

WHEATON® CONTAINER GUIDE



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Glass & Plastic Containers

Glass Bottles

DWK offers over 3,000 containers and closures from borosilicate to soda-lime glass. Each container has an assortment of caps and liners to choose from. We are able to provide small case quantities of containers as well as large bulk packs. We also offer the ability to customize your order to meet all your needs. In addition, WHEATON offers convenience bulk packs of containers with or without caps attached for high use items or facilities with centralized stockrooms. Tamper Evident Seal / HAZCOM Label provided in each case of bottles with the exception of bulk packs.

The United States Pharmacopeia classifies pharmaceutical glass containers according to their resistance to water attack, also referred to as chemical durability. Containers are classified as Type I, II, and III. Type I is the most durable glass, and Type III is the least durable glass. Test methods and specification limits for determining the chemical resistance of glass can be found in the current revision of the U. S. Pharmacopeia, section <660> Containers. Most of the glass containers offered by DWK are manufactured from either Type I borosilicate or Type III soda-lime glass.

Glass in the USP Type I classification are borosilicate glass with superior chemical resistance. This class of glasses represents the least reactive glass containers available. Typically, this glass can be used for most applications, including packaging for parenteral and non-parenteral products. Type I glass may be used to package acidic, neutral and alkaline products. Water for injection, un-buffered products, chemicals, sensitive products and those requiring sterilization are commonly packaged in Type I borosilicate glass. Type I glass can be subject to chemical attack under certain conditions, thus container selection must be made carefully for very low and very high pH applications.

USP Type III is a soda-lime glass with moderate chemical resistance. It is typically acceptable for packaging dry powders that will be dissolved into solutions or buffers that are insensitive to alkali. Type III glass may not be suitable for autoclaved products because the autoclaving process will accelerate the glass corrosion reaction. Dry heat sterilization processes are typically not a problem for Type III containers. Light sensitive products must be packaged in amber glass. Amber glass is formulated to absorb light in the Ultra Violet region of the electromagnetic spectrum.

Plastic Bottles

Plastic containers have been developed for a variety of applications across many different industries over the years. There are many different types of polymers used in the creation of these containers to help fill the demands for the various applications. Polymers offer a variety of properties, each having different levels of importance with different users depending on the application. Some users may have flexibility within their product formula or filling process and therefore focus on economical containers while others may need containers that are stronger, autoclavable, transparent, sterilized, etc., therefore requiring more specifications. DWK can help with polymer selection through comprehension of the customer's product, goals, and adaptability.

For more information on DWK Plastic Bottles, contact your DWK Regional Sales Manager or Customer Service at 800-225-1437.

Table of Contents

Essential Glass Laboratory Containers

> AC Round Bottles.....	6
> Boston Round Bottles	3
> Dropping Bottles	11
> French Square Bottles.....	5
> Media Lab 45™ Bottles, Graduated	9
> Media Lab Bottles, Graduated	10
> Media Lab Bottles, Non-Graduated	10
> Reagent Bottles	6
> Reagent Bottles, Wide Mouth	6
> Standard Wide Mouth Bottles.....	11
> Straight Sided Jars.....	12
> Valumetric™ Graduated Bottles	8
> Wide Mouth Packers, Amber	7

Essential Plastic Laboratory Containers

> Leak Resistant Bottles.....	19
> PET Containers	21
> Polypropylene Containers	20
> Polystyrene Containers.....	20
> Round HDPE & LDPE Bottles	20
> Wide Mouth HDPE Containers	20
> Sterile PETG Containers.....	21

Safety Coated Containers

> Safety Coated Bottles	13
> Safety Coated Jar.....	14
> Safety Coated Lab 45™ Media / Reagent Bottles..	14
> Safety Coated Media / Reagent Bottles.....	14
> Safety Coated Reagent Bottles	14
> Safety Coated Solution Bottles	14

Technical Data

> Chemical Compatibility.....	23
> Closure Liners.....	24
> Glass Types.....	15
> Plastic Resins.....	22





General Purpose Glass Bottles

- Bottles manufactured from soda-lime glass that conforms to USP Type III requirements
- Available in clear glass or amber glass for light sensitive samples
- Narrow mouth bottles are ideal for liquids
- Wide mouth bottles are ideal for dry and viscous samples
- Valumetric™ bottles are for measuring while you sample
- White polypropylene or black phenolic screw caps
- Screw caps are pre-attached to the containers or are available separately
- Choice of cap liners: PTFE faced foamed polyethylene liner, poly-vinyl liner, rubber liner, PTFE faced rubber, or PE cone liner
- Tamper Evident Seal / HAZCOM Label provided in each case of bottles with the exception of bulk packs

Cap Liner Specifications

Material	Description	Applications
Pulp / Poly-Vinyl	One mL poly-vinyl film bonded to one mL 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.
PTFE Faced Foamed Polyethylene	PTFE faced foamed polyethylene liner that 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.
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.
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. Autoclavable.
PTFE Faced Rubber	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 totally inert inner seal and surface facing the sample or product. Autoclavable.

French Square

- Clear or Amber, USP Type III soda-lime glass
- Ideal for solvent, chemical or sample storage
- Square shape maximizes storage space
- Available with caps attached or bulk packs without caps

Valumetric™ Graduated Bottle

- Clear, USP Type III soda-lime glass
- Ideal for general storage
- Easy removal of contents
- Graduated in mL and ounces
- Available with caps attached or bulk packs without caps

Media Bottle, Lab 45™

- Manufactured from USP Type I borosilicate glass
- Available with or without caps
- 45mm screw thread, wide mouth finish
- Cap has a built-in wedge shaped sealing, eliminating the need for a liner



Boston Round Bottle

- Clear or Amber, Type III soda-lime glass
- Ideal for solvent, chemical or sample storage
- Available with caps attached or bulk packs without caps

Media Bottles

- Clear borosilicate glass bottle with graduations and marking patch
- Amber borosilicate glass bottle in 125mL size only
- Pre-attached black phenolic screw caps with choice of three liners
- Hand grips on 1 Liter bottle provide easy handling

Wide Mouth Packer

- Amber, USP Type III soda-lime glass
- Ideal for storage of light sensitive samples or dry powders
- Easy removal of contents

Tamper Evident Seal / HAZCOM Peel-and-Stick Label

- HAZCOM label allows for ID of content and safety notification
- Labels provided in each case of bottles with the exception of bulk packs
- Tamper Evident Seal keeps bottle sealed, protecting contents from accidental misuse



Not actual label size

Boston Round Bottle

- Clear or Amber, Type III soda-lime glass
- Ideal for solvent, chemical or sample storage
- Available with caps attached or bulk packs without caps



Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-158**	Clear	1	30	31 x 79	20-400	Without Cap	—	432
02-911-320	Clear	1	30	31 x 79	20-400	White Polypropylene	Poly-Vinyl	48
02-911-344	Clear	1	30	31 x 79	20-400	White Polypropylene	Poly-Vinyl	432
02-911-326	Clear	1	30	31 x 79	20-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-911-332	Clear	1	30	31 x 79	20-400	Black Phenolic	PE Cone	48
02-911-338**	Clear	1	30	31 x 79	20-400	Black Phenolic	Rubber	48
02-912-164**	Amber	1	30	31 x 79	20-400	Without Cap	—	432
02-911-350	Amber	1	30	31 x 79	20-400	White Polypropylene	Poly-Vinyl	48
02-911-373	Amber	1	30	31 x 79	20-400	White Polypropylene	Poly-Vinyl	432
02-911-356	Amber	1	30	31 x 79	20-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-911-362	Amber	1	30	31 x 79	20-400	Black Phenolic	PE Cone	48
02-911-368**	Amber	1	30	31 x 79	20-400	Black Phenolic	Rubber	48
02-912-159**	Clear	2	60	39 x 94	20-400	Without Cap	—	288
02-911-327	Clear	2	60	39 x 94	20-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-333	Clear	2	60	39 x 94	20-400	Black Phenolic	PE Cone	24
02-911-339**	Clear	2	60	39 x 94	20-400	Black Phenolic	Rubber	24
02-912-165**	Amber	2	60	39 x 94	20-400	Without Cap	—	288
02-911-351	Amber	2	60	39 x 94	20-400	White Polypropylene	Poly-Vinyl	24
02-911-374	Amber	2	60	39 x 94	20-400	White Polypropylene	Poly-Vinyl	288
02-911-357	Amber	2	60	39 x 94	20-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-363	Amber	2	60	39 x 94	20-400	Black Phenolic	PE Cone	24
02-911-368**	Amber	2	60	39 x 94	20-400	Black Phenolic	Rubber	24
02-912-160**	Clear	4	125	48 x 112	22-400	Without Cap	—	160
02-911-322	Clear	4	125	48 x 112	22-400	White Polypropylene	Poly-Vinyl	24
02-911-346	Clear	4	125	48 x 112	22-400	White Polypropylene	Poly-Vinyl	160
02-911-328	Clear	4	125	48 x 112	22-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-334	Clear	4	125	48 x 112	22-400	Black Phenolic	PE Cone	24
02-911-340**	Clear	4	125	48 x 112	22-400	Black Phenolic	Rubber	24
02-912-166**	Amber	4	125	48 x 112	22-400	Without Cap	—	160
02-911-352	Amber	4	125	48 x 112	22-400	White Polypropylene	Poly-Vinyl	24
02-911-375	Amber	4	125	48 x 112	22-400	White Polypropylene	Poly-Vinyl	160
02-911-358	Amber	4	125	48 x 112	22-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-364	Amber	4	125	48 x 112	22-400	Black Phenolic	PE Cone	24
02-911-369**	Amber	4	125	48 x 112	22-400	Black Phenolic	Rubber	24
02-912-161**	Clear	8	250	60 x 136	24-400	Without Cap	—	108
02-911-323	Clear	8	250	60 x 136	24-400	White Polypropylene	Poly-Vinyl	12
02-911-347	Clear	8	250	60 x 136	24-400	White Polypropylene	Poly-Vinyl	108
02-911-329	Clear	8	250	60 x 136	24-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-335	Clear	8	250	60 x 136	24-400	Black Phenolic	PE Cone	12
02-911-341**	Clear	8	250	60 x 136	24-400	Black Phenolic	Rubber	12
02-912-167**	Amber	8	250	60 x 136	24-400	Without Cap	—	108
02-911-353	Amber	8	250	60 x 136	24-400	White Polypropylene	Poly-Vinyl	12
02-911-376	Amber	8	250	60 x 136	24-400	White Polypropylene	Poly-Vinyl	108
02-911-359	Amber	8	250	60 x 136	24-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-365	Amber	8	250	60 x 136	24-400	Black Phenolic	PE Cone	12
02-911-370**	Amber	8	250	60 x 136	24-400	Black Phenolic	Rubber	12

*Approximate capacity**Autoclavable

Boston Round Bottles (continued)

Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-162**	Clear	16	500	75 x 168	28-400	Without Cap	—	60
02-911-324	Clear	16	500	75 x 168	28-400	White Polypropylene	Poly-Vinyl	12
02-911-348	Clear	16	500	75 x 168	28-400	White Polypropylene	Poly-Vinyl	60
02-911-330	Clear	16	500	75 x 168	28-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-336	Clear	16	500	75 x 168	28-400	Black Phenolic	PE Cone	12
02-911-342**	Clear	16	500	75 x 168	28-400	Black Phenolic	Rubber	12
02-912-168**	Amber	16	500	75 x 168	28-400	Without Cap	—	60
02-911-354	Amber	16	500	75 x 168	28-400	White Polypropylene	Poly-Vinyl	12
02-911-360	Amber	16	500	75 x 168	28-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-366	Amber	16	500	75 x 168	28-400	Black Phenolic	PE Cone	12
02-911-371**	Amber	16	500	75 x 168	28-400	Black Phenolic	Rubber	12
02-912-163**	Clear	32	1000	94 x 206	33-400	Without Cap	—	12
02-911-325	Clear	32	1000	94 x 206	33-400	White Polypropylene	Poly-Vinyl	12
02-911-349	Clear	32	1000	94 x 206	33-400	White Polypropylene	Poly-Vinyl	12
02-911-331	Clear	32	1000	94 x 206	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-337	Clear	32	1000	94 x 206	33-400	Black Phenolic	PE Cone	12
02-911-343**	Clear	32	1000	94 x 206	33-400	Black Phenolic	Rubber	12
02-912-169**	Amber	32	1000	94 x 206	33-400	Without Cap	—	30
02-911-355	Amber	32	1000	94 x 206	33-400	White Polypropylene	Poly-Vinyl	12
02-911-378	Amber	32	1000	94 x 206	33-400	White Polypropylene	Poly-Vinyl	30
02-911-361	Amber	32	1000	94 x 206	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-367	Amber	32	1000	94 x 206	33-400	Black Phenolic	PE Cone	12
02-911-372**	Amber	32	1000	94 x 206	33-400	Black Phenolic	Rubber	12

*Approximate capacity**Autoclavable

Replacement Caps for Boston Round Bottles

Cat. No.	Cap Size	Qty/Pack	Qty/Case
Black Phenolic with Rubber Liner (Autoclavable)			
03-084-124	20-400	72	144
06-451-350	22-400	72	144
03-084-125	24-400	72	144
03-410-302	28-400	72	144
02-912-249	33-400	72	144
Black Phenolic / PE Cone Liner			
02-984-15	20-400	72	144
02-984-19	22-400	72	144
02-984-23	24-400	72	144
02-984-27	28-400	72	144
02-984-31	33-400	72	144

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-14	20-400	72	144
02-984-18	22-400	72	144
02-984-22	24-400	72	144
02-984-26	28-400	72	144
02-984-30	33-400	72	144
White Polypropylene / Poly-Vinyl Liner			
02-984-13	20-400	72	144
02-984-17	22-400	72	144
02-984-21	24-400	72	144
02-984-25	28-400	72	144
02-984-29	33-400	72	144

Torque for Screw Closures (in/lb)

Application torque is an important aspect used to optimize the integrity of the closure-to-container seal. If the closure is applied too loosely, the contents could leak, especially during shipping. If the closure is applied too tightly, it may be too difficult to remove, or the container could break during application.

The table below offers some suggested torques that should provide an adequate seal for most applications. It is recommended that proper tests be performed to determine the optimum torque for the application. The most practical way to check the tightness is to measure the removal torque after the closure has been on the container for about 5 minutes. The minimum removal torque noted in the table should be maintained after a 24 hour period.

Closure (mm)	Phenolic / Urea Closure on Glass Container		Phenolic / Urea Closure on Plastic Container		PP / PE Closure on Glass Container		PP / PE Closure on Plastic Container	
	Application Torque	Min Removal Torque	Application Torque	Min Removal Torque	Application Torque	Min Removal Torque	Application Torque	Min Removal Torque
15	8	4	6	3	12	7	8	4
20	10	5	8	4	15	9	10	5
24	12	6	10	5	18	11	12	6
28	14	7	12	6	21	12	14	7
33	18	9	15	7	24	14	17	8
38	20	10	17	7	29	17	19	9
43	22	11	18	9	33	20	22	11
48	24	12	20	10	36	22	24	12
58	28	14	24	12	44	26	29	14
70	35	18	28	14	52	32	35	17
100	50	25	40	20	75	45	50	25

Although the information in this chart was acquired from reputable sources, it should only be used as a guide in determining the proper application torque. WHEATON accepts no responsibility for the accuracy of this data or for any consequences resulting from its use. Visit www.DWK-LifeSciences.com for more information.

