



# Plastic Packaging Solutions

Ophthalmics

As one of the world's leading suppliers of rigid plastics packaging to the pharmaceutical industry, our multi material, multi process services include

- package design and development
- graphic design
- mold engineering and production
- plastic resin selection
- sampling and production

Our plastics operations are **vertically integrated, cGMP, ISO 9002 certified** and **operate as an extension to our Customers' businesses.**

Our commitment and services touch many parts of the product value chain from product creation and development, technical resin support, product stability support, and project management through product launch, with our objective of ensuring our customer's success in the marketplace. We know that speed-to-market, high quality, high value solutions and responsive services are critical in supporting this business.

We design and **develop stock and custom packages** using many thermoplastic resins. Our in-house design, machinery, and mold services provide speed-to-market control and flexibility.

Our design services are exclusive and cost effective, using Design for Lean Six Sigma (DFLSS) methodology, we offer aesthetic but practical solutions, interactive development and 3D CAD and Solidworks™ visualization tools. With our innovative development comes rapid prototyping, flexible tooling designs, and material and process optimization.

Our advanced manufacturing capabilities include Electric Injection Blow Molding (IBM) into Class 100,000 cleanrooms, specialized finishing and assemblies, data based continuous improvement, automated high-speed production and just-in-time delivery.

## Technology

- Injection Blow Molding (IBM)
- Injection Molding (IM)
- In-mold Labeling
- Stretch Blow Molding (SBM)
- Extrusion Blow Molding (EBM)
- RFID Integration

## Bottles, Fitments & Closures

Key products include a full line of stock bottles in a wide variety of shapes, sizes and resin types, as well as custom and stock injection molded closures and fitments. We offer a comprehensive listing of readily available molds, several of which can be combined to provide complete packages. Many are maintained in inventory to service immediate needs, and we encourage our customers to provide items that should be added or modified to meet their needs.

### Bottles

- Boston rounds
- Cylinder rounds
- Liquid medicinal rounds
- PET bullet rounds
- PET boston rounds
- PET reverse taper ovals
- Drug ovals
- Serum vials
- Square wide mouth packers
- PET round packers
- Round wide mouth packers
- Blake wide mouth packers
- Bellows packages
- Jars
- Wide selection of PET bottles

### Fitments & Closures

- Tamper evident closures
- Child resistant closures
- Stock threaded ribbed closures
- Smooth wall closures
- Sure Snaps dispensing closures
- Orifice reducers
- Snap fitments
- Spray mist fitments
- Dropper tip fitments
- Dropper tips - extended & extended controlled



# How to Best Use This Catalog NEED A COMPLETE PACKAGE?

Use the Package Identification Code (PIC) when you need a “total package”. Each product table listed in this catalog has a column labeled “PIC”. The series of numbers that appear in the “PIC” column provide a simple reference to closures and fitments that match your container selection, and are used to develop complete packages.

## How the PIC System Works

Select a bottle and identify the PIC code. The PIC code on the example below is 1-20. The first digit tells us the type of finish on this bottle. In the example below, the first digit of the PIC is “1”. Based upon Table 1, we can tell this bottle accepts snap-in fitments and has a recess. Use Table 1 as a guide to identify the type of neck finish, and whether or not a fitment or dropper tip is recommended for this bottle.

**Example:** Bottle

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
20863	1 OZ	37.5	20/410	1-20	6.20	2.739	1.234	1500

The second digit in the PIC code tells us the size of the bottle finish, in millimeters. The above example shows a PIC Code of 1-20, which tells us this bottle has a 20mm neck finish.

**Note:** The PIC system is blind to the height of the bottle neck finish (i.e. 400, 410, 415), so it is necessary to choose a closure that is the same height as the bottle you have chosen. For instance, use a 20/410 closure with a 20mm/410 bottle finish.

The third digit in the PIC code indicates the closure style and type. Only fitments (dropper tips, orifice reducers, etc.) utilize the third digit of the PIC code. In the example listed below, the third digit of the fitment PIC code is “1”. Based upon Table 1, we can tell this fitment accepts a Dropper Tip Closure. Use Table 1 to identify the closure type for each fitment and bottle selection.

**Example:** Tip

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/CARTON
11918	20 MM	EXT TIP ROUND 1/16 (.062)	1-20-1	LDPE	4500
15025	20 MM	DROPPER TIP CAP	20-1	PP	4500



**Table 1. Description of Package Identification Codes**

**First Digit:** Bottle neck finish style

- 0 Does not accept a fitment
- 1 Accepts “Snap-in” Fitments - recessed
- 3 Accepts “Snap-in” Fitments - no recess
- 4 Accepts “Friction Fit” fitments
- 5 Accepts “Roll-on Ball”
- 6 Pour lip finish - will not accept a fitment
- 7 Serum finish
- 8 Accepts stock Snap Caps or C/R Snap Caps
- 9 Bellows package finish

**Second Digit:** The size of the neck finish - (mm)

**Third Digit:** Indicates the closure style and type

- 0 Accepts Continuous Thread Closures  
(The height of this closure must also match the finish of the bottle, i.e., 400/ 410/ 415)
- 1 Accepts Dropper Tip Closures
- 2 Accepts Nasal Tip Closure
- 3 Accepts Roll-On Closure
- 4 Snap Cap Closure

## A Short Cut To Reading PIC Codes

### ■ Bottle PIC:

1 20  
 These two numbers describe the finish and size.  
 Any fitment with a PIC code starting with the same two digits will fit this container.

### ■ Fitment PIC:

1 20 1  
 The first two numbers of this fitment code indicate that it will function properly with the above container’s neck finish.  
 These two numbers describe the neck finish and matching closure type.

### ■ Closure PIC:

20 1  
 The two numbers of this code indicate that the closure will function properly with the above container and fitment.

# SELECTING A PLASTIC CONTAINER



**Table 2. Properties of Common Resins**

Many resins are available for molding plastic containers. This chart illustrates a comparison of relative properties of common resins. These resins are available in several grades that can alter and modify its properties. Please contact us for more information about specific resin grades.

Requirement	PE	PP	PET	PC	COC	PEN	PS
Lightweight	2	1	5	6	3	5	3
Clarity	3	2	1	1	1	1	1
Toughness	1	3	2	3	5-7	2-7	9
Water absorption	2	2	3	6	1	3	4
Water vapor permeability	2	2	4	7	1	3	5
CO2 permeability	6	5	2	9	6	2	9
O2 permeability	7	6	2	8	7	2	8
Resistance to acids	2	2	4	4	2	3	4
Resistance to alkalis	2	2	3	7	2	2	2
Resistance to oils	4	3	2	4	5	2	4
Resistance to solvents	3	3	2	3	3	2	6
Resistance to humidity	1	1	1	6	1	1	1
Resistance to light	4	4	1	4	1	1	5
Resistance to heat (hot fill)	3	2	3	1	1	1	5
Resistance to cold	1	4	2	1	5-7	2-7	5

1 = best, 9 = worst

This chart is provided only as a guide. Actual compatibility of the resin and the product is the responsibility of the product manufacturer.

