



CeraPure™ High-Purity Ceramics



# CeraPure™ High-Purity Ceramics for High-Performance Medical Devices

## Developed Specifically for Medical Applications

CeraPure technical ceramics are designed to work well in medical device applications requiring:

- Strong resistance to thermal shock
- High strength
- Biocompatibility
- Superior chemical resistance
- Excellent high-temp electrical resistivity

## Typical applications include:

Electro-surgical devices

- High stiffness
- Dielectric strength

Electro-mechanical devices

- High stiffness
- MRI transparent
- Lightweight

Rotary valve components

- Low friction seal-less designs
- High precision & repeatability

Fluid handling/pump and valve components

- Precision clearances 0.000075"
- Low-friction and long- wear characteristics

## USP Class VI Approved Materials

CoorsTek offers a broad range of high-performance ceramic materials approved to USP Class VI for medical applications. See chart below for a sample of biocompatible materials.

## World-Class Manufacturing Expertise

As the world's leading manufacturer of engineered technical ceramics, CoorsTek ensures optimal product performance by developing proprietary materials and working closely with leading medical device OEMs.

## Superior Quality

Our signature OpX™ quality and manufacturing excellence system combines best-practice methods, including: lean manufacturing, Six-Sigma, and ISO-certification to ensure high-quality products, on-time delivery, and exceptional service.

For more information, contact our medical ceramics experts at +1 800 621 6000 or visit [coorstek.com](http://coorstek.com)

| PROPERTIES                                  | UNITS                        | TEST          | ALUMINA FG                                | ALUMINA PLUS                              | ZTA                        | YTZP  | AD-96                                   | AD-995                                    |
|---|------------------------------|---------------|---|---|----------------------------|---|---|---|
|   |                              |               | NOM. 98.5% AL <sub>2</sub> O <sub>3</sub> | NOM. 99.8% AL <sub>2</sub> O <sub>3</sub> | ZIRCONIA TOUGHENED ALUMINA | Y <sub>2</sub> O <sub>3</sub> PARTIALLY STABILIZED ZR | NOM. 96% AL <sub>2</sub> O <sub>3</sub> | NOM. 99.5% AL <sub>2</sub> O <sub>3</sub> |
| Density                                     | g/cm <sup>3</sup>            | ASTM-C20      | 3.8                                       | 3.92                                      | 4.09                       | 6.07  | 3.72                                    | 3.9                                       |
| Color                                       | -                            | -             | IVORY                                     | IVORY                                     | WHITE                      | IVORY   | WHITE                                   | IVORY                                     |
| Flexural Strength (MOR) 20° C               | MPa (psi x 10 <sup>3</sup> ) | ASTM-F417     | 375 (54)                                  | 375 (54)                                  | 623 (90)                   | 1720 (250)  | 358 (52)                                | 379 (55)                                  |
| Elastic Modulus 20° C                       | GPa (psi x 10 <sup>6</sup> ) | ASTM-C848     | 350 (51)                                  | 370 (54)                                  | 366 (52)                   | 210 (30)  | 303 (44)                                | 370 (54)                                  |
| Compressive Strength 20° C                  | MPa (psi x 10 <sup>3</sup> ) | ASTM-C773     | 2500 (363)                                | 2500 (363)                                | 4000 (580)                 | 2500 (363)  | 2068 (300)                              | 2600 (377)                                |
| Hardness                                    | kg/mm <sup>2</sup>           | KNOOP 100gm   | 13.7 (1400)                               | 14.1 (1400)                               | 17.5 (1777)                | 14.1 (1440)   | 11.5 (1175)                             | 14.1 (1440)                               |
| Fracture Toughness K(I c)                   | MPam <sup>1/2</sup>          | NOTCHED BEAM  | 4-5                                       | 4-5                                       | 6                          | 13  | 4-5                                     | 4-5                                       |
| Thermal Conductivity 20° C                  | W/m K                        | ASTM-C408     | 27.5                                      | 30  | 27                         | 2.2   | 24.7                                    | 30  |
| Coefficient of Thermal Expansion 25-1000° C | 1X 10 <sup>-6</sup> /°C      | -             | 8.2                                       | 8.2                                       | 8.3                        | 10.3  | 8.2                                     | 8.2                                       |
| Thermal Shock Resistance Δ Tc               | °C                           | ①             | 200                                       | 200                                       | 300                        | 200   | 250                                     | 200                                       |
| Maximum Use Temperature                     | °C                           | NO-LOAD COND. | 1700                                      | 1750                                      | 1500                       | 1500  | 1700                                    | 1750                                      |
| Volume Resistivity 25° C                    | ohm-cm                       | ASTM-D1829    | >10 <sup>14</sup>                         | >10 <sup>14</sup>                         | >10 <sup>14</sup>          | >10 <sup>13</sup>                                     | >10 <sup>14</sup>                       | >10 <sup>14</sup>                         |

① Thermal Shock Resistance – Tests are run by quenching samples into water from various elevated temperatures. The change in temperature where a sharp decrease in flexural strength is observed is listed as DTc.

The chart is intended to illustrate typical properties. Property values vary with method of manufacture, size, and shape of part. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which CoorsTek assumes legal responsibility. CoorsTek is a registered trademark of CoorsTek, Inc. CeraPure and OpX are trademarks of CoorsTek, Inc



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