

# WHEATON®

## CLOSURE & LINER

### STERILIZATION COMPATIBILITY GUIDE



Choosing the right septa and closures for your analysis is critical to ensure chemical compatibility with your drug content, protect sample integrity and prevent contamination.

A closure is the part of the container closure system (CCS) designed to prevent the contents from escaping and allowing no outside substance to enter the container.

In the case of CCS affixed with screw thread closures, choosing the right combination of closure and liner material is critical to ensure container contents are protected from moisture, vapor, and contamination while meeting required chemical compatibility, sealability and sterility applications.

DWK offers closures and liners appropriate for pharmaceutical, diagnostic, and personal care applications

• Chemical Reactivity	• Sealability
• Impact Strength	• Permeability
• Sterilization Compatibility	• Moisture Barrier
• Cold Storage	• Compression

# STERILIZATION METHODS

Protocol	Steam Autoclave 120C, 20min, 15psi	Dry Heat 160-180C, 60-120min	EtO Gas 60C, 4-24hr	Gamma & Ebeam 25 – 60 KGy (Kilograys)
<b>Sterilization Cap Material*</b>				
Phenolic (Wood-Filled)	No	No, Max 150°C	Not Tested	Not Tested
Phenolic (Mineral-Filled)	Yes	No, Max 150°C	Not Tested	Not Tested
Polypropylene	Yes	No, Max 140°C	Yes	Possible. May yellow
High Density Poly Ethylene (HDPE)	No	No, Max 120°C	Yes	Yes
Low Density Poly Ethylene (LDPE)	No	No, Max 80°C	Yes	Yes
Urea	No	No, Max 132°C	Not Tested	Not Tested
Polybutylene Terephthalate (PBT)	Yes	Yes	Not Tested	Gamma Resistant
<b>Sterilization Liner Material**</b>				
Polyethylene (Disk)	No	No	Yes	Yes
Foamed Polyethylene (PE Foam)	No	No	Yes	Yes
PTFE Faced Foamed Polyethylene (PTFE / PE Foam)	No	No	Yes	No
Pulp / Poly-Vinyl	No	No	Yes	No
Foil-faced Pulp Liner (Pulp / Metal Foil)	No	No	Yes	No
PTFE-faced styrene-butadiene 14B Rubber	Yes	No	Not Tested	Not Tested
Styrene-butadiene 14B Rubber	Yes	No	Not Tested	Not Tested
Polyethylene Cone (LDPE Cone)	No	No	Yes	Yes

\*Phenolic caps may be wood-filled (not autoclavable) or mineral filled (autoclavable)

\*\*Liners may be bonded or welded. Welded liners reduce the risk of adhesive contamination and bond failure which may occur with autoclaving or other high temperature operations

## PERFORMANCE — CAP MATERIAL

	Chemical Reactivity*	Permeability**	Impact Strength	Cold Storage***
Phenolic (Wood-Filled)	Excellent	Low	Good	Good
Phenolic (Mineral-Filled)	Excellent	Low	Good	Good
Polypropylene	Good	Moderate	Excellent	Excellent
High Density Poly Ethylene (HDPE)	Good	Moderate	Good	Excellent
Low Density Poly Ethylene (LDPE)	Good	High	Excellent	Excellent
Urea	Fair	Low	Excellent	Good
Polybutylene Terephthalate (PBT)	Good	Low	Good	Excellent

\*Chemical reactivity is generalized based on aggregate performance over range of chemicals. Refer to WCG\_010 Chemical Compatibility Guide for specific chemical/material compatibility

\*\*Permeability is an aggregate comparative of vapor and moisture relative to plastic materials and does not include glass

\*\*\*Generalization which varies with shelf life requirements and cold temp specification

## PERFORMANCE - LINER MATERIAL

	Chemical Reactivity	Sealability	Moisture Barrier
Polyethylene (Disk)	Good for acids, alkalis, solvents, alcohols, oils, household, personal care and aqueous products. Poor for hydrocarbon solvents.	Excellent	Excellent
Foamed Polyethylene (PE Foam)	Good for acids, alkalis, solvents, alcohols, oils, household, personal care and aqueous products. Poor for hydrocarbon solvents.	Excellent	Good
PTFE Faced Foamed Polyethylene (PTFE / PE Foam)	Excellent	Excellent	Good
Pulp / Poly-Vinyl	Good for mild acids, alkalis, solvents, alcohols, oils and aqueous products. Poor for active hydrocarbons and bleaches.	Good	Excellent
Foil-faced Pulp Liner (Pulp / Metal Foil)	Excellent for organic solvents, gases, fluids and mineral oils. Good for resistance to hydrocarbons, oils, ketones and alcohols. Not good for acids or alkalis.	Good	Excellent
PTFE-faced styrene-butadiene 14B Rubber	Excellent	Excellent	Excellent
Styrene-butadiene 14B Rubber	Satisfactory for most moderate chemicals. Not good for oils, strong acids and hydrocarbons.	Excellent	Excellent
Polyethylene Cone (LDPE Cone)	Good for acids, alkalis, solvents, alcohols, oils, household, personal care and aqueous products. Poor for hydrocarbon solvents.	Excellent	Excellent

