

# CLEARTUF® 8006C



GRUPPO MOSSI & GHISOLEI

July 2008

Polyethylene Terephthalate (PET)

Data Sheet

## DESCRIPTION

**CLEARTUF® 8006C** Polyester Resin is a TPA-based polyethylene terephthalate copolymer resin designed for a wide range of custom bottle applications produced on both one or two step processes. It is a high molecular weight polymer with an 0.80 intrinsic viscosity (IV) and a wide processing range which can help in obtaining fine detail into containers.

**CLEARTUF® 8006C** Polyester Resin is designed to provide highly desirable container properties, particularly for the custom container market. These include excellent color, high clarity and sparkle, high strength and toughness, and good barrier properties. **CLEARTUF® 8006C** Polyester Resin is designed with a special catalyst and stabilizer system that offers property retention during processing. This superior stability also enables use of the required drying conditions without affecting color or molecular weight

The following table provides the Parameters that characterize the grade. Some Parameters are shown with values that are specified to fall within certain limits. Other Parameters are shown as a single value that we regard as typical of the grade. Minor differences around this typical value will not detract from the performance of the product. All Parameters are measured under laboratory conditions by the M&G analytical method shown. Different methods or conditions of analysis may give rise to different values. Purchased material may be accompanied by a Certificate of Analysis or other document, confirming that the product is within specified limits and is consistent with the other values for the stated Parameters.

Parameter	Unit	Value	Limits	Test Method
Intrinsic viscosity (IV)	dl/g	0.80	± 0.02	M&G/QC-01
Acetaldehyde content	ppm	1.2	Max	M&G/QC-03
Color (L*-value)	--	80	Min	M&G/QC-02
Color (b*-value)	--	-1.0	Max	M&G/QC-02
Melting point ++	°C	248.0	--	M&G/QC-06
Foreign particles	--	None	--	Visual Detection

++ monitored on feed resin only

## REGULATORY STATUS

**CLEARTUF® 8006C** Polyester Resin is suitable for the manufacture of articles for numerous food packaging applications. Since food packaging regulations differ from country to country, for information about the regulatory status within the United States under FDA regulations or within Europe under EC and/or national regulations, please contact your local account manager or our Product Stewardship and Regulatory Compliance Department in the US at +1 330 239 7450.

**Supply Company**  
M&G Polymers USA, LLC

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## IMPORTANT ASPECTS OF USE IN PROCESSING

### Drying

Thermoplastic polyesters such as **CLEARTUF® 8006C** Polyester Resin can undergo hydrolysis if moisture is not eliminated prior to injection molding leading to a decrease in molecular weight and loss in mechanical properties of the bottle, particularly top load performance and impact strength. Moisture content of the resin must be reduced to a level of 0.003% (30ppm) or less, prior to melt processing. Drying is best accomplished in a continuous high heat dehumidifying type air hopper dryer with a regenerative desiccant bed using -20 °F max (-29 °C max) dew point air. Typical drying conditions are an air temperature of 350 °F (175 °C), 4-6 hours residence time and a minimum air flow rate of 1.0 ft<sup>3</sup> per minute per pound of polymer consumed per hour.

### Injection molding and Stretch blow molding

Injection molding temperatures should be maintained at the minimum levels needed to produce clear quality preforms. In addition to temperature limits, care should be taken to avoid excessive shear during injection. Typical processing temperatures are generally between 20°C and 40°C hotter than the Melting Point Parameter indicated on the front of this Data Sheet, largely dependent upon injection barrel dynamics such as residence time and shear. When stretch blow molding, preforms should be heated to minimum levels needed to produce clear, quality biaxially oriented containers. Typical preform surface temperatures are generally between 90°C to 105°C, largely dependent upon the equipment setup and efficiency.

## SAFETY ASPECTS

Please read the **Material Safety Data Sheet** written for this product. It may be obtained from your **CLEARTUF** account manager.

- **Handling**

**CLEARTUF® 8006C** Polyester Resin presents no toxic hazards, either from skin contact or inhalation, under normal conditions. Contact with melted polymer should be avoided. Product delivered in bags must not be stacked.

