

# Product Solutions

FOR BETTER LIVING







Because our plastic and chemical products are all around you,  
we take utmost care in every step throughout their journey  
to deliver only the best for you.



# About GC

PTT Global Chemical Public Company Limited (GC) is PTT Group's petrochemical flagship. We are committed to strengthening our leading position in the chemicals business by combining environmentally-friendly innovations with advanced technologies to develop products for people's better living.

GC comprises diversified and comprehensive petrochemical businesses, including manufacturing and distribution of upstream, intermediate, and downstream petrochemical products.

These products can be converted into other chemical products and serve as basic feedstock for downstream industries such as packaging, apparel, communications and electronic equipment, electrical appliances, vehicles, construction materials, engineering-based plastics, agricultural equipment, and much more. These products are not only part of our daily lives but they also enhance the way we live.



## Shareholder

We deliver the best business performance through trustworthiness to create fair and sustainable value for shareholders.

## Business Partner

We provide superior solutions from innovative and sustainable products and services to be the best choice for our business partners.



## Mission



## Vision

To be a Leading  
Global Chemical Company  
for Better Living



## Society

We integrate social and environmental responsibility into our business practices to achieve sustainable development.

## Employee

We build an organization that is prepared for dynamic change and learning by providing a happy working environment promoting the development of employees' capabilities and enabling them to meet new challenges with dedication to the organization and to professional excellence.

# Product Overview & Certificate



InnoPlus is a registered trademark of PTT Global Chemical Public Company Limited (GC). GC manufactures Polyethylene (PE), nameplate capacity at 1,950,000 MTA per year and Polyethylene Terephthalate (PET) nameplate capacity at 200,000 MTA per year.



## HDPE

InnoPlus High Density Polyethylene (HDPE) has a total production capacity at 850 KTPA. InnoPlus HDPE is made from the low-pressure polymerization using the slurry process of Mitsui Technology. InnoPlus HDPE offers high certainty of specific properties to meet all particular needs and complies with international standards regulations i.e., U.S FDA 21 CFR 177.1520 and EU 10/2011. InnoPlus HDPE also meet the Restriction of Hazardous Substances (RoHS) according to 2002/95/EC

## LLDPE

InnoPlus Linear Low Density Polyethylene (LLDPE) has a total production capacity at 400 KTPA. This technology can provide a wide range of LLDPE products.

## LDPE

InnoPlus Low Density Polyethylene (LDPE) has a total production capacity of 300 KTPA. InnoPlus LDPE is produced by a high pressure tubular process, a technology licensed by LyondellBasell.

## Certificate of HDPE, LDPE, LLDPE



**ISO 9001**  
Quality Management System by MASCI



**ISO 50001**  
Energy Management System by MASCI



**GHPs**  
Good Manufacturing Practice System by MASCI



## mLLDPE

InnoPlus Metallocene Low Density Polyethylene (mLLDPE) has a total production capacity at 400 KTPA. InnoPlus mLLDPE is produced by low pressure polymerization, using gasphase of Unipol Process under the license of Univation Technolog who is leading global technology licensor of proven metallocene PE technology. These unconventional mLLDPE from variety of catalyst offer a superior puncture and draft impact resistance, good seal ability and excellent optical property.

InnoPlus mLLDE is widely used for cast and blown film applications.

## PET

InnoPlus Polyethylene Terephthalate (PET) has total production capacity at 200 KTPA. InnoPlus PET is produced by the leading technological know-how of Lurgi Zimmer GMBH (Germany) and Bühler AG (Switzerland).



**ISO 14001**  
Environment  
Management  
System by MASCI



**ISO45001**  
Occupational  
Health and Safety  
Assessment  
Series by MASCI



**HACCP**  
Hazard Analysis  
Critical Control  
Point System  
by MASCI

# GC Product Brand of Other Polymers



PlastMate is registered trademark of PTT Global Chemical Public Company Limited (GC) for various type of compound resin such as PE compound, PP compound, PS compound, PC compound, ABS compound and Bioplastics Compound.



InnoEco is registered trademark of PTT Global Chemical Public Company Limited (GC) for high quality recycled plastic resin products. (Post-consumer recycled: PCR) of the GC group.

Maximum production capacity of 45,000 tons of recycled plastic resins each year.

