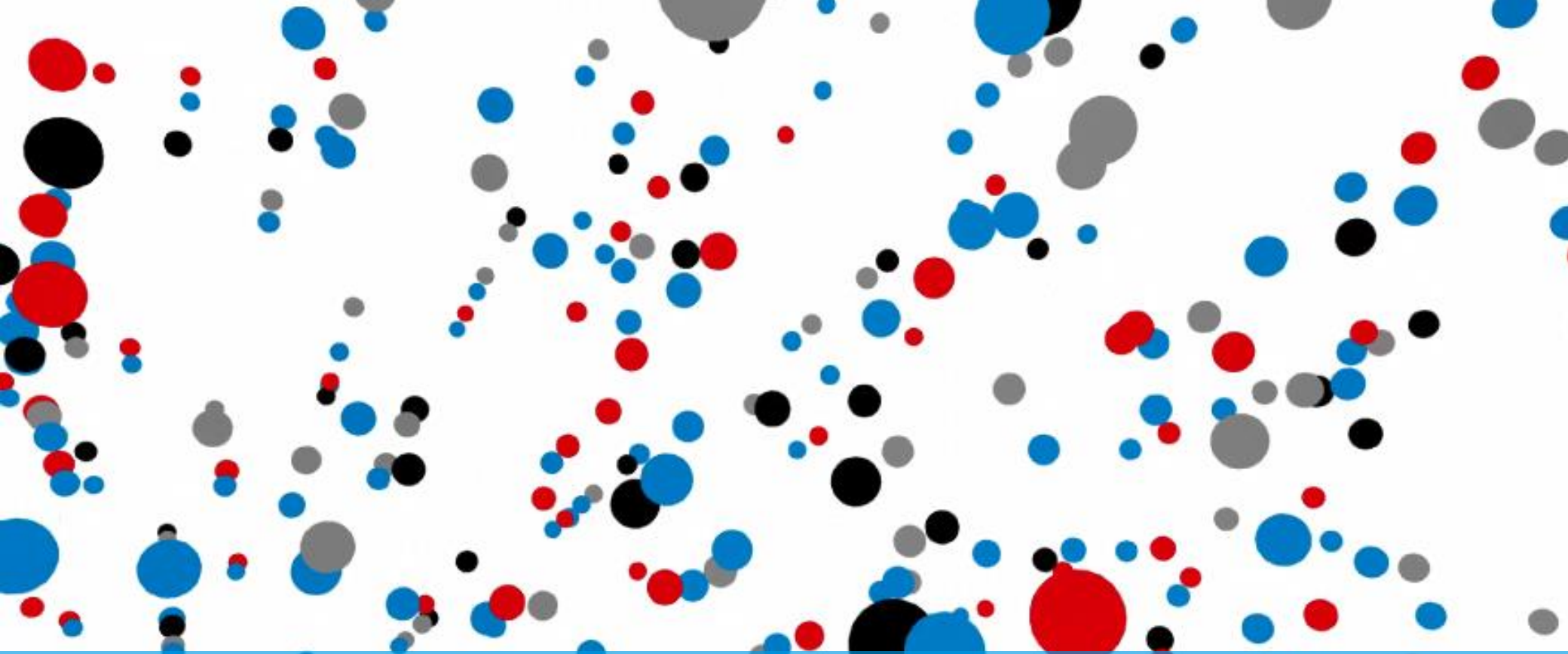

Engineering Plastics Business Briefing

16 June 2023

This document is an English translation of a statement written originally in Japanese for reference. The Japanese original should be considered as the primary version.

DAICEL
Sustainable Value Together

DAICEL CORPORATION

Daicel's Business Segment

DAICEL
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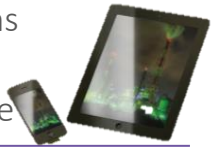
Japan's market share No.1

World's market share No.1

FY2023 Net Sales Total

538.0 bn-yen

		Major Products	
Medical / Healthcare	3%	Cosmetics ingredients such as polyglycerin Naturally derived ingredients such as equol and Konjac ceramide Chiral columns, High-purity chiral reagents, Co-processed excipients such as orally disintegrating tablets	
Smart	6%	Tri-acetate cellulose(TAC) for optical films, High-performance optical films Photoresist materials, Solvents for electronic materials, Optical lens, Printed electronics materials, Organic semiconductor device	
Safety	16%	Airbag inflators for Automobiles, micro gas generators, pyro-fuses	
Materials	30%	Acetic acid, Acetic acid derivatives(acetic anhydride ,common solvents) Cellulose acetate, Acetate tow, Organic chemicals such as Alicyclic-epoxy-resin, Caprolactone derivatives	
Engineering Plastics	44%	Engineering plastics such as POM, PBT, PPS, LCP, COC Plastics processing products such as Coating films and packaging container, Water-soluble polymer	
Others	2%	Membrane separation systems	

Introduction of Group Companies and Our Business Model of Engineering Plastics

Engineering Plastics Segment

“Combining” the technologies of four companies to “Support customers’ futures”

DAICEL Performance Materials Headquarter

100% → Daicel Miraizu Ltd.

