



**GRINDING MEDIA FOR HIGH SPEED MILLS**

**GLENMILLS® LEAD-FREE GLASS (sp. gr. 2.5)**

These soda-lime lead-free glass beads are extremely round, have a narrow size spread, and their durability makes them ideal for thinner suspensions such as agricultural chemicals, tape coatings, aqueous suspensions, biologicals, and many other milling operations. GLEN MILLS has introduced a tighter set of size ranges. Older declinations are shown below for cross-reference.

Standard packaging weight is 55 lbs. (25 kg).

<b>GLASS MEDIA FOR HORIZONTAL AND VERTICAL BEAD MILLS</b>					
<u>Catalog No.</u>	<u>Actual Size</u>	<u>Nearest US Mesh</u>	<u>(Former Size)</u>	<u>Quantity lbs</u>	<u>Price</u>
7200-000250	0.25 - 0.50mm	60 - 35	No change	1 - 110	\$4.00 / lbs.
7200-000400	0.40 - 0.60	40 - 30	No change		
7200-000500	0.50 - 0.75	35 - 25	No change		
7200-000750	0.75 - 1.00	25 - 18	No change	165 - 550	3.50
7200-001000	1.00 - 1.30	18 - "15"	1.00-1.25		
7200-001250	1.25 - 1.65	"15"- "13"	1.25-1.55		
7200-001550	1.55 - 1.85	"13"- "11"	No change	605 - 2145	3.20
7200-001700	1.70 - 2.10	12 - 10	1.7 - 2.0		
7200-002000	2.00 - 2.40	10 - 8	2.0 - 2.3		
7200-002500	2.40 - 2.90	8 - 7	2.5 - 2.85	2200 and up	2.95
7200-002850	2.85 - 3.45	7 - 6	2.85 - 3.3		
7200-003300	3.40 - 4.00	6 - 5	3.3 - 3.8		
7200-003700	3.80 - 4.40	"5.5"- "4.5"	3.7 - 4.1		

<b>LARGER DIAMETER GLASS BALLS</b>				
<u>Catalog No.</u>	<u>Actual Size</u>	<u>1-220 lbs.</u>	<u>275 - 2,145 lbs.</u>	<u>2,200 and up</u>
7200 - 005000	5 mm	\$4.50 / lbs.	\$3.50 / lbs.	\$3.25 / lbs.
7200 - 006000	6	4.50	3.50	3.25
7200 - 007000	7	4.85	3.85	3.60
7200 - 008000	8	4.85	3.85	3.60
7200 - 009000	9	4.85	3.85	3.60
7200 - 009525	9.5 (3/8 inch)	4.85	4.10	4.00
7200 - 010000	10	4.10	3.10	2.95
7200 - 011000	11	4.10	3.10	2.95
7200 - 012000	12	4.10	3.10	2.95
7200 - 012700	12.7 (1/2 inch)	4.10	3.10	2.95
7200 - 013000	13	4.10	3.10	2.95
7200 - 014000	14	4.10	3.10	2.95
7200 - 014300	14.3 (9/16 inch)	4.10	3.10	2.95
7200 - 015000	15	4.10	3.10	2.95
7200 - 015875	15.9 (5/8 inch)	4.10	3.10	2.95
7200 - 016000	16	4.10	3.10	2.95
7200 - 019000	19	4.10	3.10	2.95
7200 - 019050	3/4 inch	4.10	3.10	2.95
7200 - 022225	22.2 (7/8 inch)	4.10	3.10	2.95
7200 - 025400	25.4 (1 inch)	4.10	3.10	2.95

## GRINDING MEDIA PRICE LIST

**Smaller Diameters for Biological Cell Disruption:**

7200 - 000150	0.15 - 0.25 mm	For Bacteria	\$195.00 / 7 lbs.
7200 - 000250	0.25 - 0.50 mm	For Yeast	\$170.00 / 7 lbs.

**Precision Glass Beads**      0.8mm to 1 inch ±0.01 or ±0.02mm      **Call for price.**

Suitable for ball bearings, check valves, level gauges, and low temperature critical applications.

Available in soda lime glass:      0.8 – 50.8 mm diameters.

Available in borosilicate glass:      2.5 – 50.8 mm diameters

**Borosilicate Glass Beads**      2.0mm to 18mm      **Call for price.**

Special glass for unique chemical environments.

**ALUMINA: 60%, 87%, 90%, 92%, 94%, 99.5%, 99.9% (sp. gr. 3.0 - 3.9); 0.4mm to 1.5 inch**

This line of media has replaced glass and sand as the next higher density media. Still very popular, they are somewhat more abrasive than the zirconium oxides that follow.