- **Fire precautions**

In common with most other organic polymers, PET polymers will burn. They are difficult to ignite, but are defined as 'combustible' but not 'highly inflammable'. Reasonable precautions should be taken to ensure absence of sources of ignition in warehouses and storage areas. If large quantities are stored, normal good housekeeping should be enforced, including freedom from dust, uncluttered access ways, sprinkler system etc

## WARRANTY

All products purchased from or supplied by M&G Polymers USA, LLC, are subject to terms and conditions set out in the contract, order acknowledgment and/or bill of lading. M&G warrants only that its product will meet those specifications designated as such herein or in other publications. All other information, including that herein, supplied by M&G is considered accurate but is furnished upon the express condition that the customer shall make its own assessment to determine the product's suitability for a particular purpose. M&G makes no other warranty either express or implied, regarding such other information, the data upon which the same is based, or the results to be obtained from the use thereof; that any products shall be merchantable or fit for any particular purpose; or that the use of such other information or product will not infringe any patent.

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## **PERFORMANCE<sup>®</sup> PET 1708CC**

### ***DESCRIPTION***

**PERFORMANCE<sup>®</sup> PET 1708CC** is a food grade PET copolymer that is suitable for a wide variety of beverage and juice containers as well as many other custom containers. It is engineered for heat-set applications and offers exceptional clarity and color. The low acetaldehyde content in the resin helps eliminate any impact on aroma and flavor.

**PERFORMANCE<sup>®</sup> PET 1708CC** resin is considered safe for food packaging applications based upon compliance with FDA Regulation 21 CFR Section 177.1630 and USP 661 specifications. 1708CC also has a Drug Master File registered with the FDA.

### ***WARRANTY***

Starpet Inc. warrants that its products will comply with the specifications and related regulatory compliance detailed in its publications. No other warranty, either expressed or implied regarding the suitability of the product for any particular purpose is made. The Buyers are expected to make their own determination about the safety, health, environmental protection and suitability of use for their intended purpose. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

July 15, 2010

## **PREFORMANCE<sup>®</sup> PET 1708CC**

### **SALES SPECIFICATION**

Polyethylene Terephthalate (PET) Resin

<b>Property</b>	<b>Value</b>	<b>Starpet Method</b>
Intrinsic Viscosity (dl/g)	0.80 ± 0.02	QSWI 8.2.4.101
Color, CIE L* b*	85 ± 2.5 -1.0 ± 2.0	QSWI 8.2.4.104
Acetaldehyde (ppm)	≤ 1.0	QSWI 8.2.4.114
Bulk Density (lbs/ft <sup>3</sup> )	56	QSWI 8.2.4.150
Dust (ppm)	≤ 300	QSWI 8.2.4.132
Moisture (wt. %)	≤ 0.25	QSWI 8.2.4.112
Contaminants/Black Specs	None	-----

**Note**

Please note that PET is hygroscopic and the moisture content can go up from the reported value during storage and transit. Also, please note that the dust value is as packed.

July 15, 2010

# 台南紡織公司太子廠

TAINAN SPINNING CO., LTD. TAITZ PLANT

## 瓶片酯粒規格表

Specification of bottle chip

批號

BT280

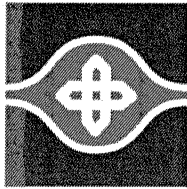
規格

A級

Lot No

Article

No	檢驗項目	管制界線	備註
1	特性黏度 (IV)	$0.80 \pm 0.02$	
2	羧基(meq/kg) (-COOH)	< 35	
3	b值 (b value)	$-2.0 \pm 2.0$	
4	熔點(°C) (M. P)	$246.5 \pm 3.0$	
5	乙醛(ppm) (AA)	< 1	
6	粒重(g/100粒) (g/100 chips)	$1.6 \pm 0.2$	
7	L值 (L value)	$84 \pm 2$	
8	含水率(%) (Water Content)	< 0.4	