There is no one ideal polymer. Polymers offer a variety of properties, excelling in some areas, falling short in others. Each customer places different importance on each facet defining package suitability. Each also may have flexibility with their product formula or filling means. Thus, the customer must define package suitability based on economics and these aspects. The package manufacturer can help with polymer selection, package design, and manufacture through comprehension of the customer's product, goals, and adaptability. Several questions should be posed to gather this understanding. Some examples are:

- 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 to be dispensed by the user?
- Have any tests been run in plastic? Was it unsuccessful and why?
- Are similar products currently being packaged in the marketplace and in what 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

The information in Table 2. can be used as an aid in determining the appropriate container material for your application.

# How to Best Use This Catalog

## SELECTING THE RIGHT RESIN

A variety of plastic resins provide numerous opportunities to develop exciting packages. Alcan Packaging Plastics Americas selects resins for packages based on product protection, appearance, economy, chemical compatibility, moisture transmission rate, pigmentation, light transmission or oxygen transmission, as well as governmental regulatory requirements. All resins employed by our processes conform to U.S. Food and Drug Administration regulations for direct Food Contact Regulations. All color pigments conform to U.S. and European heavy metal in packaging laws.

We design and develop stock and custom packages using virtually all available thermoplastic resins:

### Low Density Polyethylene (LDPE)

Flexible. Natural milky color. Translucent. High impact strength. Excellent environmental stress crack resistance. Low water and alcohol permeability. Resistant to many chemicals.

### Medium Density Polyethylene (MDPE)

Provides intermediate properties between low- and high-density polyethylene. Useful in squeeze containers, where more rigidity than LDPE and less rigidity than HDPE is required.

### High Density Polyethylene (HDPE)

More rigid than LDPE and MDPE depending on density. Natural milky color. More opacity than LDPE. Good impact strength. Good environmental stress cracking. Better barrier properties than LDPE. Easy to add color to.

### Polypropylene (PP)

Choices include Homopolymer and Copolymer Polypropylene. More rigid than HDPE. Naturally yellowish-gray color. Translucent (but with contact clarity). Nucleated grades can be clear. Excellent environmental stress crack resistance. Barrier properties generally equal to HDPE. Resistant to most chemicals.

### Polyethylene Terephthalate (PET) Polyester

Rigid. Transparent. Naturally crystal clear. Fair water barrier. Good alcohol and solvent barrier. Very good oil barrier properties.

### Glycol Modified Polyethylene Terephthalate (PETG) Copolyester

Extrusion blow moldable Copolymer. Modified PET. Rigid. Transparency better than PET particularly in thick sections. Fair water barrier. Fair alcohol and solvent barrier. Very good oil barrier properties.

### Polycarbonate (PC)

Rigid. Naturally crystal clear. Transparent. Extremely high resistance to heat. Poor barrier properties. High impact strength. Often used for reusable containers.

### Cyclic Olefin Copolymer (COC)

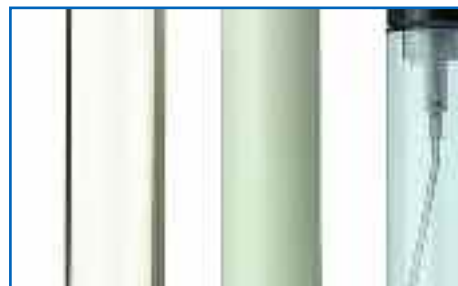
Rigid. Transparent. Colorless. Excellent moisture barrier. Sterilization via autoclave or radiation.

### Nylon 6

Dependent on grade, from flexible to rigid. Translucent to transparent. Excellent gas barrier. Excellent chemical resistance. Poor moisture barrier. Dimensions influenced by moisture.

### Polyethylene Naphthalate (PEN)

Rigid. Transparent. Colorless. Excellent moisture and oxygen barrier. Better heat stability than PET. Sterilization via autoclave or radiation.



# SELECTING A DROPPER TIP



*The information on this page should not be interpreted as a guarantee, and is to be used as a guideline only. The final determination of whether or not a particular tip can be used for a specific application is the customers' responsibility.*

Alcan Packaging offers two basic types of dropper tips – Extended Dropper Tips and Extended Controlled Dropper Tips.

## Extended Dropper Tips

Extended Dropper Tips, sometimes referred to as extended dispensing tips, are only intended to dispense product from the package by means of a molded opening or orifice in the end of the tip and are not intended to deliver a controlled or metered drop size. These tips are available with orifice sizes of 1/64 (.016), 1/32 (.031), 1/16 (.062), and 3/32 (.094) in neck finish sizes of 13mm, 15mm, 18mm, and 20mm.

The choice of orifice size for optimum tip performance is largely dependent upon the viscosity of the product being dispensed. We recommend testing tips with product to determine which orifice size is best for you.

## Extended Controlled Dropper Tips

Extended Controlled Dropper Tips are intended to deliver or dispense a controlled or metered drop. The product is delivered to the end of the tip through an orifice or opening that is either created when the tip is molded (molded orifice) or created by piercing the tip (pierced orifice) with a needle in a secondary operation. These tips are available in both round and square tip configurations in the area where the drop is formed and in neck finish sizes of 8mm, 13mm, 15mm, 18mm, and 20mm. Tips with molded orifices are available with openings as small as an .008 diameter and tips with pierced orifices are available with openings created from piercing needles as small as .018 to as large as .037 in diameter.

## Drop Size

Two factors contribute to the delivered drop size of any particular tip. First, is the external size and shape of the tip surface where the drop is being formed and second, is the coefficient of friction of the product being dispensed.

The greater the surface area is where the drop is being formed, as with a square tip, the greater the drop size will be. The higher the coefficient of friction of the liquid being dispensed, the greater the drop size will be. This is evident when dispensing entirely different liquids from the same tip. The liquid with a low coefficient of friction will cause the drop to release from the tip sooner, thus delivering a smaller drop size than the liquid with a high coefficient of friction.

Due to the variety of liquids that may be dispensed from our tips, we have determined the drop size for our tips by dispensing distilled water at room temperature with the package held in a fully vertical position. Square dropper tips will deliver 16 drops/cc +/- 2 drops of water for an actual drop size of 55-71 micro-liters. Round dropper tips, with the exception of 12086, will deliver 23 drops/cc +/- 3 drops of water for an actual drop size of 38-50 micro-liters. The 12086 dropper tip will deliver 55 drops/cc +/- 3 drops of water for an actual drop size of 17-19 micro-liters.

