

**TriForest**  
PACKAGING

a culture  
of innovation







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## About TriForest | Who We Are

Since our inception TriForest Enterprises, Inc. has been a culture of innovation. Leveraging over 50 years of engineering, tool design, development, and injection molding experience, we entered the life science labware industry in 2001. The first products developed were square polycarbonate media bottles designed to create an alternative to glass bottles that had been the traditional choice but were unsafe. Our autoclavable media bottles shifted the paradigm in the manufacturing of terminally sterilized products such as aqueous solutions, buffers, microbial suspension culture media. Glass bottles were replaced with our safe, crystal clear, non-leaching, autoclavable, durable, reusable and shatterproof polycarbonate media bottles. From those humble beginnings we have evolved into a premier plastic bottle and labware supplier, offering US manufactured PET, PETG and polypropylene caps and bottles for high throughput automated filling systems in cleanroom environments.



Our extensive experience in designing and manufacturing bottles coupled with our experience manufacturing reagents, buffers, culture media and biologicals through our sister company GROWCELLS, Inc. has provided us with a firsthand insight to understanding what our customers need. As a manufacturer and consumer of our own packaging products, we offer a unique perspective on the utility of our bottles. This understanding has helped us to develop, design and manufacture packaging bottles optimized to meet the challenges of the life science industry packaging and production.

## What We Do

We manufacture premium plastic bottles for the industrial and life science research marketplace. We are a vertically integrated organization that designs, develops, tests and manufactures everything in-house. This core competency and self-dependency make us a nimble organization ready to meet our customer's needs.

## Facilities

TriForest Enterprises, Inc. is located in Orange County, California. Our products are domestically manufactured in a 25K square feet, state of the art manufacturing facility. Every bottle is manufactured in class 10K clean room, with monitored particulate count to supply our customers aseptic and sterile, particulate free\* bottles.

## Core Competency



### QUALITY

We are an ISO Certified manufacturing company with commitment to meeting our customer's needs and consistently providing them with high quality products. We offer detailed validation studies and qualitative testing data designed to eliminate compatibility concerns. We believe that the quality of the content is only as good as the container its packaged in. As a result, we manufacture each bottle with your peace of mind as our utmost priority.



### RELIABILITY

Our Media/Packaging bottles guarantee peace of mind. We provide reliability in every product, ensuring the integrity of your precious contents will be maintained. TriForest Packaging products are designed for discriminating users who appreciate the utmost level of durability and ruggedness. We stand behind our products and are committed to provide a quality experience for all our users.



### CONVENIENCE

At TriForest, we value common sense, practicality, and functionality. We go above and beyond our competitors to make sure the work on your end is minimized. Our product line is ergonomically engineered to maximize user performance in extensive applications. TriForest Packaging is easy to store, easy to use, and reuse. It offers the clarity and chemical compatibility necessary for packaging bottles. For that reason, we believe our ultimate loyalty is to your convenience.



### SAFETY

The foundation of our company begins with user-safety. We know how essential it is to have in hand a product that is reliable, user-friendly, and most of all, a tool to help eliminate packaging accidents. TriForest provides customers a plastic alternative that is impact resistant, transparent, broadly chemically compatible, and FDA compliant. Furthermore, our support team is highly trained to assist you with utilization specifics with the ultimate goal of protecting those who matter the most.



### SUSTAINABILITY

TriForest prides in providing premium bottles that are safe, economical, reliable, innovative and sustainable. All of our products are conveniently recyclable and easy to store, but our conservational efforts do not end there. We manufacture all of our products in an environmentally friendly facility using renewable energy which lowers our carbon footprint. We offer a broad product portfolio with autoclavable capabilities, which enables terminal sterilization of products not available in most plastics.



## Product Profile :: Anatomy of a TriForest Bottle



Optically Clear



Autoclavable



Leakproof



Shatterproof



Gamma Radiated

### Neck Threads

Closures are designed to eliminate the possibility of jumping or stripping the threads from over torquing of caps on the bottle

### Neck Ring

Designed to hold shrink wrap bands and tamper-evident caps to ensure the integrity of the contents of the bottle

### Heavy-Duty Uniformly Thick Walls

Our proprietary injection blow molding techniques create a bottle with uniform wall thickness that is resistant to sagging, breakage, or cracking during use

### Leak-Proof Cap

Seal ring creates tight seal eliminating the need for plastic liners

### Tamper-Evident Cap

TriForest bottles are available with a tamper-evident cap eliminating the need to use shrink wrap band post filling

### Autoclavable:

TriForest Round and Square Polypropylene media bottles are the clearest PPP bottles on the market and provide visible contents. Ideal for pharmaceutical packaging and general laboratory use where autoclaving is necessary.

