HMC Polymers offerings for Flexible Packaging Application

November 2025

HMC Polymers

An overview of

HMC Polymers

A Preferred Partner for Sustainable PP Solutions

Classified as General

Corporate Highlight

HMC Polymers

1 MILLION TONS Reaching *No.1* PP capacity in ASEAN

The most *advanced PP*
through LyondellBasell's ***Spheripol*** and ***Spherizone*** technologies

Global market presence PP Products exported worldwide

The *Largest* company by
market share in **SP/DP** in Thailand

Wide range of *products*
covering Specialties and Differentiated applications

Leader of *Sustainable PP*
products and solutions

Vision & Mission

Vision

Preferred Partner for Sustainable PP Solutions

Mission

Capturing the Full Potential of PP & HMC Polymers

Pillars of Success

- Market Leading Innovation
- Outstanding Customer Orientation
- World Class HSE & Operational Excellence

Foundation

Result-Oriented, Experienced, and Engaged People through HMC Polymers Core Values and Behaviors

4 CORE BEHAVIORS

Facts & Figures

Total Asset Value

34 billion Baht
(1 billion US dollars)

Annual Sales Revenue

26 billion Baht
(0.7 billion US dollars)

Employees: 468

134 | 334

33% Women in top-level management

29% Women in all operations

Locations

HEAD OFFICE

20 th Floor,
Sathorn City Tower
South Sathorn Road
Thungmahamek,
Sathorn Bangkok,
Thailand

PP PLANT

- **Area** : 156 rai | 25 hectares
- **PP Capacity** : 1,060 KTA
- **Production** : 4 Production lines
- **Technology** : ***Spheripol*** and ***Spherizone*** from LYB
- **Standard** : ISO 9001 and ISO 14001

PDH PLANT

- **Area** : 59 rai | 9.4 hectares
- **Propylene Capacity** : 300 KTA
- **Technology** : UOP's Oleflex
- **Standard** : ISO9001 and ISO14001

Long Heritage of Achievement

1980s

- **1983** : Founded on December 8th by Himont, Metro (Srikrung) and Bangkok Bank
- **1987 :** Construction start of HMC Polymers' first plant - first PP manufacturing facility in Thailand.
- **1989 :** First plant completed in September. Production startup in Nov. for "Pro-fax" – 100 KTA

1990s

- **1995 :** PP Line 1 debottlenecked to 125 KTA Investment in Rayong Olefins. / PP Line 2 construction started.
- **1997 :** PP Line 2 startup with 200 KTA and Impact Copolymers capability.
- **1999** : ISO 9001 (1994 version) & ISO 14001 certification.

2000s

- **2001 :** PP Line 2 debottlenecked to 250 KTA
- **2002 :** PP Line 1 debottlenecked to 165 KTA
- **2006 :** PTT became shareholder. Invested in PDH and PP *(Spherizone)* Projects – 300 KTA each
- **2007 :** PDH and PP Line 3 construction started

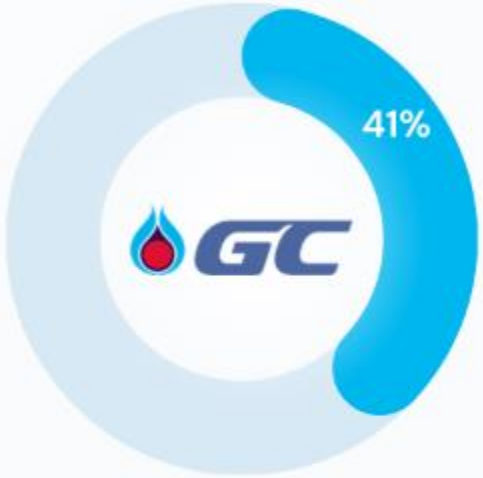
2010s

- **2010 :** PP Line 3 completed
- **2011 :** PDH completed
- **2015 :** Debottlenecked PP Line 3 to 360 KTA
- **2017 :** Transfer of PTT JV ownership to GC

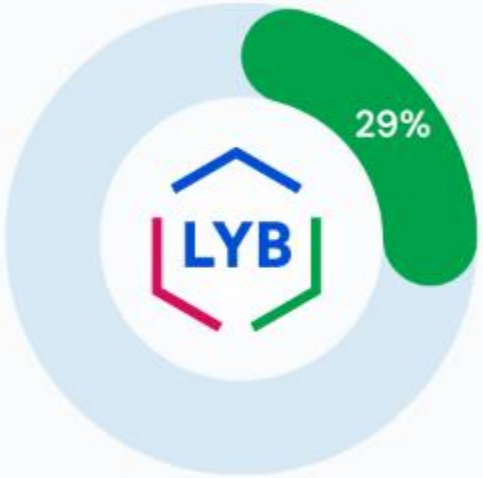
2020s

- **2022 :** PP Line 4 , the most advanced PP plant completed.
- **2023 :** 40th Anniversary – The Largest PP Manufacturer in Thailand

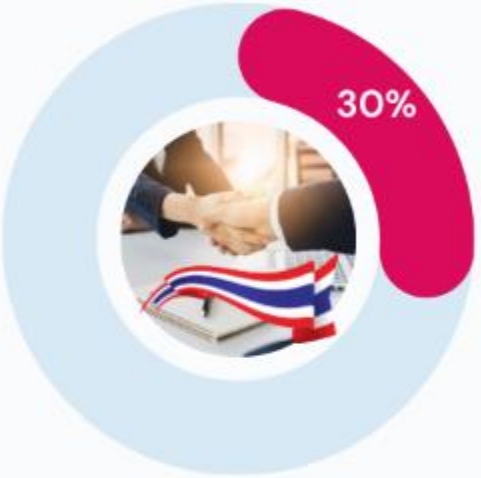
Strong & Aligned Shareholders



- GC leverages HMC Polymers as a flagship for **Polypropylene (PP)** to broaden its product range to encompass high-performance goods.
- Ensure security in competitive feedstock, utilities, logistics, and ancillary services.
- Disseminate sales and marketing expertise across the Asia Pacific region.



- LyondellBasell is recognized as a global leader in **Polypropylene (PP)** technology and catalyst development.
- The second-largest PP producer globally.
- Sales and marketing activities worldwide, offering a range of global grades and brands.



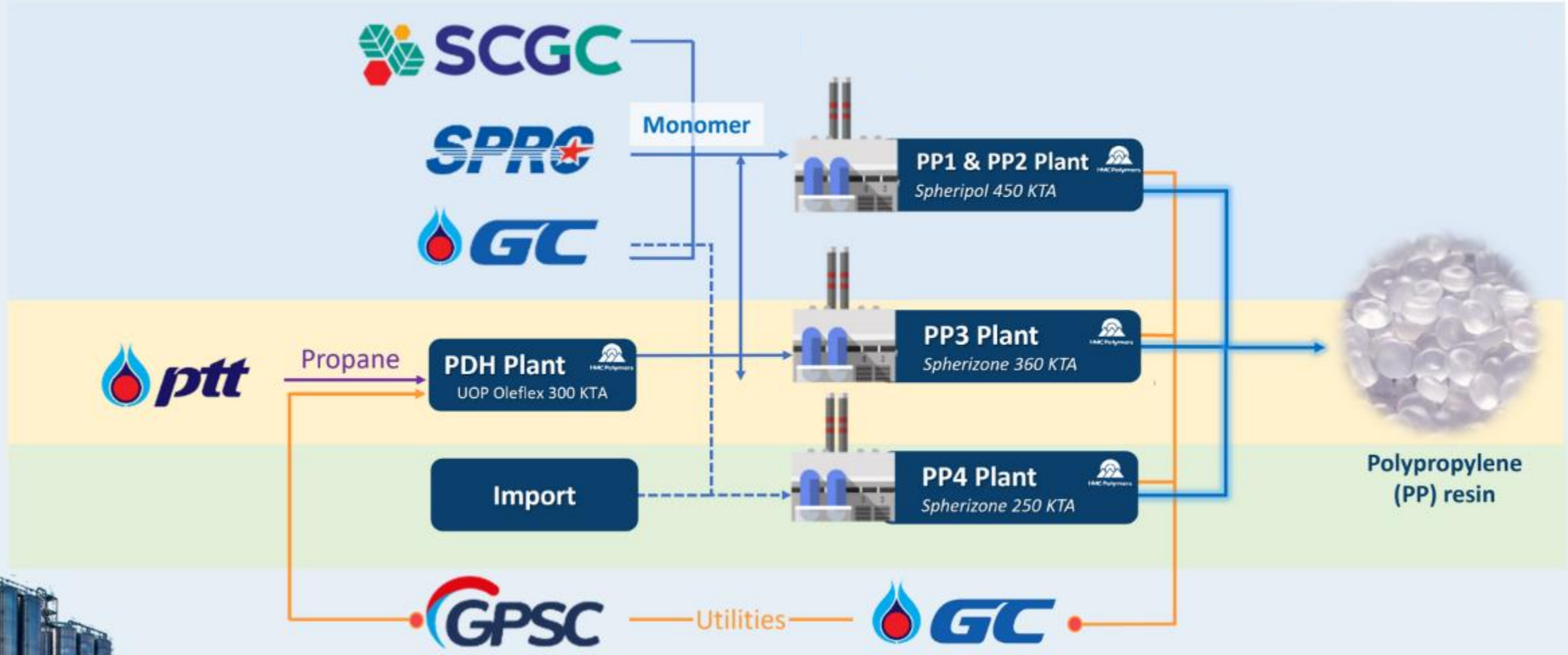
Original founders include

Bangkok Bank ธนาคารกรุงเทพ

HUA KEE COMPANY LIMITED

establishing robust connections with industry and financial institutions.