Consisting of 30,000 tons of PCR PET resin and 15,000 tons of PCR HDPE resin.



DIAREX is a registered trademark of PTT Global Chemical Public Company Limited for Polystyrene (GPPS and HIPS).

The capacity of GPPS and HIPS are 60,000 MTA and 30,000 MTA, totally 90,000 MTA. Furthermore, we offer a wide range of Diarex grade with various properties for using in injection molding or extrusion process.



X PURGE is registered trademark of GC Marketing Solutions Company Limited (GCM) subsidiary of PTT Global Chemical Public Company Limited (GC) for Purging compound. Distributed by GC Marketing Solutions Company Limited (GCM)

X PURGE is a high efficiency ready-to-use purging compound which provides fast and effective color, material change and contaminant removal in the machine without disassembly. X PURGE will reduce machine downtime and/or maximize productivity. This product is designed for cleaning various types of the machines i.e., injection molding machines, blow molding machine, blown film machine, sheet casting machine.



InnoSis is a registered trademark of GC Marketing Solutions Company Limited, a subsidiary of PTT Global Chemical Public Company Limited (GC) for polyethylene trading.

Trading polyethylene of InnoSis is the product under the concept of being a leading distributor of plastic resin who is developing products to meet customer needs and create better quality products.

## GC Product Label

Bioplastics are plastics derived from agricultural raw materials (Biobased) or petroleum (Petrobased). Bioplastics have a plastic-like quality and characteristics. They can be melted and formed by general processes with general machines; only slight adjustments may be needed. For bioplastics made from agricultural raw materials, they are produced by a fermentation process that converts agricultural raw materials into monomers, which are then used to produce plastic pellets. Currently, the raw materials used in bioplastics production are corn, sugarcane, and cassava.



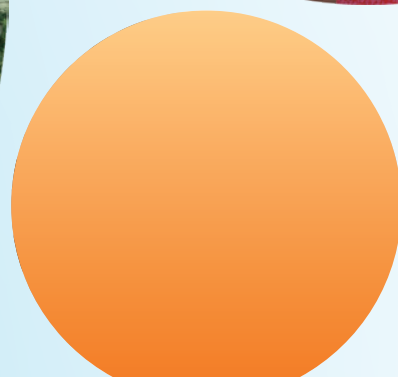
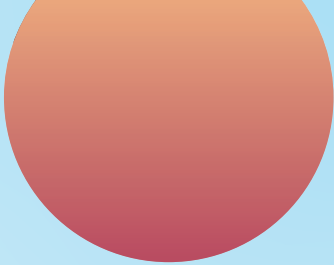




START  
TODAY  
SAVE  
TOMORROW

ประหยัด  
ต้นทุน

103.90





# Solutions

## For Every Product Applications

GC commits to continually develop plastic resins covering all applications various market to support all needs, reinforce efficiency including adding value to products for all industries such as packaging, agriculture, home goods and personal care, construction, electrical appliances, automotive and others.

# Rigid Packaging



## Caps and Closures (\*)

Caps and Closures application is innovated under the concept of Connected Packaging Development to deliver an identical proposition of brand owners, or conversion players and to experience on closure functions for supporting consumers trend such as lightweight, easy opening, complicated closure design for niche. GC offers wide range of product grades to serve packaging trend and carbon reduction goal with caring environmental change.



## Large Blow Molding

Large blow molding application is commonly used in the packaging containers of household and industrial sectors. GC products can serve from 20 up to 3,000 liter covering jerry cans, chemical and industrial drums, intermediate bulk container (IBC) with product durability and various design. By the durability performance of the material, consumers can gain the benefit from extending of the product lifetime which can be engaged in supporting the environmental care and sustainability aspects.



## Liquid Bottles (Small Blow)

Blow molding is typically used to produce containers or bottles in the liquid bottle segment. The market for HDPE blow-molded products uses machines and materials that deliver faster cycle times and lightweight products. HDPE blow-molded products require a balance of easy processing and good mechanical strength to enhance the combination of productivity, cost-effectiveness, and bottle-strength performance. GC's blow molding product portfolio offers a comprehensive range of grades to meet a wide variety of performance requirements.



## Consumer Goods

Injection molding is a common process for producing application parts from small to large volumes, e.g., toy parts, plastic containers, crates, garbage bins, plastic pallets, etc. The extrusion-thermoforming process is a general process for producing plastic thin wall sheets and forming thin wall products such as plastic tray for food or E&E appliances, plastic cup or lid, etc.

