Beryllium Products

there's no substitute for genuine

beryllium

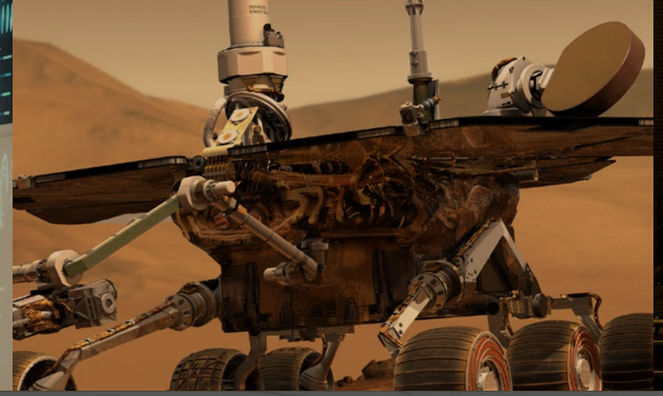
MATERION

Beryllium stands up to increasingly advanced applications.

Demand for genuine beryllium products continues to grow as engineers recognize that beryllium's performance and reliability are unrivaled in advanced space, nuclear, defense, medical and acoustic technologies. Intense environments require extraordinary materials, so it's not surprising that beryllium is so often the material of choice and that Materion is the supplier of choice. We have, after all, led the industry in the mining, production and manufacture of beryllium for more than 80 years.

Our history and depth of experience with beryllium and beryllium-containing materials enable our team to provide expert insights into the benefits, custom engineering and design options, and safe handling of genuine beryllium. So no matter what your industry or application, you can confidently rely on Materion to help you bring your design concepts to full fruition.

Clive Grannum
President



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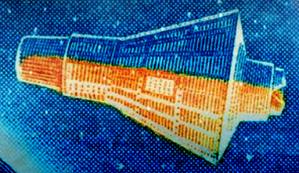
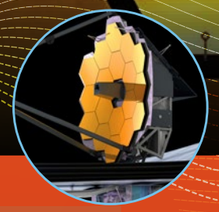
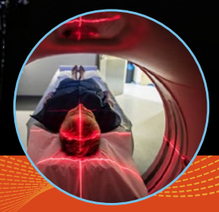
PROJECT MERCURY



U.S. MAN IN SPACE





Materion's collaboration with NASA on space technologies dates back to 1958, when our company (then called Brush Beryllium Company) developed a beryllium shield for the Project Mercury mission to protect Alan Shepard's return capsule from the blazing reentry heat. Much more recently, Materion created beryllium-based solutions for the Spirit and Opportunity Mars rovers, Kilopower nuclear reactor project, and James Webb Space Telescope.

These historic successes illustrate the extraordinary performance of Materion's beryllium. In extreme environments — for space, nuclear, defense, medical and other demanding applications — no other materials come close.

Key Attributes

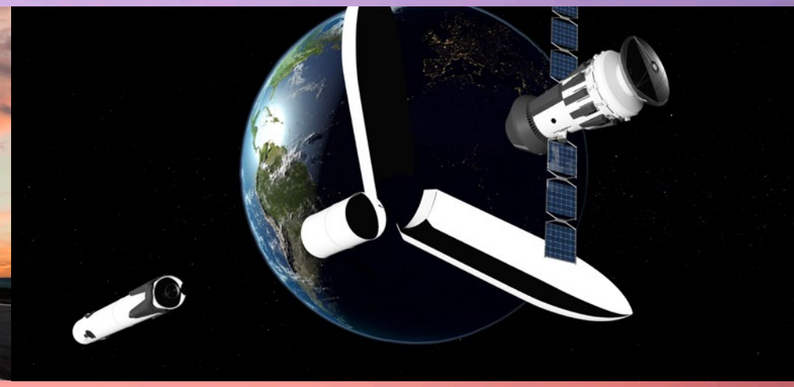
- High stiffness and low density
- Unmatched modulus-to-weight ratio
- Lighter weight and higher thermal conductivity than aluminum
- Low thermal expansion

60-year legacy in space Learn More >

Beryllium optics enable space technologies Learn More >

Defense Applications

From defense satellites and missile defense systems to Apache helicopters and F-35 fighters, Materion engineers beryllium metals to maximize the stiffness and minimize the weight of defense equipment. In avionics components, beryllium provides increased stiffness and consistent properties in high altitudes which translates to exceptional reliability for mission critical avionics such as military reconnaissance equipment, aircraft guidance systems, radar systems and electronic chassis.