French Square Bottle

- Clear, USP Type III soda-lime glass
- Ideal for solvent, chemical or sample storage
- Square shape maximizes storage space
- Available with caps attached or bulk packs without caps
- 32oz bottle has moulded graduations



Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-121	Clear	.5	15	26 x 62	20-400	White Polypropylene	Poly-Vinyl	48
06-450-304	Clear	0.5	15	27 x 66	20-400	White Polypropylene	Poly-Vinyl	576
02-912-127	Clear	.5	15	26 x 62	20-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-176	Clear	.5	15	26 x 62	20-400	Black Phenolic	PE Cone	48
02-912-170**	Clear	.5	15	26 x 62	20-400	Black Phenolic	Rubber	48
02-912-185**	Clear	1	30	31 x 72	24-400	Without Cap	—	280
02-912-180	Clear	1	30	31 x 72	24-400	White Polypropylene	Poly-Vinyl	280
02-912-122	Clear	1	30	31 x 72	24-400	White Polypropylene	Poly-Vinyl	48
02-912-128	Clear	1	30	31 x 72	24-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-177	Clear	1	30	31 x 72	24-400	Black Phenolic	PE Cone	48
02-912-171**	Clear	1	30	31 x 72	24-400	Black Phenolic	Rubber	48
02-912-186**	Clear	2	60	39 x 87	28-400	Without Cap	—	240
02-912-181	Clear	2	60	39 x 87	28-400	White Polypropylene	Poly-Vinyl	240
02-912-123	Clear	2	60	39 x 87	28-400	White Polypropylene	Poly-Vinyl	48
02-912-129	Clear	2	60	39 x 87	28-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-178	Clear	2	60	39 x 87	28-400	Black Phenolic	PE Cone	48
02-912-172**	Clear	2	60	39 x 87	28-400	Black Phenolic	Rubber	48
02-912-187**	Clear	4	125	45 x 111	33-400	Without Cap	—	120
02-912-182	Clear	4	125	45 x 111	33-400	White Polypropylene	Poly-Vinyl	120
02-912-124	Clear	4	125	45 x 111	33-400	White Polypropylene	Poly-Vinyl	24
02-912-130	Clear	4	125	45 x 111	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-179	Clear	4	125	45 x 111	33-400	Black Phenolic	PE Cone	24
02-912-173**	Clear	4	125	45 x 111	33-400	Black Phenolic	Rubber	24
02-912-188**	Clear	8	250	56 x 137	43-400	Without Cap	—	84
02-912-183	Clear	8	250	56 x 137	43-400	White Polypropylene	Poly-Vinyl	84
02-912-125	Clear	8	250	56 x 137	43-400	White Polypropylene	Poly-Vinyl	24
02-912-131	Clear	8	250	56 x 137	43-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-174**	Clear	8	250	56 x 137	43-400	Black Phenolic	Rubber	24
02-912-189**	Clear	16	500	68 x 167	48-400	Without Cap	—	40
02-912-184	Clear	16	500	68 x 167	48-400	White Polypropylene	Poly-Vinyl	40
02-912-126	Clear	16	500	68 x 167	48-400	White Polypropylene	Poly-Vinyl	24
02-912-132	Clear	16	500	68 x 167	48-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-175**	Clear	16	500	68 x 167	48-400	Black Phenolic	Rubber	24
06-450-303**	Clear	32	1000	85 x 207	58-400	Without Cap	—	24
06-450-302	Clear	32	1000	85 x 207	58-400	White Polypropylene	PE Cone	12
06-450-305	Clear	32	1000	85 x 207	58-400	White Polypropylene	Poly-Vinyl	12
06-450-301**	Clear	32	1000	85 x 207	58-400	Black Phenolic	Rubber	12

*Approximate capacity**Autoclavable

Replacement Caps for French Square Bottles

Cat. No.	Cap Size	Qty/Pack	Qty/Case
Black Phenolic with Rubber Liner (Autoclavable)			
03-084-124	20-400	72	144
03-084-125	24-400	72	144
03-410-302	28-400	72	144
02-912-249	33-400	72	144
02-912-251	43-400	72	72
02-912-252	48-400	72	72
Black Phenolic / PE Cone Liner			
02-984-15	20-400	72	144
02-984-23	24-400	72	144
02-984-27	28-400	72	144
02-984-31	33-400	72	144

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-14	20-400	72	144
02-984-22	24-400	72	144
02-984-26	28-400	72	144
02-984-30	33-400	72	144
02-984-43	48-400	72	72
White Polypropylene with Poly-Vinyl Liner			
02-984-13	20-400	72	144
02-984-21	24-400	72	144
02-984-25	28-400	72	144
02-984-29	33-400	72	144
02-984-36	43-400	72	72
02-984-42	48-400	72	72

AC Round Bottle

- Clear, USP Type III soda-lime glass
- Taller & narrower than Straight Sided Jars
- Available with caps attached or bulk packs without caps



Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-240**	Clear	1	30	34 x 68	33-400	Without Cap	—	432
02-912-133	Clear	1	30	34 x 68	33-400	White Polypropylene	Poly-Vinyl	48
02-912-138	Clear	1	30	34 x 68	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-241**	Clear	2	60	42 x 83	38-400	Without Cap	—	288
02-912-134	Clear	2	60	42 x 83	38-400	White Polypropylene	Poly-Vinyl	48
02-912-139	Clear	2	60	42 x 83	38-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-242**	Clear	4	125	51 x 102	48-400	Without Cap	—	144
02-912-135	Clear	4	125	51 x 102	48-400	White Polypropylene	Poly-Vinyl	24
02-912-140	Clear	4	125	51 x 102	48-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-243**	Clear	8	250	62 x 127	58-400	Without Cap	—	96
02-912-136	Clear	8	250	62 x 127	58-400	White Polypropylene	Poly-Vinyl	24
02-912-141	Clear	8	250	62 x 127	58-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-244**	Clear	16	500	76 x 145	70-400	Without Cap	—	48
02-912-137	Clear	16	500	76 x 145	70-400	White Polypropylene	Poly-Vinyl	24
02-912-142	Clear	16	500	76 x 145	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24

*Approximate capacity**Autoclavable

Replacement Caps for AC Round Bottles

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-30	33-400	72	144
02-984-34	38-400	72	72
02-984-43	48-400	72	72
02-984-49	58-400	72	72
02-984-55	70-400	24	48
White Polypropylene / Poly-Vinyl Liner			
02-984-29	33-400	72	144
02-984-33	38-400	72	72
02-984-42	48-400	72	72
02-984-48	58-400	72	72
02-984-54	70-400	24	48

Reagent Bottle, Wide Mouth

- Borosilicate glass bottle and stopper
- Features no-drip pour lip
- Ground glass stopper fits securely to prevent contamination
- Wide mouth ideal for solids and viscous liquids
- Easy to clean
- Autoclavable



Cat. No.	Capacity (mL)	Dia x H (mm)	Stopper Size	Qty/Case
02-911-307	50	43 x 90	24/20	6
02-911-308	100	54 x 110	29/22	6
02-910G	500	89 x 175	45/40	10
02-910H	1000	109 x 215	60/46	10

Reagent Bottle, Narrow Mouth

- Borosilicate glass bottle and stopper
- Features no-drip pour lip
- Octagon-shaped round glass stopper fits securely to prevent contamination
- Narrow mouth ideal for liquids
- Use amber bottles to protect light-sensitive samples during storage
- Autoclavable



Cat. No.	Color	Capacity (mL)	Dia x H (mm)	Stopper Size	Qty/Case
02-911-304	Clear	100	53 x 115	14/23	6
02-911-306	Amber	100	53 x 115	14/23	6
S318731	Clear	250	72 x 145	19/26	10
22-308-622	Amber	250	72 x 145	19/26	10
S318741	Clear	500	88 x 175	24/29	10
02-918B	Amber	500	88 x 175	24/29	10

Reagent Bottle, Screw Cap

- Manufactured from USP Type I borosilicate glass
- Features no-drip pour lip
- Pre-attached polypropylene screw cap with PTFE liner
- Large writing patch
- Autoclavable



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Qty/Case
03-439-68A	250	67 x 150	33-430	6
03-439-68B	500	88 x 190	33-430	6

Wide Mouth Packer, Amber

- Amber, USP Type III soda-lime glass
- Ideal for storage of light sensitive samples or dry powders
- Easy removal of contents



Cat. No.	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-206**	1	30	37 x 65	28-400	Without Cap	—	432
02-912-144	1	30	37 x 65	28-400	White Polypropylene	Poly-Vinyl	24
02-912-155	1	30	37 x 65	28-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-148	1	30	37 x 65	28-400	Black Phenolic	PE Cone	24
02-912-200	1	30	37 x 65	28-400	White Polypropylene	Poly-Vinyl	432
02-912-207**	2	60	44 x 75	33-400	Without Cap	—	216
02-912-150	2	60	44 x 75	33-400	White Polypropylene	Poly-Vinyl	24
02-912-156	2	60	44 x 75	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-120	2	60	44 x 75	33-400	Black Phenolic	PE Cone	24
02-912-201	2	60	44 x 75	33-400	White Polypropylene	Poly-Vinyl	216
02-912-208**	4	125	54 x 95	38-400	Without Cap	—	180
02-912-151	4	125	54 x 95	38-400	White Polypropylene	Poly-Vinyl	24
02-912-157	4	125	54 x 95	38-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-149	4	125	54 x 95	38-400	Black Phenolic	PE Cone	24
02-912-202	4	125	54 x 95	38-400	White Polypropylene	Poly-Vinyl	180
02-912-209**	8	250	66 x 119	45-400	Without Cap	—	84
02-912-152	8	250	66 x 119	45-400	White Polypropylene	Poly-Vinyl	24
02-912-145	8	250	66 x 119	45-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-203	8	250	66 x 119	45-400	White Polypropylene	Poly-Vinyl	84
02-912-210**	16	500	80 x 146	53-400	Without Cap	—	60
02-912-153	16	500	80 x 146	53-400	White Polypropylene	Poly-Vinyl	12
02-912-146	16	500	80 x 146	53-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-912-204	16	500	80 x 146	53-400	White Polypropylene	Poly-Vinyl	60
02-912-211**	32	1000	99 x 178	53-400	Without Cap	—	36
02-912-154	32	1000	99 x 178	53-400	White Polypropylene	Poly-Vinyl	12
02-912-147	32	1000	99 x 178	53-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-912-205	32	1000	99 x 178	53-400	White Polypropylene	Poly-Vinyl	36
02-912-398	42	1250	108 x 192	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	6
02-912-399	85	2500	142 x 241	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12

*Approximate capacity**Autoclavable

Replacement Caps for Wide Mouth Packers

Cat. No.	Cap Size	Qty/Pack	Qty/Case
Black Phenolic / PE Cone Liner			
02-984-27	28-400	72	144
02-984-31	33-400	72	144
02-927-140	38-400	48	576
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-26	28-400	72	144
02-984-30	33-400	72	144
02-984-34	38-400	72	72
02-984-40	45-400	72	72
02-984-46	53-400	72	72
02-984-55	70-400	24	48

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / Poly-Vinyl Liner			
02-984-25	28-400	72	144
02-984-29	33-400	72	144
02-984-33	38-400	72	72
02-984-39	45-400	72	72
02-984-45	53-400	72	72

Why Amber Glass?

Light sensitive products must be packaged in amber glass. Amber glass is formulated to absorb light in the Ultra Violet region of the electromagnetic spectrum, filtering out the light to protect the sample in the container. This Test methods and specification limits for light protection can be found in the U. S. Pharmacopoeia.

Valumetric™ Graduated Bottle, Clear

- Clear, USP Type III soda-lime glass
- Easy removal of contents
- Graduated in mL and ounces
- Ideal for general storage
- Available with caps attached or bulk packs without caps



Cat.No.	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-235**	1	30	34 x 68	33-400	Without Cap	—	432
02-912-212	1	30	34 x 68	33-400	White Polypropylene	Poly-Vinyl	48
02-912-217	1	30	34 x 68	33-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-222	1	30	34 x 68	33-400	Black Phenolic	PE Cone	48
02-912-224**	1	30	34 x 68	33-400	Black Phenolic	Rubber	48
02-912-228	1	30	34 x 68	33-400	White Polypropylene	Poly-Vinyl	432
02-912-233	1	30	34 x 68	33-400	Black Phenolic	PE Cone	432
02-912-236**	2	60	42 x 83	38-400	Without Cap	—	288
02-912-213	2	60	42 x 83	38-400	White Polypropylene	Poly-Vinyl	48
02-912-218	2	60	42 x 83	38-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
02-912-223	2	60	42 x 83	38-400	Black Phenolic	PE Cone	48
02-912-225**	2	60	42 x 83	38-400	Black Phenolic	Rubber	48
02-912-229	2	60	42 x 83	38-400	White Polypropylene	Poly-Vinyl	288
02-912-234	2	60	42 x 83	38-400	Black Phenolic	PE Cone	288
06-450-306	2	60	43 x 84	38-400	Black Phenolic	Foil	48
02-912-237**	4	125	51 x 102	48-400	Without Cap	—	144
02-912-214	4	125	51 x 102	48-400	White Polypropylene	Poly-Vinyl	24
02-912-219	4	125	51 x 102	48-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-226**	4	125	51 x 102	48-400	Black Phenolic	Rubber	24
02-912-230	4	125	51 x 102	48-400	White Polypropylene	Poly-Vinyl	144
06-450-307	4	125	52 x 103	48-400	Black Phenolic	Foil	24
02-912-238**	8	250	62 x 127	58-400	Without Cap	—	96
02-912-215	8	250	62 x 127	58-400	White Polypropylene	Poly-Vinyl	24
02-912-220	8	250	62 x 127	58-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-227**	8	250	62 x 127	58-400	Black Phenolic	Rubber	24
02-912-231	8	250	62 x 127	58-400	White Polypropylene	Poly-Vinyl	96
06-450-308	8	250	64 x 129	58-400	Black Phenolic	Foil	24
02-912-239**	16	500	76 x 145	70-400	Without Cap	—	48
02-912-216	16	500	76 x 145	70-400	White Polypropylene	Poly-Vinyl	24
02-912-221	16	500	76 x 145	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-232	16	500	76 x 145	70-400	White Polypropylene	Poly-Vinyl	48
06-450-309**	16	500	78 x 147	70-400	Black Phenolic	Rubber	24

*Approximate capacity**Autoclavable

Replacement Caps for Valumetric™ Graduated Bottles

Cat. No.	Cap Size	Qty/Pack	Qty/Case
Black Phenolic / PE Cone Liner			
02-984-31	33-400	72	144
02-927-140	38-400	48	576
Black Phenolic / Rubber Liner			
02-912-249	33-400	144	144
02-912-252	48-400	72	72

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-30	33-400	72	144
02-984-34	38-400	72	72
02-984-43	48-400	72	72
02-984-49	58-400	72	72
02-984-55	70-400	24	48
White Polypropylene / Poly-Vinyl Liner			
02-984-29	33-400	72	144
02-984-33	38-400	72	72
02-984-42	48-400	72	72
02-984-48	58-400	72	72
02-984-54	70-400	24	48

Media Bottle, Lab 45™ Graduated Bottles

- Borosilicate glass helps prevent pH changes
- 45mm screw thread, wide mouth finish
- Graduated with writing patch
- Special pour lip facilitates easy pouring
- Bottles, caps and pour rings are autoclavable
- Manufactured from USP Type I borosilicate glass
- Cap has a built-in wedge shaped sealing ring, eliminating the need for a liner



Cat. No.	Capacity (mL)	Description	Dia. x H (mm)	Cap Size (mm)	Cap Color	Qty / Case
02-940-27	250	Bottle Only	70 x 138	45	—	12
02-940-23	250	Attached Pour Ring and Cap	70 x 144	45	White	12
02-940-32	500	Bottle Only	86 x 180	45	—	12
06-451-291	500	Attached Pour Ring and Cap	86 x 186	45	White	12
02-940-33	1000	Bottle Only	101 X 227	45	—	12
06-451-292	1000	Attached Pour Ring and Cap	101 x 233	45	White	12
02-940-28	2000	Bottle Only	137 X 261	45	—	6
02-940-24	2000	Attached Pour Ring and Cap	137 x 267	45	White	6

Accessories, Lab 45™ Media Bottles

- 45mm screw caps with or without sealing ring
- For high temperature applications, use the PBT (polybutylene terephthalate) screw caps and the ETFE (ethylene tetrafluoroethylene) pour lips which can withstand temperatures up to 200°C up to 2 hours
- Autoclavable

Cat. No.	Description	Size (mm)	Qty/Case
02-926-980	Pink Polypropylene Cap with Sealing	45	12
06-450-79	White Polypropylene Cap with Sealing Ring	45	12
02-940-34	Red Polypropylene Cap with Sealing Ring	45	12
02-940-35	Blue Polypropylene Cap with Sealing Ring	45	12
06-450-80	White Polypropylene Cap without Sealing Ring	45	12
06-450-81	White Polypropylene Cap with PTFE Faced Silicone Liner	45	12
06-450-82	White Polypropylene Cap with Open Top	45	12
06-450-83	Red Pbt Cap with PTFE Faced Silicone Liner	45	10

Tablet Square Bottles

- Made from USP Type III soda-lime glass
- Wide mouth ideal for solids
- Pre-attached white polypropylene caps with PE Cone liner



Cat. No.	Capacity (oz)	Capacity (mL)	Dia. x H (mm)	Cap Size (mm)	Cap Liner	Qty / Case
03-084-176	1	30	33 x 63	33-400	PE Cone	288
03-084-177	2	60	41 x 87	33-400	PE Cone	144

USP Type I vs. USP Type III Glass

Containers are classified by the USP as Type I, Type II and Type III. Type I is the most chemically durable glass and Type III is the least durable. Test methods and specification limits are determined by the USP in Chapter <660> Containers.