## NAN YA PLASTICS CORPORATION, AMERICA SOUTH CAROLINA PLANT

140 E BEULAH ROAD, LAKE CITY, SOUTH CAROLINA  
P.O. BOX 939, LAKE CITY, SC 29560  
TEL 843-389-7800 FAX 843-389-6894

### Tairilin Chip General Specifications

Specification: CNGFA080  
Description: A-grade Bottle Resin  
Lot No: AA20

Property	Unit	General Specification	Test Method
A. IV (Intrinsic Viscosity)	dL/g	0.800 ± 0.02	NALC-QC-104
B. Color 1. L, Luminance 2. b, Yellowness		84.0 ± 3.0 -2.0 ± 3.0	NALC-QC-106
C. Melting Point	°C	246 ± 3	NALC-QC-115
D. Acetaldehyde Content	ppm	< 1.00	NALC-QC-410

1. Nan Ya PET resin complies with the U.S. FDA Code of Federal Regulations Title 21 part 177.1630 and EC Directive 2002/72/EC with respect to its use for food contact applications.

2. Typical drying conditions:

Maximum acceptable moisture level: 40ppm

Drying air temp: 160-180°C

Drying air dew point: < -40°C

Drying residence time: 4 - 6hours

3. Typical molding conditions:

Barrel temperatures: 275-285 °C

The conditions stated above are typical but not specific. Individual machine conditions will vary from machine to machine.

# EASTLON PET CB-602 (CLEAR)

## PHYSICAL PROPERTY DATA SHEET

Product Name : EASTLON PET CB-602  
 Chemical Name : Poly (Ethylene Terephthalate - Isophthalate)  
 Formula :  $(\text{OCOC}_6\text{H}_4\text{COOCH}_2\text{CH}_2)_n$   
 Manufacturer : FAR EASTERN NEW CENTURY CORPORATION  
 33F No. 207 Sec 2 Tun Hwa S. RD Taipei Taiwan  
 TEL: 886-2-27338000 FAX : 886-2-27368304  
 Version : DEC 2013

Property, Units	Test Method	Value
Density, g/cm <sup>3</sup>	ASTM-D-1505	1.40
Bulk Density, lb/ft <sup>3</sup> (kg/m <sup>3</sup> )	ASTM-D-1895	49 (785) 54 (870)
Poured		
Vibrated		
Melt Density, @285°C, g/cm <sup>3</sup>	-	1.2
Molecular Number average (Mn)	-	28,000
Molecular Weight average (Mw)	-	42,000
Intrinsic viscosity *	ASTM-D-4603	0.80 ± 0.02
Crystallinity, %	-	> 45
Crystalline Peak Melting Point, °C	ASTM-D-3418	250 ± 5
Heat of Fusion, cal/g (j/kg)	DSC	14 ( 58 * 10 <sup>3</sup> )
Thermal Conductivity, Cal/cm°C. S(W/m.k)	ASTM-D-177	6.5*10 <sup>-4</sup> (0.27)
Acetaldehyde, ppm	Celanese-Method	< 1.0
Diethylene Glycol, % by wt.	-	1.3 ± 0.2
Pellets Weight, g/100 grains	-	1.5 ± 0.2

\* Eastlon PET CB-602 is a condensation polymer produced from pure terephthalic acid (PTA), isoterephthalic acid (IPA) and ethylene glycol (EG) using a continuous polymerization.

\* Packing : 1,100 or 1,050kgs in PP woven bag with PE interlining.  
20bags in one 20 feet container.

\* Properties reported here are typical of average lots.  
FENCC makes no representation that the material in any particular shipment will conform exactly to the values given.