# LINER / CLOSURE COMBINATIONS

	Phenolic (wood filled)	Phenolic (mineral filled)	Polypropylene	HDPE	LDPE	Urea	PBT
Polyethylene (Disk)	Yes	*	No	No	No	No	No
Foil-faced Pulp Liner (Pulp / Metal Foil)	Yes	*	Yes	No	No	Yes	No
PTFE Faced Foamed Polyethylene (PTFE / PE Foam)	Yes	*	Yes	No	No	Yes	No
PTFE-faced styrene-butadiene 14B Rubber	No	Yes	Yes	No	No	Yes	Yes
Styrene-butadiene 14B Rubber	No	Yes	No	No	No	No	No
Polyethylene Cone (LDPE Cone)	Yes	*	No	No	No	Yes	No
Pulp / Poly-Vinyl	Yes	*	Yes	No	No	No	No
Foamed Polyethylene (PE Foam)	No	*	Yes	No	No	No	No
Linerless	No	Yes	Yes	Yes	Yes	No	Yes

\*Custom

## Closure Liner Guide

### PTFE Faced Silicone Rubber (PTFE / Silicone)

The liner consists of 0.005" thick PTFE bonded to 0.055" thick silicone rubber.

Ideal for low temperature storage applications. PTFE facing provides excellent chemical barrier. Autoclavable

### Polyethylene Cone (PE Cone)

Manufactured from polyethylene (LDPE). The unique cone design provides a wedge type seal that not only seals across the top but also across the inside diameter.

Unique problem solving type of liner. This liner is stress crack resistant and offers superior torque retention and excellent sealing characteristics. It is recommended that this liner be tested prior to use for leak seal.

### Low Density Polyethylene (LDPE) Disk

Manufactured from polyethylene. Good for distilled water, analytical standards and reagents.

### PTFE Faced Foamed Polyethylene (PTFE / PE Foam)

PTFE faced foamed polyethylene liner offers the excellent chemical resistance of PTFE with the compressibility and sealing properties of polyethylene foam.

Typical applications: analytical lab samples, high purity chemicals, strong acids, solvents. Excellent for environmental samples, pharmaceuticals and diagnostic reagents.

### Pulp / Poly-Vinyl

One mil poly-vinyl film bonded to one mil HDPE on a #30 white pulp paper backing. Superior to plain pulp paper because it provides an excellent moisture barrier.

General purpose: Suitable for wide range of applications. Chemical resistance: Good for mild acids, alkalis, solvents, alcohols, oils and aqueous products. Poor for active hydrocarbons and bleaches.

### Pulp / Metal Foil

Aluminum foil bonded to pulp board. Good barrier properties, good resistance to hydrocarbons, oils, ketones and alcohols. Not good for acids or alkalis.

### Styrene-Butadiene Rubber (14B)

The 14B white rubber lining material consists of homogeneous sulfur cured styrene-butadiene rubber. FDA Status complies with 21CFR 177.26, "Rubber articles intended for repeated use."

Excellent properties of resilience, resistant to moisture vapor. Satisfactory for most moderate chemicals. Not good for oils, strong acids and hydrocarbons. Not a natural rubber. Autoclavable.

### Foamed Polyethylene (PE Foam)

A one piece, three ply coextruded liner consisting of both foamed and solid LDPE. The foam core is sandwiched with solid clear PE.

General Purpose: Broad applications base. Chemical resistance-good for acids, alkalis, solvents, alcohols, oils, household cosmetics and aqueous products. Poor for hydrocarbon solvents. Liner provides tight seal.

### Styrene-Butadiene Rubber / 0.005 PTFE (PTFE / Styrene-Butadiene)

The white rubber / 0.005" PTFE liner consists of virigin PTFE bonded to the white sulfur cured styrene-butadiene rubber. Complies with the FDA 21CFR 177.1550.

Designed for the ultimate in product safety. PTFE provides a totally inert inner seal and surface facing the sample or product. Autoclavable.



Excellence in your hands

Contact us at [DWK.com](https://www.dwk.com)

© 2021 DWK Life Sciences • The trademarks used are owned by DWK Life Sciences GmbH, DWK Life Sciences LLC or DWK Life Sciences Ltd.