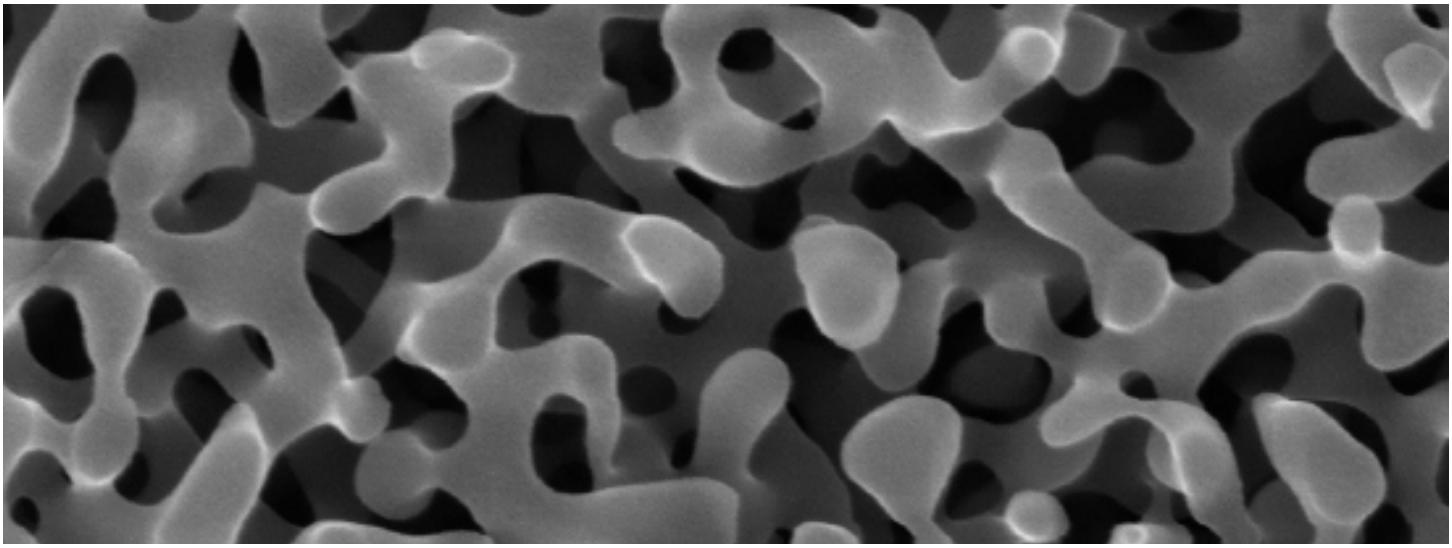
SCHOTT
glass made of ideas

INNOVATION



Keeping It Dry

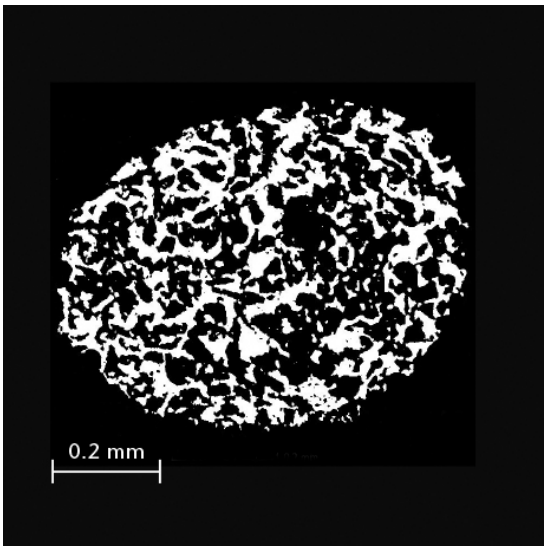
Porous Glass Can Act as an Effective Desiccant to Preserve Precision and Functionality in Medical, Optics, and CO_2 Laser Applications

Nearly as ubiquitous as the air we breathe, moisture occurs naturally and is all around us on a near-constant basis: condensation on a drinking glass, low fog in the morning, spray from waves on the beach to name just a few examples. While commonly encountered in everyday life, moisture is not always a mundane and ignorable presence. In the case of high-performance electronics that are well known for both their precision and sensitivity, moisture intrusion can have catastrophic consequences. There are established methods for mitigating moisture presence in ordinary consumer products, but what about the circumstances in which even the slightest detectable presence of moisture can result in damaging effects? This is where porous glasses serve an important purpose: with substantial surface area and the appropriate surface chemistry, porous glasses can act as a high-performance desiccant to protect moisture-sensitive electronics in applications that include medical devices, precision optics, and CO2 lasers, among others.