Production Flow Diagram



Our Technologies

Spheripol

Common to all polymerisation units is the bulk section for homo and random copolymers. This bulk polymerisation employs tubular loop reactors filled with liquid propylene, to which the catalyst and hydrogen for molecular weight control is continuously fed. In the case of random copolymers, a comonomer such as ethylene is also added.

Spheripol PP products including Homopolymers, Random Copolymers, and Heterophasic Copolymers are generated with the world-renowned production technology licensed by LyondellBasell.

Spherizone

LyondellBasell's breakthrough ***Spherizone*** multi-zone circulating reactor process provides an economical and efficient method of manufacturing a wide range of high-quality polypropylene and novel, propylene based polyolefinic resins.

HMC Polymers' ***Spherizone*** line is equipped to use butene-1 (C4) as co-monomer for the production of C4-RaCo and Terpolymer. PP4 use hexene-1 (C6) as a co-monomer under an exclusive license from LYB.

Our Product & Innovation

HMC Polymers

Specialty & Differentiated (SP/DP) grade

Sustainable PP product

Our Focus Segments

HMC Polymers

cutting-edge technology

LYB

Spheripol & Spherizone

Specialty & Differentiated (SP/DP) grade

Commodity grade

Healthcare & Hygiene

Medical | Spunbond

Industrial Products

Pipes | Automotive | Appliances | Compounds | Industrial Products

Rigid Packaging

Caps & Closures | Crates & Pails | EBM and ISBM | Thermoforming | TWIM | Houseware

Flexible Packaging

Blown Film | BOPP | CPP | IPP | POF Shrink film | Raffia | Coating

Our Sustainable PP Segments

exporting to Asia and Australia continental

1 Bio - Circular PP

made from second generation Bio-Based feedstock based on waste and residues.

ISCC

Less carbon footprint

Circular Economy

Engage circular economy

2 Advance Recycling PP

made from PCR mixed plastic wastes through pyrolysis process.

ISCC

Less new plastic used

3 Mechanical Recycling PP

PCR PP grade with US FDA LNO is also available.

Global Recycled Standard

Certified number CGI-700274

Health, Safety and Environment (HSE) Strategy

The health and safety of employees, contractors, communities and customers is our top priority

We protect the environment of communities in which we operate

We maintain open and positive relationships with our stakeholders

Process Safety Management is an integral component of our manufacturing operations

We ensure full compliance and strive for continuous improvement in our Safety, Health, and Environmental Management and Quality Management programs to deliver excellent business results

HMC Polymers

Sustainability Policy

We, HMC Polymers Company Limited, are highly ambitious for enabling our business sustainable. We strongly believe that building a solid foundation of environmental protection, social responsibility, good governance, and sound business practices is vital to achieve this ambition. Eventually, our business operations and actions will then be created, enhanced, and shared with all relevant stakeholders.

1. Comply with all applicable laws and regulations, adhere to international practices, and uphold good corporate governance.
2. Operate our business in an economically, socially and environmentally sustainable manner, while balancing interests a various groups of stakeholders
3. Bring awareness and promote our sustainable practices to business partners, customers, and other stakeholders.
4. Promoting sustainability practices and reduce operational impacts throughout the value chain
5. Continuously advance our production process, innovate, and deliver high quality products / services through sustainable procurement to stakeholders for sustaining optimum returns and enhancing values.
6. Disclose the policy, management approach and performance of our sustainable business conduct.

The commitment and contribution herein will be undertaken by the management and all employees to ensure that we continue conducting business in a sustainable manner.

Corporate Sustainability Roadmap

	2024	2026 - 2027	2030	Onwards
Circularity *End of plastic waste & supporting a circular economy*	• Optimize along the value chain for PP circularity • Procure circular feedstocks or mechanical PCR PP • Grow sales volume of Circular PP to brand owners and potential customers who have sustainability as the organization's goal • Co-invest or partnership with circular feedstock suppliers or recyclers	• Optimize along the value chain for PP circularity • Procure circular feedstocks or mechanical PCR PP • Grow sales volume of Circular PP to brand owners and potential customers who have sustainability as the organization's goal • Co-invest or partnership with circular feedstock suppliers or recyclers	**Achieve 5% Circular PP of nameplate capacity**	**Sustainable PP solutions provider in strategic segments**
Carbon Reduction *Taking climate action*	Carbon Footprint Product Certification for 60 grades	• Achieve carbon reduction of over 17,000 tons through process optimization process optimization and enhancement of equipment efficiency and reliability (4% reduction compare to Y2020) • Obtain full Carbon Footprint Product Certification	**20% Reduction of greenhouse gas in scope 1&2**	**Net Zero by 2060**
Connectivity *Supporting a thriving society*	• Governance (e.g. Data Privacy, business continuity) • Achieve SHE independent level by 2024 • Internal and external communication / training	• Achieve UN Global Compact and LEAD recognition • Maintain world-class SHE performance (Reach interdependent level by 2029) • Proceed advance CAC Certification • Enhance internal and external communication and training	**Achieve 70% of total spending in sustainable procurement**	**Create connectivity for business sustainability**

SUSTAINABILITY IN ACTION

Circularity

Sustainable PP Products

BIO CIRCULAR PP

CIRCULAR PP

Sustainable Project

PP REBORN
ชุบชีวิต PP กับ

Carbon Reduction

Process Optimization & Energy saving

21
current projects

17,531 tCo2Eq
ตันคาร์บอนไดออกไซด์เทียบเท่า

Partnership for long term project

a transformative collaborative project aimed at expanding green areas dedicated to CO_2 absorption

Connectivity

Key Drivers for packaging

Functional

Enhanced shelf life

Extended shelf life
Higher barrier performance

Faster packaging Lines

Lower Seal Initiation temperatures
Good seal integrity

Branding : Enhanced Aesthetics

Differentiation on the shelf
Good printability
High Gloss
Matte look

Consumer convenience

Easy to open (Easy peel / tear)

Consumer behavior

Urbanization and nuclear families →increased consumption of Ready to eat food

Increased performance requirement from freezer to microwave

Online food order and delivery

Higher heat resistance

Growing health concerns

Stricter regulatory requirements

Sustainability

Reduce consumption at source

High performance materials that can support downgauging

Recyclable packaging

Monomaterial solutions
High barrier for foil replacement

Sustainable / recycled products

Renewable feedstock such as biobased or chemical recycling from plastic waste

Some countries Ban on Single use Plastics

May need to redesign the products for multiple use

HMC Polymers

BOPP portfolio

Flexible Packaging

Biaxial Orientation Polypropylene (BOPP)

New

Properties	BOPP Grade								
	HP525J	HA712J	RC112L	RC6142	RC221L	*Adsyl* 6093	*Adsyl* 6064	*Adsyl* 6155	*Adsyl* 6146
MFR @ 2.16 kg (g/10min)	2.8	3.0	7.0	5.5	6.0	6.5	5.5	5.5	5.5
Tensile strength at yield (MPa)	33	37	20	29	25	23	23	24	24
Flexural Modulus (MPa)	1500	1900	550	1050	760	730	730	840	800
Izod Impact Strength (J/m)	34	33	97	48	47	50	50	68	72
HDT @455 kPa (°C)	97	110	74	87	80	80	75	79	78
SIT (°C)	-	-	115	-	115	108	108	**105**	**95**
Additive package	Barefoot	Barefoot	Barefoot	Barefoot	Barefoot	AB	Barefoot	Barefoot	Barefoot

HMC Polymers

Adsyl 6155 *:* Terpolymer PP with lower SIT for Film Application

Adsyl 6155 is Terpolymer resin with improved SIT at 105°C. *Adsyl* 6155 does not contain slip or anti-block additives.

Property	Unit	*Adsyl* 6155
MFR @ 230 C/2.16kg	g/10min	5.5
Tensile strength at yield	MPa	24
Elongation at yield	^{0}C	13
Flexural Modulus	MPa	840
HDT (0.45 MPa)	^{0}C	79
SIT on BOPP film	^{0}C	105
Melting temperature (Tm)	^{0}C	133

Key Features :

- Low SIT ~ 105 ^{0}C
- Good sealing performance
- Improved film surface solidification
- Good processing performance at high-speed line
- Good transparency and glossiness

New Industrialization in 2025

HMC Polymers

Adsyl 6146*:* Terpolymer PP with low SIT at <100°C for Film Application

Adsyl 6146 is Terpolymer resin with low SIT at 95°C. *Adsyl* 6146 does not contain slip or anti-block additives.