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 FACTORY: TEL. #: (021) 5017484 TO 85 FAX: (021) 5017750  
 E-MAIL: [NOVAFAC@NOVATEX.COM](mailto:NOVAFAC@NOVATEX.COM) WEBSITE:[WWW.GATRONOVA.COM](http://WWW.GATRONOVA.COM)

# **GATRONOVA PET**

## **Standard Specifications of Gatronova PET resin A-80 Polyester Bottle Grade Chips**

<b>Description</b>	<b>Unit</b>	<b>Test Method</b>	<b>Test Equipment</b>	<b>Novatex Specifications</b>
<b>Intrinsic viscosity (IV)</b>	[dl/g]	PV-07040.5 <sup>a</sup>	Capillary Viscometer	0.80 ± 0.02 <sup>a</sup>
<b>DEG Content</b>	%	PV-09040	Gas Chromatograph	≤ 1.5
<b>Carboxylic End Groups</b>	m.mol/kg	PV-07013.4	Titranoplus	35 max.
<b>Acetaldehyde (AA)</b>	ppm	Cobarr 201/A <sup>1</sup>	Gas Chromatograph	< 1.0
<b>Moisture Content</b>	%	PV-07109.5	MEECO	0.4 Max.
<b>Melting Point (DSC)</b>	[°C]	PV-07089.2	Mettler DSC	247 ± 2
<b>Color No. Hunter Lab</b>	LH	PV-07136.1	BYK Gardener	≥ 83
<b>Color No. Hunter Lab</b>	bH	PV-07136.1	BYK Gardener	0.0 ± 0.95
<b>Number of Chips/gram</b>	No.	Manual	-	61 ± 3
<b>Crystallinity</b>	%	ASTM D 1505	Techne Gradient Column	≥ 50

Specifications as per Zimmer test methods. Details of method can be provided upon request.

<sup>1</sup> As per Sinco method

<sup>a</sup> IV is done according to PV-07040.5- Solvent is Phenol/Dicholobenzene using ubbelohde type 1(c) capillary viscometer at 25°C.

≤ read as less than or equal to

≥ read as greater than or equal to

The information and the data contained here is believed to be correct and there are FDA/EEC compliance certifications and other major food grade approvals available and can be provided upon request.

### **Please direct all you inquiries to:**

#### **Gatronova Marketing and Exports Department**

GROUND FLOOR, G&T TOWER #10, BEAUMONT ROAD, CIVIL LINES-10, KARACHI, PAKISTAN 75530.

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**RECRON (MALAYSIA) SDN. BHD.** (Company No. 781769-K)

Member Reliance Group  
(Formerly known as Real Aim Development Sdn. Bhd)  
NILAI, POLY PLANT

## SSP PET SPECIFICATION

<b>PRODUCT NAME</b>	Polyethylene Terephthalate
<b>COLOUR</b>	SSP (Bottle Grade)
<b>LOT NUMBER</b>	6868
<b>GRADE</b>	A

<b>ITEM</b>	<b>UNIT</b>	<b>SPECIFICATION</b>	<b>TEST METHOD</b>
<b>IV</b>	dl/g	$0.8000 \pm 0.02$	Zimmer PV 07040.4
<b>COOH</b>	$\mu\text{eq/g}$	$\leq 35$	Zimmer PV 07090.4
<b>L*</b>	-	$> 82$	Zimmer PV 07110.5
<b>a*</b>	-	$< 0.5$	Zimmer PV 07110.5
<b>b*</b>	-	$-3.5 \sim 0.0$	Zimmer PV 07110.5
<b>DEG</b>	%	$1.3 \pm 0.3$	Zimmer PV 09008.7
<b>IPA</b>	%	$2.0 \pm 0.3$	Zimmer PV 09008.7
<b>AA</b>	ppm	$\leq 1.0$	Zimmer WN-B010-9013E
<b>Tm</b>	degC	$244 \pm 2$	Zimmer PV 07089.2
<b>Cryst</b>	%	$\geq 50$	Zimmer PV 07016.3
<b>Moisture</b>	wt%	$\leq 0.25$	AQP-35KF COULOMETER