USP Type I classification is a borosilicate glass with superior chemical resistance. This class of glass represents the least reactive glass containers available. Typically, this glass can be used for most applications, including packaging for parenteral and non-parenteral products. Type I glass may be used to package acidic, neutral and alkaline products. Water for injection, unbuffered products, chemicals, sensitive lab samples and those requiring sterilization are commonly packaged in Type I borosilicate glass.

USP Type III is a soda-lime glass with moderate chemical resistance. It is typically acceptable for packaging dry powders that will be dissolved into solutions or buffers that are insensitive to alkali.

Media Lab Bottle, Graduated

- Clear borosilicate glass bottle with graduations and marking patch
- Amber borosilicate glass bottle in 125mL size only
- Pre-attached black phenolic screw caps with choice of three liners
- Hand grips on 1 Liter bottle provide easy handling



Cat No.	Color	Capacity (mL)	Cap On*	Cap Off*	Cap Size	Cap Material/Cap Liner	Qty/Case
03-439-67D	Clear	125	55 X 123	55 X 119	33-430	Without Cap	48
06-451-281	Clear	125	55 X 123	55 X 119	33-430	Polyethylene (LDPE) Lined Phenolic Cap	48
06-451-287	Amber	125	55 X 123	55 X 119	33-430	Polyethylene (LDPE) Lined Phenolic Cap	48
06-404A**	Clear	125	55 X 123	55 X 119	33-430	Rubber Lined Phenolic Cap	48
06-404F**	Clear	125	55 X 123	55 X 119	33-430	PTFE Rubber Lined Phenolic Cap	48
06-451-289**	Amber	125	55 X 123	55 X 119	33-430	PTFE Rubber Lined Phenolic Cap	48
03-439-67E**	Clear	250	67 X 152	67 X 148	33-430	Without Cap	48
06-451-282	Clear	250	67 X 152	67 X 148	33-430	Polyethylene (LDPE) Lined Phenolic Cap	48
06-404B**	Clear	250	67 X 152	67 X 148	33-430	Rubber Lined Phenolic Cap	48
06-404G**	Clear	250	67 X 152	67 X 148	33-430	PTFE Rubber Lined Phenolic Cap	48
03-439-67F**	Clear	500	88 X 192	88 X 188	33-430	Without Cap	24
06-451-283	Clear	500	88 X 192	88 X 188	33-430	Polyethylene (LDPE) Lined Phenolic Cap	24
06-404D**	Clear	500	88 X 192	88 X 188	33-430	Rubber Lined Phenolic Cap	24
02-940-20**	Clear	500	88 X 192	88 X 188	33-430	PTFE Rubber Lined Phenolic Cap	24
02-912-653**	Clear	1000	103 X 235	103 X 231	38-430	Without Cap	12
06-451-284	Clear	1000	103 X 235	103 X 231	38-430	Polyethylene (LDPE) Lined Phenolic Cap	24
06-404E**	Clear	1000	103 X 235	103 X 231	38-430	Rubber Lined Phenolic Cap	24
06-404-1**	Clear	1000	103 X 235	103 X 231	38-430	PTFE Rubber Lined Phenolic Cap	24

* Dia x H (mm) **Autoclavable

Media Lab Bottle, Non-Graduated

- Clear borosilicate glass bottle without graduations
- Amber borosilicate glass bottle in 125mL size only
- Pre-attached black phenolic screw caps with choice of liner
- Hand grips on 1 Liter bottle provide easy handling



Cat No.	Color	Capacity (mL)	Cap On*	Cap Off*	Cap Size	Cap Material/Cap Liner	Qty/Case
06-407**	Clear	125	55 X 123	55 X 119	33-430	Without Cap	48
06-451-290**	Amber	125	55 X 123	55 X 119	33-430	Without Cap	48
06-411	Clear	125	55 X 123	55 X 119	33-430	Polyethylene (LDPE) Lined Phenolic Cap	48
06-414**	Clear	125	55 X 123	55 X 119	33-430	Rubber Lined Phenolic Cap	48
06-408**	Clear	250	67 X 152	67 X 148	33-430	Without Cap	48
06-412	Clear	250	67 X 152	67 X 148	33-430	Polyethylene (LDPE) Lined Phenolic Cap	48
06-415**	Clear	250	67 X 152	67 X 148	33-430	Rubber Lined Phenolic Cap	48
06-409**	Clear	500	88 X 192	88 X 188	33-430	Without Cap	24
06-451-278	Clear	500	88 X 192	88 X 188	33-430	Polyethylene (LDPE) Lined Phenolic Cap	24
22-263008**	Clear	500	88 X 192	88 X 188	33-430	Rubber Lined Phenolic Cap	24
02-912-651**	Clear	1000	103 X 235	103 X 231	38-430	Without Cap	12
02-912-650	Clear	1000	103 X 235	103 X 231	38-430	Polyethylene (LDPE) Lined Phenolic Cap	12
02-912-652**	Clear	1000	103 X 235	103 X 231	38-430	Rubber Lined Phenolic Cap	12

* Dia x H (mm) **Autoclavable

Replacement Black Phenolic Screw Caps for Media Bottles

Cat. No.	Cap Size	Qty/Case
With Polyethylene (LDPE) Liner		
06-450-7	33-430	200
06-450-8	38-430	200
With Rubber Liner (Autoclavable)		
06-450-34	33-430	200
06-450-35	38-430	200

Cat. No.	Cap Size	Qty/Case
With PTFE Faced Rubber Liner (Autoclavable)		
06-406-33	33-430	100
22-295-763	38-430	100
Open Top Cap With Gray Chlorobutyl / 50 Septa and Flange (Autoclavable)		
06-450-74	33-430	100
06-450-75	33-430	1000

Wide Mouth Bottle, Clear

- Clear, Type III soda-lime glass
- Largest bottles available
- Ideal for general, small to large volume storage
- Available with caps attached or without caps
- Available in graduated and non-graduated



Cat. No.	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
02-912-195**	4	125	52 x 84	48-400	Without Cap	—	24
02-911-422	4	125	52 x 84	48-400	White Polypropylene	Poly-Vinyl	24
02-911-427	4	125	52 x 84	48-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-196**	8	250	63 x 110	58-400	Without Cap	—	24
02-911-423	8	250	63 x 110	58-400	White Polypropylene	Poly-Vinyl	24
02-911-428	8	250	63 x 110	58-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-197**	16	500	79 x 133	63-400	Without Cap	—	24
02-911-424	16	500	79 x 133	63-400	White Polypropylene	Poly-Vinyl	24
02-911-429	16	500	79 x 133	63-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
06-450-311	32	1000	98 x 174	89-400	Without Cap	—	12
06-450-310	32	1000	98 x 174	89-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
06-450-312	32	1000	98 x 174	89-400	White Polypropylene	Poly-Vinyl	12
02-912-198**	65	2000	122 x 213	83-400	Without Cap	—	6
02-911-425	65	2000	122 x 213	83-400	White Polypropylene	Poly-Vinyl	6
02-911-430	65	2000	122 x 213	83-400	White Polypropylene	PTFE Faced Foamed Polyethylene	6
02-912-199**	130	4000	157 x 256	89-400	Without Cap	—	4
02-911-426	130	4000	157 x 256	89-400	White Polypropylene	Poly-Vinyl	4
02-911-431	130	4000	157 x 256	89-400	White Polypropylene	PTFE Faced Foamed Polyethylene	4

*Approximate capacity**Autoclavable

Large Bottles with Jug Handle

- Clear or Amber, USP Type III soda-lime glass
- Bottles have jug handle

Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
03-084-172	Clear	64	2000	126 x 270	38-400	White Polypropylene	PTFE Faced Foamed Polyethylene	6
03-084-169	Clear	64	2000	126 x 270	38-400	Black Phenolic	PE Cone Cone	6
03-084-163	Amber	80	2365	141 x 315	38-430	Black Phenolic	PTFE Faced Foamed Polyethylene	6
03-084-168	Clear	128	3840	169 x 295	38-400	White Polypropylene	Poly-Vinyl	4
03-084-170	Clear	128	3840	169 x 295	38-400	Black Phenolic	PE Cone Cone	4
03-084-171**	Clear	128	3840	169 x 295	38-400	Black Phenolic	Rubber	4
03-084-173	Clear	128	3840	169 x 295	38-400	White Polypropylene	PTFE Faced Foamed Polyethylene	4
03-084-164	Amber	128	3840	161 x 346	38-430	Black Phenolic	PTFE Faced Foamed Polyethylene	6
03-084-165	Amber	128	3840	161 x 346	38-430	Black Phenolic	PE Cone Cone	6
03-084-166**	Amber	128	3840	161 x 346	38-430	Black Phenolic	Rubber	6
03-084-167	Amber	128	3840	161 x 346	38-430	Black Phenolic	Poly-Vinyl	6

*Approximate capacity**Autoclavable

Dropping Bottle, All Glass

- Delivers stains or indicator solutions drop by drop
- Available in clear or amber glass
- Complete with a glass stopper
- A partial turn of the ground glass stopper seals the bottle
- Manufactured from soda-lime glass



Cat. No.	Color	Capacity (mL)	Dia x H (mm)	Qty/Case
02-911-300	Clear	50	45 x 95	6
02-911-302	Amber	50	45 x 95	6
02-911-301	Clear	100	56 x 120	6
02-911-303	Amber	100	56 x 120	6

Testing Jars

- Made from USP Type III clear soda-lime glass
- Wide mouth ideal for solids
- Pre-attached white polypropylene caps with choice of liner



Cat. No.	Capacity (mL)	Dia x H (mm)	Cap Liner	Qty/Case
03-084-174	60	45 x 95	Poly-Vinyl	6
03-084-175	60	45 x 95	PTFE Faced Foamed Polyethylene	6

Straight Sided Jar

- Clear or Amber, USP Type III soda-lime glass
- Wide mouth design is great for large solid samples
- Walls allow for complete removal of contents
- Ideal for soil sampling and environmental applications
- Available with caps attached or bulk packs without caps



Cat. No.	Color	Capacity (oz)	Capacity (mL)*	Dia x H (mm)	Cap Size	Cap Material	Cap Liner	Qty/Case
03-084-159	Clear	1	30	44 x 44	43-400	White Polypropylene	PTFE Faced Foamed Polyethylene	48
03-084-160	Clear	1	30	44 x 44	43-400	White Polypropylene	Poly-Vinyl	48
02-912-190**	Clear	2	60	55 x 48	53-400	Without Cap	—	144
02-911-406	Clear	2	60	55 x 48	53-400	White Polypropylene	Poly-Vinyl	24
02-911-411	Clear	2	60	55 x 48	53-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-417	Clear	2	60	55 x 48	53-400	White Polypropylene	Poly-Vinyl	144
02-912-191**	Clear	4	125	60 x 68	58-400	Without Cap	—	24
02-911-407	Clear	4	125	60 x 68	58-400	White Polypropylene	Poly-Vinyl	24
02-911-412	Clear	4	125	60 x 68	58-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-911-416**	Clear	4	125	60 x 68	58-400	Black Phenolic	Rubber	24
02-911-418	Clear	4	125	60 x 68	58-400	White Polypropylene	Poly-Vinyl	24
03-084-161	Amber	4	125	62 x 73	58-400	White Polypropylene	PTFE Faced Foamed Polyethylene	24
02-912-192**	Clear	8	250	73 x 88	70-400	Without Cap	—	24
02-911-408	Clear	8	250	73 x 88	70-400	White Polypropylene	Poly-Vinyl	12
02-911-413	Clear	8	250	73 x 88	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-911-419	Clear	8	250	73 x 88	70-400	White Polypropylene	Poly-Vinyl	24
03-084-162	Amber	8	250	75 x 94	70-400	White Polypropylene	PTFE Faced Foamed Polyethylene	12
02-912-193**	Clear	16	500	91 x 95	89-400	Without Cap	—	12
02-911-409	Clear	16	500	91 x 95	89-400	White Polypropylene	Poly-Vinyl	12
02-911-414	Clear	16	500	91 x 95	89-400	White Polypropylene	PTFE Foamed Faced Polyethylene	12
02-912-194**	Clear	32	1000	95 x 170	89-400	Without Cap	—	12
02-911-410	Clear	32	1000	95 x 170	89-400	White Polypropylene	Poly-Vinyl	12
02-911-415	Clear	32	1000	95 x 170	89-400	White Polypropylene	PTFE Foamed Faced Polyethylene	12

*Approximate capacity**Autoclavable

Replacement Caps for Straight Sided Jars

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-37	43-400	72	72
02-984-46	53-400	72	72
02-984-49	58-400	72	72
02-984-55	70-400	24	48
02-984-61	89-400	24	48

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / Poly-Vinyl Liner			
02-984-36	43-400	72	72
02-984-45	53-400	72	72
02-984-48	58-400	72	72
02-984-54	70-400	24	48
02-984-60	89-400	24	48

Replacement Caps for Standard Wide Mouth Bottles

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / PTFE Faced Foamed Polyethylene Liner			
02-984-43	48-400	72	72
02-984-49	58-400	72	72
02-911-233	63-400	24	48
02-984-58	83-400	24	48
02-984-61	89-400	24	48

Cat. No.	Cap Size	Qty/Pack	Qty/Case
White Polypropylene / Poly-Vinyl Liner			
02-984-42	48-400	72	72
02-984-48	58-400	72	72
02-984-51	63-400	24	48
06-451-364	83-400	24	48
02-984-60	89-400	24	48

Safety Coated Bottle

- Plastisol coating for safety
- Made from clear or amber soda-lime glass that conforms to USP Type III requirements
- Available with or without caps
- 4, 8, 16 and 32oz Boston Round style
- 80oz and 4L with jug handle