Adsyl 6146 is develop for low SIT sealant resin as low as 95°C to address requirements of Lower SIT for faster packaging machines and for mono-material flexible laminates packaging.

Property	Unit	*Adsyl* 6146
MFR @ 230 C/2.16kg	g/10min	5.5
Tensile strength at yield	MPa	24
Elongation at yield	°C	13
Flexural Modulus	MPa	800
HDT (0.45 MPa)	°C	78
SIT on BOPP film	°C	95
Melting temperature (Tm)	°C	132

Key Features :

- Low SIT at 95°C
- Good sealing performance
- Good optical properties
- Barefoot formulation
- Good processing on process lines

Adstif HA712J

High stiffness and heat resistance HOMO PP for BOPP film

Adstif HA712J is high stiffness Homo Polypropylene with broad molecular weight distribution and good processability.

Adstif HA712J does not contain slip or anti-block additives and is suitable for metallization

Adstif HA712J offers:

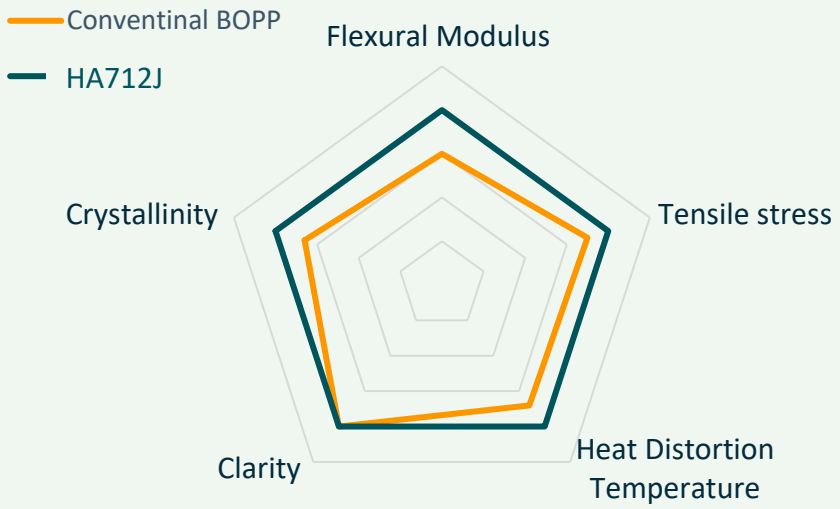
- High stiffness
- Good heat resistance
- Improved barrier properties
- Low gel
- Ca-St free

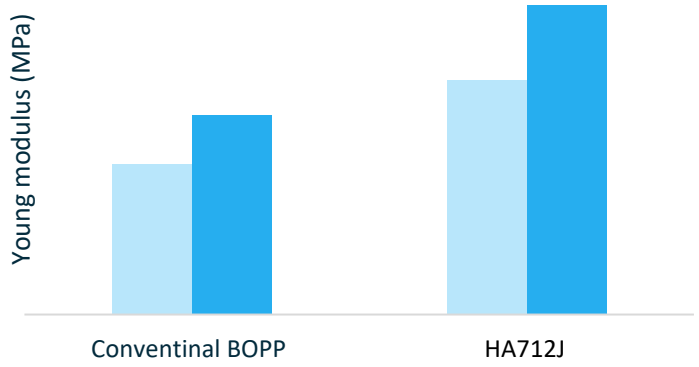
Adstif HA712J

High stiffness and heat resistance HOMO PP for BOPP film

***Adstif* HA712J**

- High stiffness
- High temperature resistance
- High barrier

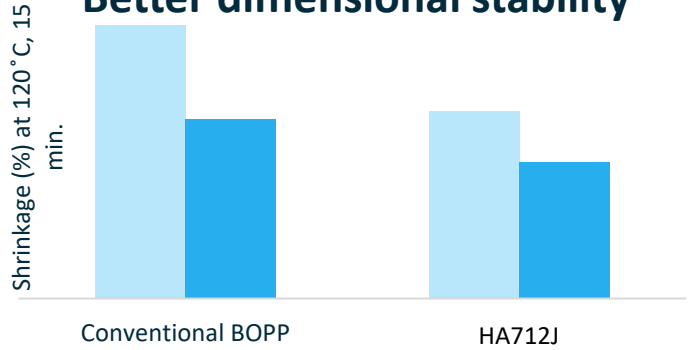




% Improvement

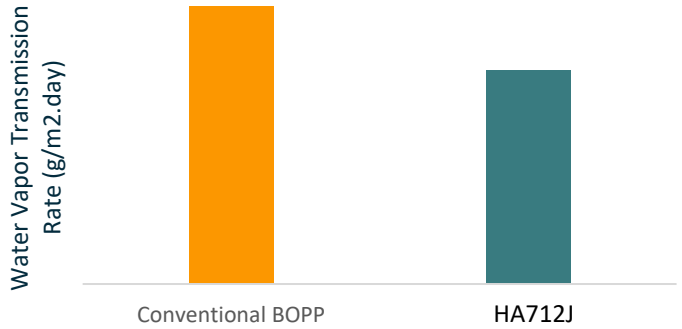
MD	17.2 %
TD	23.7 %

Better dimensional stability

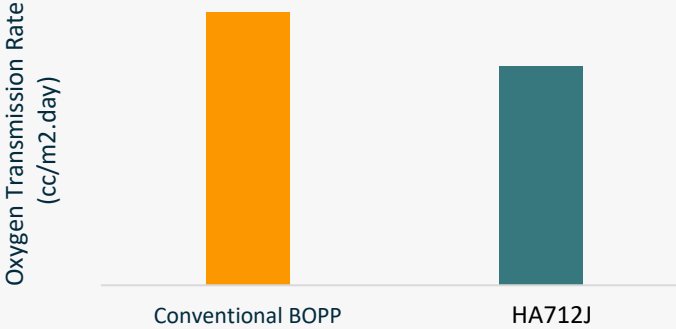


% Improvement

MD	34.4 %
TD	27.2 %



23.0 % Improvement



19.8 % Improvement

Clyrell RC112L

Copolymer – for skin and printing layer of BOPP film

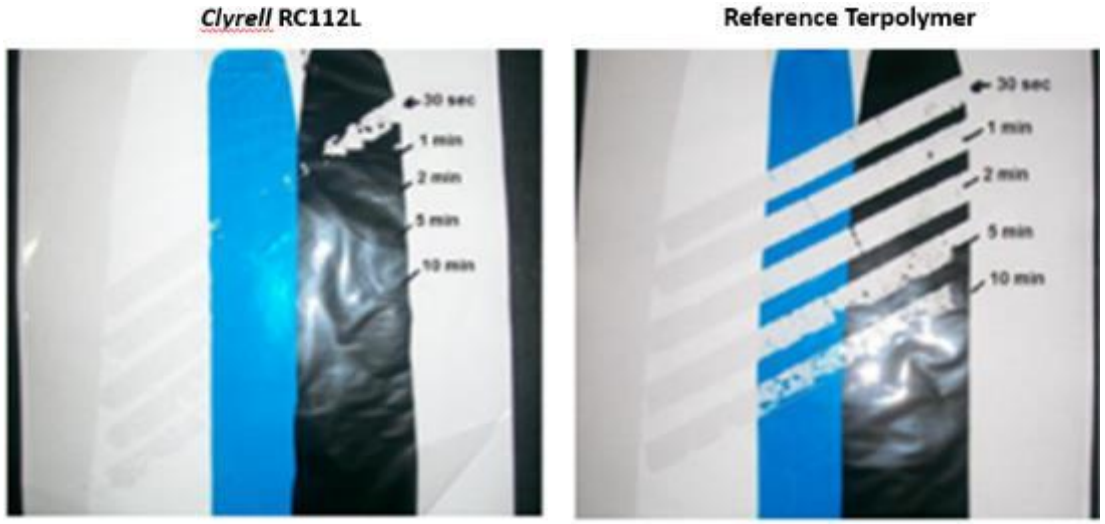
Clyrell RC112L is a Polypropylene Random copolymer resin which is designed for skin and sealant layer of BOPP film.

