

Closure Liner Suggestions

NOTE: It is the customer's responsibility to determine the suitability of closures and closure liner materials for the customer's product. California Glass disclaims any and all implied warranties of merchantability or fitness for a particular purpose. The customer assumes all risk that products purchased will be suitable for their intended use.

HOW A CLOSURE LINER FUNCTIONS

The only part of a properly functioning closure and liner that comes in contact with the contents of the package is the face or facing of the liner. The threads or other parts of the closure perform no sealing function other than the mechanical one of maintaining intimate contact between the face of the liner and the glass sealing lip.

A properly functioning liner must fulfill three general requirements:

1. When the face or facing is pressed against the container-sealing surface with normal closure pressure, it must provide a positive barrier against liquid leakage.
2. It must provide an adequate barrier against escape of vapors of all components of the packaged product, and against entry of atmospheric moisture and gases.
3. It must withstand constant contact with the product under all conditions of storage without appreciable chemical or physical change, and must contribute nothing deleterious to the products such as odor, flavor, toxicity, or unsatisfactory appearance.

EVALUATING CLOSURE LINERS

Customers are responsible for evaluating or testing to determine the suitability of closure design and closure liner material for their specific product and package requirements. California Glass Company has no control over product formulations, package design, package handling, and storage and cannot therefore assume any responsibility for customer's choice of closure or closure liner materials. The entire package including the closure should be tested and evaluated by the customer to confirm that the package is satisfactory for its intended use.

Caution: Particular care should be exercised in the selection of liners for *child-resistant* closure systems. Certain products can alter the effectiveness of child-resistant closure if exposed to the child-resistant mechanism or closure components. Therefore, in selecting a child-resistant closure liner, appropriate testing should be conducted to demonstrate that the package remains child-resistant and adult-effective throughout its expected shelf life and use.

STANDARD LINERS

Where possible, standard liners are suggested as first choice with nonstandard liner materials as alternate suggestions, providing that standard liners are compatible with the product and are competitive in price. The use of standard liners is advantageous to customers because these materials are generally in stock.

TACSEAL®

Tacseal® is the Owens-Brockway designation for an inner-seal liner, which is positioned in the closure and applied over the orifice of the container when the closure is applied. A Tacseal® liner remains in place on the container when the closure is removed and forms a seal until lifted or broken. There are three primary methods of applying the Tacseal® liner, namely, by wet adhesives, heat activation, or pressure activation. The Tacseal® is an extra seal that can add protection for such factors as water vapor and volatile components and protection against contamination and leakage. Tacseal® liners are normally available in sizes through 89 mm C.T. closures.

Again, the customer has the responsibility to evaluate the inner-seal system to be used with the product, the container to be sealed, and the equipment used to close and/ or activate the materials selected.

WAX COATINGS

Three wax treatments are available: Lubricant Finish (LF), Light Wax (LW), and Full Wax (FW). Each of these coatings is applied at different coating weights and uses different wax formulations.

LUBRICANT FINISH (LF):

Lubricant finish treatment is used to reduce excessive removal torque buildup typical of vinyl and polyethylene-coated papers. Vinyl and polyethylene-coated papers have a tendency to cold flow, and as such, may result in removal torque buildup. This characteristic is accentuated with time and temperature.

The "LF" coating of wax does not completely eliminate the buildup but does materially reduce its effects to a practical workable range. The "LF" coating is also used with Saran film. Saran film has a tendency to grab the glass-sealing surface during capping, thus causing erratic capping performance, which results in false application values. Closures that appear to be on tight are reduced to approximately zero removal, which has a slight impact on handling. To overcome this tendency and to ensure good application and removal torque performance, the "LF" coating of wax should be used on all Saran liners when product compatibility will allow.

In view of the above characteristics of vinyl and polyethylene-coated papers and Saran film, it is strongly suggested that the "LF" coating of wax be used on these liners at all times, particularly with molded plastic caps with glued-in liners, when product compatibility will allow.

LIGHT WAX (LW)

Light wax treatment is generally used to improve the moisture vapor barrier characteristic of a given liner facing. The type of wax used for this treatment also acts as a lubricant in the same manners that "LF" coating of wax does for vinyl and polyethylene-coated papers and Saran films.

FULL WAX (FW)

Full wax treatment is generally used on wide-mouth closures as a caulking agent. Many liner facings provide a less than satisfactory seal for wide-mouth containers. The larger the finish, the greater the tolerance in both container and finish. The inherent waves and dips of large finishes also contribute to this condition. For this reason, full wax treatment is generally suggested for closures 58 mm and larger.

The full wax treatment will also provide an additional moisture barrier and act as a lubricant similar to the "LW" and "LF" coating treatments.

LINER DESIGNATIONS

Abbreviations for duplex liners describe the liner starting with the backing material and working toward the facing. Everything to the left of the "slant" is related to the backing material, and everything to the right of the "slant" is concerned with the facing and its treatment, i.e.:

	P = Pulpboard
P/SFLF	SF = Saran Film
	LF = Lubricant Finish Wax Treatment

The following list comprises the liner facings appearing in the suggestion chart:

RVT Vinylseal	Thermosetting vinyl coating applied on high-density polyethylene-coated white paper
SF Saran Film	Paper-backed Saran film
SCK*** Saran Coated Kraft	PVDC (Saran) emulsion coated on polyethylene-coated Kraft paper
SA-66* Polyester / Aluminum Foil	Polyester film laminated to MF-514* paper-backed 0.00035 aluminum foil
PE Polyethylene-Coated Paper	0.0015 polyethylene film extrusion coated to bleached Kraft paper
TF* Tin Foil	0.0015 tin foil laminated to paper
VAF Vinyl-Coated Aluminum Foil	Vinyl coating on paper-backed 0.00035 aluminum foil
O Oil Paper	Oleoresinous varnish coating applied to Kraft paper
H* Harvel	Varnish coated paper (cashew nut shell derivative)
AF* Aluminum Foil	0.0015 aluminum foil laminated to white Kraft paper

Unit Liners (No Separate Backing)

PY* Solid Polyethylene	Extruded solid polyethylene.
PW Pulp Waxed	Pulpboard with .001 to .002 wax coating on one side.
Plastisol****	Vinyl chloride resin applied as a liquid and baked to final form. (Flowed-In)
F-217**	Coextrusion of low-density solid polyethylene/foamed low-density polyethylene/low-density solid polyethylene.
F-422**	Coextrusion of high-density solid polyethylene/foamed low-density polyethylene/high-density solid polyethylene.

EVAVIII*****

Extrusion of low-density polyethylene-vinyl acetate copolymer resin.

CAP-SEAL II

Formulated polyolefin (polyethylene) having a continuous 4230* barrier facing to 2-4 mils in conjunction with a resilient foamed backing.

*** Nonstandard liner in all closures**

**** Nonstandard liner in metal C.T. closures**

***** Nonstandard liner in plastic closures**

****** Call California Glass for information**

******* Available only in aluminum roll-on pilfer-proofconvenience closures**