## Orifice Size

Orifice size has very little impact on drop size. The size of the orifice and the viscosity of the liquid being dispensed determines the rate at which the drop is formed on the tip and the ease or difficulty required to expel the liquid from the bottle.

Dropper tips with molded orifices, as the term implies, have orifices that are formed during the molding of the tip. Dropper tips with pierced orifices are molded without an orifice and a membrane is pierced with a needle post-molding to form an orifice. The piercing process produces an irregular shaped orifice with the resulting orifice size being about half the diameter of the needle used to pierce the tip. Alcan Packaging will pierce tips with needles ranging from .018-.037 diameters.

# CAP THREAD FINISHES

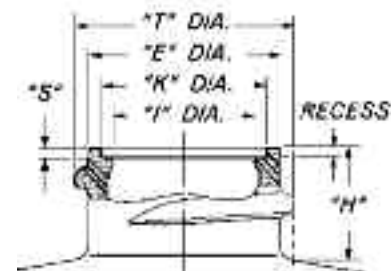
## Determining a Cap's Thread Finish

The closure industry has not standardized on dimensions the way the container industry has and it is usually advantageous to buy both container and closure from the same supplier when possible. Similar to the container industry, when a closure finish is designated as 33-400, it means that the nominal diameter measured across the inside of the cap at the opening is approximately 33 mm. (See "T" dimension on illustration.) The 400 designates a specific style of thread. The thread finish of the cap and container must be the same. A container with a 33-400 thread finish should be used with a cap that has a 33-400 thread finish.

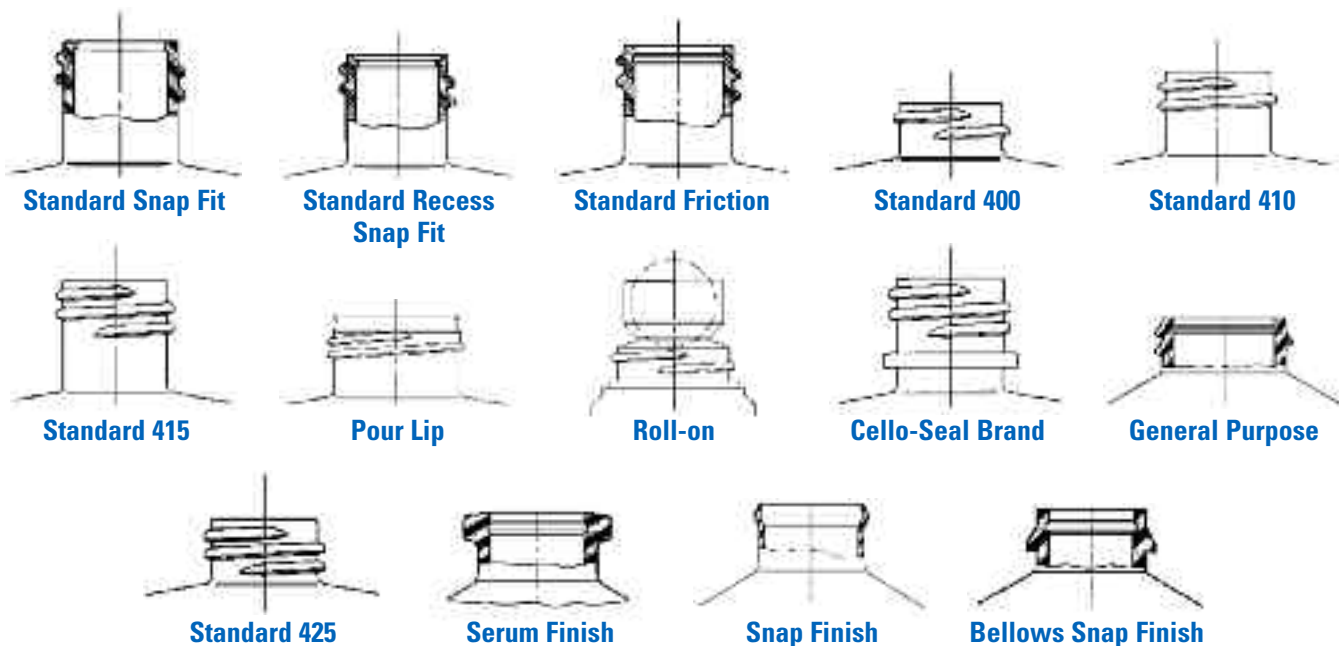


To determine the cap size, place a ruler across the cap opening and read from one side of the inner wall to the opposite side of the inner wall. Compare this number to the numbers found in the "T" dimension columns in Table 4a or 4b (on page 8). Once this number is found in the table, follow the row to the far left to find the "Nominal Diameter" of the cap (33 in the above example).

To determine the specific style of thread, measure the depth of the cap from the liner surface to the outside edge of the cap. Compare this number to the numbers found in the "H" dimension columns in Table 4a or 4b (on page 8) that appear in the same row as the Nominal Diameter of the cap. Once this number is found in the table, follow the column to the top to find the specific style number (400 in the above example). The dimensions in the tables are approximate and will probably be slightly different from what is measured (especially the "H" dimension, due to variations in liner thickness), but should be close enough to allow for the proper determination of the cap size.



## Plastic Neck Finishes



# CAP THREAD FINISHES

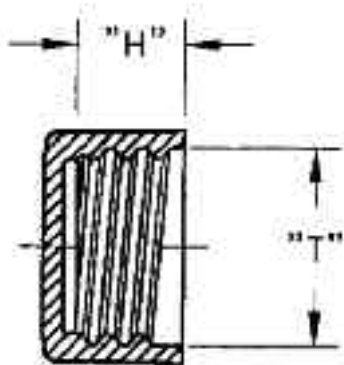
**Table 4a. Cap Thread Finish Dimensions (Dimensions are in inches)**