Raw materials for the finished part are the foundational components, which are generally chosen based on the function and specifications of the final product part. GC's consumer goods product portfolio offers a wide range of product grades in a broad processing window in order to support versatile product performance and needed design.

## International Standard Compliances

	<b>RoHS</b> Restriction of Hazardous Substances:EU Directive 2011/65/EU		<b>TIS 816-2556*</b> (TIS.816) Polyethylene industrial standard		<b>Halal</b> Islamic law for food relate goods/product		<b>US FDA</b> Food and Drug Administration (FDA) Specification according to US FDA 21 code of Federal regulations part 177.1520 ©
	<b>EU FDA</b> Plastic Materials and Articles intended to Come into contact with food		<b>Phthalate Content</b> According to ASTM D3421-1975		<b>GB480 6.6-2016*</b> (Chinese FDA) The Hygienic Standards for Uses of Additives in Food Containers and Packaging Materials* under GB31603- 2015		

\*This certification will be updated and revised by 2024 to TIS 816-2565

## Only for (\*)

	<b>JCII</b> Japan Chemical Innovation and Inspection Institute.		<b>TAIWAN FDA</b> Sanitation STD. For food utensils, container and package		<b>Organoleptic</b> German Food Articles of Daily Use and Feed Code of September 1,2005 (LFGB), Section 31-Sensory Examination Odour and Taste Test
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# Caps & Closures

## Rigid Packaging



Bottled Water



Carbonated Soft Drinks (CSD)



Non-Carbonated Soft Drinks (non-CSD)



Food & Beverage



Home and Personal Care (HPC)

InnoPlus: HDPE							
Properties	Test Method	Unit	Caps & Closures				
			HD1010J	HD1600JP	HD2401C	HD2200JP	HD3200C
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	20	12	7	3.5	2.3
Density	ASTM D1505	g/cm <sup>3</sup>	0.956	0.958	0.964	0.961	0.967
Melting Temperature	ASTM D3418	°C	130	132	136	135	132
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	290	290	310	310	310
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	140	200	175	210	200
Elongation at Break	ASTM D638	%	200	230	750	>1,000	150
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	12,000	12,500	15,000	14,500	17,000
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	4 (C*)	3 (C*)	4 (C*)	5 (C*)	2.5 (C*)
Durometer Hardness	ASTM D2240	shore D	64	64	65	66	67
Vicat Softening Point	ASTM D1525	°C	122	120	127.5	126	123
ESCR; 10% Igepal, F <sub>50</sub>	ASTM D1693	Hours	Initial	3	6	4	15
<b>Slip Agent</b>			No	No	No	No	No
<b>End Product</b>			Non-CSD /Food/HPC	Bottled Water/ Non-CSD			
<b>Product Highlight</b>			Over caps, Screw spout caps, Flip spout caps. Excellent processability for high complexity mold design with organoleptic property.	Beverage caps and closures for mineral and still water, juice, tea or liquid dairy with organoleptic property. Compatible with injection and compression processings.			

Note: \*C = Complete Break \*P = Partial Break \*NB = Non Break

InnoPlus: HDPE							
Properties	Test Method	Unit	Caps & Closures				
			HD3000C	HD3001C	HD3500C	HD3502C	HD4502C
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	2	2	1	1	0.5
Density	ASTM D1505	g/cm <sup>3</sup>	0.954	0.954	0.956	0.956	0.957
Melting Temperature	ASTM D3418	°C	132	132	130	130	130
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	260	260	240	240	276
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	320	320	270	270	268
Elongation at Break	ASTM D638	%	900	900	>1,000	>1,000	900
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	11,300	11,300	11,500	11,500	11,800
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	5 (P*)	5 (P*)	6 (NB*)	6 (NB*)	6.8 (NB*)
Durometer Hardness	ASTM D2240	shore D	62	62	62	62	62
Vicat Softening Point	ASTM D1525	°C	122	122	120	120	120
ESCR; 10% Igepal, F <sub>50</sub>	ASTM D1693	Hours	24	24	460	460	>1,000
<b>Slip Agent</b>			Yes	No	Yes	No	No
<b>End Product</b>			Bottled Water/ Non-CSD/CSD		CSD		
<b>Product Highlight</b>			Beverage caps and closures for CSD and Functional Sparkling with organoleptic property. Compatible with injection and compression processings.				Lightweight CSD caps and closures with organoleptic property, superior stress cracking resistance. Compatible with injection and compression processings.