Cat No.	Color	Approx Size (oz)	Cap On***	Cap Off***	Cap Size	Cap Material/Cap Liner	Qty/Case
03-084-184	Amber	4	52 x 117	52 x 114	22-400	Poly-Vinyl Lined White Polypropylene Cap	24
03-084-187	Amber	4	52 x 117	52 x 114	22-400	PE Cone LDPE Black Phenolic Cap	24
02-927-144	Amber	4	52 x 117	52 x 114	22-400	PTFE Faced Foamed PE White Polypropylene Cap	24
03-439-69A**	Clear	8	64 x 142	64 x 139	24-400	Without Cap	48
06-451-351**	Amber	8	64 x 142	64 x 139	24-400	Without Cap	48
02-927-150	Clear	8	64 x 142	64 x 139	24-400	Poly-Vinyl Lined White Polypropylene Cap	12
02-927-152	Clear	8	64 x 142	64 x 139	24-400	PTFE Faced Foamed PE White Polypropylene Cap	12
03-084-188	Amber	8	64 x 142	64 x 139	24-400	PE Cone LDPE Black Phenolic Cap	12
02-927-145	Amber	8	64 x 142	64 x 139	24-400	PTFE Faced Foamed PE White Polypropylene Cap	12
06-451-307**	Clear	16	78 x 174	78 x 171	28-400	Without Cap	24
06-451-352**	Amber	16	78 x 174	78 x 171	28-400	Without Cap	24
02-927-149	Clear	16	78 x 174	78 x 171	28-400	PE Cone LDPE Black Phenolic Cap	12
03-084-185	Amber	16	78 x 174	78 x 171	28-400	Poly-Vinyl Lined White Polypropylene Cap	12
02-927-146	Amber	16	78 x 174	78 x 171	28-400	PTFE Faced Foamed PE White Polypropylene Cap	12
06-451-319	Amber	16	78 x 174	78 x 171	28-400	PE Cone LDPE Black Phenolic Cap	24
02-927-153	Clear	16	78 x 174	78 x 171	28-400	PTFE Faced Foamed PE White Polypropylene Cap	12
02-927-143	Amber	16	78 x 174	78 x 171	28-400	PE Cone LDPE Black Phenolic Cap	12
06-451-353	Clear	16	78 x 174	78 x 171	28-400	Polyethylene LDPE lined Black Phenolic Cap	24
06-451-354	Amber	16	78 x 174	78 x 171	28-400	Polyethylene LDPE lined Black Phenolic Cap	24
03-439-60L**	Clear	16	78 x 174	78 x 171	28-400	PTFE Rubber Lined Black Phenolic Cap	24
06-451-322**	Amber	16	78 x 174	78 x 171	28-400	PTFE Rubber Lined Black Phenolic Cap	24
06-451-310	Clear	16	78 x 174	78 x 171	28-400	Aluminum Foil Lined Black Phenolic Cap	24
06-451-317	Amber	16	78 x 174	78 x 171	28-400	Aluminum Foil Lined Black Phenolic Cap	24
06-451-308**	Clear	32	98 x 212	98 x 209	33-400	Without Cap	12
02-927-148**	Clear	32	98 x 212	98 x 209	33-400	Without Cap	30
06-451-315**	Amber	32	98 x 212	98 x 209	33-400	Without Cap	12
02-927-151	Clear	32	98 x 212	98 x 209	33-400	Poly-Vinyl Lined White Polypropylene Cap	12
03-084-186	Amber	32	98 x 212	98 x 209	33-400	Poly-Vinyl Lined White Polypropylene Cap	12
02-927-147	Amber	32	98 x 212	98 x 209	33-400	PTFE Faced Foamed PE White Polypropylene Cap	12
06-451-313	Clear	32	98 x 212	98 x 209	33-400	PE Cone LDPE Black Phenolic Cap	12
06-451-355	Clear	32	98 x 212	98 x 209	33-400	Polyethylene LDPE lined Black Phenolic Cap	12
03-439-69G	Amber	32	98 x 212	98 x 209	33-400	Polyethylene LDPE lined Black Phenolic Cap	12
03-439-60M**	Clear	32	98 x 212	98 x 209	33-400	PTFE Rubber Lined Black Phenolic Cap	12
02-918D**	Amber	32	98 x 212	98 x 209	33-400	PTFE Rubber Lined Black Phenolic Cap	12
02-927-154	Clear	32	98 x 212	98 x 209	33-400	PTFE Faced Foamed PE White Polypropylene Cap	12
06-451-311	Clear	32	98 x 212	98 x 209	33-400	Aluminum Foil Lined Black Phenolic Cap	12
06-451-318	Amber	32	98 x 212	98 x 209	33-400	Aluminum Foil Lined Black Phenolic Cap	12
06-451-309**	Clear	80*	135 x 295	135 x 291	38-439	Without Cap	6
03-439-50A	Clear	80*	135 x 295	135 x 291	38-439	Aluminum Foil Lined Black Phenolic Cap	6
06-451-316**	Amber	4L*	160 x 340	160 x 336	38-430	Without Cap	4
06-451-356	Amber	4L*	160 x 340	160 x 336	38-430	PE Cone LDPE Black Phenolic Cap	4
03-439-69H	Amber	4L*	160 x 340	160 x 336	38-430	Polyethylene LDPE lined Black Phenolic Cap	4
06-451-323**	Amber	4L*	160 x 340	160 x 336	38-430	PTFE Rubber Lined Black Phenolic Cap	4
03-439-50B	Amber	4L*	160 x 340	160 x 336	38-430	Aluminum Foil Lined Black Phenolic Cap	4

*Manufactured with jug handle

**Autoclavable

***Dia x H (mm)

Safety Coated Jar

- Plastisol coating for safety
- Made from clear or amber soda-lime glass that conforms to USP Type III requirements
- Wide mouth for use with solid samples
- Available with or without caps



Cat No.	Color	Approx Size (oz)	Cap On***	Cap Off***	Cap Size	Cap Material/Cap Liner	Qty/Case
03-439-60J**	Clear	8	75 x 92	75 x 90	70-400	Without Cap	12
03-439-60A	Clear	8	75 x 92	75 x 90	70-400	With Poly-Vinyl Lined Black Phenolic Cap	12
02-927-155	Clear	8	77 x 94	77 x 91	70-400	PTFE Faced Foamed PE White Polypropylene Cap	12
03-084-178	Amber	8	69 x 125	69 x 122	45-400	PTFE Faced Foamed PE White Polypropylene Cap	24
03-084-181	Amber	8	69 x 125	69 x 122	45-400	Poly-Vinyl Lined White Polypropylene Cap	24
03-439-60K**	Clear	16	78 x 147	78 x 145	70-400	Without Cap	12
03-439-60B	Clear	16	78 x 147	78 x 145	70-400	With Poly-Vinyl Lined Black Phenolic Cap	12
02-927-156	Clear	16	80 x 151	80 x 148	70-400	PTFE Faced Foamed PE White Polypropylene Cap	12
02-914-000	Clear	16	80 x 151	80 x 148	70-400	Poly-Vinyl Lined White Polypropylene Cap	12
03-084-179	Amber	16	85 x 152	85 x 149	53-400	PTFE Faced Foamed PE White Polypropylene Cap	12
03-084-182	Amber	16	85 x 152	85 x 149	53-400	Poly-Vinyl Lined White Polypropylene Cap	12
03-439-60F**	Clear	32	95 x 182	95 x 180	70-400	Without Cap	12
03-439-60C	Clear	32	95 x 182	95 x 180	70-400	With Poly-Vinyl Lined Black Phenolic Cap	12
06-450-300	Clear	32	100 x 175	100 x 172	89-400	Poly-Vinyl Lined White Polypropylene Cap	12
02-927-157	Clear	32	100 x 175	100 x 172	89-400	PTFE Faced Foamed PE White Polypropylene Cap	12
03-084-180	Amber	32	103 x 183	103 x 180	53-400	PTFE Faced Foamed PE White Polypropylene Cap	12
03-084-183	Amber	32	103 x 183	103 x 180	53-400	Poly-Vinyl Lined White Polypropylene Cap	12

* Dia x H (mm) **Autoclavable

Safety Coated Lab 45™ Media / Reagent Bottle

- Plastisol coating for safety
- Made from clear borosilicate glass
- 45mm white polypropylene screw cap attached
- Pour ring eliminates drips
- Autoclavable
- Color coded caps available separately



Cat. No.	Size (mL)	Approx Dia x H (mm)	Cap Size (mm)	Qty/Case
06-451-357	250	70 x 144	45	12
06-451-293	500	86 x 186	45	12
06-451-294	1000	101 x 233	45	12

Screw Caps

Cat. No.	Description	Size (mm)	Qty/Case
06-450-79	White Polypropylene	45	12
02-940-34	Red Polypropylene	45	12
02-940-35	Blue Polypropylene	45	12
02-926-980	Pink Polypropylene	45	12

Safety Coated Media / Lab Bottle

- Plastisol coating for safety
- USP Type I clear borosilicate glass
- Provided with graduations and writing patch
- 33-430 screw cap can be purchased separately
- Autoclavable



Cat. No.	Size (mL)	Approx Dia x H (mm)	Cap Size	Qty/Case
06-451-274	125	55 x 119	33-430	48
06-451-275	250	67 x 148	33-430	48

Screw Caps, Black Phenolic

Cat. No.	Cap Size	Liner	Qty/Case
06-450-34	33-430	14B White Rubber Liner	200
06-450-7	33-430	Polyethylene (LDPE) Liner*	200
06-406-33	33-430	PTFE Faced (14B) Styrene-Butadiene	100

* Not autoclavable

Safety Coated Reagent Bottle

- Plastisol coating for safety
- Clear borosilicate glass with writing patch
- 33-430 screw cap attached
- Polypropylene cap with PTFE liner
- 125 and 250mL size
- Autoclavable



Cat. No.	Size (mL)	Approx Dia x H (mm)	Cap Size	Qty/Case
03-439-51A	125	58 x 122	33-430	6
06-451-358	250	69 x 151	33-430	6

Safety Coated Solution Bottle

- Plastisol coating for safety
- Made from low extractable borosilicate glass
- Serum finish takes rubber stopper closure



Cat. No.	Size	Approx Dia x H (mm)	Stopper Size	Qty/Case
06-451-326	5 gallon	294 x 502	12	1

Safety Coated Reservoir, High Capacity

- Ideal as HPLC mobile phase or filtration reservoir
- Safety coated glass bottles provide an added measure of safety
- UV protectant coating
- Manufactured from WHEATON 33 low extractable borosilicate glass that conforms to USP Type I and ASTM E 438 Type I, Class A requirements
- Supplied white polypropylene screw cap has a built-in wedge-shaped sealing ring, eliminating the need for a liner
- Autoclavable



Cat. No.	Size (mL)	Cap Size (mm)	Dia x H (mm)	Qty/Case
13-703-993	2000	45	138 x 246	1
13-703-994	5000	45	186 x 318	1

Glass Types

The glass products in this catalog are made from many different glass formulations. Following are brief definitions of these glass types and descriptions of their characteristics.

180 Glass: An exceptionally clear borosilicate glass of high chemical durability, which has been especially formulated for the lowest background count. Great care has been taken to select only those ingredients for the batch that would not cause unwanted background count or color. Potassium as a separate element has been excluded from the batch to minimize K40. Special controls assure high quality and batch-to-batch uniformity. This glass type is used in the manufacture of specialty tubing containers.

200 Glass: Also referred to as 33 expansion low extractable borosilicate glass, is a clear borosilicate glass with exceptional thermal endurance that meets the requirements for ASTM Type I, Class A. This glass also meets USP Type I Glass Grains, USP Arsenic, EP Type I Glass Grains (Test B), and EP Arsenic, as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia. This glass type is used in the manufacture of tubing containers and laboratory glassware. Some containers may also be tested for compliance to the current USP Type I Surface Test and EP Type I Surface Test (Test A). Compliance to these tests will be noted on the certificate of compliance for that item.

300 Glass: A chemically resistant clear borosilicate glass that meets the requirements for ASTM Type I, Class B. This glass also meets USP Type I Glass Grains, USP Arsenic, EP Type I Glass Grains (Test B), and EP Arsenic, as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia. This glass type is used in the manufacture of tubing containers. Some containers may also be tested for compliance to the current USP Type I Surface Test and EP Type I Surface Test (Test A). Compliance to these tests will be noted on the certificate of compliance for that item.

320 Glass: A similar composition to 300 Glass except amber color for light sensitive applications. Meets UV light protection limits as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia.

400 Glass: A clear borosilicate glass that falls well within the limits for USP Type I Glass Grains, USP Arsenic, EP Type I Glass Grains (Test B), and EP Arsenic, as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia. This glass type is used in the manufacture of molded bottles. Some containers may also be tested for compliance to the current USP Type I Surface Test and EP Type I Surface Test (Test A). Compliance to these tests will be noted on the certificate of compliance for that item.

500 Glass: Similar to the 400 Glass formulations except amber color for light sensitive applications. Meets UV light protection limits as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia.

800 Glass: A superior soda-lime clear glass that meets the requirements for USP Type III Glass Grains, USP Arsenic, EP Type III Glass Grains (Test B), and EP Arsenic, as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia. This glass type is used in the manufacture of molded bottles. Some containers may also be tested for compliance to the current USP Type III Surface Test and EP Type III Surface Test (Test A). Compliance to these tests will be noted on the certificate of compliance for that item.

900 Glass: Similar in formulation to 800 Glass except amber color for light sensitive applications. Meets UV light protection limits as specified in the current revisions of the U.S. Pharmacopeia and European Pharmacopeia.

Typical Properties of WHEATON® Glass

	Glass Type							
	Borosilicate						Soda-Lime	
	"180" Tubing Vial Clear	"200" Tubing Vial Clear	"300" Tubing Vial Clear	"320" Tubing Vial Amber	"400" Molded Container Clear	"500" Molded Container Amber	"800" Molded Container Clear	"900" Molded Container Amber
Strain Point °C	510	505	525	510	530	515	510	496
Annealing Point °C	560	560	570	560	570	550	548	536
Softening Point °C	820	820	785	770	750	745	729	713
Linear Coefficient of Expansion (0-300°C) x 10 ⁻⁷	33	33	55	54	60	61	88	91
Density g/cm ³	2.23	2.23	2.33	2.39	2.41	2.42	2.48	2.50
ASTM Glass Type & Class	I A	I A	I B	—	—	—	—	—
USP Powered Glass <660>	Type I	Type I	Type I	Type I	Type I	Type I	Type III	Type III
USP Light Transmission <671>	—	—	—	Yes	—	Yes	—	Yes
USP Arsenic <211>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EP Glass Grains (Test B) 3.2.1	Type I	Type I	Type I	Type I	Type I	Type I	Type III	Type III
EP Spectral Transmission 3.2.1	—	—	—	Yes	—	Yes	—	Yes
EP Arsenic 3.2.1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

USP= U.S. Pharmacopeia, EP= European Pharmacopeia

Factors for Selecting a Glass Container

Chemical Durability

The U.S. Pharmacopeia classifies pharmaceutical glass containers according to their chemical durability, which is their resistance to water attack. Different types of glass react differently when exposed to solutions and vapors. Reactive substances will leach constituents from the glass surface into the contained product. This reaction can occur with ordinary aqueous, saline and alcohol based solutions. The primary ion removed from the glass surface is sodium; however all elements are subject to leaching. It is not uncommon to experience an increase in product pH as sodium is extracted from the container. Corrosion of the glass occurs over time and is accelerated by moist heat-treating processes like autoclaving.

Containers are classified by the USP as Type I, Type II and Type III. Type I is the most chemically durable glass and Type III is the least durable. Test methods and specification limits are determined by the USP in Chapter <660> Containers. USP Type can be used as a general guide for container selection but should not be the only criteria in the decision making process. A set of criteria has been developed over the years to assist with the selection of glass containers. These guidelines were established to narrow the selection of possible containers. It is the product manufacturers responsibility to do testing to ensure that the glass container is suitable for the application and contained product.