NOMINAL DIA. (MM)	400		410		415		425		430	
	"T"	"H"	"T"	"H"	"T"	"H"	"T"	"H"	"T"	"H"
8	—	—	—	—	—	—	0.360 (3/8)	0.245 (1/4)	—	—
10	—	—	—	—	—	—	0.415 (13/32)	0.255 (1/4)	—	—
13	—	—	—	—	0.520 (17/32)	0.430 (7/16)	0.520 (17/32)	0.280 (9/32)	—	—
15	—	—	—	—	0.585 (19/32)	0.535 (17/32)	0.585 (19/32)	0.280 (9/32)	—	—
18	0.710 (23/32)	0.360 (3/8)	0.710 (23/32)	0.500 (1/2)	0.710 (23/32)	0.595 (19/32)	—	—	0.710 (23/32)	0.605 (19/32)
20	0.790 (25/32)	0.360 (3/8)	0.790 (25/32)	0.530 (17/32)	0.790 (25/32)	0.720 (23/32)	—	—	0.790 (25/32)	0.605 (19/32)
22	0.870 (7/8)	0.360 (3/8)	0.870 (7/8)	0.560 (9/16)	0.870 (7/8)	0.815 (13/16)	—	—	0.870 (7/8)	0.605 (19/32)
24	0.945 (15/16)	0.390 (3/8)	0.945 (15/16)	0.620 (5/8)	0.945 (15/16)	0.935 (15/16)	—	—	0.945 (15/16)	0.650 (21/32)
28	1.095 (1 3/32)	0.390 (3/8)	1.095 (1 3/32)	0.685 (11/16)	1.095 (1 3/32)	1.060 (1 1/16)	—	—	1.095 (1 3/32)	0.725 (23/32)
30	1.130 (1 1/8)	0.390 (3/8)	—	—	—	—	—	—	1.130 (1 1/8)	0.760 (3/4)
33	1.270 (1 9/32)	0.390 (3/8)	—	—	—	—	—	—	1.270 (1 9/32)	0.775 (25/32)
38	1.480 (1 1/2)	0.390 (3/8)	—	—	—	—	—	—	1.480 (1 1/2)	0.940 (15/16)
43	1.660 (1 21/32)	0.390 (3/8)	—	—	—	—	—	—	—	—
45	1.750 (1 3/4)	0.390 (3/8)	—	—	—	—	—	—	—	—
48	1.875 (1 7/8)	0.390 (3/8)	—	—	—	—	—	—	—	—
53	2.075 (2 1/16)	0.390 (3/8)	—	—	—	—	—	—	—	—
58	2.230 (2 7/32)	0.390 (3/8)	—	—	—	—	—	—	—	—
63	2.470 (2 15/32)	0.390 (3/8)	—	—	—	—	—	—	—	—
70	2.745 (2 3/4)	0.390 (3/8)	—	—	—	—	—	—	—	—
83	3.275 (3 9/32)	0.470 (15/32)	—	—	—	—	—	—	—	—
89	3.520 (3 17/32)	0.515 (1/2)	—	—	—	—	—	—	—	—
100	3.945 (3 15/16)	0.580 (19/32)	—	—	—	—	—	—	—	—

( ) fractions within parentheses have been rounded to the nearest thirty-second of an inch.

**Table 4b. Cap Thread Finish Dimensions (Dimensions are in millimeters)**

NOMINAL DIA. (MM)	400		410		415		425		430	
	"T"	"H"	"T"	"H"	"T"	"H"	"T"	"H"	"T"	"H"
8	—	—	—	—	—	—	9.14	6.22	—	—
10	—	—	—	—	—	—	10.54	6.48	—	—
13	—	—	—	—	13.21	10.92	13.21	7.11	—	—
15	—	—	—	—	14.86	13.59	14.86	7.11	—	—
18	18.03	9.14	18.03	12.70	18.03	15.11	—	—	18.03	15.37
20	20.07	9.14	20.07	13.46	20.07	18.29	—	—	20.07	15.37
22	22.10	9.14	22.10	14.22	22.10	20.70	—	—	22.10	15.37
24	24.00	9.91	24.00	15.75	24.00	23.75	—	—	24.00	16.51
28	27.81	9.91	27.81	17.40	27.81	26.92	—	—	27.81	18.42
30	28.70	9.91	—	—	—	—	—	—	28.70	19.30
33	32.26	9.91	—	—	—	—	—	—	32.26	19.69
38	37.59	9.91	—	—	—	—	—	—	37.52	23.88
43	42.16	9.91	—	—	—	—	—	—	—	—
45	44.45	9.91	—	—	—	—	—	—	—	—
48	47.63	9.91	—	—	—	—	—	—	—	—
53	52.71	9.91	—	—	—	—	—	—	—	—
58	56.64	9.91	—	—	—	—	—	—	—	—
63	62.74	9.91	—	—	—	—	—	—	—	—
70	69.72	9.91	—	—	—	—	—	—	—	—
83	83.19	11.94	—	—	—	—	—	—	—	—
89	89.41	13.08	—	—	—	—	—	—	—	—
100	100.20	14.73	—	—	—	—	—	—	—	—





# Ophthalmics BOTTLES



## BOSTON ROUNDS

See our Tips, Caps, Closures Section  
for a complete package

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>HDPE BOSTON ROUNDS</b>								
23535	20 ML	23.50	18/415	0-18	4.50	2.244	1.110	1800
21663	0.5 OZ	19.60	15/415	0-15	3.50	2.372	0.973	800
21108	1.0 OZ	33.50	20/410	1-20	5.10	2.525	1.234	1900
21962	1.0 OZ	38.00	20/410	1-20	6.50	2.739	1.234	1500
23723	1.0 OZ	39.20	20/415	0-20	6.70	2.937	1.234	1500
21884	2.0 OZ	70.00	18/410	1-18	8.80	3.312	1.507	950
23063	2.0 OZ	70.00	20/410	0-20	9.30	3.390	1.515	800
22816	4.0 OZ	135.00	24/410	0-24	14.50	4.187	1.831	450
23360	4.0 OZ	138.00	20/410	1-20	14.20	4.250	1.843	450
22171	8.0 OZ	274.00	24/414	6-24	23.60	5.275	2.359	175
20241	16.0 OZ	584.00	28/410	0-28	32.00	6.343	3.062	125

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>LDPE BOSTON ROUNDS</b>								
21223	7.5 ML	8.60	15 MM	1-15	2.50	1.536	0.832	1800
• 20480	10.0 ML	12.00	15/400	1-15	3.35	1.679	0.984	1400
• 20810	10.0 ML	12.60	15/415	1-15	3.30	1.791	0.984	1400
20334	10.0 ML	12.80	13/425	3-13	2.70	1.718	0.984	1400
22015	10 ML	12.60	15/415	0-15	3.30	1.791	0.984	1400
20355	0.5 OZ	18.00	15/400	1-15	4.30	2.234	0.984	800
20640	0.5 OZ	19.40	15/415	1-15	5.00	2.588	0.984	800
• 20639	0.5 OZ	19.10	15/415	1-15	3.50	2.372	0.984	800
• 20641	0.5 OZ	20.50	15/415	1-15	3.90	2.588	0.984	800
22793	1.0 OZ	32.00	15/415	1-15	6.20	2.800	1.234	1500
21554	1.0 OZ	37.50	20/410	1-20	6.20	2.739	1.234	1500
• 20863	1.0 OZ	37.50	20/410	1-20	6.20	2.739	1.234	1500
21126	1.0 OZ	38.00	20 MM	1-20	6.00	2.750	1.234	1600
23573	1.0 OZ	38.80	20/415	0-20	6.80	2.968	1.234	1340
22024	2.0 OZ	66.50	18/410	1-18	7.50	3.365	1.450	860
• 20928	2.0 OZ	72.00	20/410	1-20	9.30	3.343	1.540	800
22140	2.0 OZ	74.00	20/410	1-20	10.30	3.594	1.531	800
23574	2.0 OZ	72.00	20/415	0-20	9.50	3.531	1.531	730
20844	4.0 OZ	139.00	20/410	1-20	14.40	4.250	1.828	450
• 20929	4.0 OZ	137.00	24/410	1-24	14.60	4.187	1.831	450
20618	4.0 OZ	138.50	20/410	1-20	15.10	4.465	1.828	450