### Stable Base

TriForest bottles have the flat bottom necessary for use on automated, conveyor belt, sensor high-through-put liquid filling lines.

**Multi-application:** Our bottles are designed and developed with a broad spectrum of applications in mind. Available with or without a cap for use with automated fill lines.

## Packaging



### Sterile – Proof of Sterility

All TriForest sterile Packaging bottles are first specially packaged in the particle-free plastic trays, with each tray sealed in a heat-shrink elastomer, inside a Class 7 clean room, as a sterile barrier. Each tray is labeled to identify the specific product, with an indicator to provide evidence of proper sterilization via gamma irradiation.



### Sterile – Multi-layer Barrier

The shrink-wrapped and sealed trays of TriForest Packaging bottles are packaged in two polymer outer bags, with each bag individually tied, before they are packaged in the master case for Gamma sterilization. This creates a multi-layer barrier that makes our packaging bottles compatible with clean room operations.



### Aseptic – Clean Room Packaging

With all of our Packaging series bottles being first packaged in plastic trays and sealed inside a clean room environment, we provide the highest level of particle control of our products to meet the requirements of many full- and semi-automated filling operations, and to be ready for post-filling gamma sterilization.

# Square PETG Media Bottles



Square PETG Media Bottles with Standard Caps

Sterile polyethylene terephthalate co-polyester bottles are available with or without high density polyethylene caps in shrink wrapped trays. Heavy duty, break-resistant bottles designed for manual and automated fill lines; recommended by ISIA\*\* for storage of valuable sera.

- Thick walled and durable; shatter resistant
- Excellent gas barrier properties; reduced permeability to CO<sub>2</sub>/O<sub>2</sub>
- Sterile 10-6 SAL (Also available non-sterile with 30 case MOQ)
- Molded-in graduations for approximate volume reference
- Compliant with USP Class VI guidelines
- Non-pyrogenic, Nuclease Free, and Non-Cytotoxic
- Bottle and cap material are Certified Animal Derived Component Free



Optically Clear



Leakproof



Shatterproof



Standard Cap



Tamper-Evident Cap

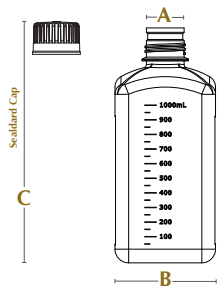


Freezing Temperature

## PRODUCT SPECIFICATIONS



Catalog #	PGC2000MS	PGC1000MS	PGC0500MS	PGC0250MS	PGC0125MS	PGC0060MS	PGC0030MS
<b>Size/Volume</b>	2000ml	1000ml	500ml	250ml	125ml	60ml	30ml
<b>Cap Size</b>	53B	38-430	38-430	38-430	38-430	24-415	24-415
<b>Neck I.D. (mm) (A)</b>	39	27	27	27	27	17	17
<b>O.D (mm) (B)</b>	116	92	73	59	53	40	38
<b>Height w/ Cap (mm) (C)</b>	276	223	182	152	114	88	67
<b>Bottles per Tray</b>	6	12	20	30	24	40	40
<b>Bottles per Case</b>	12	24	40	90	96	200	280



Bottles are supplied packed in shrink wrapped in polymer trays to eliminate static adherence to particulate matters. Double poly-bagged for unwrapping in cleanroom operations to maintain utmost integrity of cleanroom based sterile production/filling/packaging requirements.



## Square PET Media Bottles

Polyethylene terephthalate bottles with or without high density polyethylene caps in shrink wrapped trays. Lightweight and shatter resistant; recommended for storage of all compatible, solutions, biologicals, liquid culture media and aqueous buffers.

- Excellent gas barrier properties; reduced permeability to CO<sub>2</sub>/O<sub>2</sub>
- Sterile 10-6 SAL
- Molded in graduations for approximate volume reference
- Comply with USP Class VI guidelines
- Non-pyrogenic, Nuclease Free, and Non-Cytotoxic
- Bottle and cap material are Certified Animal Derived Component Free

**Packaging:** Packed in shrink wrapped plastic trays to eliminate particulate. Double poly-bagged for use in clean room environments and placed in master carton for shipping.