USP Type I

USP Type I classification is a borosilicate glass with superior chemical resistance. This class of glass represents the least reactive glass containers available. Typically, this glass can be used for most applications, including packaging for parenteral and non-parenteral products. Type I glass may be used to package acidic, neutral and alkaline products. Water for injection, unbuffered products, chemicals, sensitive lab samples and those requiring sterilization are commonly packaged in Type I borosilicate glass. Type I glass can be subject to chemical attack under certain conditions, thus container selection must be made carefully for very low and very high pH applications. Most glass laboratory apparatus are Type I borosilicate glass.

Even though Type I glass has the highest chemical durability, there still may be some sensitivity with certain packaged products. For applications where standard Type I glass does not provide sufficient protection against alkali extraction and pH shifting, internal surface treatment can be used to further improve the chemical durability of the container. This surface enhancement may become especially important for pH sensitive products packaged in small containers because smaller containers have a higher surface area to volume ratio. See the USP Type II description for an explanation of the internal surface treatment process. It should be noted that the USP does not place any additional durability requirements on surface treated Type I glass.

USP Type II

USP Type II glass is soda-lime glass that has been treated with sulfur compounds to de-alkalize the interior surface of the container. This treatment results in a container with high chemical resistance because alkali is removed from the glass surface prior to use. The amount of ions available to leach into the product is reduced, thus the container durability is increased. Extraction salts will be present on the interior surface of new sulfur treated containers, and the containers may require washing prior to use. Type II glass is less chemically durable than Type I glass, but is more chemically durable than Type III glass. It can be used for acidic and neutral parenteral preparations that remain below pH 7 during their shelf life.

USP Type III

USP Type III is a soda-lime glass with moderate chemical resistance. It is typically acceptable for packaging dry powders that will be dissolved into solutions or buffers that are insensitive to alkali.

Type III glass may not be suitable for autoclaved products because the autoclaving process will accelerate the glass corrosion reaction. Dry heat sterilization processes are typically not a problem for Type III containers.

Factors other than USP Type

Handling Considerations

It is important to consider filling and processing steps when choosing a container. Both mechanical and thermal stresses are important factors. For a given thermal expansion range, a typical tubing vial with thin, uniform walls will withstand thermal shock better than a molded glass container.

The physical design of the container will play a part in the amount of thermal and mechanical shock resistance it exhibits. It is often necessary to make a compromise between high resistance to mechanical shock and high resistance to thermal shock.



Light Sensitivity

Light sensitive products must be packaged in amber glass. Amber glass is formulated to absorb light in the Ultra Violet region of the electromagnetic spectrum. Test methods and specification limits for light protection can be found in the U. S. Pharmacopoeia.

Specific Ion Sensitivity

If a product is sensitive to the presence of particular ions, the composition of the glass container should be considered. For example, products that contain sulfate salts may experience the formation of precipitates if packaged in glass with barium or calcium in the formulation. In this example, it would be desirable to avoid glass that contains barium and calcium. A second example is pre-cleaned containers for environmental sampling. Even though the containers are clean, the chemical durability characteristics of the glass have not been altered. Thus, it would not be feasible to test the samples for low levels of sodium, because the sample will extract sodium from the container's surface.





An Alternative to Glass

Plastic Bottles

Plastic containers have been developed for a variety of applications across many different industries over the years. There are many different types of polymers used in the creation of these containers to help fill the demands for the various applications. Polymers offer a variety of properties, each having different levels of importance with different users depending on the application. Some users may have flexibility within their product formula or filling process and therefore focus on economical containers while others may need containers that are stronger, autoclavable, transparent, sterilized, etc., therefore requiring more specifications. DWK can help with polymer selection through comprehension of the customer's product, goals, and adaptability. Several questions should be posed to gather this understanding.

Some examples include:

What is the container size and physical design: Narrow mouth vs. wide mouth, tall vs. short, etc.?

Must the package be transparent, translucent, opaque or colored for either marketing or light protection?

Are there specific shipment and storage conditions such as refrigeration, freezing, exclusion of light, etc.?

Are there governmental regulations pertaining to the product?

How is the product going to be dispensed by the user?

Have any tests been run in plastic? Was it unsuccessful and why? What type of plastics?

Many things govern polymer suitability for package use. These include:

- Permeation / Barrier
- Sorption Characteristics
- Chemical Resistance
- Stress Crack Resistance
- Rigidity / Flexibility
- Impact Resistance
- Sterilizability
- Recyclability
- Temperature Resistance

For more information on DWK Plastic Bottles, contact your DWK Regional Sales Manager or Customer Service at 800-225-1437.

Leak Resistant Bottles

- High or low density polyethylene or polypropylene
- Superior double seal closure for leak resistance
- Amber or natural color
- Available in narrow or wide mouth

Wide Mouth Blake Packer

- High density polyethylene, natural color
- Good chemical resistance
- Wide mouth is ideal for solid samples
- Blake design maximizes storage space

Wide Mouth Container, Polypropylene

- Durable container with good chemical resistance
- Polypropylene container with linerless cap is autoclavable



Cylinder Round Bottles

- High density polyethylene
- Available in white or natural
- Good chemical resistance
- Narrow mouth is ideal for liquids

Sterile PETG Media Bottles

- Excellent gas barrier properties, ensuring pH stability
- Sterile, tamper-evident seal ensures product integrity prior to use
- Meets ISO 10993 and/or USP Class VI biocompatibility requirements
- Recommended temperature range 70°C to -40°C

Sterile PET Media Bottle

- Polyethylene terephthalate
- Permanent in-mold graduations
- Supplied with caps pre-attached and shrink wrapped in convenient trays

Packageability of Plastic Containers

Requirement	PC	PE	PET	PETG	PP	PS	PVC
Lightweight	6	2	5	5	1	3	6
Clarity	1	3	1	1	2	1	1
Toughness	3	1	2	1	3	9	8
Water Adsorption	6	2	3	3	2	4	2
Water Vapor Permeability	6	2	5	4	2	5	4
CO ₂ Permeability	7	6	2	3	5	9	3
O ₂ Permeability	7	7	2	3	6	8	2
Resistance: Acids	4	2	4	4	2	4	2
Resistance: Alkalis	7	2	5	5	2	2	2
Resistance: Oils	4	4	2	2	3	4	2
Resistance: Solvents	3	3	2	2	3	6	4
Resistance: High Humidity	6	1	1	1	1	1	1
Resistance: Sunlight	4	4	1	2	4	5	5
Resistance: Heat (hot fill)	1	3	1	1	2	5	1
Resistance: Cold	1	1	2	2	4	5	9

This chart is a generalization to aid in selection; there are many forms, thicknesses and various copolymers and additives available. The lower the number, the better the property. 1=Excellent; 9=Poor. (PE Properties are similar for HDPE & LDPE.)

Leak Resistant Bottle

- High or Low Density Polyethylene, or Polypropylene
- Amber or natural color
- Available in narrow or wide mouth



- Superior double seal closure for leak resistance
- No-drip pour lip for safe and clean pouring
- Polypropylene cap attached



Cat. No.	Size (oz)*	Size (mL)	Material	Color	Mouth Opening	Dia x H (mm)	Cap Size	Qty/Pack	Qty/Case
03-083-8	.1	4	HDPE	Natural	Narrow	16 x 38	13-425	12	72
03-083-17	.1	4	HDPE	Amber	Narrow	16 x 38	13-425	12	72
03-083-26**	.1	4	PP	Natural	Narrow	16 x 38	13-425	12	72
03-083-1	.3	8	LDPE	Natural	Narrow	25 x 43	20-410	12	72
03-083-9	.3	8	HDPE	Natural	Narrow	25 x 43	20-410	12	72
03-083-18	.3	8	HDPE	Amber	Narrow	25 x 43	20-410	12	72
03-083-27**	.3	8	PP	Natural	Narrow	25 x 43	20-410	12	72
03-083-2	.5	15	LDPE	Natural	Narrow	25 x 56	20-410	12	72
03-083-10	.5	15	HDPE	Natural	Narrow	25 x 56	20-410	12	72
03-083-19	.5	15	HDPE	Amber	Narrow	25 x 56	20-410	12	72
03-083-28**	.5	15	PP	Natural	Narrow	25 x 56	20-410	12	72
03-083-3	1	30	LDPE	Natural	Narrow	32 x 69	20-410	12	72
03-083-11	1	30	HDPE	Natural	Narrow	32 x 69	20-410	12	72
03-083-20	1	30	HDPE	Amber	Narrow	32 x 69	20-410	12	72
03-083-29**	1	30	PP**	Natural	Narrow	32 x 69	20-410	12	72
03-083-34	1	30	LDPE	Natural	Wide	33 x 69	28-410	12	72
03-083-39	1	30	HDPE	Natural	Wide	33 x 69	28-410	12	72
03-083-125	1	30	HDPE	Amber	Wide	33 x 69	28-410	12	72
03-083-49**	1	30	PP	Natural	Wide	33 x 69	28-410	12	72
03-083-4	2	60	LDPE	Natural	Narrow	39 x 84	20-410	12	72
03-083-12	2	60	HDPE	Natural	Narrow	39 x 84	20-410	12	72
03-083-21	2	60	HDPE	Amber	Narrow	39 x 84	20-410	12	72
03-083-30**	2	60	PP	Natural	Narrow	39 x 84	20-410	12	72
03-083-40	2	60	HDPE	Natural	Wide	39 x 88	28-410	12	72
03-083-45	2	60	HDPE	Amber	Wide	39 x 88	28-410	12	72
03-083-50**	2	60	PP	Natural	Wide	39 x 88	28-410	12	72
03-083-5	4	125	LDPE	Natural	Narrow	50 x 101	24-410	12	72
03-083-13	4	125	HDPE	Natural	Narrow	50 x 101	24-410	12	72
03-083-22	4	125	HDPE	Amber	Narrow	50 x 101	24-410	12	72
03-083-31**	4	125	PP	Natural	Narrow	50 x 101	24-410	12	72
03-083-36	4	125	LDPE	Natural	Wide	51 x 98	38-410	12	72
03-083-41	4	125	HDPE	Natural	Wide	51 x 98	38-410	12	72
03-083-46	4	125	HDPE	Amber	Wide	51 x 98	38-410	12	72
03-083-51**	4	125	PP	Natural	Wide	51 x 98	38-410	12	72
03-083-6	8	250	LDPE	Natural	Narrow	61 x 129	24-410	12	72
03-083-14	8	250	HDPE	Natural	Narrow	61 x 129	24-410	12	72
03-083-23	8	250	HDPE	Amber	Narrow	61 x 129	24-410	12	72
03-083-32**	8	250	PP	Natural	Narrow	61 x 129	24-410	12	72
03-083-37	8	250	LDPE	Natural	Wide	61 x 125	43-410	12	72
03-083-42	8	250	HDPE	Natural	Wide	61 x 125	43-410	12	72
03-083-47	8	250	HDPE	Amber	Wide	61 x 125	43-410	12	72
03-083-52**	8	250	PP	Natural	Wide	61 x 125	43-410	12	72
03-083-15	16	500	HDPE	Natural	Narrow	72 x 171	28-410	12	48
03-083-24	16	500	HDPE	Amber	Narrow	72 x 171	28-410	12	48
03-083-33**	16	500	PP	Natural	Narrow	72 x 171	28-410	12	48
03-083-38	16	500	LDPE	Natural	Wide	72 x 164	53-410	12	48
03-083-43	16	500	HDPE	Natural	Wide	72 x 164	53-410	12	48
03-083-48	16	500	HDPE	Amber	Wide	72 x 164	53-410	12	48
03-083-53**	16	500	PP	Natural	Wide	72 x 164	53-410	12	48
03-083-16	32	1000	HDPE	Natural	Narrow	91 x 210	38-430	6	24
03-083-25	32	1000	HDPE	Amber	Narrow	91 x 210	38-430	6	24
03-084-00**	32	1000	PP	Natural	Narrow	91 x 210	38-430	6	24
02-911-272	32	1000	HDPE	Natural	Wide	91 x 199	63-415	12	48
02-911-273	32	1000	HDPE	Amber	Wide	91 x 199	63-415	12	48

* Approximate capacity **Autoclavable

Cylinder Round Bottle, HDPE, Natural & White

- High Density Polyethylene, natural and *white color
- Good chemical resistance
- Narrow mouth ideal for liquids
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (oz)	Size (mL)**	Dia x H (mm)	Cap Size	Qty/Pack	Qty/Case
06-451-7	1	30	27 x 78	20-410	12	72
03-439-70G*	1	30	27 x 78	20-410	12	72
06-451-8	2	60	35 x 98	20-410	12	72
03-439-70H*	2	60	35 x 98	20-410	12	72
03-084-201	8	250	52 x 160	24-410	—	230
03-084-202	16	500	64 x 203	24-410	—	24
03-084-203	16	500	64 x 203	24-410	—	180
03-084-204	32	1000	81 x 243	28-400	—	77

*White HDPE **Approximate capacity

Jug, HDPE

- High Density Polyethylene, natural color
- Good chemical resistance
- Narrow mouth ideal for liquids
- Pre-attached white polypropylene screw cap with polyvinyl liner



Cat. No.	Size (oz)	Cross Section x H (mm)	Cap Size	Qty/Case
03-084-206	64	123 x 253	38-400	40
03-084-207	128	137 x 295	38-400	4
03-439-55B	128	137 x 295	38-400	4

Round Bottle, LDPE, Translucent

- Low Density Polyethylene, translucent color
- LDPE is very flexible with high impact strength
- Excellent for mild and strong buffers, good chemical resistance
- Narrow mouth ideal for liquids
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Qty/Pack	Qty/Case
03-439-70A	7	19 x 63	15-415	12	144
03-439-70B	15	25 x 78	15-415	12	144
03-439-70C	30	33 x 73	20-410	12	72
03-439-70D	60	39 x 88	20-410	12	72
02-913-560	125	47 x 115	20-410	12	72

Wide Mouth Blake Packer, HDPE, Natural

- High Density Polyethylene, natural color
- Good chemical resistance
- Blake design maximizes storage space
- Wide mouth ideal for solids
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (oz)	Size (mL)*	Dia x H (mm)	Cap Size	Qty/Case
03-084-215	8	250	72 x 51 x 121	43-400	48
03-084-152	40	1200	110 x 81 x 193	53-400	6

*Approximate capacity

Wide Mouth Round Packer, HDPE, Natural

- High Density Polyethylene, natural color
- Good chemical resistance
- Wide mouth ideal for solids
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (oz)	Size (mL)*	Dia x H (mm)	Cap Size	Qty/Case
02-911-274	2	60	39 x 77	33-400	72
06-451-359	4	120	50 x 88	38-400	72
02-911-276	8	250	65 x 102	53-400	72
06-451-360	16	500	77 x 142	53-400	48
06-451-361	32	1000	95 x 179	53-400	24

*Approximate capacity

Wide Mouth Container, Polypropylene

- Durable container with good chemical resistance
- Pre-attached white polypropylene screw cap unlined or with foamed polyethylene liner
- Polypropylene container with linerless cap is autoclavable



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Cap Liner	Autoclavable	Qty/Case
02-912-986	30	39 x 41	43-400	Polyethylene	No	72
02-912-981	60	49 x 46	53-400	No liner	Yes	48
02-912-987	60	49 x 46	53-400	Polyethylene	No	48
02-912-982	125	53 x 68	58-400	No liner	Yes	36
02-912-988	125	53 x 68	58-400	Polyethylene	No	36
02-912-983	250	84 x 64	89-400	No liner	Yes	36
02-912-989	250	84 x 64	89-400	Polyethylene	No	36
02-912-984	500	85 x 99	89-400	No liner	Yes	24
02-912-990	500	85 x 99	89-400	Polyethylene	No	24
02-912-985	1000	116 x 97	120-400	No liner	Yes	24
02-912-991	1000	116 x 97	120-400	Polyethylene	No	24