Data Sheet of Wankai PET resin bottle grade

	Item	Unit	WK-801	WK-811	WK-821	WK-881	WK-851	
1	I.V.	dL/g	0.80±0.015	0.80±0.015	0.84±0.015	0.855±0.015	0.85±0.015	
2	Melting Point (DSC)	°C	243±2.0	250±2.0	243±2.0	243±2.0	243±2.0	
3	Carboxyl End Group	mmol/kg	≤26	≤26	≤26	≤26	≤26	
4	Moisture	%wt	≤0.4					
5	Color	L	—	≥84.0	≥84.0	≥84.0	≥84.0	≥72.0
		b	—	≤1.0	≤1.0	≤1.0	≤1.0	≤0.0
6	DEG	%wt	1.4±0.10	1±0.10	1.4±0.10	1.4±0.10	1.4±0.10	
7	Crystallinity	%	55±5					
8	Weight of 100 chips	g	1.55±0.10					
9	Acetaldehyde	µg/g	≤1.0					
10	Discoloration	pcs/500g	none	none	none	none	none	
11	Dust	mg/kg	≤100					
12	Ash	%wt	≤0.08					
Remark: 1) I.V. IS TESTED BY PHENOL/TETRACHLORIDE ETHANE 3:2, AT 25°C								

The data sheet effects from Oct.1,2010

**Indorama Polymers Public Company Limited**

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[www.indoramapolymers.com](http://www.indoramapolymers.com)

**Factory:**

72 Moo 11, Bang-ngha Thaklong Road, T. Kaosamorkon, Amphur Tawung, Lopburi 15180.

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**Sales Specifications**

Product: Polyethylene Terephthalate (PET) Polymers - Copolymer

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**RAMAPET N1**

Property	Unit	Value	Test Method
Intrinsic Viscosity	dl/g	0.80 ± 0.02	IR-001 (Ubbelohde Viscometer)
Acetaldehyde	ppm	1 Max.	IR-002 (Gas Chromatograph)
Melting point	°C	247 ± 2	IR-003 (Differential Scanning Calorimeter)
Color b		-1.5 ± 1.5	IR-004 (CIE Lab)
Crystallinity	%	50 Min.	IR-005 (Density Gradient Column)
Moisture content (when packed)	wt %	0.2 Max.	IR-006 (Gravimetric Method)
Chips/gm	pieces	60 ± 5	IR-007 (Weighment Method)

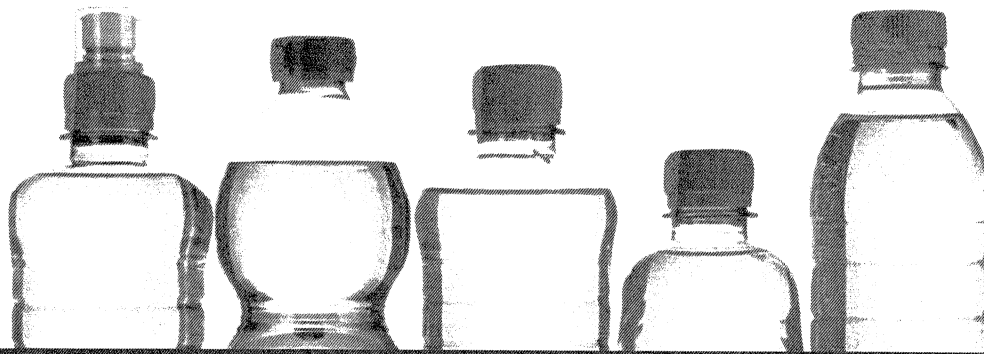
**Description**

**RAMAPET N1** is a General purpose food grade PET copolymer resin that is suitable for a wide variety of containers. The resin offers good strength characteristics like dimensional stability and mechanical properties. Suitable for Carbonated water, Alcoholic beverages, Pharmaceuticals, Oils, Agrochemicals, wide mouth containers and for APET sheet / Film extrusion application. It is also suitable for heat set blow molding that are used for warm fill applications.

**RAMAPET N1** resin is considered safe for food packaging applications based upon compliance with FDA regulation 21 CFR Section 177.1630, EC regulation 90/128/EEC and Coneg (Heavy metals) regulations.

**Warranty**

Indorama warrants that its products will comply with the specifications and related regulatory compliance detailed in its publications. No other warranty, either expressed or implied regarding the suitability of the product for any particular purpose is made. The buyers are expected to make their own determination about the safety, health, environmental protection and suitability of use for their intended purpose. No warranty is made of the merchantability or fitness of any product and nothing herein waives any of the seller's conditions of sale.