Square PET Media Bottles with Standard Caps



Optically Clear



Leakproof



Shatterproof



Standard Cap



Tamper-Evident Cap

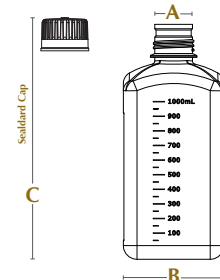


Freezing Temperature

### PRODUCT SPECIFICATIONS



Catalog #	PTC1000S	PTC0650S	PTC0500S	PTC0250S	PTC0125S	PTC0060S	PTC0030S
Size/Volume	1000ml	650ml	500ml	250ml	125ml	60ml	30ml
Cap Size	38-430	38-430	38-430	38-430	38-430	24-415	24-415
Neck I.D. (mm) (A)	27	27	27	27	27	17	17
O.D (mm) (B)	92	78	73	59	53	40	38
Height w/ Cap (mm) (C)	218	178	178	147	109	83	63
Bottles per Tray	12	30	20	30	24	40	40
Bottles per Case	24	60	40	90	96	200	280



Bottles are available with standard cap (PTCXXXXS-C), tamper evident cap (PTCXXXXS-A) or without cap (PTCXXXXS-N) for use with automated fill lines. Available leak-proof caps are detailed on page 8 of this catalog.



Autoclavable



Leakproof



Shatterproof



Standard Cap



Tamper-Evident Cap

## Square Polypropylene Bottles

Our proprietary manufacturing process and unique resin enables us to manufacture polypropylene bottles that are almost transparent. They are designed to allow visibility of the content and to provide the customers with the inertness of polypropylene, coupled with the benefits of transparency. Bottles are durable, chemical-resistant and ideal for either manual or automated filling lines.

- Non-sterile
- Autoclavable
- Uniquely Manufactured with Natural clarified polypropylene copolymer
- Molded-in graduations for approximate volume reference
- Comply with USP Class VI & FDA guidelines
- Resistant to acids, alcohol and bases
- Bottle and cap material are Certified Animal Derived Component Free



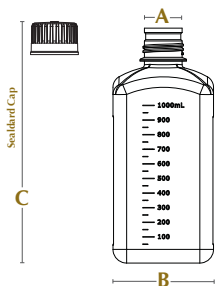
Square Polypropylene Bottles with Standard Caps

**Packaging:** Packed in shrink wrapped plastic trays to eliminate static adherence of particulate matter.

### PRODUCT SPECIFICATIONS



Catalog #	PPP2000	PPP1000	PPP500	PPP250	PPP125
Size/Volume	2000ml	1000ml	500ml	250ml	125ml
Cap Size	53B	38-430	38-430	38-430	38-430
Neck I.D. (mm) (A)	39	27	27	27	27
O.D (mm) (B)	116	92	73	59	53
Height w/ Cap (mm) (C)	276	223	182	152	114
Bottles per Tray	6	12	20	30	24
Bottles per Case	12	24	40	90	96



Bottles are available with standard cap, tamper evident cap or without cap for use with automated fill lines. Available leak-proof caps are detailed on page 8 of this catalog.

# Boston Round Polypropylene Bottles

Our proprietary manufacturing process and unique resin enables us to manufacture polypropylene bottles that are almost transparent. They are designed to allow visibility of the content and to provide the customers with the inertness of polypropylene, coupled with the benefits of transparency. Bottles are durable, chemical-resistant and ideal for either manual or automated filling lines.

- Non-sterile
- Uniquely Manufactured with Natural clarified polypropylene copolymer
- Molded-in graduations for approximate volume reference
- Comply with USP Class VI & FDA guidelines
- Bottle and cap material are Certified Animal Derived Component Free
- Autoclavable
- Resistant to acids, alcohol and bases



Round Polypropylene Bottles with Standard Caps



Autoclavable



Leakproof



Shatterproof



Standard Cap

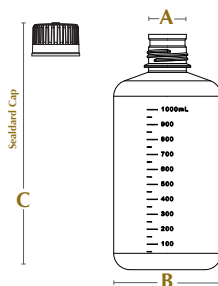


Tamper-Evident Cap

## PRODUCT SPECIFICATIONS



Catalog #	RPP1000	RPP0500
Size/Volume	1000ml	500ml
Cap Size	38-430	38-430
Neck I.D. (mm) (A)	27	27
O.D (mm) (B)	95	81
Height w/ Cap (mm) (C)	218	178
Bottles per Tray	12	12
Bottles per Case	48	72



Bottles are available with standard cap or without cap for use with automated fill lines. Available leak-proof caps are detailed on page 8 of this catalog

## Closure Systems and Patented Caps

TriForest bottle caps are made with FDA approved, high density polyethylene resin. They are designed to provide a liner-less, leak-proof seal that is the hallmark of our closure system. Each bottle neck is uniquely designed to provide assurance of a leakproof container.