100% → Polyplastics DAICEL Group

Evonik Japan — 50% → Polyplastics Evonik

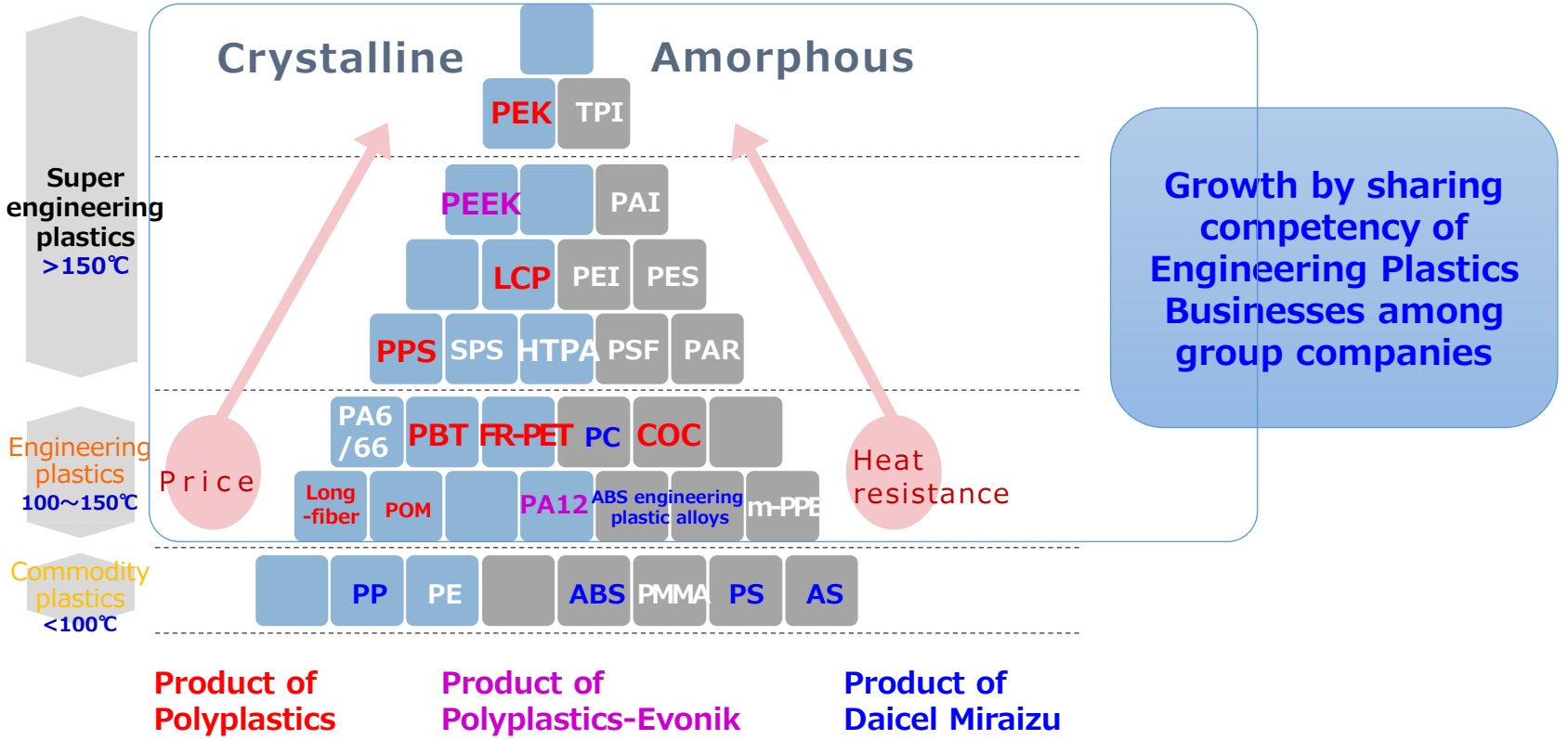
50% → POLYPLASTICS EVONIK

Daicel Miraizu Ltd.	Polyplastics DAICEL Group	POLYPLASTICS EVONIK
Meet customers’ individual needs with a diverse selection of compounding technologies ranging from commodity resins to engineering plastics.	Develop new materials together with our customers through technical services based on our knowledge of engineering plastics, which have been adopted for numerous applications.	Solve customers’ problems with technical services and high-performance products such as Evonik’s PA12 and PEEK, combined with processing technologies such as injection, extrusion, and powder coating.

Product Portfolio in Daicel Group

◆ **An extensive product portfolio for providing technical solutions, which is essential for Engineering Plastics businesses**

- ➢ **Sharing Group companies' product portfolio and infrastructure**
- ➢ **We will expand our portfolio by forming alliance or joint venture**



5

Providing Solutions Need for Developing Engineering Plastics Markets

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・Long time use inside gasoline tank
・Internal stress to the resin product

Resinization of automotive fuel sender module

(POM fuel sender module integrated with polyethylene gasoline tank)

Customers → Design → Engineering・analysis → Trial production → Mold design → Start of production

Challenge : Predict life duration in Gasoline

Challenge : Prolong life duration of molded products

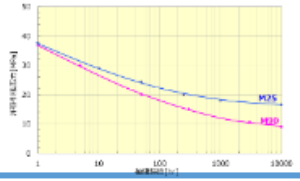
Polyplastics → Acquire analitical data → Life time, reliability analysis → Develop methods of product evaluation and processing → Product Analysis → Trouble Shooting

Creep test in gasoline

<We developed an unique method of evaluation>

・We implement the evaluation in autoclave filled with gasoline.

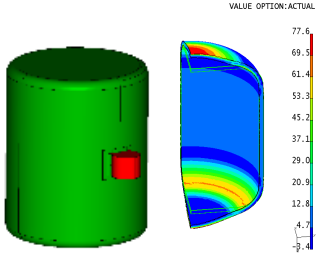
・We monitor the fracture of drop temperature of specimen after its fraction, because we cannot see inside of autoclave.



Life duration prediction in CAE

<Predict life duration with high accuracy>

・We implement the life duration prediction using the real creep data in gasoline and CAE result.



Examination of welding method

<Optimized hot plate welding>

・Flange should be welded with case.

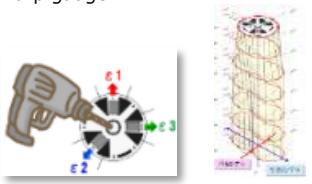
・Hot plate welding enough to resist from internal stress. We optimized its condition.

Residual internal stress measurement method

<Developed original method>

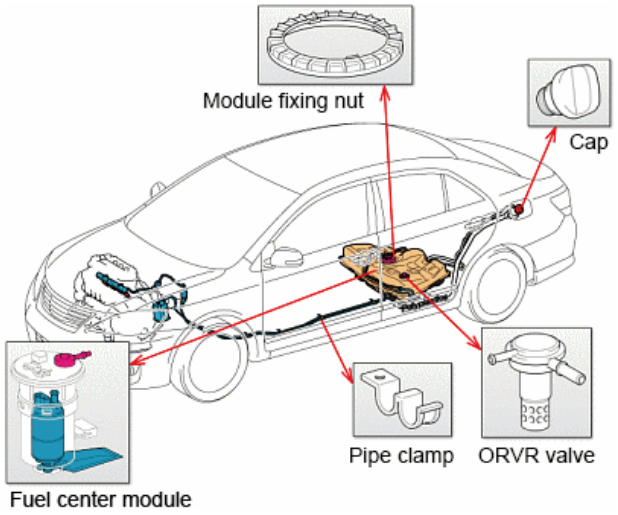
・We developed a method for visualizing residual stress.