## PET RESIN PQS MW

*This resin targets the bottled water market but is also suitable for any product that needs superior clarity and gloss. Quality and stability allow molding in wide processing windows and designing lightweight containers. **PQS MW** is a copolymer resin formulated to provide extra clear containers with low acetaldehyde level and superior performance in the production of performs and bottles.*

### PACKAGING APPLICATIONS

- .Still water
- .Beverages
- .Edible oil
- .Food packaging
- .Pharmaceuticals
- .Cosmetics
- .Household cleaning products

## Product Specification

PARAMETER	UNIT	SPECIFICATION	TEST METHOD
Intrinsic Viscosity	dl/g	0.80 ± 0.2	ASTM D 4603
Color L*	—	Min. 87.5	HunterLab Colorimeter
Color b*	—	Max. 0	
Melting Point	°C	250	DSC
Acetaldehyde	ppm	Max. 1	GC
Fine Particles	ppm	Max. 100	Gravimetric

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**Industrial Site**  
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 ZIP: 55590-000 - Suape  
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## Holland Colours Americas Inc.

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Richmond, IN 47374  
Phone (765) 935-0329  
Fax (765) 966-3376

### TECHNICAL DATA SHEET

Holcoprill<sup>®</sup> Amber 175-20-36444

Product Description	Colorants/Additives in a non-polymeric carrier
Physical Form	Solid Bead
Melt Temperature	85-88°C
Specific Gravity	1.11-1.31 g/cm <sup>3</sup>

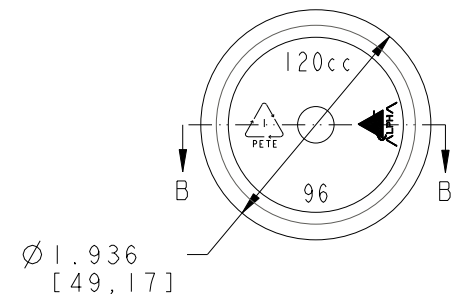
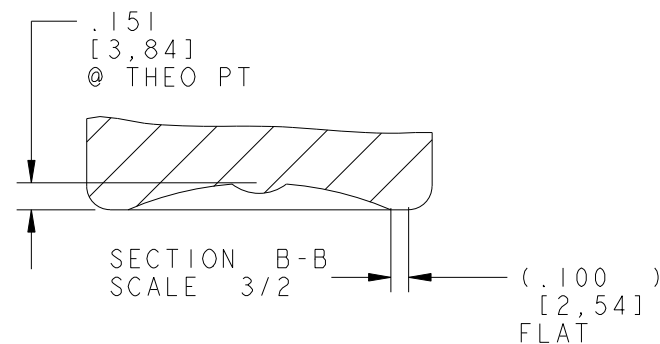
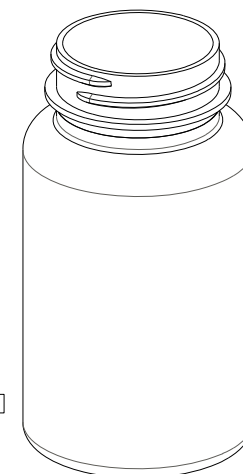
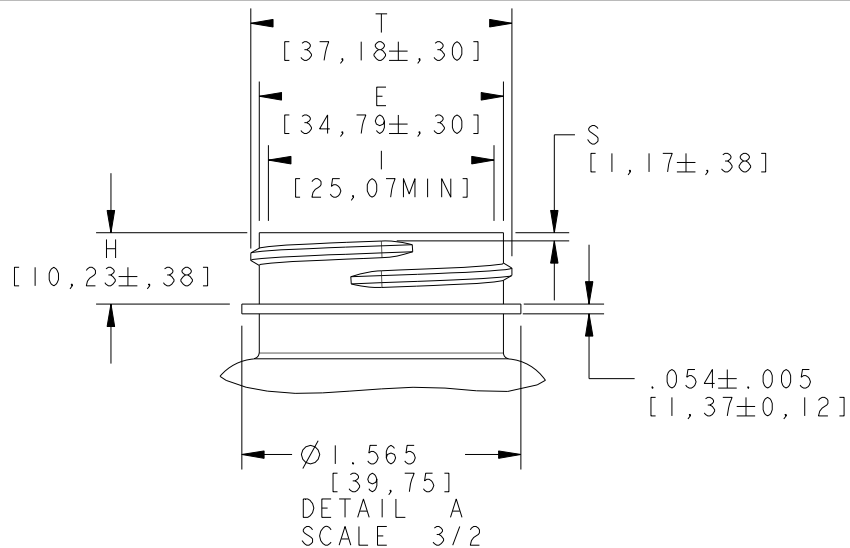
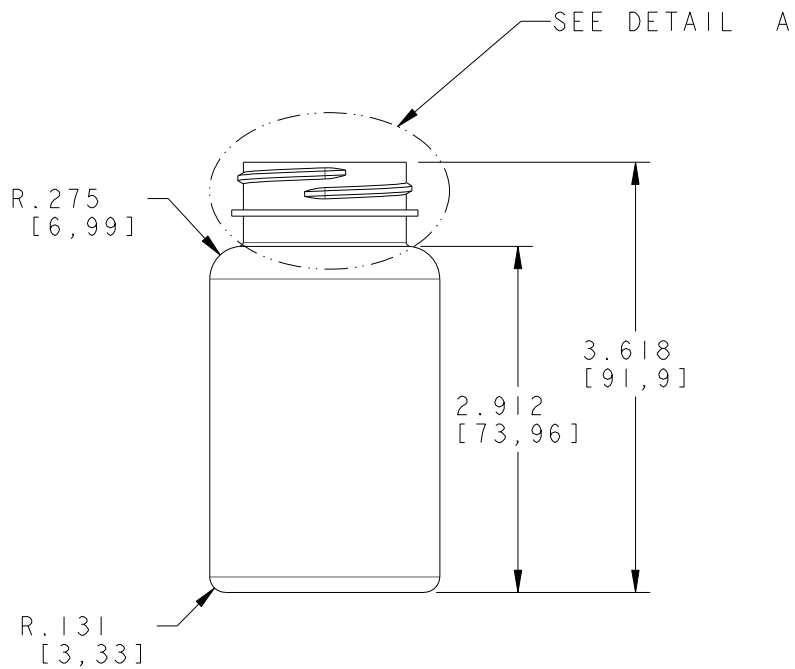