Wide Mouth Container, Polystyrene

- Clear polystyrene offers clarity of glass and safety of plastic
- Good resistance to inorganic chemicals
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Qty/Case
02-912-992	30	39 x 41	43-400	72
02-912-993	60	49 x 46	53-400	48
02-912-994	125	53 x 68	58-400	36
02-912-995	250	84 x 64	89-400	36
02-912-996	500	85 x 99	89-400	24
02-912-997	1000	116 x 97	120-400	24

Wide Mouth Container, HDPE

- High Density Polyethylene, natural color
- Good chemical resistance
- Largest container available: 2000 to 3840mL size
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Qty/Case
02-912-998	2000	89-400	89-400	6
02-912-999	3000	100-400	100-400	4
06-451-362	3840	89-400	89-400	4

Sterile PETG Media Bottles

- Excellent gas barrier properties, ensuring pH stability
- Sterile, tamper-evident seal ensures product integrity prior to use
- Meets ISO 10993 and/or USP Class VI biocompatibility requirements
- Recommended temperature range 70°C to -40°C
- Graduated in mLs
- Leak resistant



Cat. No.	Capacity	Cap Size	Cap Type	Qty/Pack
02-924-970	30	20-415	PETG Tamper Evident	24
02-924-971	60	24-415	PETG Tamper Evident	24
02-924-972	125	38-430	PETG Tamper Evident	24
02-924-973	250	38-430	PETG Tamper Evident	24
02-924-974	250	38-430	PETG Standard Cap	24
02-924-975	500	38-430	PETG Tamper Evident	12
02-924-976	1000	38-430	PETG Tamper Evident	12
02-924-977	1000	38-430	PETG Standard Cap	12
02-924-978	2000	53B	PETG Tamper Evident	6
02-924-979	2000	53B	PETG Standard Cap	6

Wide Mouth Round Packer, PET

- PET offers clarity of glass with the safety of plastic
- Good alcohol and solvent barrier; not good for strong acids and bases
- Sterilizable through EtO and gamma radiation

Cat. No.	Size (oz)	Size (mL)*	Dia x H (mm)	Cap Size	Qty/Case
03-084-208	2	60	40 x 75	33-400	48
03-084-209	4	120	54 x 97	38-400	48
03-084-210	8	250	66 x 116	45-400	48

*Approximate capacity

HDPE Oblong Bottles

- High Density Polyethylene, Natural
- Good chemical resistance
- Wide Mouth ideal for solids
- With or without** cap attached



Cat. No.	Size (oz)	Size (mL)*	L x W x H (mm)	Cap Size	Qty/Case
03-084-213	4	125	48 x 40 x 97	38-400	48
03-084-214	4	125	48 x 40 x 97	38-400	500
03-084-215	8	250	69 x 49 x 119	43-400	48
03-084-147	8	250	69 x 49 x 119	43-400	250
03-084-211 **	16	500	76 x 63 x 152	43-400	160
03-084-148	16	500	76 x 63 x 152	43-400	24
03-084-149	16	500	76 x 63 x 152	43-400	168
03-084-212 **	32	1000	96 x 79 x 172	53-400	116
03-084-150	32	1000	96 x 79 x 172	53-400	12
03-084-151	32	1000	96 x 79 x 172	53-400	116
03-084-152	42	1250	107 x 79 x 187	53-400	6

*Approximate capacity

PET Diagnostic Bottle

- Ideal for reagents and buffer solutions
- Clear and amber PET available
- PP Caps lined with F217 foamed LDPE
- Additional colors of PP caps available



Cat. No.	Color	Size (mL)	Qty/Pack	Qty/Case
W220000	Clear	5	20	100
W220003	Amber	5	20	100
W220001	Clear	10	20	100
W220004	Amber	10	20	100
W220002	Clear	20	20	100
W220005	Amber	20	20	100

PET Bottle, Transparent

- Polyethylene Terephthalate, transparent
- PET offers clarity of glass with the safety of plastic
- Good alcohol and solvent barrier; not good for strong acids and bases
- Sterilizable through EtO and gamma radiation
- 120mL cylinder round style, smaller sizes have sloped shoulders
- Narrow mouth ideal for liquids
- Pre-attached white polypropylene screw cap with foamed polyethylene liner



Cat. No.	Size (mL)	Dia x H (mm)	Cap Size	Qty/Pack	Qty/Case
06-451-363	22	29 x 64	20-415	12	72
06-451-4	120	41 x 120	20-410	12	72

Media Bottle, Sterile PET

- Lightweight
- Permanent in-mold graduations
- No-drip pour lip
- 20% headspace for additives
- Manufactured from polyethylene terephthalate tested superior for pH stability, temperature durability, cloning efficiency and cytotoxicity
- Supplied with caps pre-attached and shrink-wrapped in convenient trays



Cat. No.	Size (mL)	Grad. (mL)	Dimensions (L x W x H)	Cap Size	Qty/Tray	Qty/Case
06-451-298	125	25	53 x 53 x 99mm	33-430	24	48



Plastic Resins

Listed below are the primary resins used in the manufacture of our products. Following are some of the characteristics and features of these resins. Also listed is the Society of the Plastic Industry (SPI) resin identification code number.

High Density Polyethylene (HDPE)

Flexible but more rigid than LDPE. Natural color is milky white, semi-translucent depending on density. Good impact strength and stress crack resistance. Good chemical resistance. Good vapor barrier but poor gas barrier. Sterilizable via EtO or gamma radiation.



Low Density Polyethylene (LDPE)

Very flexible, natural milky color, translucent with high impact strength. Excellent for mild and strong buffers, good chemical resistance. Good water vapor and alcohol barrier properties. Poor gas barrier, sterilizable with EtO or gamma radiation. Good stress crack and impact resistance.



Linear Low Density Polyethylene (LLDPE)

Very flexible, natural milky color, translucent with high impact strength. Excellent for mild and strong buffers, good chemical resistance. Good water vapor and alcohol barrier properties. Poor gas barrier, sterilizable with EtO or gamma radiation. Good stress crack and impact resistance.



Polybutylene Terephthalate (PBT)

Good chemical resistance, clear color, resistant to water, weak acids and bases at room temperature. Can be sterilized by EtO and autoclaving, at temperatures up to 180°C.



Polycarbonate (PC)

Rigid and strong, excellent clarity. High impact strength. Poor barrier properties.



Polyethylene Terephthalate (PET)

Semi-rigid to rigid depending on wall thickness. Natural color — clear and transparent. Good alcohol and solvent barrier; good gas and fair moisture barrier. Good to fair chemical barrier; not good for strong acids or bases. Good moldability. Sterilizable through EtO and gamma radiation. Good stress crack and impact resistance at room temperature and above.



Polyethylene Terephthalate Glycol (PETG)

Semi-rigid to rigid depending on wall thickness. Natural color — clear and transparent. Good alcohol and solvent barrier; fair gas and good moisture barrier. Good to fair chemical barrier; not good for strong acids or bases. Good moldability. Sterilizable through EtO and gamma radiation. Good stress crack and impact resistance at room temperature and above.



Polypropylene (PP)

Rigid, solid, durable in container or closure forms. Opaque, natural grayish yellow in natural form. Excellent stress crack and impact resistance. Excellent moisture barrier, good oil and alcohol barrier, poor gas barrier properties. Good chemical resistance. Sterilizable with EtO or autoclaving.



Polystyrene (PS)

PS is a transparent, rigid and glass-like polymer. Good resistance to inorganic chemicals. Light and heat stable, biologically inert and non-toxic. Poor impact and stress crack resistance, poor barrier properties. EtO or Gamma sterilizable.



Polyvinyl Chloride (PVC)

Flexible to rigid. Good for coatings; fair water and good oxygen barrier. Transparent to yellowish color in natural state. Good chemical resistance. Sterilizable by EtO. Good impact and some stress crack resistance. Poor recycling due to chloride residues.



PTFE, FEP, PFA

Polytetrafluoroethylene, fluorinated ethylene propylene, perfluoroalkoxy. All fluoropolymers feature opaque characteristics, excellent chemical resistance, good heat stability and thermal shock resistance. All are autoclavable, heat, and gas sterilizable.



Typical Properties of Plastics

	HDPE	LDPE	LLDPE	PC	PET	PETG	PP	PS	PVC	PTFE
Max. Temp °C	120	80	50	135	60	70	135	70	70	240
Transparency	Translucent	Translucent	Translucent	Transparent	Transparent	Transparent	Translucent	Transparent	Translucent	Opaque
Sterilization**										
Autoclave	No	No	No	Yes	No	No	Yes	No	No	Yes
Gas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dry Heat	No	No	No	No	No	No	No	No	No	Yes
Radiation	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Disinfectants	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Density G/Cm3	0.95	0.92	0.92	1.19	1.33	1.27	0.90	1.06	1.34	2.15
Flexibility	Semi	Flex	Flex	Rigid	Semi	Semi	Rigid	Rigid	Rigid	Rigid
Brittleness Temp °C	< -75	< -75	-76	-135	-10	-40	0	+20	-30	-110
Tensile Strength, Psi	4000	2400	2000	9000	8000	7500	5000	6000	5000	4000

**Depends on thickness and relates to containers and closures. Because there are many grades of resins and processing methods, the above information should be used as a general guideline only.

Permeability of Plastics

		HDPE	LDPE	LLDPE	PC	PET	PETG	PP	PS	PVC	PTFE
N ₂	See Note 1	42	180	—	50	0.8	10	44	50	2	—
O ₂	See Note 1	150	500	—	250	5	25	90-140	185-485	4	—
CO ₂	See Note 1	580	2700	—	1000	15	125	650	1160	4	—
Moisture	See Note 2	0.3	1.3	—	7.4	2.0-4.0	0.5	0.3-0.7	8.5	1.0-5.0	—

Note 1: Units are cc x mil / 100 in² x day x atm @ 25°C

Note 2: Units are g x mil / 100 in² x day @ 38°C, 50 - 90% RH

Chemical Compatibility

	Container Materials							Closure Liner Materials					Closure Materials				
	Glass	HDPE	LDPE	PC	PET	PETG	PP	Al Foil	LDPE	Poly Vinyl	PTFE	SBR	Silicone	PBT	Phenolic	PP	Urea
Acetic Acid, Glacial	A	A	B	C	A	C	A	A	B	B	A	C	B	C	A	A	D
Acetone	A	D	D	D	C	D	B	A	D	D	A	D	B	D	A	B	A
Acetonitrile	A	A	A	D	B	C	A	A	A	D	A	B	D	—	A	A	—
Acrylonitrile	A	A	A	D	B	—	B	B	A	D	A	C	D	—	D	B	—
Ammonium Sulfide	A	A	A	D	—	—	A	D	A	A	A	B	A	—	A	A	C
Benzene	A	D	D	D	C	D	D	B	D	D	A	D	D	A	A	D	A
Bleach	A	A	B	B	C	C	B	D	B	A	A	D	B	C	D	B	—
Boric Acid	A	A	A	A	A	A	A	D	A	A	A	A	A	A	B	A	—
Carbonic Acid	A	A	A	A	—	A	A	B	A	A	A	B	A	B	—	A	—
Chlorobenzene	A	C	D	D	B	C	C	A	D	D	A	D	D	B	A	C	B
Chloroform	A	C	C	D	D	D	D	A	C	D	A	D	D	D	A	D	A
Dichloromethane (DCM)	A	C	D	D	D	D	C	D	D	D	A	D	D	D	C	C	B
Diethylamine	A	C	D	D	—	—	B	A	D	D	A	B	B	—	—	B	—
Dimethyl Formamide (DMF)	A	A	A	D	B	C	A	A	A	D	A	D	B	C	A	A	—
Dimethyl Sulfoxide (DMSO)	A	A	A	D	B	C	A	A	A	D	A	D	D	C	—	A	—
Dioxane	A	B	B	D	A	A	D	D	B	D	A	D	D	B	A	D	—
Ether	A	C	D	D	A	A	D	B	D	D	A	D	D	A	B	D	B
Ethyl Acetate	A	B	B	D	B	C	C	B	B	D	A	D	C	C	A	C	B
Ethyl Alcohol	A	A	A	A	A	A	A	B	A	B	A	A	B	A	B	A	A
Ethylene Glycol	A	A	A	A	A	A	A	B	A	A	A	A	A	A	B	A	B
Formaldehyde	A	A	A	A	B	A	A	A	A	C	A	B	B	A	B	A	A
Formic Acid 50%	A	A	B	B	—	—	A	C	B	B	A	B	C	A	C	A	D
Gasoline	A	C	D	C	B	B	C	A	D	D	A	D	D	A	B	C	A
Glycerine	A	A	A	A	—	A	A	A	A	C	A	A	B	A	A	A	—
Heptane	A	C	D	B	B	—	C	A	D	C	A	D	D	A	A	C	A
Hexane	A	B	D	C	C	B	B	A	D	D	A	D	D	A	B	B	—
Hydrochloric Acid (HCL) 50%	A	A	A	D	B	C	A	D	A	B	A	D	D	C	A	A	D
Hydrofluoric Acid (HF) 50%	D	A	A	D	C	D	A	D	A	C	A	D	D	C	D	A	D
Hydrogen Peroxide 50%	B	A	A	A	B	B	A	A	A	C	A	C	B	B	D	A	D
Iodine	A	C	D	C	A	—	C	A	D	C	A	B	A	D	—	C	—
Isopropyl Alcohol	A	A	A	A	A	A	A	A	A	B	A	B	A	A	A	A	—
Methyl Alcohol	A	A	A	B	B	A	A	A	A	C	A	A	A	B	B	A	A
Methyl Ethyl Ketone (MEK)	A	D	D	D	B	C	B	A	D	D	A	D	D	C	A	B	—
Methylene Chloride	A	C	D	D	D	D	C	D	D	D	A	D	D	D	C	C	B
Nitric Acid 50%	A	C	B	B	C	B	C	D	B	B	A	D	D	C	B	C	D
Pentane	A	C	C	A	—	—	D	A	C	D	A	D	D	B	—	D	—
Perchloric Acid 50%	B	B	B	D	B	C	B	D	B	D	B	D	D	—	—	B	—
Phenol 50%	A	D	D	D	D	D	D	A	D	C	A	D	D	D	A	D	—
Phosphoric Acid 50%	A	A	A	A	B	—	A	B	A	B	A	D	D	B	B	A	D
Picric Acid	A	D	D	D	B	—	D	A	D	D	A	B	D	D	A	D	D
Potassium Hydroxide	D	A	A	D	D	D	A	D	A	A	A	B	C	C	D	A	—
Sodium Hydroxide 50%	D	A	B	D	D	C	A	D	B	C	A	A	B	C	D	A	C
Sodium Peroxide	A	B	B	A	—	—	B	C	B	A	A	B	D	B	B	B	D
Sodium Thiosulfate	A	A	A	B	B	—	A	A	A	A	A	B	A	B	A	A	B
Sulfuric Acid 50%	A	A	A	B	B	C	B	C	A	C	A	D	D	B	C	B	D
Tetrahydrofuran (THF)	A	C	C	D	A	D	B	A	C	D	A	D	D	D	A	B	—
Toluene	A	C	C	D	C	C	C	A	C	C	A	D	D	D	A	C	—
Trifluoroacetic acid (TFA) 50%	A	A	B	D	A	—	—	A	A	—	—	D	—	—	A	—	—
Vegetable Oil	A	B	B	A	A	A	A	A	B	A	A	D	A	A	A	A	A
Xylene	A	C	D	D	C	—	D	A	D	D	A	D	D	C	A	D	B

(Tests conducted at room temp)

A - Resistant

B - Limited Resistance

C - Poor Resistance

D - Not Resistant

— - Unknown

Al Foil = aluminum foil

HDPE = high density polyethylene

LDPE = low density polyethylene

PBT = polybutylene terephthalate

PC = polycarbonate

PET = polyethylene terephthalate

PETG = polyethylene terephthalate glycol copolymer

PP = polypropylene

PTFE = polytetrafluoroethylene

SBR = styrene butadiene rubber

Although the information in this chart was acquired from reputable sources, it should only be used as a guide in selecting a container and closure system. Because so many factors can affect the chemical resistance of a material, in-house testing under actual conditions should be performed. WHEATON accepts no responsibility for the accuracy of this data or for any consequences resulting from its use.