Clyrell RC112L does not contain slip or anti-block additives and Calcium stearate

High quality printing

Key Features :

- Easy processing on very high-speed BOPP lines
- Excellent printing ink adhesion for high quality multi color printing (minimize missing dots)
- Good optical properties
- Good sealing performance, SIT ~ 115 ^{0}C*



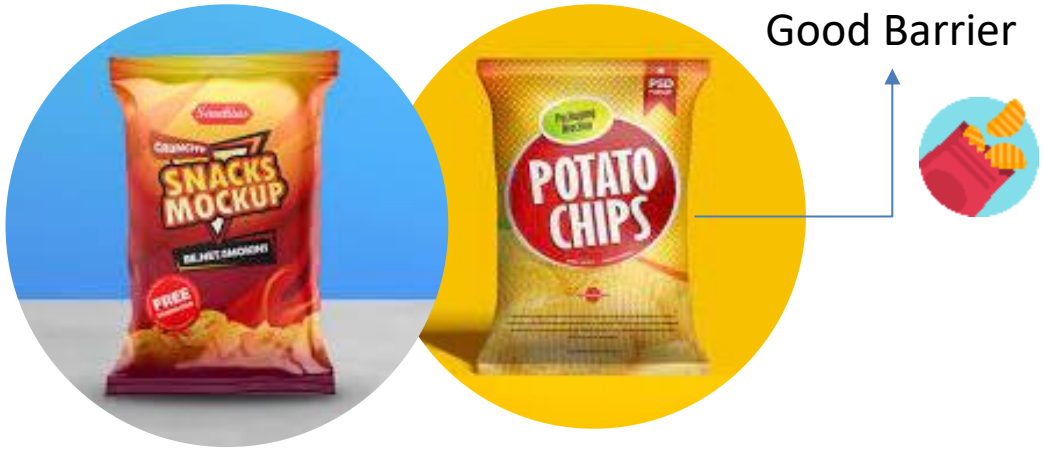
*It is not declared as specification

Clyrell RC6142

Copolymer – for high barrier metallizing film

Clyrell RC6142 is Polypropylene Random copolymer resin which is designed for high barrier metallizable skin layer of BOPP film

Clyrell RC6142 does not contain slip or anti-block additives and Calcium stearate



Key Features :

- Good metallizing performance
- Good barrier performance for metallized films – it can be enhanced further using Adstif in core layer
- Good dyne retention on metallized films
- Good processing performance
- Higher melting point of 145 ^{0}C – Good candidate for extrusion lamination

Customer Result

- Film thickness : 18 micron metallized BOPP film
- Optical density : 2.3-2.5
- OTR : 16 cc/m2/24 hrs. at ^{0}C, 0% RH
- MVTR : 0.15 g/m2/ 24 grs at 38 ^{0}C, 90% RH

Clyrell RC221L

Terpolymer – for skin and sealant layer of BOPP film

Clyrell RC221L is a Polypropylene Terpolymer resin designed for skin and sealant layer of BOPP film.

Clyrell RC221L does not contain slip or anti-block additives and Calcium stearate

Key Features :

- Good processing on BOPP lines
- Good stiffness
- Good optical properties
- Good printing
- Metallizable
- Good sealing performance, SIT ~ 115 ^{0}C

Adsyl 6064 and 6093

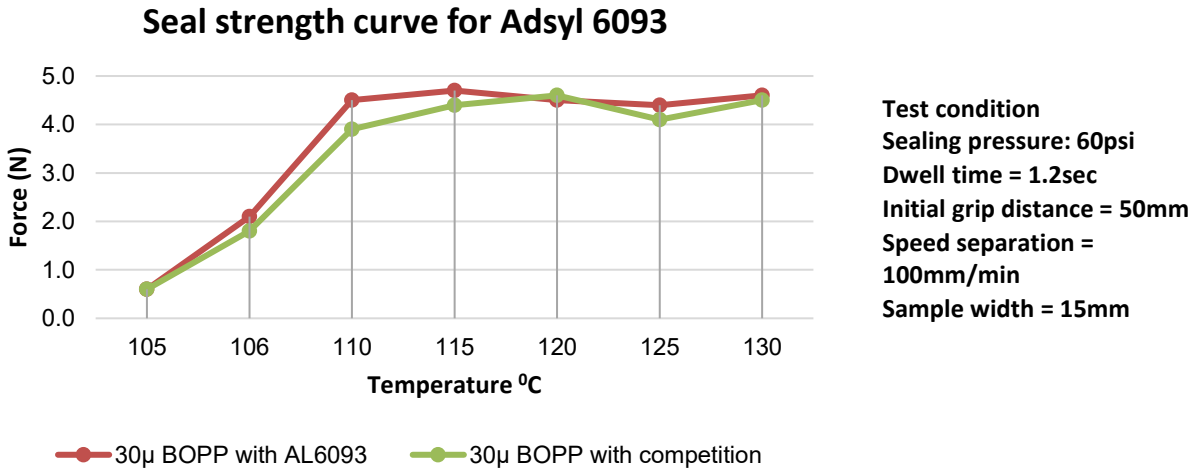
Terpolymer – Low SIT for skin and sealant layer of BOPP film

Adsyl 6064 and *Adsyl* 6093 are terpolymer resins for low SIT BOPP ~ 108 ^{0}C

- *Adsyl* 6064 does not contain slip or anti-block additives and Calcium stearate
- Adsyl 6093 is free of Calcium stearate and contains antiblock additives

Key Features :

- Low SIT ~ 108 ^{0}C on BOPP film
- Good sealing performance
- High transparency and gloss
- Good processing performance

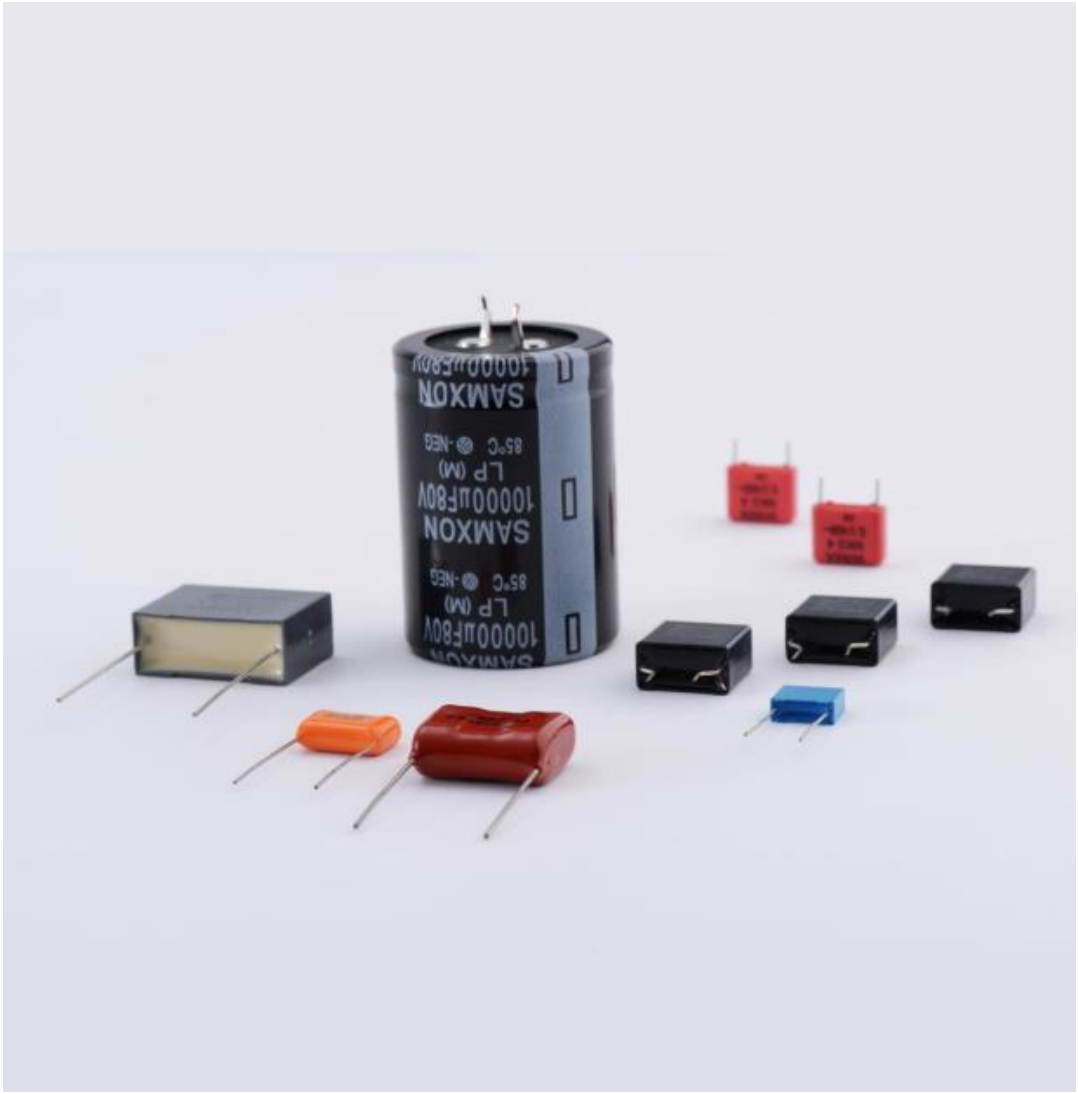


HMC Polymers

Moplen HP600J
SUPERIOR PURITY POLYPROPYLENE FOR BOPP FILM CAPACITOR

Innovation & TS department

PRODUCT APPLICATION FOCUS



The metallic film capacitors are widely used in power electronic circuits including DC link circuits, pulse circuits, switching circuits, etc.