The Function and Importance of Desiccants

The term desiccant defines substances that act as drying or dehumidifying agents. The most well-known example of a desiccant comes in the form of a small bag filled with silica that is typically found with a “do not eat” label in packaging for clothing, footwear, pharmaceuticals, and scores of other common products. These consumer-grade packets keep things dry during shipping and storage with great effectiveness.

Porous glasses perform an essentially identical function as the aforementioned silica packets with similar success. While silica packets keep a general environment of low-moisture with their presence in a box or bag, porous glasses – with their rigidity and fully customizable shaping options – enable the desiccant to be tailored to the space available and affixed securely. This is particularly advantageous in applications where even minute moisture presence can be damaging, as porous glasses can act as a “hands on” drying agent directly in moisture-sensitive areas.



A look at the porous structure of
SCHOTT CoralPor porous glass

A CO2 laser being used in skin treatment

Use Cases for Porous Glass as a High-Performance Desiccant

There are several core applications where porous glass could be an exceptional fit in its use as a desiccant for moisture mitigation requirements. The shape adaptability and customization options of porous glass allow for seamless integration without major change to existing systems and component designs – it can be designed to fit existing applications rather than the other way around.

Medical Devices

Medical devices in all settings – from those used in routine checkups to complex surgical instruments – require an uncompromising high degree of performance and precision. Technological advancements in recent years have brought increased functionality through advanced electronics integration in medical devices. Examples include imaging cameras, patient monitoring systems, and even robotic surgery components. Regardless of usage, a common requirement for medical devices is complete protection and absolute dryness for sensitive electronic components. This is something that can be a challenge given the fact that many procedure-based devices must undergo intense and humid sterilization processes or otherwise be exposed to moisture in their typical usage. Porous glass can serve as a highly-effective desiccant in medical applications to prevent damaging moisture buildup in sensitive electronics. Flexible customization enables easy integration with minimal to no changes needed to existing device designs.

Precision Optics

Rangefinders and night-vision goggles utilize intricate electronic infrastructure to act as vision aids for measurements and low-light conditions. Both of these optical devices operate using laser systems to perform their key functions. These lasers are extremely sensitive, particularly when it comes to moisture. The presence of any moisture in the laser system can result in inaccurate performance or even total failure of the entire device. Usage of these devices typically takes place outdoors and in a variety of weather conditions, and sometimes in mission-critical military and defense settings. With frequent potential

exposure to harsh environmental conditions and safety-critical demands for performance, porous glass is an ideal choice to serve as an effective desiccant for moisture prevention in these precision optical devices. Effective weather sealing in combination with rigid custom fitment of porous glass directly around sensitive laser components affords piece of mind for uncompromised performance in all types of conditions.

CO_2 Lasers

The CO_2 laser is a very common and versatile laser type that has been in frequent continuous usage since its development in the mid-1960s. CO_2 lasers are known for their high power output, which is adjustable depending on application requirements. Common uses for CO_2 lasers include industrial cutting and welding as well as skin treatment procedures. As with the previously mentioned applications, moisture intrusion can adversely affect or completely disable CO_2 lasers – a particular concern when working in industrial or patient-facing uses where safety is paramount. Placing porous glass in CO2 lasers to act as a desiccant can address these concerns. The moisture mitigation delivered by porous glass can help effectively promote the precision, functionality, and lifespan of CO_2 laser systems.

While well suited for these applications, these are not an exhaustive list of the potential uses for porous glass. In fact, any application with stringent requirements for moisture prevention by use of a desiccant is a potential fit for integration of porous glass – particularly those that utilize lasers in some form.

Staying Dry When it Matters Most

Desiccants serve an important purpose in mitigating the potentially damaging effects of moisture presence in a wide-reaching array of applications areas. When the requirements are particularly stringent for complete moisture prevention and unwavering performance, porous glass can serve as a highly effective desiccant that has the capability to be customized for fitment directly in sensitive areas without major design changes to existing components or systems. Working with a glass expert with experience in porous glass manufacturing and fitment, especially in the case of laser systems, can help deliver reliability, longevity, and peace of mind thanks to effective moisture prevention in areas where it is a crucial requirement.