・We calculate residual stress by measuring the level of deformation after making a hole on the product using a special warp gauge.



Response to the change in needs by social trends

Appearance of various biofuels



Fuel pump module made from POM

The theory of creep life prediction

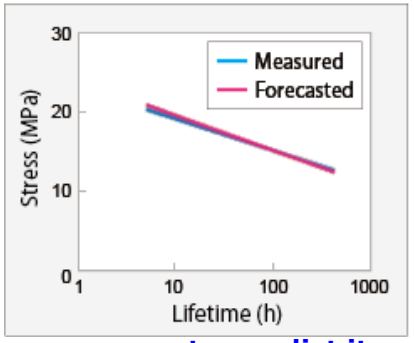
Zhurkov's kinetics of fracture processes

$$t_b \propto \exp\left((\Delta F - v^*\sigma)/k_B T\right)$$

t_b : Creep rupture life
ΔF : Activation energy
v^* : Activated energy
σ : Stress
k_B : Boltzmann constant
T : Absolute temperature

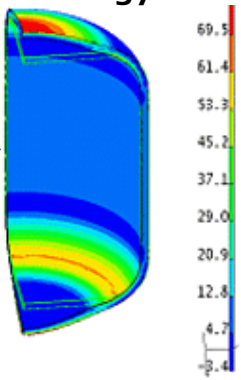
Predict creep life duration

The chart of creep life prediction of biofuel (60℃)



Fracture judgments

Stress analysis using CAE technology



It is necessary to predict its creep life by each fuel
=Verifying by implementing analysis in practice

History in Products in Engineering Plastics (for Automotive)

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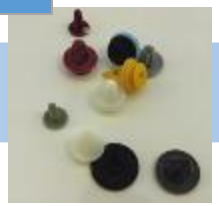
1980 1990 2000 2010

●Gasoline Car ●HEV ●EV

Mechanical Strengths


POM
Clips


POM
Door locks


POM
Emergency Locking Retractor


PBT
Door mirror stay


PPS
Regenerative cooperative braking system

Chemical Resistance


POM
Fuel caps


POM
Fuel Module


PPS


PPS
Electric water pump

Heat Resistance


PPS
Sensor for Engine


PPS
Throttle body


PPS
Automotive motor insulator

Change in the Amount of Consumption of Engineering Plastics by the Shift to xEV

- The type of Engineering Plastics was changed by the shift to electronic vehicle.
- The amount of consumption of resin for engine and fuel-related components decreased. On the other hand, that for battery, censor actuator and 5G related increased.

The weight of consumption of each resin for automotive (kg/ a car)

	POM	PBT	PPS
Gasoline Car	5.0	5.5	1.0
Positive effect	+0.0	+0.8	+0.7
Negative effect	-1.0	-0.3	-0.2
EV	4.0	6.0	1.5
Compared to Gasoline Car	80%	109%	150%

Engineering plastic applications growing with electrification and automation

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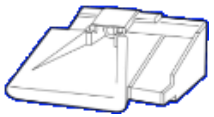
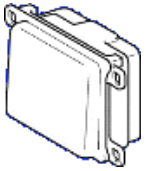
Sensor

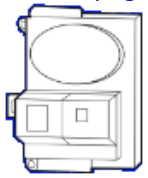
Camera
Low warpage PBT



Radar
Low dielectric PBT

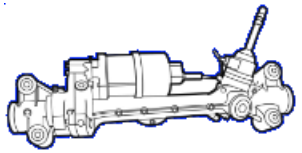


LIDAR
Low warpage PBT

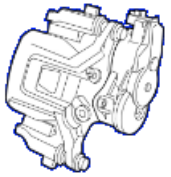


Electric actuator

EPB
Alkali resistant PBT*



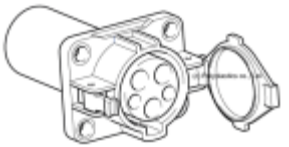
EPS
Alkali resistant PBT*

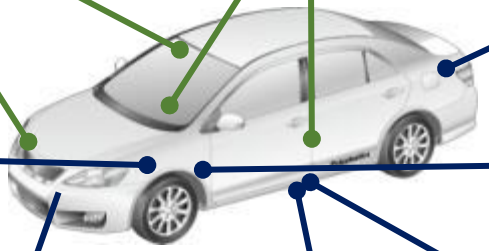


Charging

Charging plug
High toughness PBT

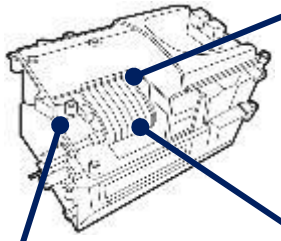
Inlet
High toughness PBT



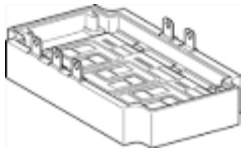


PCU

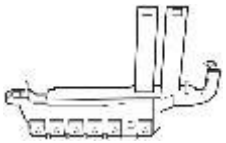
PCU



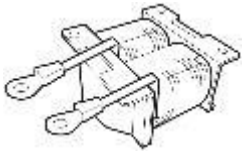
Inverter case
Thermal shock resistant PPS



Current sensor
Thermal shock resistant PPS



Reactor
Thermal shock resistant PPS

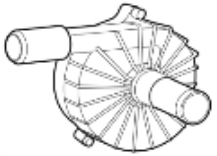


Motor

Motor insulator
High stiffness PPS

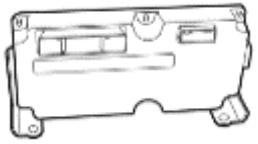
Cooling system

Electric water pump
Thermal shock resistant PPS



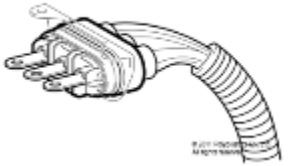
Battery

Battery monitoring ECU
Thermal shock resistant PPS



Power supply

High voltage connector
High tracking resistance PBT*



New applications and major components by the development of 5G

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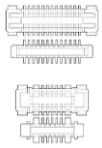
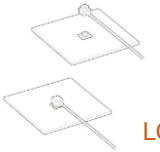
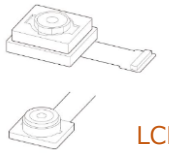
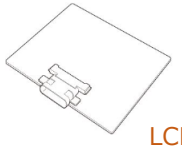
Narrow pitch connector