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>MDPE BOSTON ROUNDS</b>								
23609	0.5 OZ	20.50	15/415	1-15	3.50	2.406	0.984	800

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>PP BOSTON ROUNDS</b>								
23141	0.5 OZ	21.00	15/415	0-15	3.30	2.600	0.984	800
21469	0.5 OZ	21.20	15/415	0-15	3.30	2.578	0.984	800
22280	2.0 OZ	72.50	24/400	0-24	8.50	3.190	1.604	800
23188	2.0 OZ	66.00	20/400	0-24	8.70	3.340	1.513	800
23043	4.0 OZ	126.50	22/400	0-22	14.00	4.152	1.875	450

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>HDPE CYLINDER ROUNDS</b>								
23715	1 ML	1.5	8/425	0-8	0.60	1	0.471	3000
20708	3 ML	3.5	8/425	3-08	1.00	1.528	0.531	3000
22639	6.0 ML	6.50	13/425	3-13	2.20	1.641	0.688	2600
22573	15.0 ML	19.00	15/415	0-15	4.50	2.837	0.880	750
22069	1.0 OZ	33.50	20/410	0-20	6.00	3.000	1.078	500
20943	2.0 OZ	71.00	20/400	1-20	10.80	3.757	1.382	750
22654	2.0 OZ	74.00	20/410	0-20	9.20	3.757	1.406	750
23679	2.0 OZ	75.00	20/410	0-20	8.50	3.757	1.406	830
21500	3.0 OZ	98.50	20/410	1-20	11.50	4.124	1.521	600
22520	4.0 OZ	4.789	20/410		12.5	4.72	1.65	1000
23112	4.0 OZ	128.00	24/410	0-24	14.50	4.758	1.625	450
23662	4.0 OZ	135.00	20/410	0-20	12.00	4.641	1.665	510
21323	4.0 OZ	130.00	24/410	1-24	14.50	4.758	1.625	450
21358	6.0 OZ	200.50	24/410	0-24	16.70	5.406	1.876	325
21831	8.0 OZ	256.00	24/410	0-24	21.50	6.234	1.968	200



## CYLINDER ROUNDS

*See our Tips, Caps, Closures Section for a complete package*

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>HDPE METRIC CYLINDER ROUNDS</b>								
70401	150 ML	163.90	22/415	0-22	20.50	5.770	1.690	410

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>HDPE MODIFIED CYLINDER ROUNDS</b>								
21098	4.0 OZ	130.00	20/410	1-20	11.60	4.687	1.625	450
20307	6.0 OZ	192.00	24/410	1-24	16.00	5.093	1.906	350

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>LDPE CYLINDER ROUNDS</b>								
23236	1.0 ML	1.50	8/425	3-08	0.60	1.000	0.470	3000
20319	3.0 ML	3.50	8/425	3-08	1.00	1.531	0.531	3000
20272	5.75 ML	6.60	13/415	3-13	2.30	1.813	0.672	2600
20374	6.0 ML	6.80	13/425	3-13	2.00	1.641	0.688	2600
20298	2.0 DR	8.50	15/415	1-15	3.10	1.989	0.734	1800
21415	15.0 ML	19.00	15/415	1-15	4.80	2.837	0.880	750
21335	1.0 OZ	32.75	20/410	1-20	6.00	3.000	1.078	1700
20851	1.0 OZ	33.00	18/410	1-18	5.75	2.968	1.078	1700
23500	1.0 OZ	33.00	18/410	1-18	5.75	2.968	1.078	1700
20706	2.0 OZ	71.00	20/410	1-20	10.90	3.750	1.390	750
21499	3.0 OZ	99.00	20/410	1-20	11.50	4.124	1.521	600
20648	4.0 OZ	124.50	20/410	1-20	14.40	4.625	1.656	425

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>PET MODIFIED CYLINDER ROUNDS</b>								
28100	4.0 OZ	133.00	20/410	0-70	21.50	1.543	2.718	580

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>PET CYLINDER ROUNDS</b>								
23665	2.0 OZ	66.00	20/410	0-20	10.00	3.590	1.238	1010

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/CARTON
<b>PP CYLINDER ROUNDS</b>								
21695	2.0 DR	9.50	15/415	1-15	2.00	1.989	0.734	1800

# Ophthalmics BOTTLES



## ROUND OPHTHALMIC LENS CARE BOTTLES

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	DIAMETER INCHES	PARTS/ CARTON
<b>OPHTHALMIC LENS CARE BOTTLES</b>								
<b>HDPE CYLINDER ROUND</b>								
70402	8 OZ	261.50	18/410	0-18	19.50	6.281	2.005	260
7040	12 OZ	405.00	18/410	0-18	27.50	6.330	2.300	170
70405	16 OZ	508.50	18/410	0-18	32.65	6.880	2.700	130



## DRUG OVALS

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	WIDTH INCHES	THICKNESS INCHES	PARTS/ CARTON
<b>HDPE DRUG OVALS</b>									
23072	7.0 ML	7.8	8/425	0-8	1.60	1.728	0.88	0.656	2200
21495	15 ML	18.5	15/415	0-15	4.20	2.406	1.284	0.730	950
20289	30 ML	34.0	15/415	6-15	6.10	2.734	1.505	0.990	2000
• 20709	2 OZ	69.0	20/410	1-20	10.50	3.557	1.984	1.050	1000
20691	3 OZ	104.0	20/410	1-20	15.00	4.088	2.250	1.156	650