Note: \*C = Complete Break \*P = Partial Break \*NB = Non Break

InnoPlus: LLDPE			
Properties	Test Method	Unit	Caps & Closures
			LL8420A
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	20
Density	ASTM D792	g/cm <sup>3</sup>	0.924
Molded Plague Properties			
Tensile Strength at Yield	ASTM D638	MPa	15
Tensile Strength at Break	ASTM D638	MPa	10
Elongation at Break	ASTM D638	%	700
Vicat Softening Point	ASTM D1525	MPa	92
Durometer Hardness	ASTM D2240	Shore D	53
ESCR; 25% Igepal, F <sub>50</sub>	ASTM D1693	Hours	-
Slip Agent			No
End Product			Food/HPC
Product Highlight			Flip top caps, Lids, Pull Ring caps for Edible Oils, Dairy etc., Hinge caps. Excellent processability.

InnoPlus: LDPE				
Physical Properties	Test Method	Unit	Caps & Closures	
			LD2026K <sup>(2)</sup>	LD2426K <sup>(2)</sup>
MFR (190 °C, 2.16 kg)	ISO 1133	g/10 min	4	4
Density	ISO 1183	g/cm <sup>3</sup>	0.920	0.924
Melting Temperature	ISO 11357	°C	109	112
Vicat Softening Point	ASTM D1525	°C	88	92
Slip Agent			Yes	Yes
End Product			Food/HPC	
Product Highlight			Flip top caps, Lids, Pull Ring caps for Edible Oils, Dairy etc., Hinge caps. Excellent processability.	

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# Large Blow Molding

## Rigid Packaging



< 200L Drum



IBC



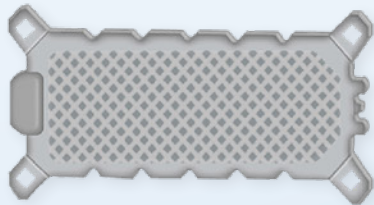
≥ 200L Drum



Floating Solar Pontoon

InnoPlus: HDPE									
Properties	Test Method	Unit	Large Blow Molding						
			HD7200B	HD7500B	HD7800B	HD7808B	HD8200B	HD9100B	HD8225B
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	0.05	0.05	0.04	0.04	0.03	0.01	0.03
MFR (190 °C, 21.6 kg)	ASTM D1238	g/10 min	8.5	8	6	6	4	2.5	4
Density	ASTM D1505	g/cm <sup>3</sup>	0.956	0.954	0.950	0.950	0.955	0.952	0.955
Melting Temperature	ASTM D3418	°C	134	134	130	130	134	134	134
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	300	260	300	300	300	250	300
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	350	380	370	370	370	400	370
Elongation at Break	ASTM D638	%	800	800	850	850	850	720	850
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	12,000	10,000	12,000	12,000	12,000	10,000	12,000
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	25 (NB*)	29(NB*)	72 (NB*)	72 (NB*)	64 (NB*)	85 (NB*)	64(NB*)
Durometer Hardness	ASTM D2240	shore D	63	63	61	61	64	62	64
Vicat Softening Point	ASTM D1525	°C	124	124	125	125	128	126	128
ESCR; 25% Igepal, F <sub>50</sub>	ASTM D1693	Hours	> 1,000	>1,000	> 1,000	> 1,000	> 1,000	> 1,000	> 1,000
UV Stabilizer			No	No	No	Yes	No	No	Yes
End Product			<200L Drum		IBC	≥ 200L Drum		Floating Solar Pontoon	
Product Highlight			Excellent Processability, Extremely High Stacking Performance, High Impact Strength recommended for Large Blow Molding Products e.g. Drums, Jerry cans, Water Tanks, etc.	Excellent Processability, Extremely High Impact Strength and Good Stacking Performance recommended for Large Blow Molding Products e.g. Drums, Jerry cans, Pontoon and heavy duty applications, etc.	UV Added Grade with Excellent Processability, Extremely High Impact Strength and Good Stacking Performance, suitable for Large Blow Molding Product e.g. Intermediate Bulk Containers (IBC), Drums, Jerry cans, Pontoons and Outdoor Applications, etc.	Excellent Processability, Extremely High Impact Strength and Stacking Performance recommended for Large Blow Molding Products e.g. 200 L Drums, Jerry cans, Pontoon and heavy duty applications, etc.		UV stabilizer added for providing extremely outstanding UV resistance specially designed for long-term durability service life outdoor applications	