For additional information, refer to the MSDS and specifications for this product.


Holland Colours Americas Inc. does not control the conditions under which its products are used. Therefore we are not in a position to warrant that our customers' products are suitable for their intended use. Holland Colours Americas Inc. recommends that the customer perform their own tests to ensure acceptable performance.

**CONFIDENTIAL**

Created on 1/15/2008



Neck Finish: L38SP400		<b>DISCLAIMER:</b> Alpha Packaging assumes no responsibility for form, fit and function of closures, accessories, and/or shelf life and compatability of intended contents with this bottle.				
©Alpha Packaging, Inc.	<b>Min Thk</b>	<b>Color</b>	<b>Weight</b>	<b>Std. Pack</b>	<b>Revisions</b>	
All measurements are in inches, [Metric]	.010 [ ,25]	All Colors	21 Gms±3	576, Stack	E	Add Metric, 4/30/10, scf
	.010 [ ,25]	All Colors Heavy Gram 150 P	24 Gms±3	450, Bulk	F	Rmv 16g, wt was ±1,9/17/13, scf
<b>Neck Dimensions:</b>					Tolerance: Where not shown Decimal ±0.05 [1,27] Angular ±1°	
T = 1.464±.012					<b>120cc PACKER, STRAIGHT SIDED, 38-400 CT, PET</b> 120S38PET <b>F</b> Approved By: S J Drawing NO: 120PS1XX38L400	
E = 1.370±.012						
H = .403±.015						
I = .987 MIN						
S = .046±.015						
Overflow Capacity: 142 ml ± 5				Material: PET		


**Alpha Packaging, Inc.**  
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 Scale: 1/1 Drawn By: SCT Date: 07-25-00