Large variety of compositions, shapes, and sizes.      **Call for price.**

**GLENMILLS® ZIRCONIUM OXIDE (sp. gr. 3.8) "ZrO"**

These are also called "fused zirconium oxide" or "zirconia silica". Perhaps the most popular media available having established a strong market position in the past two decades. They are 69% ZrO<sub>2</sub> and 31 % SiO<sub>2</sub>. Their surface is extremely smooth which minimizes mill wear. Standard grade "A" is available in the wider spreads. Some narrow range standard grade "A" is still available. Pre-conditioned grade "S" material has hollow, weak, and other debris removed. Pre-conditioned grade "S" is available in both wide and narrow spreads.

Packaging is 55 lbs. (25 kg.)

<b><u>PRE-CONDITIONED ZIRCONIUM OXIDE "S"</u></b>				
<u>Catalog No.</u>	<u>Approx. Size</u>	<u>Actual US Mesh</u>	<u>Quantity lbs</u>	<u>Price</u>
7305 - 000001	0.1 - 0.2 mm		} 1 - 220	\$9.10 / lbs.
7305 - 000002	0.2 - 0.3	70 - 50		
7305 - 000003	0.3 - 0.4	50 - 40	} 275 - 1045	8.10
7305 - 000004	0.4 - 0.6	40 - 30		
7305 - 000007	0.6 - 0.8	30 - 20		
7305 - 000010	0.8 - 1.0	20 - 18	} 1100 - 2145	7.60
7305 - 000020	1.0 - 1.25	18 - 16		
7305 - 000031	1.25 - 1.6	16 - 12	} 2200 and up	7.25
7305 - 000040	1.6 - 2.0	12 - 10		
7305 - 000041	2.0 - 2.5	10 - 8		
7300 - 000045*	2.5 - 3.2	8 - 6	1 - 550	6.25

\* These are standard grade "A"

Wide spreads available: 0.6 - 1.0, 0.8 - 1.25, 1.0 - 1.6, 1.25 - 2.0, 1.6 - 2.5mm      **Call for price.**

## GRINDING MEDIA PRICE LIST

### MEDIUM DENSITY ZIRCONIUM OXIDE (sp. gr. 4.1) "MD ZrO"

A newer media on the market, these are developing a position where lower cost is desired with a medium density zirconium. Also known as "sintered zirconium oxide" these are a bit more abrasive on mill components than the "fused zirconium oxide". Packaged in 55 lbs. (25kg) sacks.

Composition is 64% ZrO<sub>2</sub>, 35% SiO<sub>2</sub>, 1% Al<sub>2</sub>O<sub>3</sub>.

Sizes available range from 0.6 mm to 2.8 mm in increments of 0.2 mm.

Other materials of this composition include satellites (spheres with bands) and rods in sizes of 1/4, 3/8, 1/2, and 3/4 inch. Call for price.

### HIGH DENSITY ZIRCONIUM OXIDE (sp. gr. 5.5) "HD ZrO"

This yellow colored material offers the highest density media at a moderate price. The material is used in applications where a higher specific gravity is needed for effective grinding. Composition is 95% ZrO with 3% MgO stabilizer. Packing is 25 lbs. containers.

Catalog No.	Size (mm)	Tyler Mesh	1 - 975 lbs.*
7320 - 000100	0.6 - 0.85	28 - 20	\$ 35.00 / lbs.
7320 - 000101	0.85 - 1.18	20 - 14	25.00
7320 - 000103	1.4 - 1.7	12 - 10	22.75
7320 - 000104	1.7 - 2.3	10 - 8	19.50

\* For quantities greater than 1,000 pounds, prices are lower. Call for price.

Other sizes in rods and satellites include: 1/4, 3/8, 1/2, 3/4, 1, and 1-1/4 inches. Call for price.

### VERY HIGH DENSITY ZIRCONIUM OXIDE (sp. gr. 6.0) "VHD ZrO"

This material is the highest density material available without the problems of metal contamination. The balls are very precise diameter, extremely smooth surface for minimal mill and bead wear, and are offered in a wide range of diameters. Composition is 95% ZrO<sub>2</sub> and 5% Y<sub>2</sub>O<sub>3</sub>. Also known as "Yttria Stabilized Zirconium Oxide". Extremely high initial cost is reasonable when the better grinds and extremely long life are considered. (Two alternative material of similar composition but lower physical properties are available at lower cost, call.) Sold in 1 kg (2.2 lbs) increments.