LCP

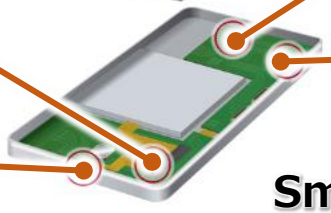
FPC Connector

LCP

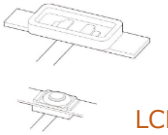
Coaxial Connector

LCP

Camera Module

LCP

Micro USB

LCP

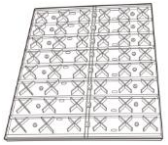


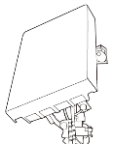
Smartphone

Micro Switch

LCP

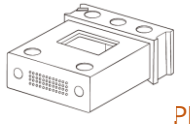
Band-Pass Filter

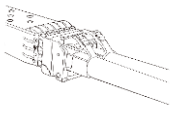
PPS

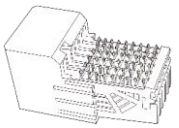
antenna base

PPS
LCP

Radome

PBT

Base Station

Optical Connector

PPS

Optical Transceiver

LCP

Connector for Server Computers

LCP

Optical Network & Data Center

History in Products in Engineering Plastics

●The engineering plastics businesses have been developed by responding to the new applications and needs in the situation of changing final products

1960 1970 1980 1990 2000 2010

●**Fiber**

●**Electric appliances**

●**Automotive**

●**Semiconductor**

●**Components for Smartphone**

Components for manufacture in silk

POM

Tomioka Silk Mill

CD／DVD

POM/PBT

Gear, Pick up

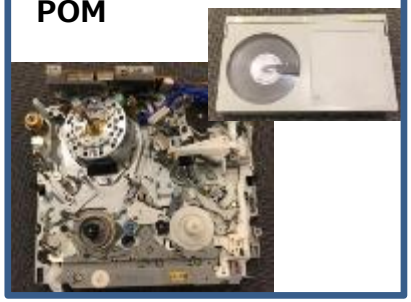
PC

PBT･PPS

CPU socket / Connector

Video／Tape

POM



Gear, Cam, Bearing

Fuel Module

POM

Fuel-related Components

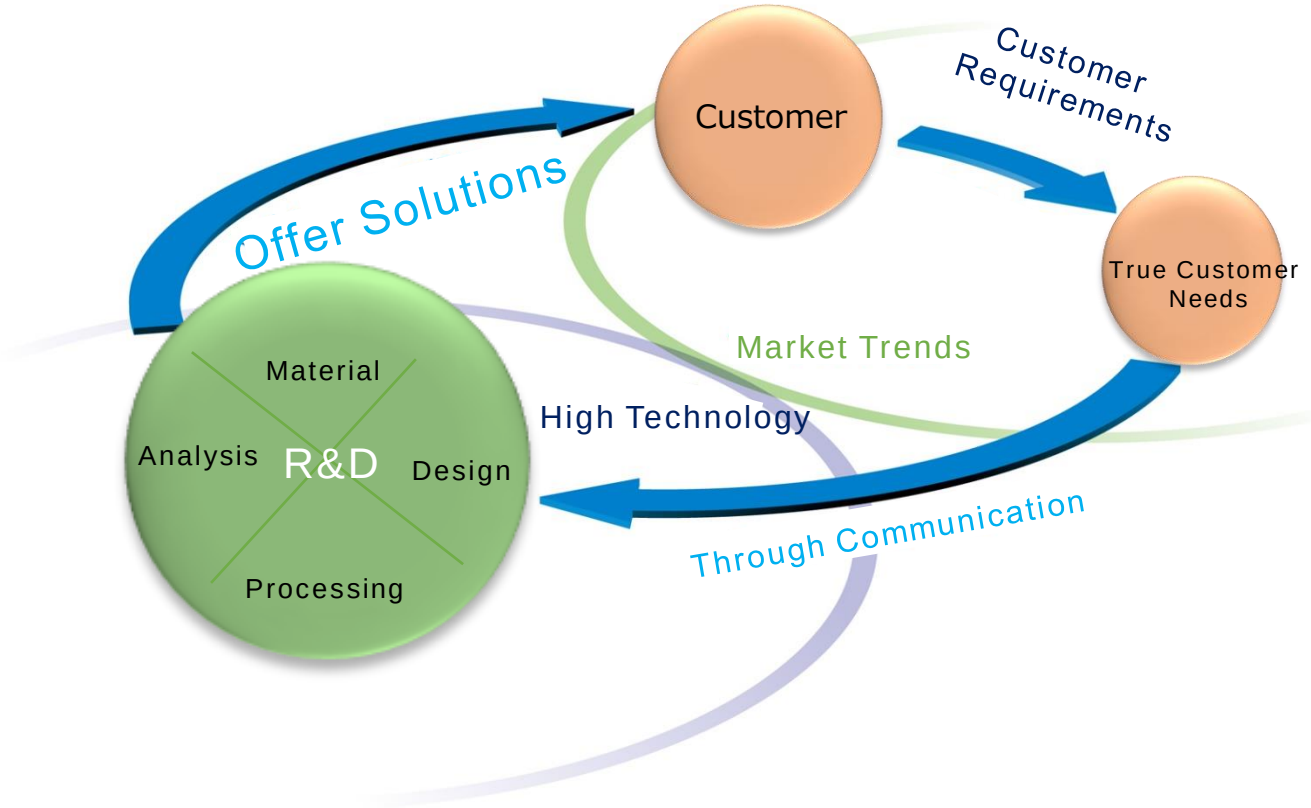
Smartphone / Connector

LCP

Narrow Pitch Connector
Camera Module

History of Engineering Plastics = Providing Solution

Our business model is that breaking down from the needs from markets and customers to the requirement to the Engineering Plastics, providing them with materials and instructions corresponded to the applications fulfilling customers' concept.