APPLICATION REQUIREMENT

- High crystallinity
- Low level of impurities and catalyst residues
- Low ash content
- Good thermal properties

Product Design

Moplen HP600J

A superior purity Polypropylene with low level of impurity and residues for BOPP film capacitors

KEY FEATURES

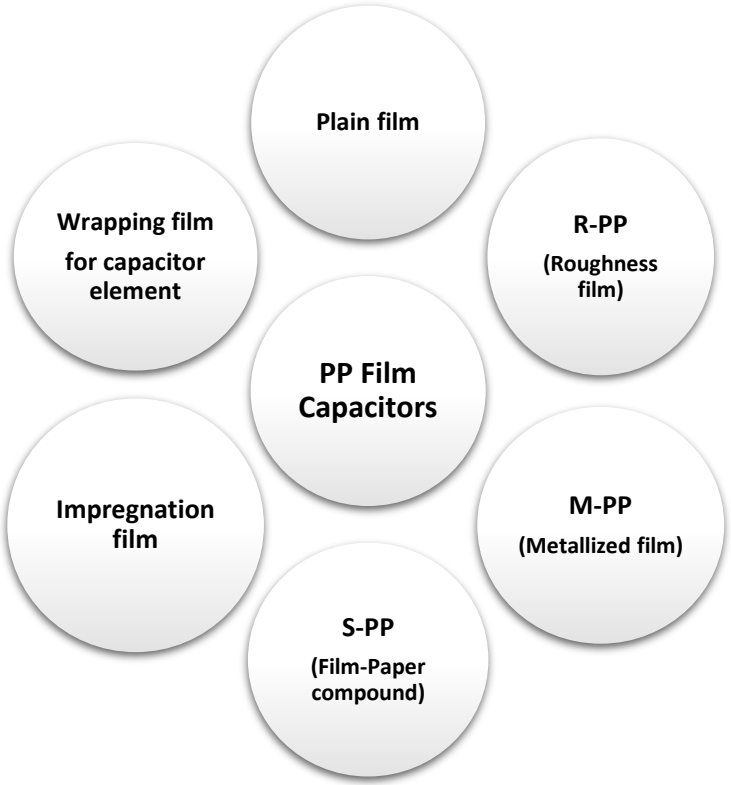
- Wide processing window
- Good drawability and thickness control
- Low level of impurities and catalyst residues
- Low ash content
- Low moisture absorption
- High crystallinity
- Good thermal properties

HP600J – Product Properties

Item	Unit	Testing Method	Market reference	*Moplen* HP600J
Melt Flow Rate	g/10 min	ASTM D1238	3.2	**3.0**
Isotactic	%	HMC Method	96	**> 97.8**
Meling temperature	^{o}C	MTM 15902E	162 - 165	**163 - 166**
Ash content	ppm	HMC Method	< 30	**< 20**
Element residue (per each element)	ppm	HMC Method	< 5	**< 5**

Typical Properties of BOPP Capacitor Films (Market Ref.)

Typical properties of BOPP capacitor films (Market ref.)



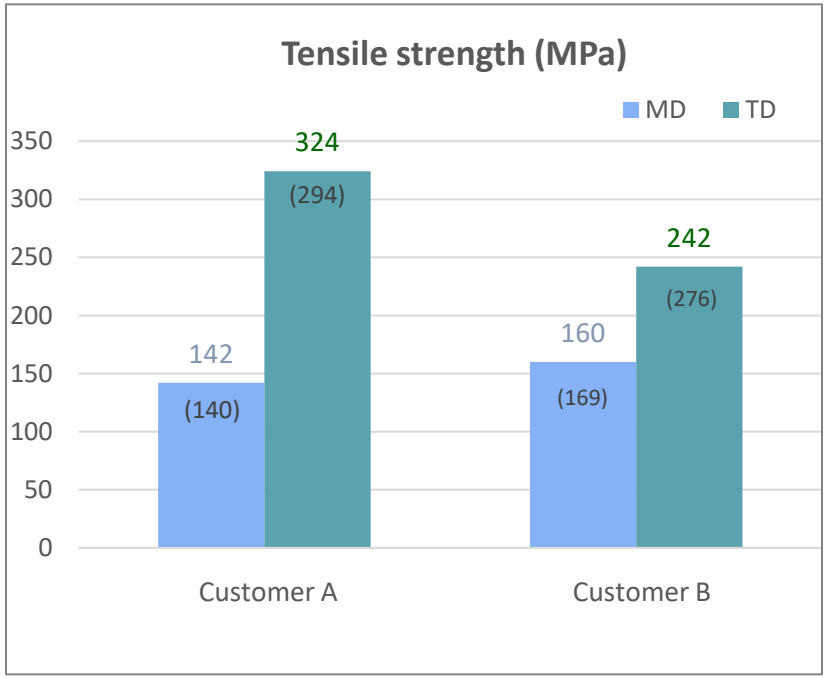
Type of PP film capacitors	Tensile strength (MPa)		Dielectric strength or BDV (V/μm)	Shrinkage (%)	
	MD	TD		MD	TD
Plain film	140	250	400 - 500	4.2	0.5
R-PP (Roughness film)	120 - 140	200 - 250	550 - 580	5.0	3.0
M-PP (Metallized film)	140 - 150	240 - 250	550	3.5 - 4.5	1.0 - 2.0
S-PP (Film-Paper compound)	140 - 150	240 - 250	550	3.5 - 4.5	1.0
Impregnation film	140	200	350-500	4.0	1.0
Wrapping film for capacitor element	140	250	400-600	4.0	1.5
HP600J	**140 – 160**	**240 – 324**	**560 – 590**	**0.2 – 3.5**	**0.05 – 2.88**

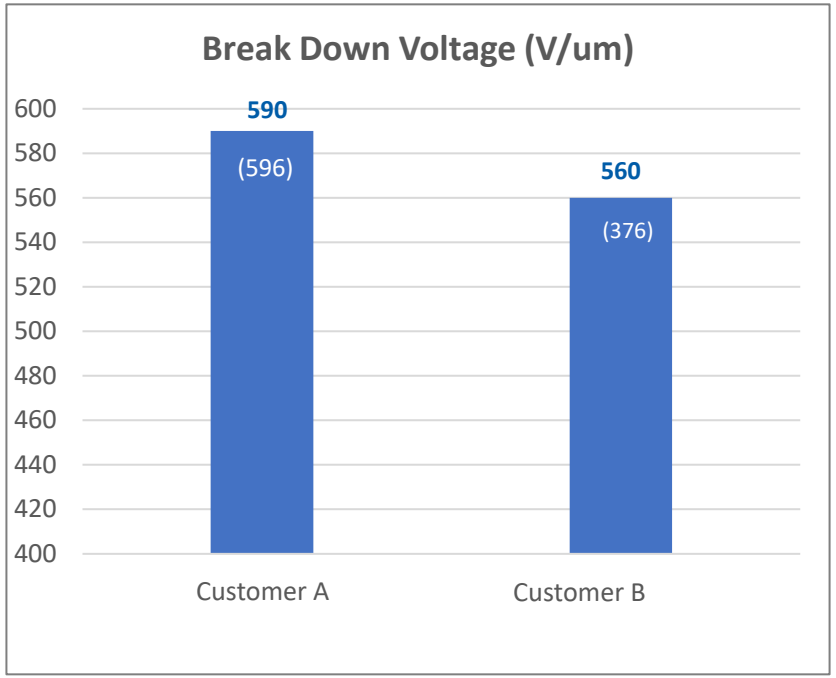
HP600J meets the mechanical and electrical property requirements of leading capacitor film producers for majority application segments.

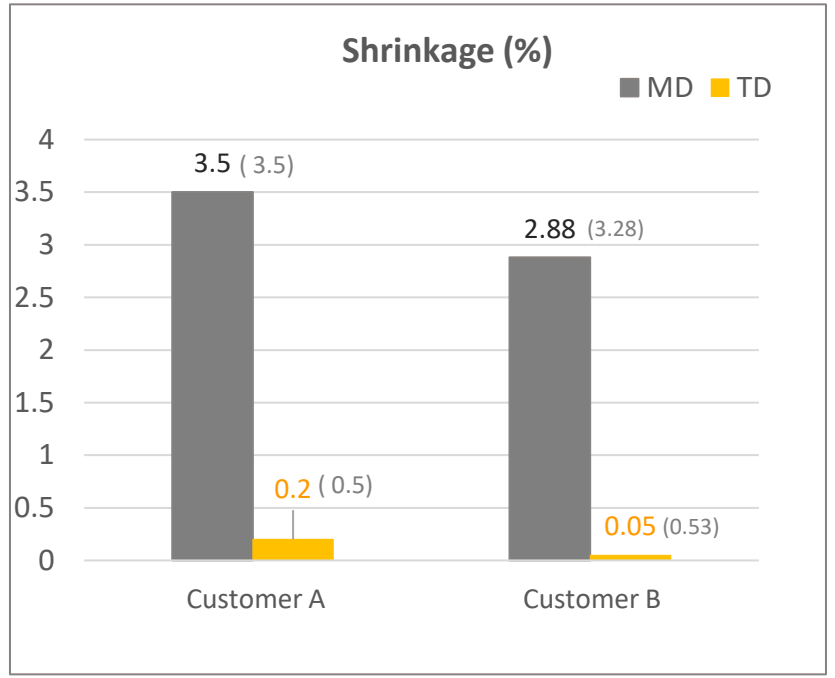
HP600J - Capacitor Film Properties

Number above bar = HP600J result
Number in bracket = Ref. result

Remark: The testing is different conditions, depending on customer's method at film thickness 6 micron.