Catalog No.	Size	1 - 9 kg	10 - 49 kg*
7361-000050	0.05mm	\$1,100.00 / kg	\$ 980.00 / kg
7361-000100	0.1	625.00	590.00
7361-000200	0.2	430.00	420.00
7361-000300	0.3	312.00	298.00
7361-000400	0.4	291.00	279.00
7361-000500	0.5	251.00	240.00
7361-000600	0.65	240.00	230.00
7361-000800	0.8	229.00	219.00
7361-001000	1.0	220.00	210.00
7361-001250	1.25	220.00	210.00
7361-001500	1.5	220.00	210.00
7361-001750	1.75	220.00	210.00
7361-002000	2.0	204.00	195.00
7361-003000	3.0	204.00	195.00
7361-005000	5.0	199.00	190.00
7361-010000	10.0	199.00	190.00
7361-015000	15.0	209.00	199.00
7361-020000	20.0	209.00	199.00
7361-025000	25.0	209.00	199.00

\* For quantities of 50 kg and greater, prices are lower. Call for price.

Other sizes in cylinders include: 1/2 and 3/8 inch. Call for price.

**GRINDING MEDIA PRICE LIST**

**STEEL BALLS (sp. gr. 7.8) "Near Ball Bearing Quality"**

These balls are produced by essentially the same method as precision balls used in ball bearings. They are extremely round, good hardness of RHC 57-67, and tight sizes. From over 1 inch in diameter down to 0.8mm they are reasonably priced. Below 1.0mm the prices climb dramatically. For steel sizes below 1.5mm see steel shot below.

*Alloys available include:*

- |                       |   |
|-----------------------|---|
| <i>AISI 52100</i>     | <i>Chrome steel RHC 60-67</i>                 |
| <i>AISI 302/304</i>   | <i>Stainless steel RHC 25-39</i>              |
| <i>AISI 316</i>       | <i>Stainless steel RHC 25-39</i>              |
| <i>AISI 440C</i>      | <i>Stainless steel RHC 58-65</i>              |
| <i>AISI 1010/1022</i> | <i>Low carbon steel RHC 60 min (surface)</i>  |
| <i>AISI 1065</i>      | <i>High carbon steel RHC 60 min (surface)</i> |

Since steel pricing varies with market conditions and quantities, do call for current prices. As an example, the 52100 chrome steels in sizes of 3/8 to 3/4 inch diameter run in the \$1 to \$3 per pound price for quantities of 1,000 lbs.

**STEEL SHOT (sp. gr. 7.8)**

These are conditioned to reduce irregular shapes and stuck debris, plus are hardened to Rockwell Hardness C 55-60 90% min. Shot is best for milling dark products. For the high density of steel in sizes below 1.5 mm they are the only reasonably priced material. Shot is a sifted product from 0.075mm to 3.0mm so call for a detailed size chart.

<u>Carbon Steel Shot</u>		<u>300 Series Cast Stainless Steel Shot</u>	
1 - 499 lbs	\$2.00 / lbs	50 - 150 lbs	\$7.00 / lbs
500 - 1,000	1.85	200 - 950	6.00
1,000 - 1,999	1.70	1,000 - 2,150	5.50
2,000 and up	1.50	2,000 and up	5.00

An older material not often used is "chilled iron" which is steel with higher carbon content. This is more brittle, but harder. Available in bulk quantities ... inquire.

**TUNGSTEN CARBIDE (sp. gr. 15) "WC"**

This is the highest density grinding media currently available with ~94% WC and ~6% Cobalt. GLEN MILLS offers unique bead sizes from ~0.5mm to 2.0mm and larger shapes 3/16" to 3/4".

**OTHER MEDIAS AVAILABLE ...**

This listing has included the more popular materials used for grinding applications. There are other materials GLEN MILLS supplies including: Plastics (polystyrene, polycarbonate, polyamide, acrylic), Ottawa Sand, Zirconium Toughened Alumina (ZTA), Silicon Carbide, Silicon Nitride, Syalon™, Porox™, Agate, Flint Pebbles, Rare Earth ZrO/CeO...  
**NEW → TEFLON COATED STEEL BALLS and more!**

*Additional \$20.00 per item for containers other than standard.  
 Additional \$50.00 per signed factory documents (COA, COC, et al). No charge for MSDS.  
 All prices F.O.B. Clifton, New Jersey, or ex works.  
 For Standard Terms and Conditions of Sale see: <http://www.glenmills.com/terms.shtml>.  
 Specifications and prices subject to change without prior notice.*