Lineup of resin products of Polyplastics Co., Ltd.

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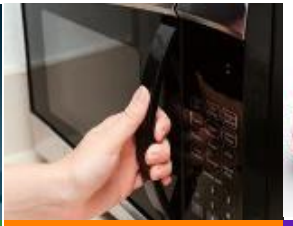
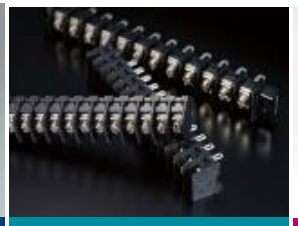
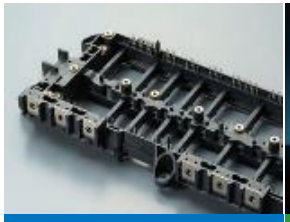
Polyacetal	Polybutylene terephthalate	Polyphenylene sulfide	Liquid crystal polymer	Cyclic olefin copolymer	Polyethylene terephthalate	Long Fiber Reinforced
DURACON® POM	DURANEX® PBT	DURAFIDE® PPS	LAPEROS® LCP	TOPAS® COC	RENATUS® PET	PLASTRON® LFT
Balanced mechanical properties and outstanding sliding properties	**Excellent electrical properties and high reliability, for electronic devices & components**	**Linear polymer delivering high toughness and impact resistance**	**Prominent super engineering plastic with thin-wall flowability that exceeds the norms for engineering plastics**	**Superior transparency and safety for healthcare and food packaging**	**High heat resistance and superior electrical properties on par with thermoset resins**	**Long fiber reinforced thermoplastics expanding new areas of resinization**
 Fuel pump module	 Small switches	 HEV motor insulator	 Narrow pitch connectors	 Prefilled syringes	 Microwave ovens	 Automotive
 Door locks	 Terminal blocks	 Heating coil bases for IH rice cookers	 HEV power module cases	 Water quality test bottles	 Rice cookers	 Bicycles
 Combination switches	 Car-mounted sensors	 Electric VTC	 Micro USB connectors	 Freezer bags	 Door-mounted rearview mirrors	 Pump housings

Polyplastics-Evonik Corporation

Major Applications

DAIAMID ® VESTAMID® Polyamide 12、612、Polyamide elastomer

Cooling line
- Lightweight, Hydrolysis resistance, Chemical resistance


Power busbar coating for xEVs
- Electric insulation, Easy bending after coating, Flame retardancy, Halogen-free, High extrusion processability

Shoe sole
- Direct bonding with TPUs, Lightweight, High bounce

TROGAMID® Transparent Polyamide

Lens
- Transparency, Chemical resistance, Lightweight, Easy cutting

Frame
- Transparency, Toughness

Wristwatch housing
- Toughness, High impact strength, High stiffness

VESTAKEEP ® VESTAKEEP ®-J Polyetheretherketone(PEEK)

Gear inside vehicle engine
- High fatigue properties at high temp., Noise reduction, High productivity by injection molding method

Components for semiconductor manufacturing processes
- High process cleanness by low dust generation, low outgassing, antistatic properties (ESD properties), High resistance to strong acid for high integration

Bearing
- High fatigue properties, High abrasion resistance, High mechanical strengths

Polyplastics-Evonik Corporation

Major Products

Long-chain polyamide granules and powders
DAIAMID®, VESTAMID®, TROGAMID, VESTOSINT ®, VESTAMELT®

PEEK
VESTAKEEP®, VESTAKEEP®-J

Rubber
VESTENAMER®

C12&C8 Monomers
CDON, COD

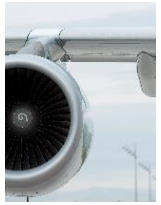
Separation membrane
SEPURAN®

Structural foams
ROHACELL®

Composite sheets
R-COMPO®

Markets and Applications


Automotive


Aerospace

General Industries


Sports


Optics


Medical


Consumer goods


Additive manufacturing


Rubber, rubber recycling


Hot gas filtration


Gas separation

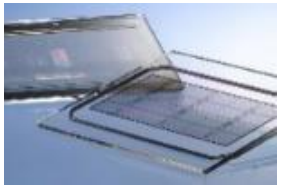
Lineup of resin products of Daicel Miraizu Ltd.

DAICEL Sustainable Value Together

AS resins
CEVIAN®-N



Sustained antistatic ABS resin
NOVALLOY® E



Semiconductor shipping trays

ABS resins
CEVIAN®-V

Electrical outlet plates

Water purifiers

PP resins
Daicel PP

Gas ranges (components)

LIB battery covers

PA/ABS resins
NOVALLOY® A

Motorcycle cowls

Cellulose fiber composite resins
CELBLEN® C

Wind instrument reeds

Harmonicas

PBT/ABS resins
NOVALLOY® B

Gas ranges (Housings)

Cellulose acetate resins
ACETY・ACETY® EC

Glasses frames

Shoelace aglets(EC)

PC/ABS resins
NOVALLOY® S

Multifunctional office machines

Computer housings

Cleaning liquids for molding machines
CELPURGE®

Consumer Businesses of Daicel Miraizu Ltd.

DAICEL Sustainable Value Together

【Product Lineup by Usage】

Films for reducing food waste

Providing barrier films to the food with short best before date, which is not so popular, contributing to the reducing food waste.

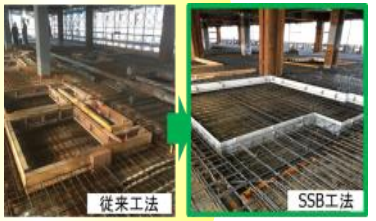
New Silage Modifier

Suggesting sodium formate and lactic acid bacteria contribute to the reductions in workers' chemical injury and prevention of rust of dump.

CMC for Lithium Ion Battery

Thickening agent for anode of battery applying to the EV and LIB.

SSB method which allows us reduce construction debris



Suggesting SSB methods contributes to the improve in carpenters' productivity and reducing construction debris.