Note: \*C = Complete Break \*P = Partial Break \*NB = Non Break





# Liquid Bottles (Small blow)

## Rigid Packaging



Oil Bottle



Drinking Water Bottle



Hot-fill Bottle



CSD Bottle



Gallon



Personal Care Bottle



Food & Beverage Bottle



Lubricant Container



InnoPlus: HDPE						
Properties	Test Method	Unit	Blow Molding			
			HD4200B	HD5200B	HD6200B	HD6600B
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	0.67	0.45	0.45	0.40
Density	ASTM D1505	g/cm <sup>3</sup>	0.966	0.966	0.962	0.957
Melting Temperature	ASTM D3418	°C	135	135	135	135
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	310	320	330	320
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	230	350	350	400
Elongation at Break	ASTM D638	%	> 1,000	> 1,000	1,000	1,000
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	18,000	17,500	15,000	14,000
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	13 (P*)	15 (P*)	12 (P*)	10 (P*)
Durometer Hardness	ASTM D2240	shore D	65	66	65	65
Vicat Softening Point	ASTM D1525	°C	125	127	125	125
ESCR; 25% Igepal, F <sub>50</sub>	ASTM D1693	Hours	25	30	60	400
<b>End Product</b>			Food Bottle, Drinking Water Bottle and Milk Bottle		Food Bottle, Drinking Water Bottle, Milk Bottle, Personal Cares and Lubricant Container	

Note : \*C = Complete Break      \*P = Partial Break      \*NB = Non Break

InnoPlus: PET							
Items	Methods	Units	Injection Blow Molding				
			SA125T	SA135T / SA135T(B)	SA135T(H)	SA145T	SA150T
Intrinsic Viscosity	MCI Method	dl/g	0.77 ± 0.02	0.82 ± 0.02	0.80 ± 0.02	0.86 ± 0.02	0.90 ± 0.02
Acetaldehyde	MCI Method	ppm	2 max	1 max	1 max	1 max	1 max
Color-L	MCI Method	-	75 min	75 min.	75 min.	75 min.	75 min.
Color-b	MCI Method	-	1.0 max	1.0 max	1.0 max	1.0 max	1.0 max
Diethylene Glycol	MCI Method	%wt	1.10-1.60	1.10-1.60	1.30 max	1.10-1.60	1.10-1.60
Powder	MCI Method	ppm	100 max	100 max	100 max	100 max	100 max
Appearance	MCI Method	-	Conformity	Conformity	Conformity	Conformity	Conformity
Foreign Matters in chip <0.2 mm	MCI Method	pc/100g	5 max	5 max	5 max	5 max	5 max
Foreign Matters in chip ≥0.2 mm	MCI Method	pc/100g	0 max	0 max	0 max	0 max	0 max
Metallic Foreign Matters	MCI Method	pc/100g	0 max	0 max	0 max	0 max	0 max
Moisture	ZIMMER Method	ppm	2,000 max	2,000 max	2,000 max	2,000 max	2,000 max
Melting Point	ASTM D3418	°C	245-249	245-249	250-255	245-249	245-249
<b>End Product</b>			Water, Cosmetic, Fruit Juice Bottle	Water, Cosmetic, Fruit Juice Bottle, Edible Oil	Hot Fill Bottle	CSD Bottle	5 Gallons

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# Consumer Goods (Injection & Sheet)