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	WIDTH INCHES	THICKNESS INCHES	PARTS/ CARTON
<b>LDPE DRUG OVALS</b>									
• 20278	7 ML	7.6	8/425	3-08	1.60	1.718	0.890	0.656	2200
• 20623	15 ML	18.5	15/415	1-15	4.30	2.406	1.265	0.725	950
22240	15 ML	19.0	15/415	1-15	4.50	2.630	1.265	0.725	850
• 20178	25 ML	27.0	15/415	1-15	5.80	2.775	1.531	0.765	1600
• 21247	1.25 OZ	41.0	18/410	1-18	8.90	3.013	1.765	0.845	1400
22646	1.25 OZ	41.5	18/410	4-18	9.30	3.148	1.781	0.885	1400
• 20852	2 OZ	70.5	18/410	1-18	12.70	3.732	2.082	1.047	600
22261	2 OZ	73.0	18/410	4-18	13.00	3.968	2.062	1.047	800

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	WIDTH INCHES	THICKNESS INCHES	PARTS/ CARTON
<b>PP DRUG OVALS</b>									
22127	25CC	27.0	15/415	1-15	5.75	2.775	1.531	0.765	1600



## OVAL OPHTHALMIC LENS CARE BOTTLES

ITEM #	SIZE	OVERFLOW CAP (ML)	NECK FINISH	PIC	GRAM WEIGHT	HEIGHT INCHES	WIDTH INCHES	THICKNESS INCHES	PARTS/ CARTON
<b>OPHTHALMIC LENS CARE BOTTLES</b>									
<b>HDPE OPTICAL OVAL</b>									
23777	2 OZ	70.5	18/410	0-18	10.0	3.920	2.045	1.040	790
23778	4 OZ	143.8	18/410	0-18	16.0	4.805	2.414	1.312	430

# Ophthalmics

## TIPS, CAPS, CLOSURES

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/ CARTON
<b>DROPPER TIP CAPS</b>					
• 15055	8 MM	DROPPER TIP CAP	08-1	PP	26000
12087	8 MM	DROPPER TIP CAP	08-1	PP	10000
15170	8 MM	DROPPER TIP CAP	08-1	PP	26000
• 15054	13 MM	DROPPER TIP CAP	13-1	PP	15000
15140	15 MM	DROPPER TIP CAP	15-1	GPSS	8000
• 15044	15 MM	DROPPER TIP CAP	15-1	PP	8000
15207	15 MM	DROPPER TIP CAP	15-1	PP	8000
• 15018	15 MM	DROPPER TIP CAP	15-1	PP	16000
• 15045	18 MM	DROPPER TIP CAP	18-1	PP	5000
• 15029	18 MM	NASAL TIP CAP	18-2	PP	5600
• 15025	20 MM	DROPPER TIP CAP	20-1	PP	4500



### DROPPER TIP CAPS

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/ CARTON
<b>DROPPER TIPS/ EXTENDED CONTROLLED</b>					
12086	8 MM	EXT ROUND TIP	3-08-1	LDPE	20000
12298	8 MM	EXT ROUND TIP MO	3-08-1	LDPE	20000
• 12208	8 MM	EXT ROUND TIP	3-08-1	LDPE	20000
10270	8 MM	EXT ROUND TIP	3-08-1	LDPE	20000
• 11987	13 MM	EXT ROUND TIP	3-13-1	LDPE	10000
12214	13 MM	EXT ROUND TIP MO	3-13-1	LDPE	10000
11215	13 MM	EXT SQUARE TIP	3-13-1	LDPE	10000
12209	15 MM	EXT ROUND TIP MO	1-15-1	LDPE	9000
• 11953	15 MM	EXT ROUND TIP	1-15-1	LDPE	9000
12272	15 MM	EXT ROUND TIP	1-15-1	LDPE	9000
• 11954	15 MM	EXT SQUARE TIP	1-15-1	LDPE	8500
12393	15 MM	EXT ROUND MO	1-15-1	LDPE	9000
• 11911	18 MM	EXT ROUND TIP	1-18-1	LDPE	6000
10593	18 MM	EXT SQUARE TIP	1-18-1	LDPE	6000
• 11914	20 MM	EXT ROUND TIP	1-20-1	LDPE	5000
11877	20 MM	EXT SQUARE TIP	1-20-1	LDPE	4500
10886	20 MM	EXT VACCINE TIP	1-20-1	LDPE	6500



### DROPPER TIPS – EXTENDED CONTROLLED

*For information on Dropper Tip selection, see page 6 in the How to Best Use This Catalog section.*

# TIPS, CAPS, CLOSURES



**DROPPER TIPS –  
EXTENDED**

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/ CARTON
<b>DROPPER TIPS/ EXTENDED</b>					
11225	13 MM	ROUND 1/64 (.016)	3-13-1	LDPE	10000
11122	13 MM	ROUND 1/32 (.031)	3-13-1	LDPE	10000
10998	13 MM	ROUND 3/32 (.094)	3-13-1	LDPE	10000
12080	15 MM	SQUARE 1/32 (.031)	1-15-1	LDPE	14000
• 11947	15 MM	ROUND 1/32 (.031)	1-15-1	LDPE	9000
11948	15 MM	ROUND 1/16 (.062)	1-15-1	LDPE	9000
• 11949	15 MM	ROUND 1/64 (.016)	1-15-1	LDPE	9000
10315	15 MM	SQUARE 1/32 (.031)	1-15-1	LDPE	10000
10323	15 MM	SQUARE 3/64 (.047)	1-15-1	LDPE	10000
11913	18 MM	ROUND 1/64 (.016)	1-18-1	LDPE	6500
11909	18 MM	ROUND 1/32 (.031)	1-18-1	LDPE	6500
11910	18 MM	ROUND 1/16 (.062)	1-18-1	LDPE	6500
10952	18 MM	ROUND 3/32 (.094)	1-18-1	LDPE	6500
11915	20 MM	ROUND 1/64 (.016)	1-20-1	LDPE	4500
11917	20 MM	ROUND 1/32 (.031)	1-20-1	LDPE	4500
11918	20 MM	ROUND 1/16 (.062)	1-20-1	LDPE	4500
10560	20 MM	ROUND 1/64 (.016)	1-20-1	LDPE	4500
10969	20 MM	ROUND 3/32 (.094)	1-20-1	LDPE	4500



**ORIFICE REDUCERS**

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/ CARTON
<b>ORIFICE REDUCERS</b>					
11105	13 MM	OR .031	3-13-0	LDPE	18000
11107	13 MM	OR .031	3-13-0	LDPE	18000
11106	13 MM	OR .062	3-13-0	LDPE	18000
10310	15 MM	OR .031	1-15-0	LDPE	18000
10311	15 MM	OR .062	1-15-0	LDPE	18000
10312	15 MM	OR .093	1-15-0	LDPE	18000
10437	18 MM	OR .031	1-18-0	LDPE	10000
10436	18 MM	OR .062	1-18-0	LDPE	10000
10423	18 MM	OR .093	1-18-0	LDPE	10000
10541	20 MM	OR .031	1-20-0	LDPE	8000
10542	20 MM	OR .062	1-20-0	LDPE	8000
10424	20 MM	OR .093	1-20-0	LDPE	7500
10276	24 MM	OR .031	1-24-0	LDPE	5000
10275	24 MM	OR .062	1-24-0	LDPE	5000
10274	24 MM	OR .093	1-24-0	LDPE	5000