Environmentally Friendly Products

The product based on acetate cellulose and other environmentally friendly material, contributing to the environmental protection in logistics and retailors.

Product Development of Consumables for Kitchen

Not developing products only itself but taking consideration of consumer needs and retailors with making series of products, thus improving the DAICEL brand.

Marine Biodegradability Resin CELBLEN EC

DAICEL
Sustainable Value Together

Cellulose acetate resins
CELBLEN EC

Transparent resin with marine biodegradability made from natural resource

Characteristics

- Biomass resin made from Cellulose which is tree-derived raw materials
- Resin that is transparent and colorable
- Resin that is recyclable
- Material that is also biodegradable in the ocean
- Antibacterial against Staphylococcus aureus and E. coli

Exiting fields	New fields		
Stationery	Pipe	Plastic document sleeves	Films
Cutlery	Plastic Straw	Lid	Blister pack	Bottle	Soft Package

バイオマスプラ

生分解性
バイオマスプラ

Business strategy for Engineering Plastics Segment

Engineering Plastics Business Strategy

DAICEL Sustainable Value Together

	2023/3		2026/3		Business strategy
	Net sales	Operating income	Net sales	Operating income	
Medical / Healthcare	16.6	1.3	17.0	1.5	• Development of a new intestinal metabolite-based food ingredient with function (Urolithin etc.) • Expansion of CPI business in China/India • Fostering businesses in the medical field, including DDS* and medical-related materials
Smart	29.6	-0.6	50.0	5.5	• Provision of materials for the semiconductor market industries and expansion of related businesses • Expand the share of high-performance films by utilizing the asset of Daicel Beyond • Creation of new businesses by utilizing dry coating technology
Safety	84.0	-0.5	111.0	15.0	• Improvement in profitability by consolidating production areas • Collaborating in India and ASEAN markets to manage risk hedging and active sales expansion • Strengthen relationship with Chinese companies • Implement mass production of Pyro-fuse for EV vehicles and its sales to Europe and the United States
Materials	160.8	20.7	182.0	30.5	• Increase in sales of acetate tow for heat-not-burn cigarettes by increase in production without expanding facilities • Expand the application of Lactone and Epoxy to high-value-added product market • Market development of cellulose acetate for environmental material
Engineering Plastics	238.1	25.3	294.0	29.0	• Sales expansion in Europe and North America (the target of market share of POM and LCP in Europe and North America : 10%) • Strengthen business in Chinese market (sales to Chinese companies) • Creation of new environmental business (development of products using bio-raw materials and recycling)
Others	9.1	0.3	6.0	0.5	—
Total	**538.0**	**47.5**	**660.0**	**82.0**	—

* DDS = Drug Delivery System

Benefits from investments in expansion

- Aimed at further business expansion by investing actively for establishing steady sales field in Asian market and expanding share of product in Europe and United States.
- Aimed at maximizing the synergy by concentrating the engineering expertise in Daicel Group

Benefits from investments in expansion targets for the fiscal year ending March 2031

Investment	Initial plan		Forecast		Effect*	
	Start of operation (FY)	Production Capacity (MT/ years)	Start of operation (FY)	Sales expansion strategy	2026/3 (Billion Yen)	2031/3 (Billion Yen)
POM	2025	90,000	2024	✓ Responding to domestic demand by expanding production capacity in China ✓ Making the more of next-generation methanol as a raw material ✓ New applications/market development other than automotive, such as medical applications	16.0	78.0
		60,000	2025			
LCP	2024	5,000	2024	✓ Maintain top market share by expanding sales further aimed at expanding demand by responding to 5G millimeter-wave demand in the future ✓ Expansion in new markets through 5G composite material (hybrids with inorganic compounds)	5.0	36.0
		5,000	By Under Planning			
COC	2023	20,000	2024	✓ Responding to the growing demand in the packaging and medical fields ✓ Sales expansion in EU countries by leveraging unique recyclability	9.0	64.0
Total					**30.0 (Initial plan: 20.0)**	**178.0**

*Cumulative benefits (EBITDA) from operation

Plan for cumulative EBITDA of 30 billion yen in FY2024/2025 byBenefits from investments in expansion.

Polyplastics' vision and path to realization

- Need to respond to future society, such as environmental measures and next-generation automobiles (CASE)

Promoting advanced development that captures social needs and implementing the “Polyplastics-Way*” in products and technologies

1. **Providing "CASE" solutions for mobility / Driving future growth as the largest market for engineering plastics**
2. **Contribution in the medical field/Establishing a position as a responsible supplier with grades for medical use**
3. **Provide solutions for carbon neutrality / Solutions for achieving circularity**
4. **Expansion of the product lineup to expand the range of solutions / Supply strategy to support the expansion of demand**

LFT, fine powder, PEK + PEEK cooperation with Polyplastic Evonik

Polyplastics' vision and path to realization

➢ “Polyplastics-Way”* around the world seeking advanced engineering plastic solutions

1. **Americas and Europe: Expand market share by providing technical support and developing high-value-added products with customers.**

2. **China: Strengthen development activities targeting Chinese customers' Spec-in business. Build relationships with Chinese OEMs and Tiers.**

3. **India: Strengthen sales expansion system in India and collaborate with advanced raw material suppliers**

***Polyplastics-Way:**

- We always stand closest to our customers.We understand customers’ needs by knowing our customers from the inside out. We continue to provide higher-than-expected value based on the best technology and services.
- Following the above, we build strong relationships of trust with our customers and grow and develop together with them.
- We call these activities the “Polyplastics Way,” which is our most important basic value.

POM's Business

➢ **World market: 1.33 million tons in 2022**
→ 1.50 million tons in 2025 (4.0%/year)

- POM is used in a wide range of applications such as automobiles, electric/electronics, and industrial equipment.
- In 2022, the POM market shrank from the previous year due to the stagnation of production activities due to the lockdown in China and the rebound from the increase in inventories by users for automobile parts and electrical and electronic parts in the previous year.
- **As POM is used in a wide range of fields, sales volume is expected to increase over the long term as the world economy grows.**

Quote from "Future outlook for and global strategies in engineering plastic markets" published by FUJI KEIZAI CO., LTD.