HP600J performance :

- Good processing performance up to 4 microns reported by customers.
- Good stiffness and mechanical properties
- Consistent electrical properties High breakdown voltage comparable to reference : between 550-600V
- Low shrinkage comparable to reference

** Values indicative of relative performance with Reference and not to be construed as specifications.

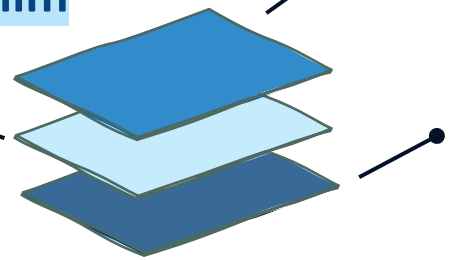
HMC Polymers

CPP Portfolio

Flexible Packaging

Cast Polypropylene (CPP)

Laminated Film



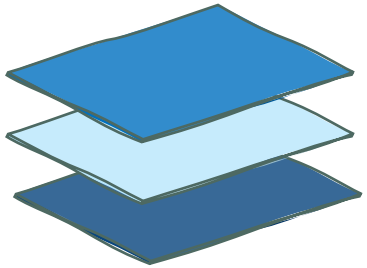
Laminated layer
RP225N

Core layer
HP520M

Sealing layer
Normal Sealing Temp
- RP225N

Low Sealing Temp
- RC221M, *Adsyl* 6093

Metalized Film



Metalized layer
RC213M

Core layer
HP520M

Sealing layer
Low Sealing Temp
- RC221M, *Adsyl* 6093

New

Properties	HP520M	RC213M	RP225N	RC116L	RC221M	*Adsyl* 6093	EP310D	EP6145
MFR @ 2.16 kg (g/10min)	8	10	11	7	7	6.5	0.7	2.5
Tensile strength at yield (MPa)	35	31	26	18	25	23	26	24
Flexural Modulus (MPa)	1550	1100	880	500	850	730	1100	1000
Izod Impact Strength (J/m)	28	31	40	102	47	50	NB	300
HDT @455 kPa (°C)	105	87	84	72	80	80	90	85
SIT (°C)	-	125	129	115	115	108	-	-
Additive package	Barefoot	AB	Slip + AB	Slip + AB	Barefoot	AB	Barefoot	Barefoot
Remark	Core layer	Metallized layer	Laminated/ Sealing layer			Sealing layer	Retort	Retort

New Industrialization in 2025

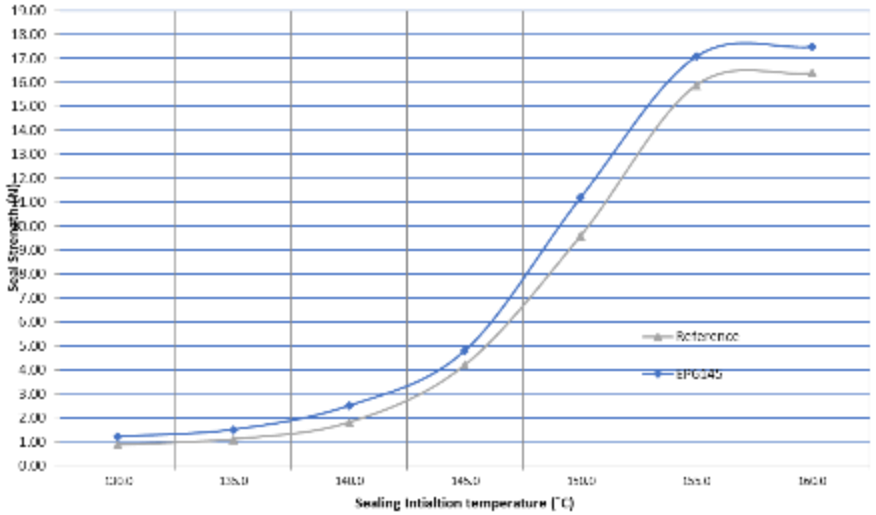
HMC Polymers

Moplen EP6145*:* PP Impact Copolymer for Retort CPP Film applications

PP heterophasic copolymer offers great balance between impact properties (at room and low temperatures) and stiffness, while featuring good puncture and tear resistance, high seal strength and seal integrity. Optimal processability on cast film lines.

Test item	Unit	EP310D	EP6145
MFR at 230°C / 2.16 kg	g/10 min	0.7	2.9
Tensile Strength at yield	MPa	26	27
Flexural Modulus	MPa	1000	1100
HDT	°C	88	90
Vicat Softening Temperature	°C	144	147

- Retort-able
- Good processability
- Good heat seal strength
- Good heat resistance
- Good impact resistance
- Low gel
- Low odor



Clyrell RC213M

Copolymer – for high barrier metallizing film

Clyrell RC213M is a Polypropylene Random copolymer resin which is designed for metallizing layer of CPP film

Clyrell RC213M is free of Calcium Stearate and additivated with antiblock additives

Key Features :

- Good metallizing performance
- Excellent Stiffness
- Good optical properties – low haze and high gloss
- Very low soluble and extractables – Customers report Good dyne retention on metallized films
- Good barrier performance

Clyrell RC221M

Terpolymer for sealing layer of CPP film

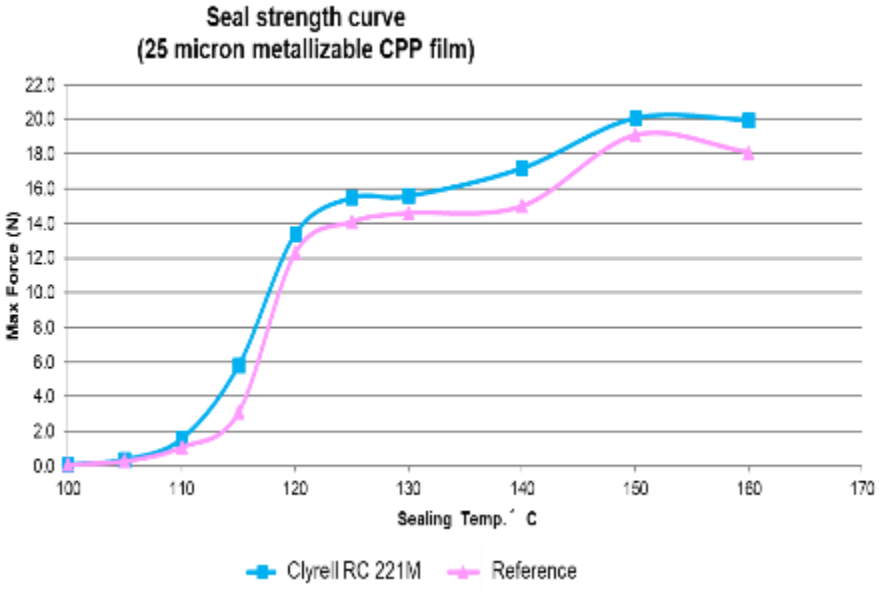
Clyrell RC221M is terpolymer resins for low SIT ~ 115^{0}C

- *Clyrell* RC221M does not contain slip or anti-block additives and Calcium stearate

Key Features :

- Low SIT ~ 115 ^{0}C on CPP film
- Good sealing performance
- High transparency and gloss
- Good processing performance

Norm Reference
ASTM F 2029 / ASTM F 88
Sealing pressure = 60psi
Dwell time = 1.2sec
Initial grip distance = 50mm
Speed separation = 100mm/min
Sample width = 15mm



Adsyl 6093

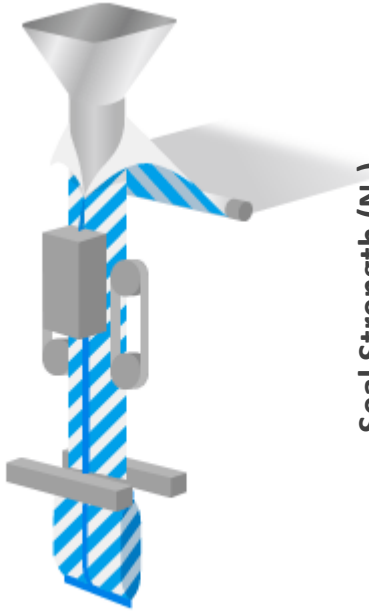
Terpolymer – Low SIT for skin and sealant layer of film