- Gamma radiation compatible to provide 10<sup>-6</sup> sterility assurance level (SAL)
- Cap material is Certified Animal Derived Component Free
- Comply with USP Class VI guidelines



**Standard Cap** – Ideal for customers that wrap bottle and cap with shrink wrap bands post filling.

Catalog #	CPT-53	CPT-38	CPT-24
Cap Size (mm)	53B	38-430	24-415
Caps per Case	193	384	384

**Tamer Evident Cap** – Feature a patented tamper-evident closure that locks on the bottle neck ring to ensure the integrity of the contents. It eliminates the added cost and step of thermally shrink seal band post filling that could impact the products due to exposure of high temperature in the packaging tunnel.



Catalog #	TECG-53	TECG-38	TECG-24
Cap Size (mm)	53B	38-430	24-415
Caps per Case	192	288	384

**Septum Cap** – Ideal for packaging of reagents that require aseptic/sterile dispensing or addition/removal of supplement by a syringe needle. Septum cap provides an excellent gas barrier.



Catalog #	SCPT-53	SCPT-38
Cap Size (mm)	53B	38-430
Caps per Case	192	288

## TriForest Torque Wrench Fittings

### Torque Data

TriForest bottles and caps are specially designed and manufactured to ensure a leak proof seal. Our bottles remain leak proof during rigorous pressure testing. When the caps are tightened to the recommended torque, the bottles maintain a leak proof seal at pressures up to 600 mm-Hg in a vacuum chamber at both half filled and full volumes. They have been tested upside down, horizontal, and at an angle with the cap pointed downward.

### PETG and PET Square Bottles Family

Product Item No	Cap Item No	Closure Size	Recommended torque range (in-lb)
PGC0030MS	CPT-24	24/415	12-15
PGC0060MS	CPT-24	24/415	12-15
PGC0125MS	CPT-38	38/430	21-22
PGC0250MS	CPT-38	38/430	21-22
PGC0500MS	CPT-38	38/430	21-22
PGC1000MS	CPT-38	38/430	21-22
PGC2000MS	CPT-38	24/415	12-15
PTC0030MS	CPT-24	24/415	12-15
PTC0060MS	CPT-24	24/415	12-15
PTC0125MS	CPT-38	38/430	21-22
PTC0250MS	CPT-38	38/430	21-22
PTC0500MS	CPT-38	38/430	21-22
PTC0650MS	CPT-38	38/430	21-22
PTC1000MS	CPT-38	38/430	21-22

### Polypropylene Round and Square Bottles Family

Product Item No	Cap Item No	Closure Size	Recommended torque range (in-lb)
RPP0500	CPT-38	38/430	21-22
RPP1000	CPT-38	38/430	21-22
PPP0125	CPT-38	38/430	21-22
PPP0250	CPT-38	38/430	21-22
PPP0500	CPT-38	38/430	21-22
PPP1000	CPT-38	38/430	21-22
PPP2000	CPT-53	53B	21-22

Updated torque setting and other information can be found online: <http://www.triforestpackaging.com/Torque>

## Product Customization



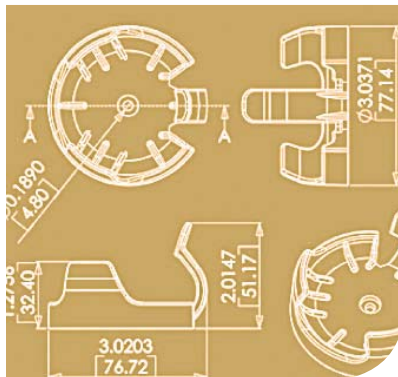
### Customizable :: Closures

TriForest molding manufacturing expertise now provides customers the option of personalizing their packaging orders. One way is to add the company logo of their choice to our product caps. The selected logotype is embedded onto our caps and resistant to scratching. Caps may also be customized to match the PMS color of choice. All caps retain the same properties after customization.\*



### Customizable :: Products

Another alternative available to TriForest customers is the customization of labels. Whether a template is provided or you request we design one for you, do not miss out on the opportunity to add labels of your company logo on our products. The graduation interval may also be customized to fit desired needs. They can be combined with our manufacturing process to provide custom-color resins in the color of choice.\*



### Product :: Customization

Personalizing our products in any color or logo allow customers to maximize brand exposure and ownership of the product line during private labeling, but our efforts do not end there. With over 40 years of plastic molding expertise, TriForest offers customers the unique opportunity to create new product designs. Whether the product is highly priced and you seek a better alternative or the product you have in mind is non-existent, we will make it for you. Contact one of our customer service representatives for more information.

*\*Minimum quantity required.*





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