POM's Business

➢ Polyplastics POM's Business Strategy

- No. 1 in global market share 18.8% (According to a survey by FUJI KEIZAI CO., LTD in 2022)
- Annual supply capacity of 290,000 tons at four locations around the world: Fuji Plant, Kaohsiung Plant, Kuantan Plant, and Nantong Plant.
- The Nantong Plant (60,000 tons/year) owned by PTM Engineering Plastics (Nantong) Co., Ltd. (70.1% owned by Polyplastics) will be shut down in 2024 in response to a request from the Nantong Economic Development Zone Authorities to suspend operations of chemical companies in the North District.
- In the same South District, we will newly establish "DP Engineering Plastics (Nantong) Co.,Ltd" (70% invested by our company). Operation is scheduled to start at 90,000 tons/year in November 2024 (Phase 1), with a supply capacity of 150,000 tons/year (Phase 2) by the beginning of 2026.
- By establishing a new manufacturing base in China, which has the largest demand and growth potential in Asia, we will be able to supply the domestic demand from the new plant. The Kuantan plant in Malaysia will respond to increased demand due to market development in Europe, Americas, and India, and will work to optimize the supply chain. Through these measures, we aim to grow the POM business faster than the market growth.

LCP's Business

➢ **World market: 57,000 tons in 2022**
→ : 63,000 tons tons in 2025 (3.0%/year)

- LCP is mainly used for electrical and electronic devices such as SMT connectors.
- In Q1-Q2 of 2022, **the number of smartphones produced decreased year-on-year and fell from the previous year even for the whole year, and the amount of LCP used per smartphone increased, so the sales volume of LCP increased from the previous year.**
- **Smartphone production is expected to remain stagnant** after 2023, but the development of next-generation communications will lead to higher densities of electronic components and multilayered internal substrates, as well as multi-lens and higher performance camera modules. **The sales volume of LCP for smartphones is expected to increase in the form of a contribution from expanding demand.**
- **Demand for connectors, relays, and sensor cases is also expected to grow for automobiles as EVs and electrification progress**.

Quote from "Future outlook for and global strategies in engineering plastic markets" published by FUJI KEIZAI CO., LTD.

LCP's Business

➢ Polyplastics POM's Business Strategy

- No. 1 in global market share 31.5% (According to a survey by FUJI KEIZAI CO., LTD in 2022)
- Fuji Plant (Fuji City, Shizuoka Prefecture) has an LCP polymerization plant with an annual production capacity of 15,000 tons.
- Polyplastics Taiwan Co., Ltd. (head office: Taipei, hereinafter referred to as PTW) will newly establish a polymerization plant with an annual production capacity of 5,000 tons (scheduled for 2024). Plan for LCP polymerization capacity of 25,000 tons per year for the entire Plastics Group
- PTW has established an integrated production system for LCP products, from polymerization to compounds, to respond to the global LCP market, which is expected to expand rapidly in the future.

COC's Business

➢ Opportunity to contribute to the Circular Economy

In 2020, the EU Council adopted a draft Directive on the Reduction of the Environmental Impact of Certain Plastic Products.
Distributing single-use plastic products was banned until 2021, and **extended producer responsibility will be obliged for all packaging materials by 2024,** accelerating the market's movement toward plastic recycling toward a circular economy.

"TOPAS®COC" has **received third-party certification (*) as a recyclable material when mixed with polyolefins.**

*Certified as a "recyclable material" by the German Institut cyclos-HTP, the first cyclic olefin resin (COC) recognized as being recyclable along with polyethylene (PE) and polypropylene (PP) for film and injection molding applications.

In addition, we have obtained Critical Guidance Recognition certification from the Association of Plastics Recyclers for our high-gloss, high-density polyethylene containers that use 20% TOPAS®COC as the outer layer. It was found that TOPAS can be recycled without adversely affecting the recycling process of high-density polyethylene.

Packaging materials such as shrink labels for PET bottles and stand pouches distributed in European countries often have PE or PP olefin-based resins and TOPAS added to enhance functionality.
The third-party certification acquired this time indicates that these packaging materials can be recycled together with the olefin-based resin in the collection process, and contributes to the promotion of recycling of packaging materials through the conversion of polyolefins into monomaterials.

COC's Business

➢ New second plant in 2024 to meet supply needs

As the demand for TOPAS is increasing, TOPAS Advanced Polymers GmbH, a local subsidiary in Germany, will build a new plant in Leuna, which is scheduled to start operation in 2024, in addition to the existing production plant in Oberhausen.

The new plant will have an annual capacity of 20,000 tons, more than doubling current production.

We plan to contribute to the social implementation of a circular economy in the European region as a manufacturing base that will play a central role in the stable supply of TOPAS in the future.

Environmental Initiatives

➢ New GHG Reduction Targets

Daicel Group

Total GHG emissions (Scope1&2) **50%** reduction (vs. FY2018)