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.

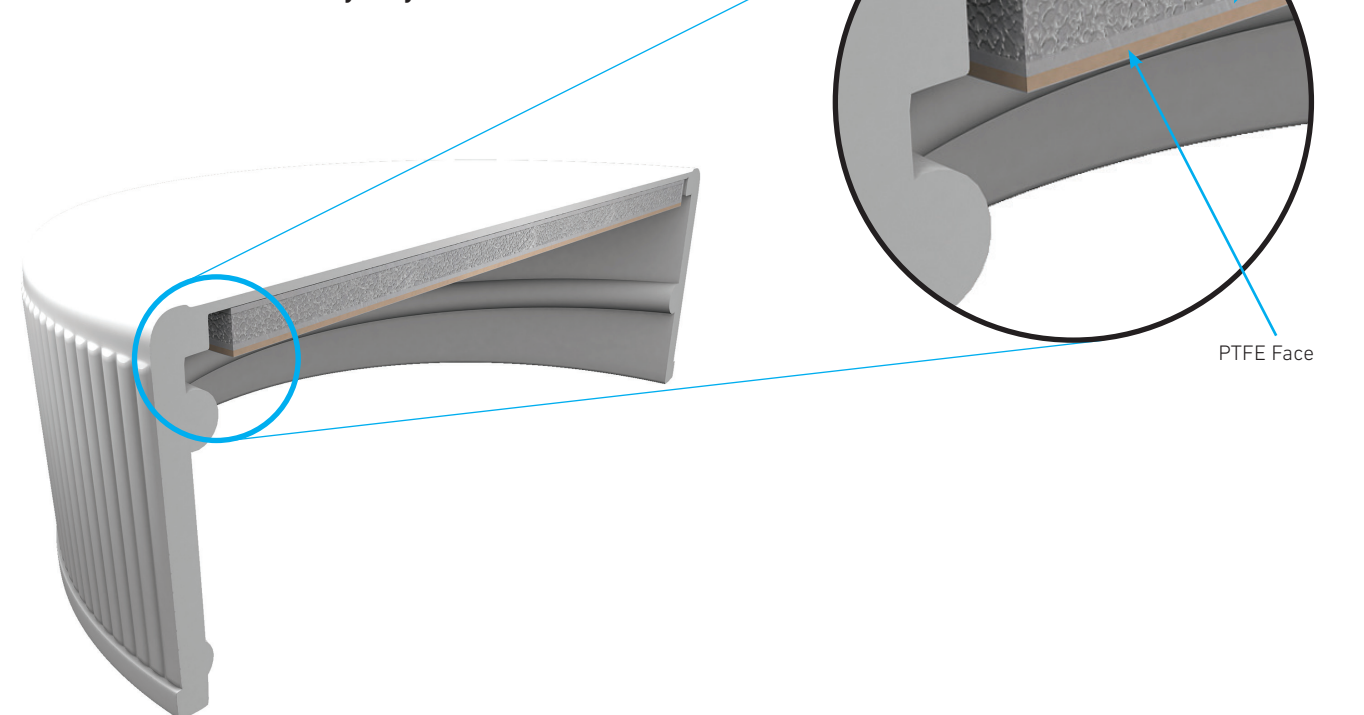
Typical applications: analytical lab samples, high purity chemicals, strong acids, solvents. Excellent for environmental samples, pharmaceuticals and diagnostic reagents.

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.

PTFE Faced Foamed Polyethylene (PTFE / PE Foam)



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.

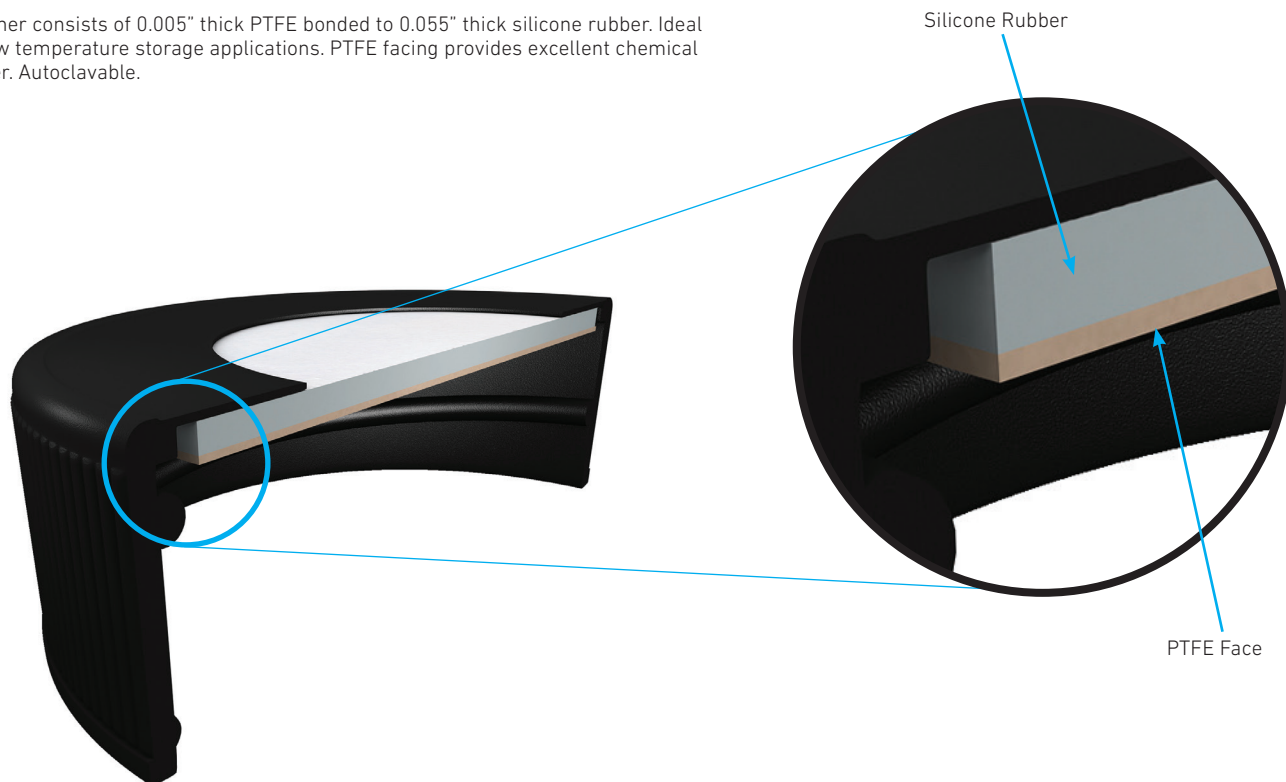
Styrene-Butadiene Rubber / 0.005 PTFE (PTFE / Styrene-Butadiene)

The white rubber / 0.005" PTFE liner consists of virgin 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.

PTFE Faced Silicone Rubber (PTFE / Silicone)

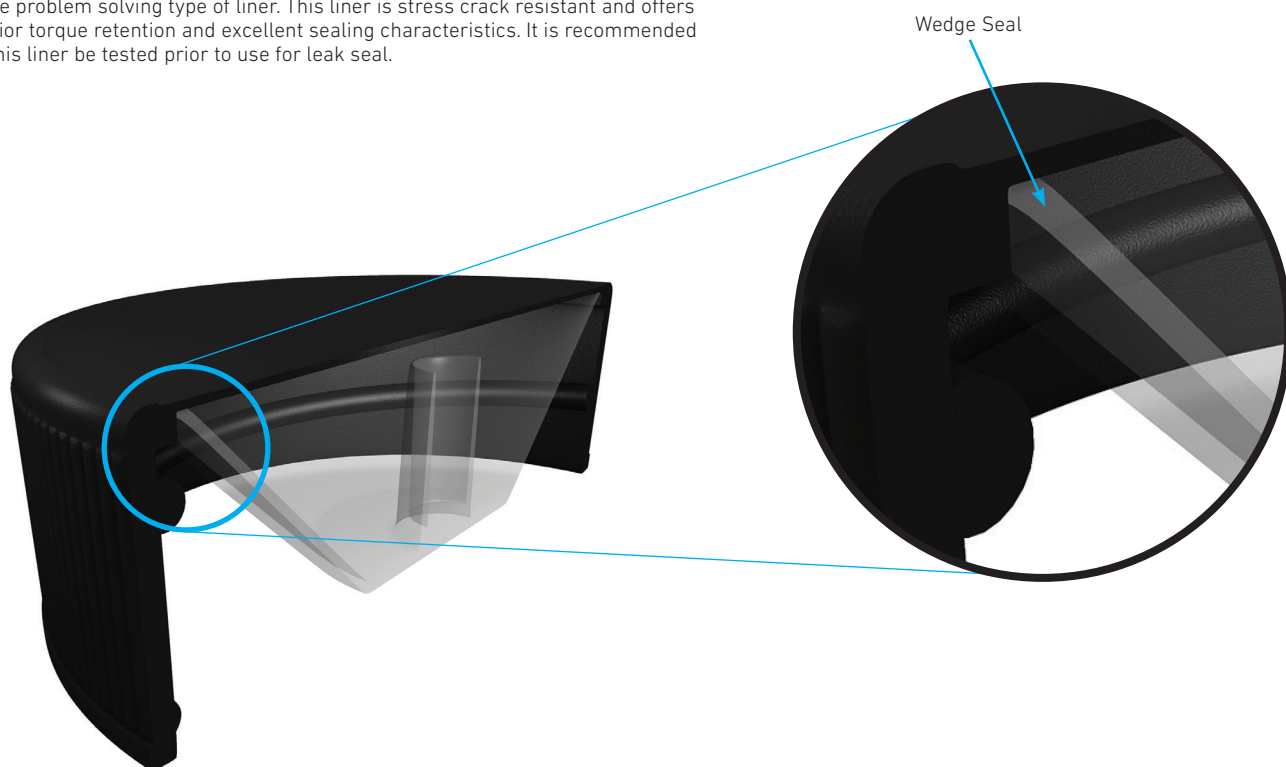
The liner consists of 0.005" thick PTFE bonded to 0.055" thick silicone rubber. Ideal for low temperature storage applications. PTFE facing provides excellent chemical barrier. Autoclavable.



Polyethylene Cone (PE Cone)

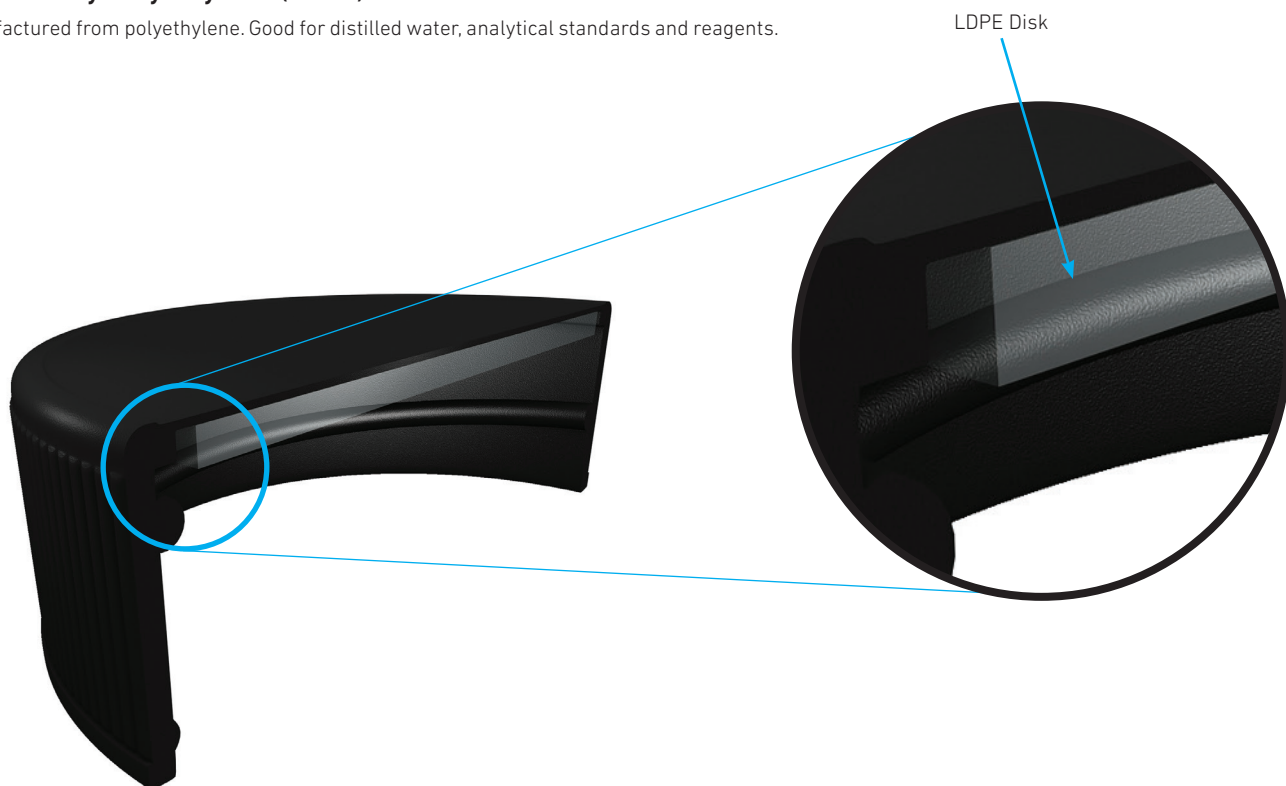
Manufactured from polyethylene (LDPE). The unique cone design provides a wedge type seal that not only seals across the top but also across the inside diameter.

