



PROSEAL+

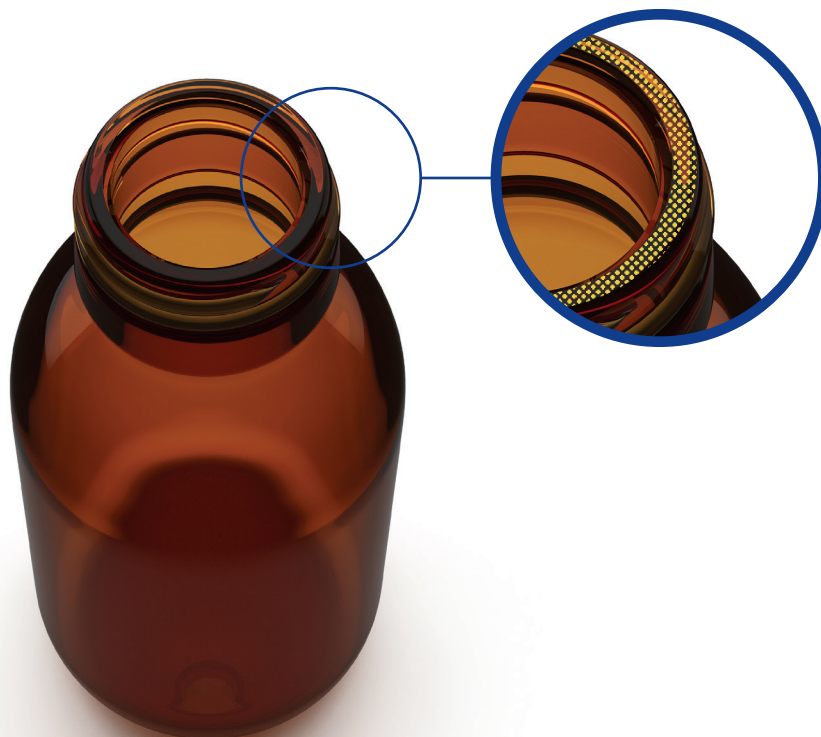
Pre-treated glass bottles for an optimal hermetic seal

Many of today's oral pharmaceutical products are sensitive to moisture and oxygen. That's why selecting the right primary packaging materials and closure systems are critical for **maintaining shelf-life**.

For oral products, especially sensitive ones such as powders and solids, adding a moisture and oxygen resistant hermetic seal to the glass bottle brings huge benefits. A hermetic seal protects both the contents and consequently the user as the seal also provides an added level of security as a **tamper evident** feature.

For over 15 years, SGD Pharma has offered an industry leading solution to bottle sealing challenges. Using a well-established **external treatment on the sealing surface** of the glass greatly enhances and guarantees an optimal seal adhesion of the foil. Our PROSEAL+ glass bottles are suitable for both induction or heat seals, both of which help form a completely hermetic seal which can **maximize product shelf life** and provide best-in-class product **protection**. Our external treatment is suitable for use in pharmaceutical-grade packaging and is food contact compliant.

Transparent adhesive
on the sealing surface

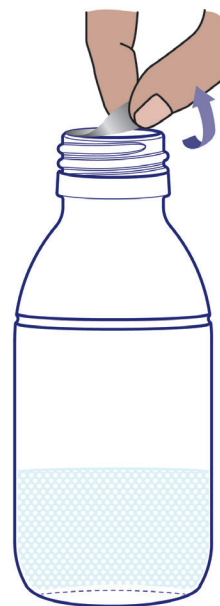


SGD PHARMA PRODUCT RANGES

PROSEAL+ bottles are available for:

- Molded glass in Type III
- Clear or amber glass
- All vials from 10mL to 730mL
- Neck finish available with adhesion enhancer: PP28, MCA2, R3/28, R3/24

Please contact your SGD Pharma experts if you have a glass container requirement not listed above. SGD Pharma supports development of new or custom glass applications.



BENEFITS OF OUR THERMOSEALING TREATMENT

Using our PROSEAL+ bottles can greatly increase the effectiveness of the sealing and reduce leakage. The enhanced sealing can generate benefits for the product including:



Enhanced product protection with hermetic sealing: oxygen and moisture-resistant closure system



Product integrity with tamper evidence for patient safety and added security throughout the supply chain



Child Resistant Senior- Friendly (CRSF) closures compatible



Compliance: a full regulatory package is available on demand.

Glass bottles remain among the most chemically inert primary packaging containers on the market, combined with an adhesion layer, product stability can be extended. SGD Pharma's PROSEAL+ pre-treated glass bottles can enhance product protection for a wide range of product types.

PROVEN PRODUCT PROTECTION

The seal can reduce oxygen permeability and water vapor transmission rate (WVTR) into capped glass bottles. Test data demonstrates the overall effectiveness of such seals, of particular importance for some dry powders or formulations that are oxygen and/or moisture-sensitive.

Contact-us if you wish to know more about test conditions

Results*

Oxygen (O₂) permeability test and water vapor transmission rate (WVTR) tests have been performed on capped vials, with and without a hermetic seal.

Using a hermetic seal that is impervious to oxygen and water vapor renders the assembled packaging system highly protected from the external environment.

Regardless of the effectiveness of the threaded cap, the heat-sealed bottle provides protection from moisture and oxygen on its own.

Once the heat seal is applied to the glass container, the entire system becomes virtually impervious to oxygen and water vapor. The adhesion layer applied to SGD Pharma glass vials and bottles ensures a reliable seal and product protection.

Added value for sensitive products

These results are especially important for the packaging of certain sensitive dry powders and/or oxygen sensitive substances.

* Data on file

Oxygen and water permeability are greatly reduced in sealed vials.

Permeability values for capped bottles with and without seal

Closure	Oxygen permeability μL/(vial.day)	Water Vapor Transmission mg/(vial.day)
Cap only	840	0.45
Cap & hermetic seal	< 1	< 0.3

The results demonstrate that PROSEAL+ bottles/vials with a seal but no cap, still provide strong protection from water vapor transmission and oxygen.

Permeability values for non-capped bottles with seal only and various neck-finishes

Neck-finish thermosealed without cap	Oxygen permeability μL/(vial.day)	Water Vapor Transmission mg/(vial.day)
R3/24	< 1	< 0.3
MCA2	< 1	< 0.3
PP28	< 1	< 0.3
R3/28	< 1	< 0.3