

Technical Ceramics

versatility meets  
high performance





# Bring on the Heat!

When the first porcelain electrical insulators were introduced in the mid-1800s, engineers couldn't even begin to imagine the depth and breadth of applications advanced ceramics would have in the centuries to come. Today, designers and engineers turn to technical ceramics when other materials simply aren't up to the task — where the intense heat generated by an electronic device requires a lightweight, miniaturized thermal management solution, for example, or where a medical device component must remain transparent to x-rays.

Materion has been part of the technical ceramics industry for decades, formulating and testing high-performance materials, and working with engineers worldwide to broaden their application potential across industries that include medical technology, electronics manufacturing, advanced defense manufacturing, energy equipment design, wireless communications and others.

Our goal at Materion is to ensure that your team always has access to the right materials so they can achieve extraordinary results. Whether you need advanced technical ceramics, high-performance alloys, clad metals, metal matrix composites or any other material, call Materion first. We're here to help you take on every challenge with confidence, clarity and the very best materials the world has to offer.



# Excellence in Technical Ceramics

The market for engineered ceramics is booming as the new generation of designers and engineers become familiar with their versatility, strength, performance and properties. These materials can be an ideal solution for applications that require thermal management and conductivity, miniaturization, weight savings, biocompatibility, or corrosion and wear resistance.

As a leading global supplier of technical ceramics, Materion keeps pace with the latest technological advances to ensure our materials meet the evolving needs of the industries that benefit most from these engineered ceramics. Our beryllium oxide (BeO) and aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) ceramic materials solve design and engineering challenges in these industries and more:

- Medical equipment
- Electronics manufacturing
- Semiconductor manufacturing
- Aerospace and defense
- Laser systems
- Energy
- Industrial
- Telecommunications

For physical and mechanical properties data related to Materion's beryllium oxide (BeO) and aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) ceramic materials, download our ceramics material properties chart.

[View properties chart](#)



## Beryllium Oxide Ceramics & Powder

With thermal conductivity second only to diamonds among insulating materials, Materion's advanced beryllium oxide (BeO) ceramics perform exceptionally well in applications across the medical, semiconductor manufacturing, advanced defense manufacturing, energy equipment and wireless communications industries.

Both Thermalox<sup>®</sup> ceramics and BW ceramics offer unparalleled solutions where product strength, reliability, miniaturization, weight savings, and thermal management and conductivity are critical. For example, common medical applications include laser bores in DNA sequencers, heat sinks in defibrillators, and components for flow cytometry and hematology. Our BeO ceramics are ideal anywhere high electrical resistivity, transparency to x-rays or a low neutron absorption cross section are required.

### Thermalox<sup>®</sup> Ceramics

Thermalox 995, Materion's standard BeO, can be used in electronic substrates, gas laser bores and medical applications. Thermalox CR, our high-purity BeO (99.7% pure), is commonly used as a crucible material for melting high-purity materials.

### BW Ceramics

When small components require great strength, BW 1000 ceramic is the optimal choice. It offers the highest flexural strength of all of Materion's beryllia grades. BW 3250 BeO ceramic offers the highest thermal conductivity of our grades at 325 W/m•K — 80% higher than common grades of aluminum nitride (AlN).

### BeO ceramics deliver:

- Superior strength
- Miniaturization
- High reliability
- Weight savings
- Thermal conductivity
- Thermal management

### BeO Powder

Materion's two grades of BeO powder are used to form critical thermally conductive components for high-performance semiconductor applications, microwave devices, vacuum tubes, gas lasers and magnetrons. These high-purity, uniform powders can be sintered into unique shapes to meet your unique design specifications.

Download our BeO powder data sheet.

[View data sheet](#)







## Durox® Alumina Ceramics

When an application calls for high thermal and dimensional stability, and low thermal expansion within very tight tolerances, consider Materion's Durox family of alumina ( $\text{Al}_2\text{O}_3$ ) technical ceramics. These high-purity materials, available in a range of shapes and purities, offer a cost-effective solution for phototonics/laser, defense, energy and telecommunications applications, as well as semiconductor manufacturing applications — heat sinks, ceramic substrates, dosimeters, laser tubing, resistor cores, etc.

Second only to diamonds in hardness, these advanced ceramics are available at a fraction of the cost. Choose Durox 98 ceramic (97.6% pure  $\text{Al}_2\text{O}_3$ ) when your focus is affordability or Durox AL ceramic (99.8% pure) when you're seeking higher tensile strength, dielectric strength and thermal conductivity.

### Durox Alumina ceramics deliver:

- Excellent RF properties
- Etching resistance
- High stiffness-to-weight ratio
- Biocompatibility
- High-temperature stability
- Low thermal expansion
- High dielectric strength
- Corrosion resistance
- Optimum wear resistance



## high strength

and thermal stability

To find out more about Materion's technical ceramics applications and specifications, contact our expert Technical Ceramics team. They can answer your questions and offer information, insights and ideas for leveraging these materials to their fullest.

Contact an expert