals like copper, silver, nickel, gold, zinc etc; 5. Recommend to be used in stirred mill and ball mill.
TZS400®	<ol style="list-style-type: none"> 1. Non-metallic minerals like Zirconium Silicate, GCC, kaolin clay; 2. Engineering Ceramics. 3. Coatings, paints, inks etc; 4. Metallic minerals like copper, silver, nickel, gold, zinc etc; 5. Metal finishing and polishing.
TZS420®	<ol style="list-style-type: none"> 1. Non-metallic minerals like Calcium Carbonate, kaolin clay, zirconium silicate, TiO2 and other minerals; 2. Dielectric materials, piezoelectric materials, capacitor; 3. Ceramic glazes and frits; 4. Coatings, paints, inks etc; 5. Metallic minerals like copper, silver, nickel, gold, zinc etc; 6. Recommend to be used in stirred mill and ball mill.



■ Application

Specification	TZS320®	TZS360®	TZS400®	TZS420®
Chemical composition	ZrO2 Al2O3 SiO2 Other	ZrO2 Al2O3 SiO2 Other	ZrO2 Al2O3 SiO2 Other	ZrO2 Al2O3 SiO2 Other
Density	>3.25	3.60~3.70	>4.0	4.20min
Packing Density	>1.85	2.20~2.35	>2.35	2.85min
Hardness (Mohs)	8	8	> 8	8min
Roundness	>90%	>90%	>90%	>90%
Size	0.2 ~ 12mm	0.2 ~ 12mm	0.4 ~ 13mm	0.2 ~ 12mm
Color	White	White	off-white	White

■ Packaging

25kg net in PP-bag or big bag of 500 or 1000kg net. 20-24MT/20'FCL.

■ Key benefits

- Very High grinding efficiency for superfine grinding.
- Fine chemical stability & contamination-free to the grinded material.
- Extremely low wear rate .
- Excellent combination of toughness and hardness .
- Technical support provided to optimize milling conditions .