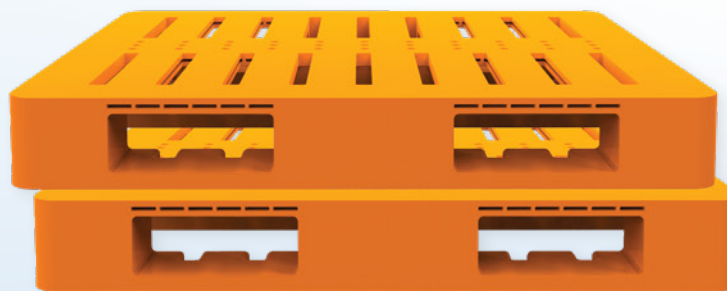
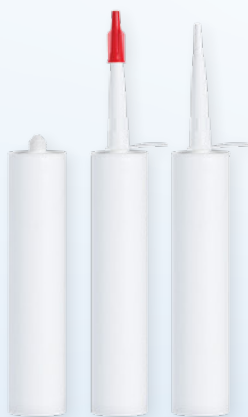
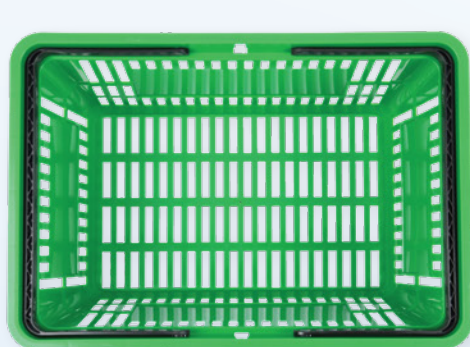
## Rigid Packaging



InnoPlus: HDPE						
Properties	Test Method	Unit	Injection			
			HD1010J	HD1600J	HD2208J	HD2308J
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	20	12	3.7	6
Density	ASTM D1505	g/cm <sup>3</sup>	0.956	0.958	0.961	0.962
Melting Temperature	ASTM D3418	°C	130	132	134	136
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	290	280	310	300
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	140	150	220	170
Elongation at Break	ASTM D638	%	200	210	>1,000	>1,000
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	12,000	12,500	13,000	15,000
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	4 (C*)	3 (C*)	5 (C*)	4 (C*)
Durometer Hardness	ASTM D2240	shore D	64	64	65	65
Vicat Softening Point	ASTM D1525	°C	122	125	122	125
ESCR; 25% Igepal, F <sub>50</sub>	ASTM D1693	Hours	Initial	Initial	6	5
<b>UV Stabilizer</b>			No	No	Yes	Yes
<b>End Product</b>			Small part, Stationery, Household products, Toys		UV added for outdoor application, Garbage bins, Pallets, Crates	

Note: \*C = Complete Break    \*P = Partial Break    \*NB = Non Break

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DIAREX: PS				
HIPS High Impact				
Properties	Test Method	Unit	Injection	Extrusion
			H350	H350E
MFR (200 °C, 5 kg)	ASTM D1238	g/10 min	3.5	2.6
Tensile Strength @ Yield*	ASTM D638	kg/cm <sup>2</sup>	298	281
		lb/in <sup>2</sup>	4,250	4,000
Tensile Elongation*	ASTM D638	%	55	53
Flexural Strength*	ASTM D790	kg/cm <sup>2</sup>	420	386
		lb/in <sup>2</sup>	6,000	5,500
Flexural Modulus (× 10,000)*	ASTM D790	kg/cm <sup>2</sup>	1.9	1.8
		lb/in <sup>2</sup>	27	26
Izod Impact Strength*	ASTM D256	kg.cm/cm	11	11
		ft.lb/in	2	2
Rockwell Hardness*	ASTM D785	Scale	R112	R112
Vicat Softening Point (1 kg)*	ASTM D1525	°C	104	101
		°F	219	213
Deflection Temperature* (18.56 kg/cm <sup>2</sup> )	ASTM D648	°C	78	76
		°F	172	169
Underwriter Laboratory*	-	-	UL-94HB	UL-94HB

\*Data based on injection molding test pieces.

DIAREX: PS						
GPPS Standard						
Properties	Test Method	Unit	Grade			
			THF77	THH102	THH103	TMF35
<b>Physical Properties</b>						
MFR (200 °C, 5 kg)	ASTM D1238	g/10 min	8.4	2.6	1.7	4.5
Density	ASTM D792	g/cm <sup>3</sup>	-	-	-	1.05
Vicat Softening Point (1 kg)*	ASTM D1525	°C	101	106	107	104
		°F	214	223	225	219
Deflection Temperature* (18.56 kg/cm <sup>2</sup> )	ASTM D648	°C	78	81	82	79
		°F	172	178	180	174
<b>Mechanical Properties</b>						
Tensile Strength @ Yield*	ASTM D638	kg/cm <sup>2</sup>	470	530	543	485
		lb/in <sup>2</sup>	6,700	7,500	7,700	6,900
Tensile Elongation*	ASTM D638	%	2	2.5	2.6	2.0
Izod Impact Strength*	ASTM D256	kg.cm/cm	2.2	2.2	2.2	2.2
		ft.lb/in	0.4	0.4	0.4	0.4
Rockwell Hardness*	ASTM D785	Scale	M80	M80	M80	M80
Underwriter Laboratory*	-	-	UL-94HB	UL-94HB	UL-94HB	UL-94HB
Type						GPPS Standard