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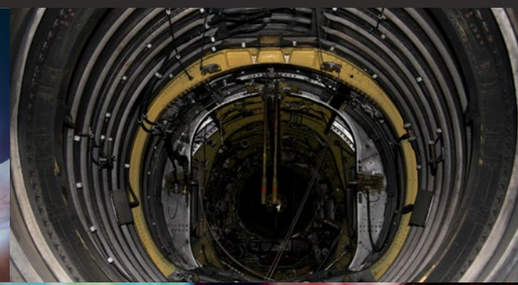
Beryllium designing & fabricating guide Learn More >

Nuclear and Physics Research

With its neutron multiplication capability and low atomic weight, beryllium is essential to fission and fusion reactors, and other equipment used for nuclear medicine, power production, environmental and groundbreaking physics research applications , including the CERN Large Hedron Collider.



/ Truextent™ Acoustic Beryllium Domes & BeX™ Diaphragm Assemblies

Clear, crisp, mind-blowing sound — on stage, at home or on the go.

Audiophiles and concertgoers alike appreciate the virtually distortion-free sound reproduction made possible by Truextent Genuine Acoustic Beryllium components. Designed for a variety of high-end OEM pro sound, aftermarket replacement and audiophile applications, these components reproduce the subtle nuances of sound with exceptional precision.

Choose from Truextent Acoustic Beryllium Foil custom-fabricated speaker domes, custom speaker cones, domes for headphones and in-ear monitors, and BeX diaphragm assemblies for loudspeakers. Our components are available in a range of sizes to fit tweeters, hi-fi midrange, compression drivers and high-end headphones.

Key Attributes

- Fewer mechanical deformations under stress
- Higher damping for distortion-free sound
- Extra usable octave of resonance-free high-frequency sound
- Greater responsiveness due to low mass
- More durable than PVD

Acoustic Properties of Beryllium white paper Download >

/ UHV Components

Beryllium powers scientific research.

Advanced laboratories around the world rely on Materion for custom-designed ultra-high vacuum (UHV) chambers to support their research applications. For more than 50 years, we have fabricated UHV components, including custom research chambers equipped with beryllium X-ray windows, actively cooled window assemblies and CF flange (ConFlat®) window assemblies. In the area of high-energy physics research, Materion has developed beryllium beampipe technology for CERN's Large Hadron Collider, as well as other particle accelerators. We also build beryllium window assemblies for particle accelerators, synchrotrons and collider research centers, and other components for advanced UHV applications.

Key Attributes

- High heat capacity (1,287°C melting point)
- High thermal conductivity
- Favorable coefficient of thermal expansion (11.4×10^{-6}/cm/cm/°C)
- High strength yet light weight (1.85 g/cm^3 density)
- Tight tolerances on roundness and straightness

Development of Beryllium Vacuum Chamber Technology for the LHC Download >

/ X-ray Window Assemblies and X-ray Foil

For medical imaging and analytical scans, the solution is clear.

When image clarity and reliability are paramount, nothing but pure beryllium will do. Materion offers beryllium X-ray foil and window assemblies in a variety of purity levels to support a broad range of medical, industrial and analytical applications. For example, our IF-1® grade beryllium foil is 99.8% pure beryllium, providing exceptional X-ray clarity for artifact-free applications, mammography and semiconductor inspection. Thicker gauges can be ideal for synchrotrons and X-ray lensing.

Materion's specialized bonding process creates a stronger seal in beryllium X-ray window assemblies than other processes do. Through stringent temperature control (below the melting point of the interstitial alloy), we ensure uncompromised beryllium strength for superior performance.

Key Attributes

- High transmissivity to X-rays
- High strength and low density
- Outstanding stiffness-to-weight ratios
- High thermal conductivity
- Low mass absorption coefficient

Case Study:
Varex Imaging Corporation Download >