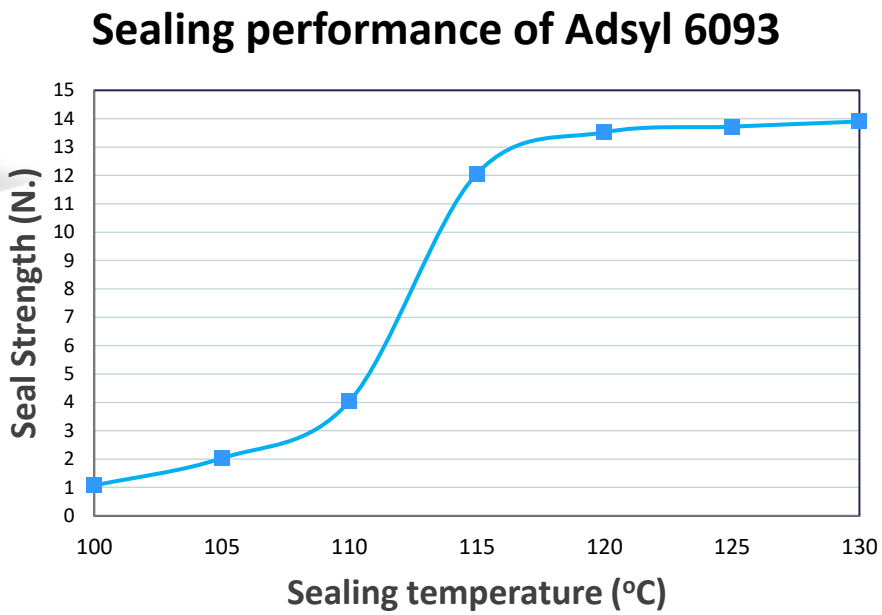
Adsyl 6093 is terpolymer resin for low SIT ~ 108 ^{0}C

- Adsyl 6093 is free of Calcium stearate and contains antiblock additives

Key Features :

- Low SIT ~ 108 ^{0}C on CPP film
- Good sealing performance
- High transparency and gloss
- Good processing performance





HMC Polymers

Sustainability
Redesign for recyclable with Mono-material packaging

Redesign for recyclable—enhancing circularity with Mono-material packaging (example)

Main properties

- Sterilization for 1h @128°C
- High seal strength after retorting, ≥23.5N/15mm
- O2TR < 1c (m2 x 24 hr)
- WVTR < 2 g/m 2x 24 h

PET film	Heat Resistant BOPP Film
Al Foil	AlOx coated BOPP film
CPP Retort film	CPP film

Frozen to Microwave food

Main properties

- Good Drop Impact resistance
- Good high temperature resistance during microwave applications

Nylon Film	Heat Resistant BOPP Film
Adhesive	Adhesive
CPP film	CPP / Blown Barrier film

HMC Polymers

Redesign
for recyclable

HMC Polymer solutions for Mono-material laminates

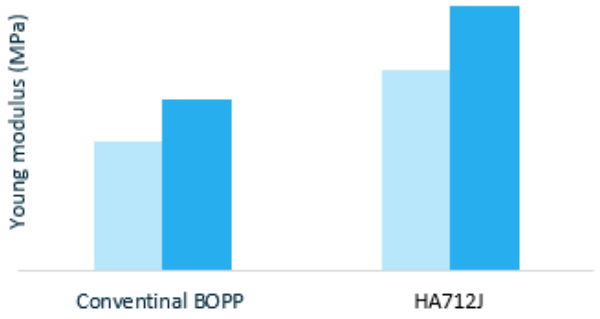
Applications	Existing	Monomaterial	New Requirements	HMC Solution
 BOPP	PET film Adhesive PE film	**BOPP film** Adhesive CPP film / BOPP Film	**BOPP film with** **- High Heat resistance** **- High stiffness** **- High Barrier**	***Adstif* HA712J**
 CPP	PET film Adhesive Metallized PET Film Adhesive PE film	BOPP film Adhesive **Metallized CPP film**	**CPP film with** **- Lower SIT** **- Higher hot tack strength** **- Broad processing window**	***Adsyl* 6093** ***Adsyl* 6064** ***Adsyl* 6155** ***Adsyl* 6146**

HMC Polymers

Redesign
for recyclable

HMC Polymer solutions for Mono-material laminates

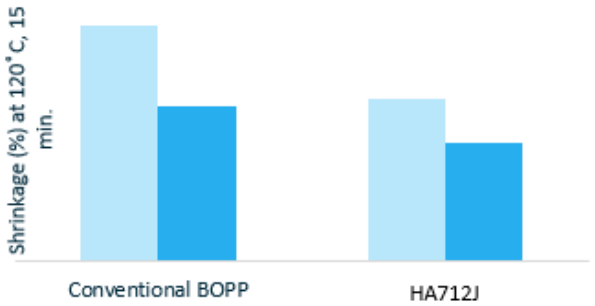
Adstif HA712J



% Improvement

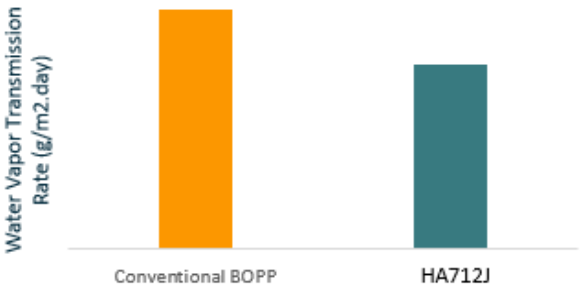
MD	17.2 %
TD	23.7 %

Better dimensional stability

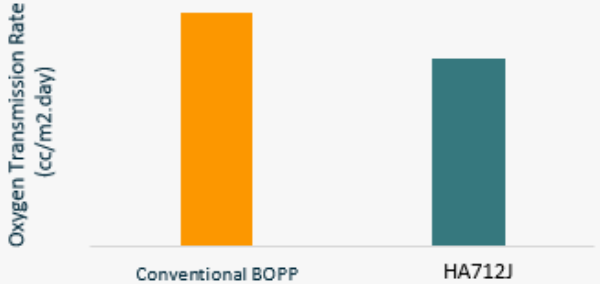


% Improvement

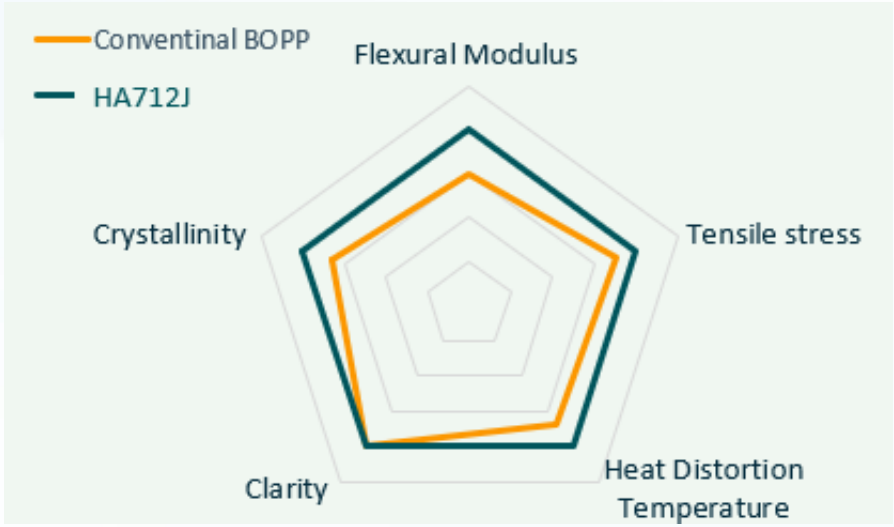
MD	34.4 %
TD	27.2 %



23.0 % Improvement



19.8 % Improvement



Key features of *Adstif* HA712J

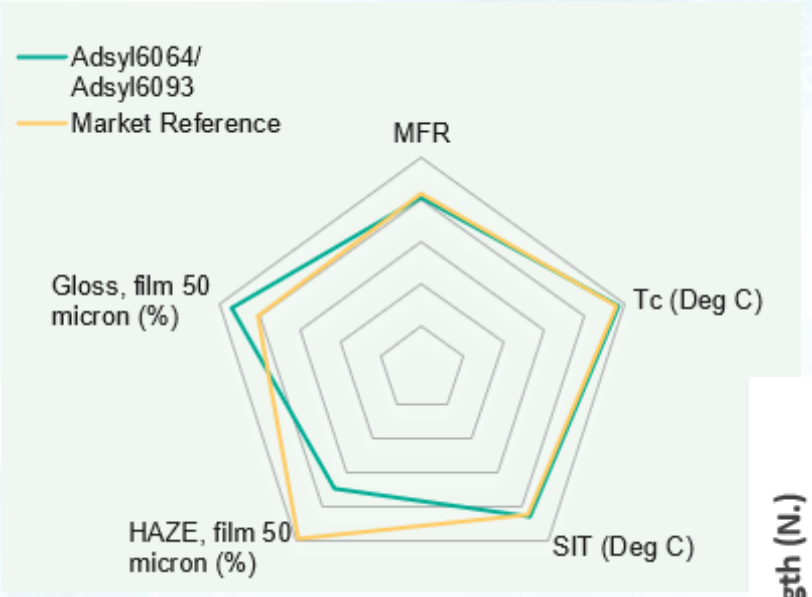
- High stiffness
- High temperature resistance
- High barrier