\*Data based on injection molding test pieces.

# PCR HDPE


## Rigid Packaging



Personal Care and  
Lubricant Oil Bottle



High-quality and 100% PCR resins which comply with global standard to the market under brand InnoEco.

InnoEco: PCR HDPE						
Properties	Test Method	Unit	Grade			
			HN035NB	HW035NB	HM035NB	HM035NJ
<b>Physical Properties</b>						
MFR (190 °C, 2.16 kg)	ASTM D1238	g/10 min	0.35	0.46	0.58	2
Density	ASTM D1505	g/cm <sup>3</sup>	0.963	> 0.970	0.959	0.957
<b>Mechanical Properties (Based on compression specimens)</b>						
Tensile Strength at Yield	ASTM D638	kg/cm <sup>2</sup>	300	277	270	270
Tensile Strength at Break	ASTM D638	kg/cm <sup>2</sup>	173	157	160	140
Elongation at Break	ASTM D638	%	460	490	330	200
Flexural Modulus	ASTM D790	kg/cm <sup>2</sup>	13,800	13,700	12,600	12,600
Notched Izod Impact Strength	ASTM D256	kg.cm/cm	9.3	6	6	4
ESCR; 25% Igepal, F <sub>50</sub>	ASTM D1693	hrs	24	24	-	-
<b>Color</b>			 Natural White	 Opaque white	 Purple	 Grayish-Green
<b>Application</b>	Extrusion blow molding, Home & personal care bottles, Lubricant Container					Injection molding applications of household product

Recommendation: Injection Molding Temperature : 170 - 220 °C  
Extruder Temperature : 165 - 190 °C  
Die Temperature : 180 - 195 °C

# PCR PET

## Rigid Packaging



Food & Beverage  
Bottle

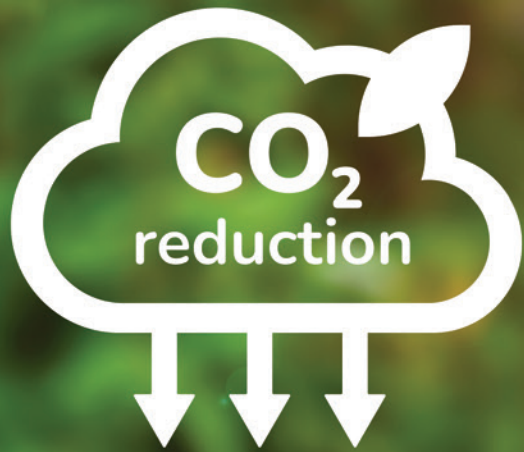


High-quality and 100% PCR resins which comply with global standard to the market under brand InnoEco.

InnoEco: PCR PET					
Properties	Test Method	Unit	Grade		
			TN080FB	TN085FB	
<b>Physical Properties</b>					
Intrinsic Viscosity (IV)	Relative to ASTM D4603	dl/g	0.80±0.03	0.85±0.03	
Acetaldehyde (AA)	ENV-Method	ppm	Max 1.5	Max 1.5	
Moisture Content	ENV-Method	%	Max 0.2	Max 0.2	
<b>Color Properties</b>					
L*	CIELAB	-	Min 63	Min 70	
b*	CIELAB	-	Max 1.0	Max 1.0	
<b>Application</b>	Food & Beverage, Home & Personal Care Bottles			CSD, Food & Beverage, Home & Personal Care Bottles	

Recommendation:  
Barrel Temperature : 270 - 295 °C  
Drying : 160 - 170 °C, 4 - 6 hrs.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose. All above values are typical values, not to be construed as specification.





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**Date as of December 2023**