ITEM #	SIZE	DESCRIPTION	PIC	MATERIAL	PARTS/ CARTON
<b>SPRAY MIST FITMENTS</b>					
10262	8 MM	EXT SPRAY MIST	3-08-1	LDPE	20000
11080	13 MM	EXT SPRAY MIST	3-13-1	LDPE	10000
11950	15 MM	EXT SPRAY MIST	1-15-1	LDPE	9000
11912	18 MM	EXT SPRAY MIST	1-18-1	LDPE	6500
10559	20 MM	EXT SPRAY MIST	1-20-1	LDPE	5000
10383	18 MM	NASAL INSERT PLUG	4-18-2	LDPE	6000
10966	18 MM	NASAL SPRAY PLUG	1-18-2	LDPE	4500
10595	18 MM	FLAT SPRAY MIST	1-18-0	LDPE	10000
10598	20 MM	FLAT SPRAY MIST	1-20-1	LDPE	7500
10765	20 MM	EXT SNIP OFF TIP	1-20-8	LDPE	6000



**SPRAY MIST FITMENTS**

**Dip Tube Information for Spray Mist Fitments**

Dip tube dimensions depend on product type (viscosity has influence) and the customer defined product amount acceptably remaining in the package after full dispensing.

Dip tubes can be cut to any length so the bottom end is just above the container inside bottom center or so the bottom end is forced to curl toward the inside side-wall edge or all the way to the bottle corner. Dip tube ends may be cut at an angle or straight across to facilitate product-dispensing dependent upon dip tube bottom location within the package.



### ■ **Gaylord**

Is a term used to designate a very large carton (i.e., 45" x 33" x 51") that will fit one per pallet. There are various sizes depending on the pallet and the customer requirements.

### ■ **Pallets**

Our standard pallet is 48" x 40" and approximately 5" high, made from reconditioned wood. The pallet has 4 way entry so that it can be picked up by loading equipment from any side. The pallet is considered a standard GMA pallet, (Grocery Manufacturers of America). Some other pallets that Alcan Packaging Plastics Americas uses are made from new wood (not reconditioned/above), plastic, and corrugated.

### ■ **Slip Sheets**

Slip Sheets are large corrugated sheets that are placed under the cartons when a pallet is not used. The slip sheet is held in place with stretch wrap. (There is overlap on two sides where the stretch wrap will hold the slip sheet to secure the unit).

### ■ **Bags**

All of the Alcan Packaging Plastics Americas standard bags are made of LLDPE (Linear Low Density Polyethylene). No BHT (Butylated Hydroxy Toluene) is allowed, which causes yellowing with age. All of the Alcan Packaging Plastics Americas standard bags are gusseted (creases in the bag which open up to allow a better fit in the carton). Standard Alcan Packaging Plastics Americas bags for containers are 1ml thick. Standard Alcan Packaging Plastics Americas bags for Injection Products are 2ml thick.

### ■ **Pads**

Pads are used between layers for layer packed product. Sometimes pads are also placed on top and/or bottom as well as between the layers inside of the carton. Standard Alcan Packaging Plastics Americas pads are chipboard (cardboard) .030" thick. Some pads have "no scratch" coatings (wax) to prevent scuffing on high gloss products. Foam pads are also used by Alcan Packaging Plastics Americas for special applications.

### ■ **Cells/Partitions**

Cells (also called Partitions) are used by Alcan Packaging Plastics Americas to separate some layer packed products. The Partitions/Cells are unfolded and placed on each pad inside the carton. Bottles or caps are then placed inside each individual cell/partition. Materials for the partitions are generally chipboard (cardboard) with "no scratch" coatings (wax). Cells/Partitions are used to prevent scuffing on high gloss products.

### ■ **Layer Pack**

PET bottles 8 ounces and larger generally require layer packing due to their propensity to dent. Other bottles require layer packing for various reasons (scratching, scuffing, and denting are the main reasons).

### ■ **Twist Ties**

Alcan Packaging Plastics Americas standard packaging does not include twist ties. However, many items are currently twist tied. Alcan Packaging Plastics Americas also has some products that require pull ties.

### ■ **Tape**

Alcan Packaging Plastics Americas Standard is clear pressure sensitive tape (brown can also be used). Also available is Kraft Tape and reinforced Kraft Tape (both are brown paper tape with glue that need water to be applied with a special tape dispenser). Alcan Packaging Plastics Americas standard packaging is "S" (single strip) tape on top and bottom of carton with pressure sensitive tape. Tape can also be applied in an "H" pattern ("H" taped) on the top and bottom of the carton. Injection Molding glues the bottom of their standard medium cartons with a special machine.