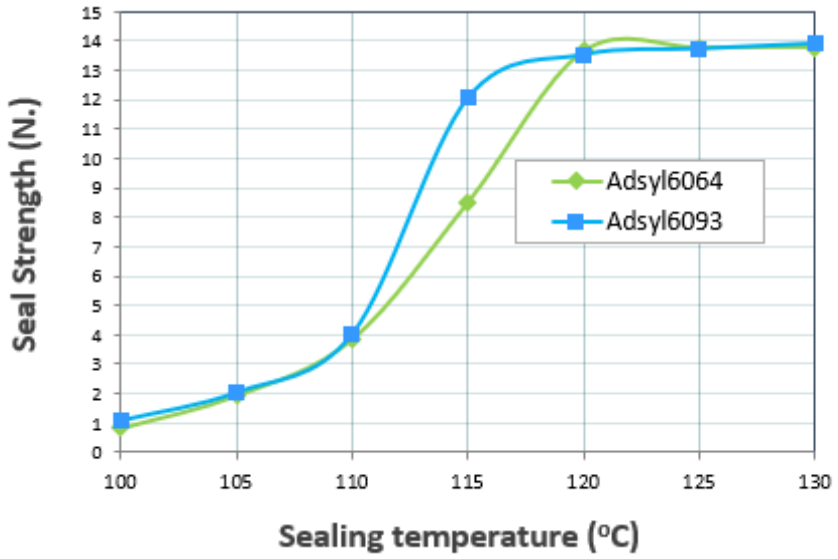
HMC Polymers

Redesign
for recyclable

HMC Polymer solutions for Mono-material laminates

Adsyl 6064, *Adsyl* 6093





Need low SIT CPP film for BOPP/CPP laminates

- Better dimensional stability of laminate on FFS machines
- Lower sticking of outer layer BOPP film to sealing jaws

Key features of *Adsyl* resin for CPP

- **Low SIT of 107–110°C on CPP film**
- **Good seal strength**
- **Good optical properties**
- **Suitable for metallizable films**
- **Broad processing window**

HMC Polymers

HMC Polymers : ISCC Plus Certification

- **The International Sustainability and Carbon Certification (ISCC)** is an independent third-party leading certification system supporting **sustainable, fully traceable, deforestation-free and climate-friendly supply chains.**

- The combination of both **the traceability and chain of custody** ensure that the physical flow of materials can be traced back and forth throughout the supply chain, which **guarantees the integrity of sustainability statements**

- Sustainable characteristics of products are well documented and forwarded by HMC Polymers through the supply chain by means of **Sustainability declarations for each transaction.**


SGS

ISCC PLUS Certificate

Certificate Number: ISCC-PLUS-Cert-DE100-15572125

SGS Germany GmbH

Europa Allee 12, D-49685 Emstek

certifies that

HMC Polymers Co., Ltd.

I-1 Road Map Ta Phut 6 Map Ta Phut Industrial Estate, Map Ta Phut, Muang

21150 Rayong

THAILAND

ISCC PLUS

(International Sustainability and Carbon Certification)

This certificate is valid from 31/07/2025 to 30/07/2026

Emstek, 31/07/2025

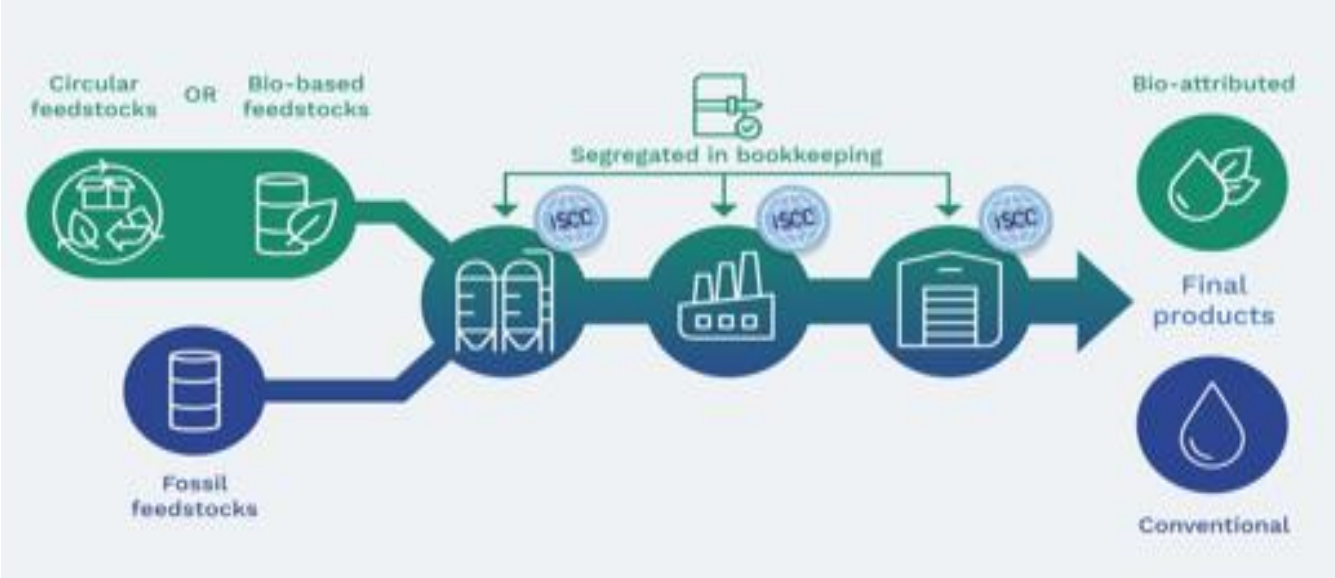
Place and date of issue

SGS Germany GmbH

Stamp, Signature

HMC PP grades using Renewable based feedstock

- HMC Polymers will blend Fossil and Renewable Based Feedstock to produce PP grade using same manufacturing process, Catalyst and additive product recipes
- Final PP product performance is expected to be the same for Fossil or Bio-based PP grades
- No need to requalify grade performance
- **Full FDA compliance** can be declared.
- **HMC Polymers is ISCC Plus certified** and will issue sustainability declaration by applying Mass balance principles



- Physical segregation of Renewable feedstock content is often practically and economically difficult.
- **The mass balance approach** makes it possible to track the amount and sustainability characteristics of circular and/or bio-based material in the value chain and attribute it to various products based on verifiable bookkeeping.

HMC Polymers solutions for Bio-Circular & Circular PP (from PCR)

HMC Polymers proudly offers a diverse range of high-quality sustainable polypropylene **(PP)** to ensure our customers achieve the best solutions contributing to a greener future.

REDUCE / RECYCLED

Sustainable Feedstock

Bio-Circular PP*
made from second generation Bio-Based feedstock based on waste and residues.

Advance Recycling PP*
made from PCR mixed plastic wastes through pyrolysis process.

**All grades manufactured by HMC Polymers can be offered by mass balance with unique sustainability declaration.*

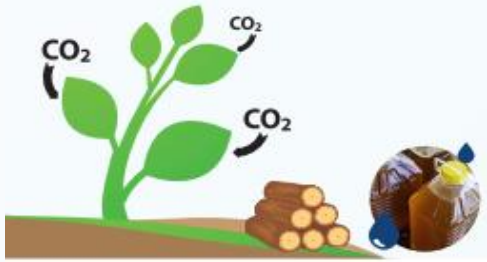
Mechanical Recycling PP
PCR PP grade with US FDA LNO is also available.

Conventional Virgin PP

Continuous development high performance PP grade to reduce weight, redesign for recyclability and replace conventional materials with more sustainable PP solution.

REDESIGN & REPLACE

Bio-Circular feedstock to reduce CO_2 emissions



- HMC Polymers uses second generation Bio-based feedstock based on waste and residues
- Plants and renewable biomass absorb CO_2 from atmosphere during their life and contribute to carbon footprint reduction
- Cradle to gate LCA analysis based on renewable feedstock show potential for carbon footprint reduction compared to fossil counterparts
- All grades manufactured by HMC Polymers can be offered by mass balance with unique sustainability declaration

Advance Recycling for Circular PP - PCR

1. Post consumer plastic waste converted back to oil by **Pyrolysis process**
2. Pyrolysis oil is used in the refinery to produce **C3 monomer**
3. HMC Polymers uses C3 monomer from PCR or advance recycling to produce **Circular PP resins**

HMC Polymers

Thank you

Disclaimer:

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