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

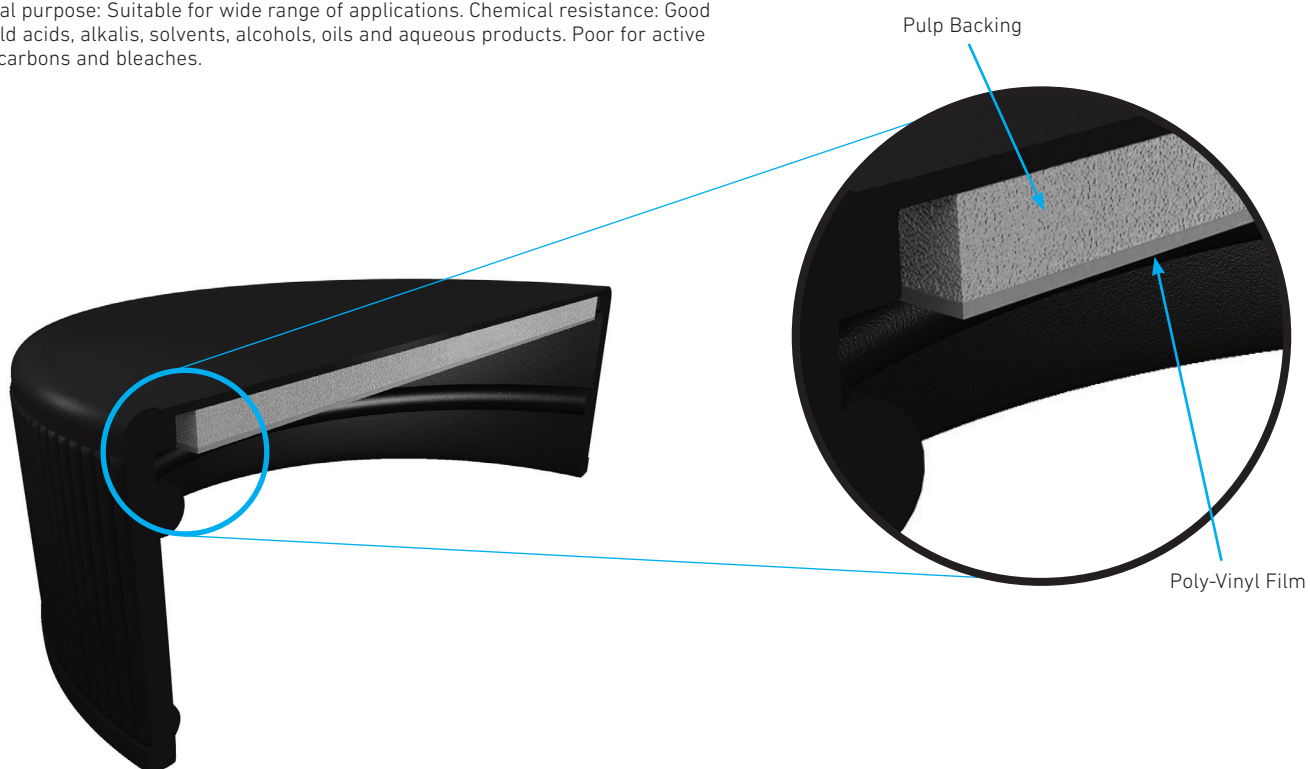
Manufactured from polyethylene. Good for distilled water, analytical standards and reagents.



Pulp / Poly-Vinyl

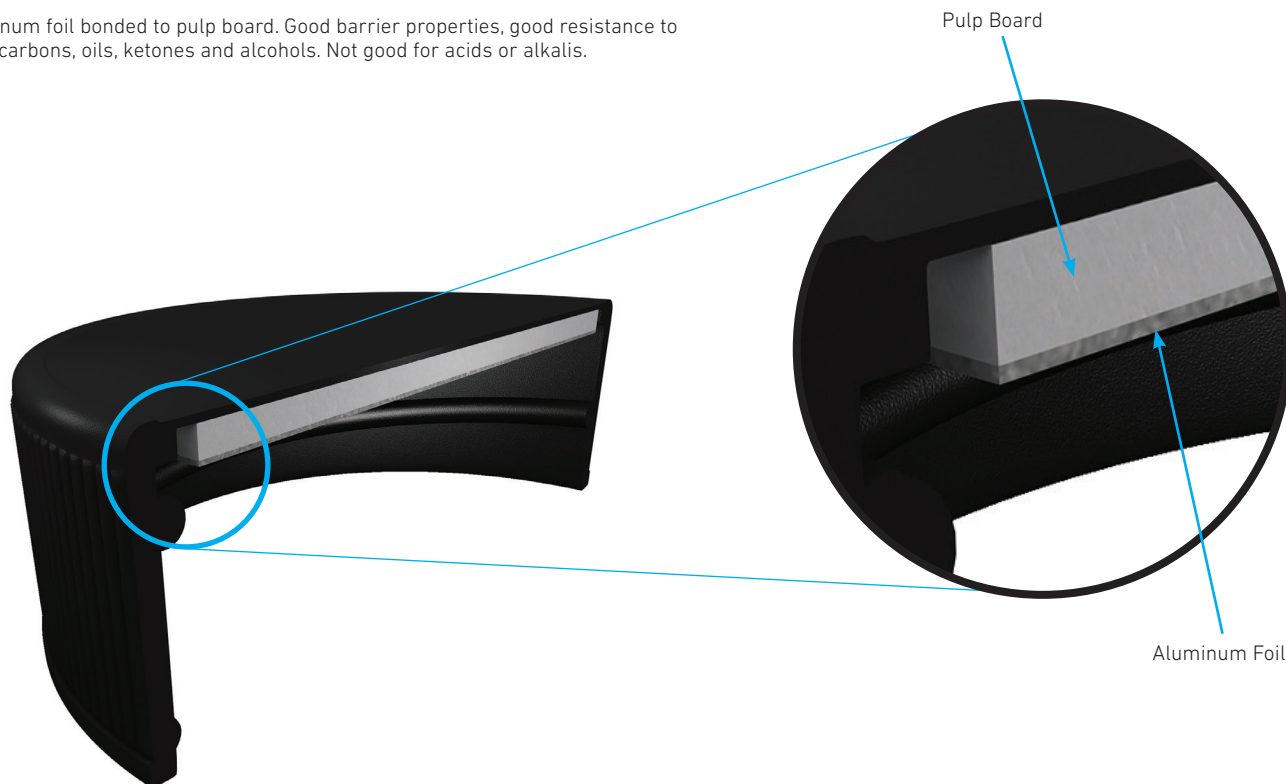
Poly-vinyl film bonded to HDPE on a #30 white pulp paper backing. Superior to plain pulp paper because it provides an excellent moisture barrier.

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

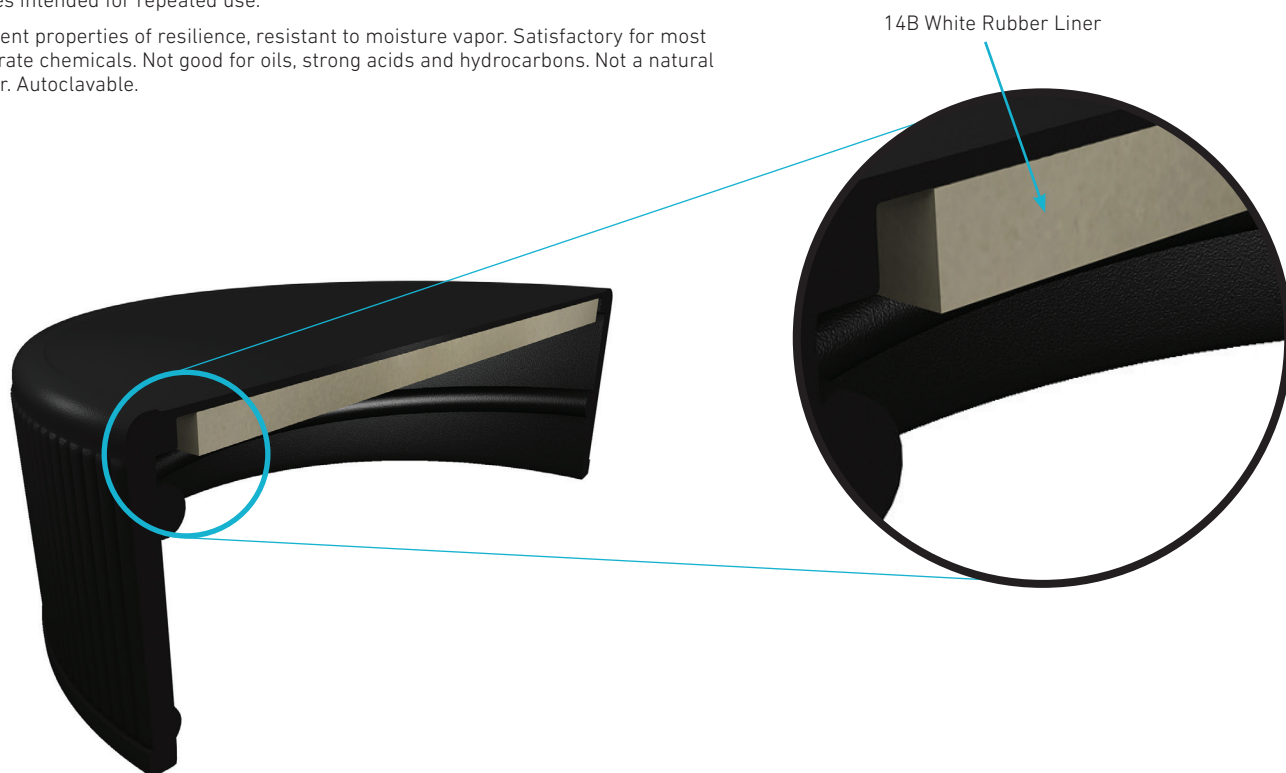
Aluminum foil bonded to pulp board. Good barrier properties, good resistance to hydrocarbons, oils, ketones and alcohols. Not good for acids or alkalis.



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."

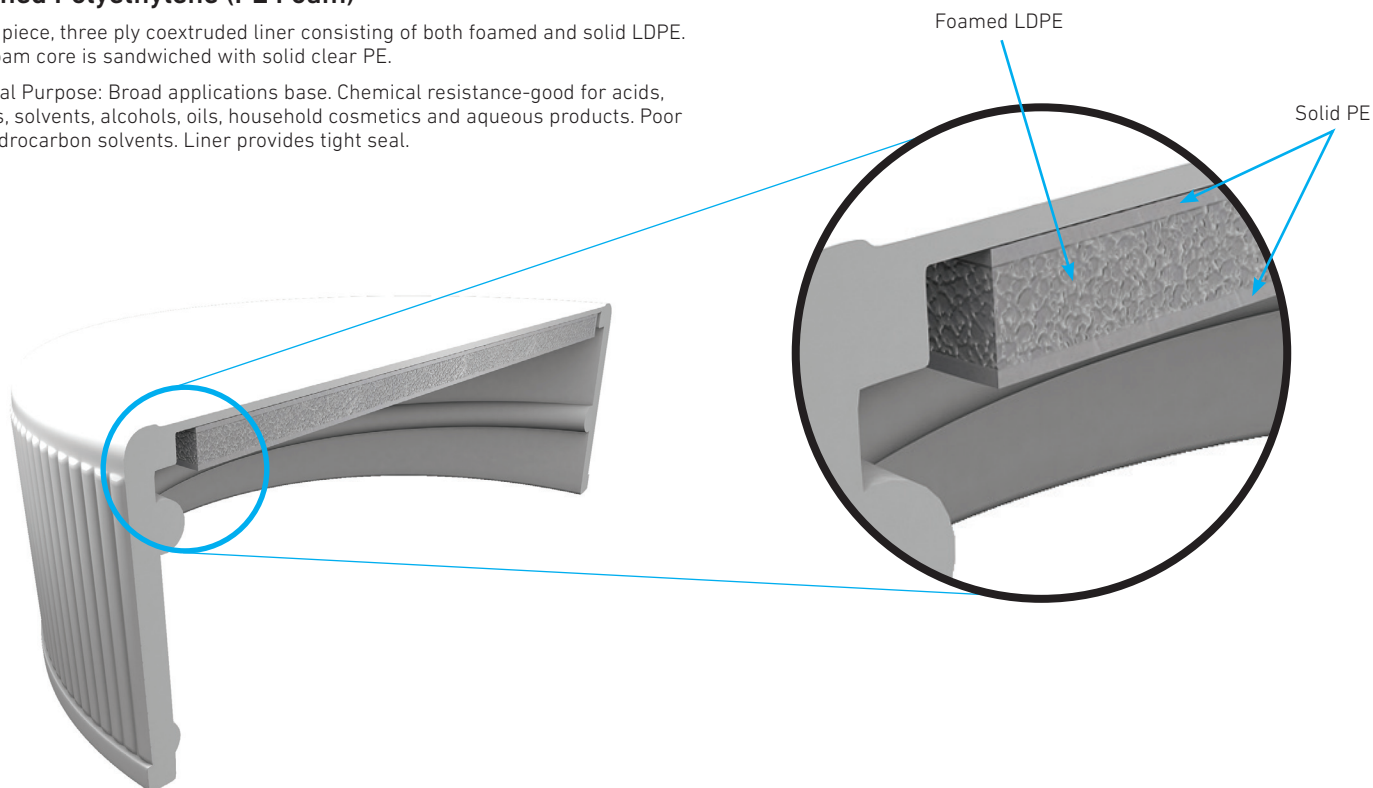
Excellent properties of resilience, resistant to moisture vapor. Satisfactory for most moderate chemicals. Not good for oils, strong acids and hydrocarbons. Not a natural rubber. Autoclavable.



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.

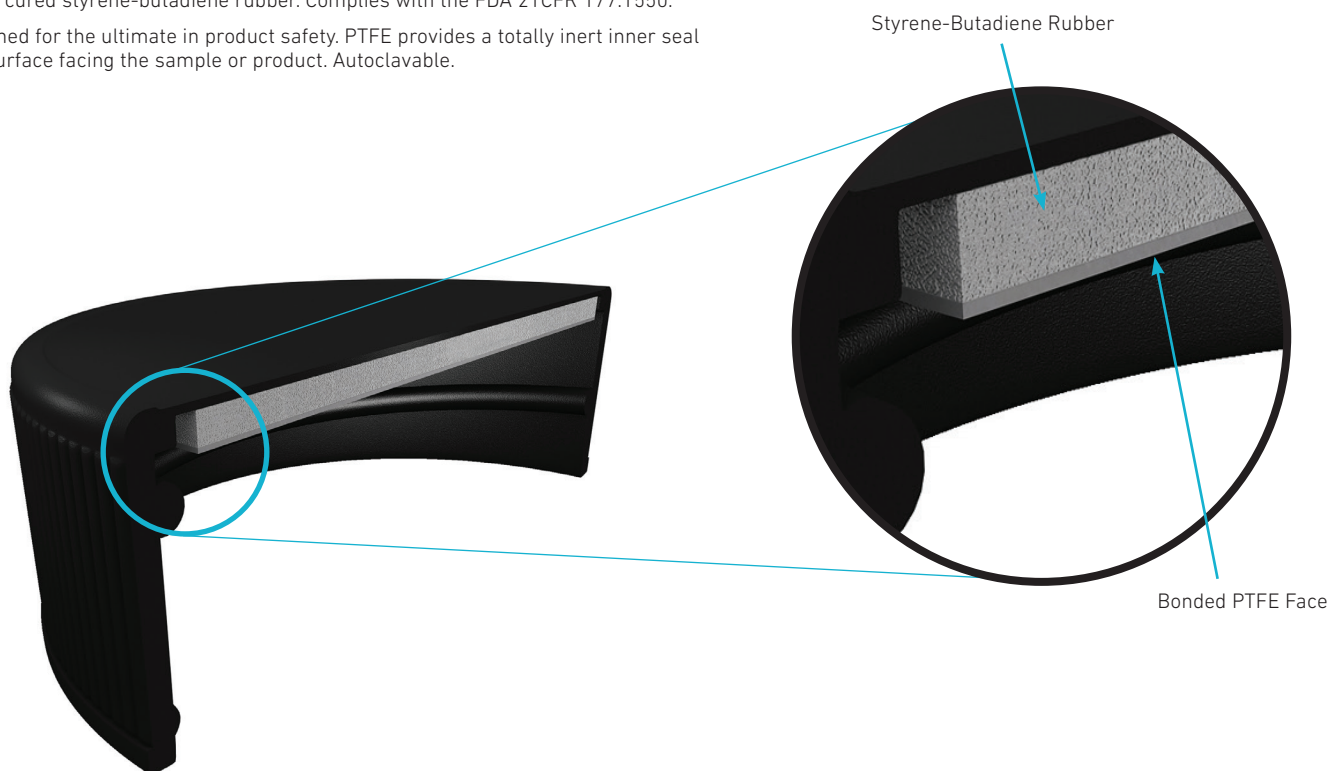
General Purpose: Broad applications base. Chemical resistance-good for acids, alkalis, solvents, alcohols, oils, household cosmetics and aqueous products. Poor for hydrocarbon solvents. Liner provides tight seal.



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

The white rubber / 0.005" PTFE liner consists of virgin 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.





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