## Technical Information

# PLASTIC TERMS

- **Blow Mold** – Cavity that receives a Preform or tube, which will be blown into the desired shape.
- **Blow Pin** – Used in Extrusion Blow Molding. Hollow tube that pierces Preform and introduces air to blow Preform into shape of Blow Mold.
- **Cavity** – That part of the mold which contains the reverse image of the product being formed.
- **Cold Runner** – Flow channel for heat-softened polymer, which goes from the Plastifier to the mold cavities. Polymer in the flow channel is cooled with shaped parts in cavities and is later removed, reground, and reused.
- **Core** – That part of a mold that allows the internal shaping of a product such as the internal threads of a cap.
- **Core Rod** – Used in Injection Blow and Injection Stretch Blow Molding. Used in conjunction with a Preform Mold to manufacture a Preform. The Preform is formed around the Core Rod creating a hollow tube, which will then be transferred to a Blow Mold where air will be introduced forcing the Preform to take the shape of the Blow Mold cavity.
- **Extrusion Blow Molding** – A molding process whereby heat-softened polymer is forced into the shape of a hollow tube. While still soft, a mold closes around the tube, pinching the top and bottom of the tube closed. A Blow Pin is introduced, and air is forced through the pin forcing the tube to take the shape of the Blow Mold cavity.
- **Flame Treating** – A method of rendering inert thermoplastic objects receptive to inks, lacquers, paints, adhesives, etc. in which the object is bathed in an open flame to promote oxidation of the surface of the article. Polyolefins (HDPE, LDPE, PP, etc.) are primarily those polymers that are flame treated.
- **Flash** – Extra plastic attached to molded ware along the parting line, which must be removed before the part can be considered finished.
- **Gate** – Used in Injection Blow, and Injection Stretch Blow Molding. The orifice through which the heat-softened polymer enters the cavity.
- **Hot Runner** – Flow channel for heat-softened polymer, which goes from the Plastifier to the mold cavities. Polymer in the flow channel is kept softened so there is no runner material to grind up and reuse.
- **Hopper** – Conical feed reservoir into which polymer pellets are loaded. These pellets then fall into a heated barrel (Plastifier), sometimes through a metering device.
- **Injection Blow Molding** – A molding process in which heat-softened polymer is injected from a Plastifier into a mold cavity creating a Preform, which is then transferred to a Blow Mold where air is blown into the Preform, forcing it to take the shape of the Blow Mold cavity.
- **Injection Molding** – A molding process whereby a heat-softened polymer is injected from a Plastifier into a relatively cool cavity, which gives the article the desired shape.
- **Injection Stretch Blow Molding** – A molding process whereby Preforms are introduced into a cavity, stretched axially by a Stretch Rod, and then blown circumferentially to the shape of the Blow Mold cavity.
- **Melt Index** – The amount, in grams, of a thermoplastic resin, which can be forced through a 0.0825 inch orifice when subjected to 2160 gms. force in 10 minutes at 190° C.
- **Mold** – Contains the cavity or cavities of a desired part in which a heat-softened polymer is shaped.
- **Mold Seam** – A line formed at the point of contact of the Mold halves.
- **Neck Ring** – Part of the mold assembly, which forms the neck and finish of a container.
- **Nozzle** – Hollow cored orifice that is screwed into the extrusion end of the Plastifier. The nozzle is designed to form a seal under pressure between the Plastifier and the Mold or Runner System. The front end of a nozzle may be either flat or spherical in shape.
- **Plastifier** – Assembly whereby polymer pellets are fed from a Hopper into a barrel where they drop onto a turning screw which forces the pellets forward. Heater bands wrapped around the barrel melt the pellets as they are forced forward along the inside of the barrel. The molten polymer is then forced out the end of the barrel through the Nozzle.
- **Preform** – Used in Blow Molding processes. Heat-softened polymer is formed into a shape similar to a thick test tube with neck threads. This tube is subsequently inflated while inside a Blow Mold to create the shape of the desired article.
- **Regrind** – A thermoplastic from a processor's own production that has been reground or re-pelletized after having been previously processed by molding.
- **Release Agent** – A lubricant that facilitates molding.
- **Stretch Rod** – Used in Injection Stretch Blow Molding. A rod that is introduced into the Preform to stretch it in an axial direction prior to the Preform being blown into the shape of the cavity.
- **Thermoplastic** – Material that will repeatedly soften when heated and harden when cooled.
- **Tri-Layer** – Tri-Layer bottles are made using the EBM (Extrusion Blow Molding Process) and consist of 3 laminate layers of PE (Polyethylene) material and/or colorant. The inner layer comprises 20% of the bottle wall thickness and is produced using virgin material. The inner layer is in contact with the filled product. The middle layer is the thickest layer at 60% and is typically produced using PCR (Post Consumer Resin) or process generated re-ground material. Colorant can be added to this layer if required. The outer layer comprises 20% of the bottle wall thickness and is typically produced using virgin material with colorant. This is the outside of the bottle which is visible to the consumer.

# Technical Information

## QUICK REFERENCE CONVERSIONS

### METRIC MEASURES >> US MEASURES

1 Dram (dr)	=	0.125	Ounces (oz)
1 Cubic Centimeter (cc)	=	0.03	Ounces (oz)
1 Liter (l)	=	2.10	Pints (pt)
1 Gram (g)	=	0.035	Ounces (oz)
1 Kilogram (kg)	=	2.20	Pounds (lb)
1 Millimeter (mm)	=	0.039	Inches (in)

### US MEASURES >> METRIC MEASURES

1 Ounce (oz)	=	8.00	Drams (dr)
1 Ounce (oz)	=	29.57	Cubic Centimeters (cc)
1 Ounce (oz)	=	29.57	Milliliters (ml)
1 Pint (pt)	=	00.47	Liters (l)
1 Ounce (oz)	=	28.35	Grams (g)
1 Pound (lb)	=	00.45	Kilograms (kg)
1 Inch (in)	=	25.40	Millimeters (mm)

### CC/ML OZ CC/ML OZ

#### UNITS OF CAPACITY CUBIC CENTIMETERS/MILLILETERS >> OUNCES

1	=	.0338	40	=	1.3524
2	=	.0676	50	=	1.6905
3	=	.1014	60	=	2.0286
4	=	.1352	75	=	2.5358
5	=	.1691	100	=	3.3810
6	=	.2029	125	=	4.2263
7	=	.2367	150	=	5.0715
8	=	.2705	200	=	6.7620
9	=	.3043	250	=	8.4525
10	=	.3381	300	=	10.1430
15	=	.5072	400	=	13.5240
20	=	.6762	500	=	16.9050
25	=	.8453	750	=	25.3575
30	=	1.0143	1000	=	33.8100

### INCHES (in.) MILLIMETERS (mm)

#### INCHES >> MILLIMETERS

1/32	=	0.8
1/16	=	1.6
1/8	=	3.2
1/4	=	6.4
3/8	=	9.5
1/2	=	12.7
5/8	=	15.9
3/4	=	19.1
7/8	=	22.2
1	=	25.4

### DRAMS OUNCES CC/ML

#### FLUID CONVERSIONS

1/4	1/32	.924
1/3	1/24	1.232
1/2	1/16	1.845
1	1/8	3.697
2	1/4	7.393
3	3/8	11.090
4	1/2	14.787
6	3/4	22.180
8	1	29.574

### MINIMS DRAMS OUNCES GILLS CC LITERS

#### LIQUID MEASURE CONVERSIONS

1 Dram	60	1	0.125	0.03125	3.69661	0.0037
1 Ounce	480	8	1	0.25	29.5729	0.0296
1 Gill	1920	32	4	1	1	0.001
1 Milliliter	16.231	0.2705	0.0338	0.0084	1	0.001
1 Liter	16231.1	270.518	33.8147	8.4536	1000	1
1 Pint	7880	128	16	4	473.167	0.4731
1 Imperial Pint	-	-	19.21	4.803	568.095	0.588095
1 Quart	-	-	32	8	946.333	0.946333
1 Imperial Quart	-	-	38.43	9.607	1136.486	1.1365
1 Gallon	-	-	128	32	3786.331	3.7853
1 Imperial Gallon	-	-	153.72	38.430	4545.946	4.545946