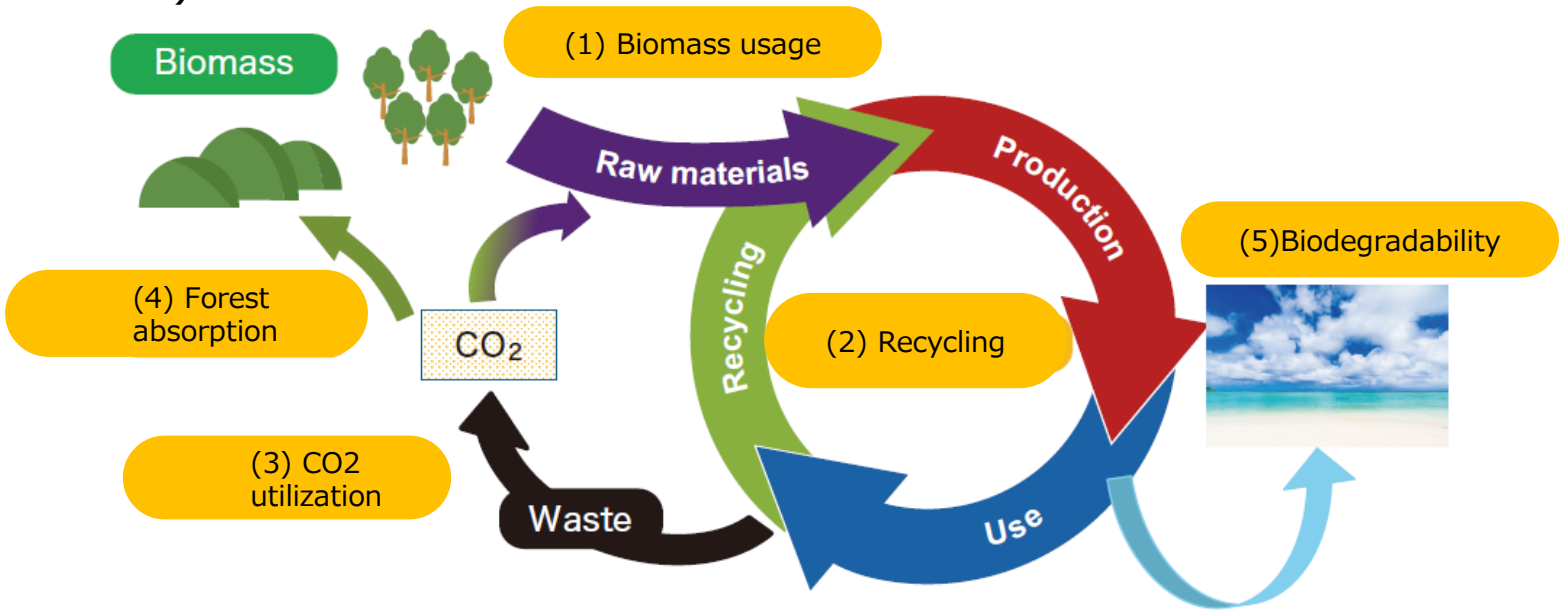
Polyplastics Group

PCF*1-focused GHG emissions intensity (including CO_2 derived from raw materials) **46%** reduction (vs. FY2013)

*1 Product Carbon Footprint

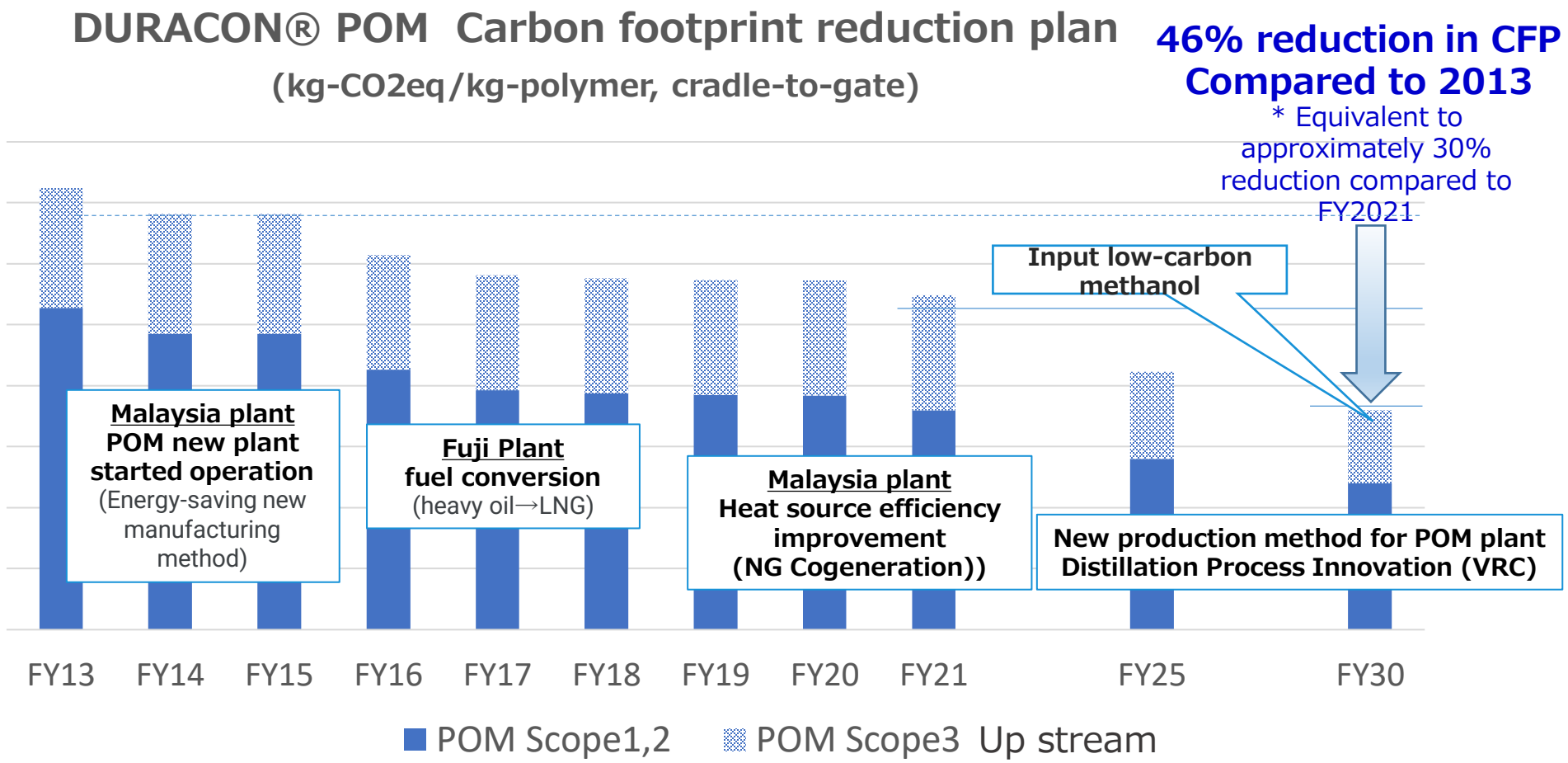
➢ Efforts towards Carbon Neutrality

- ◆ Aiming to achieve carbon neutrality by “building a circular society”
- ◆ Three pillars: (1) Biomass usage, (2) Recycling, and (3) CCU (CO_2 capture and utilization)



POM : GHG reduction including Scope3

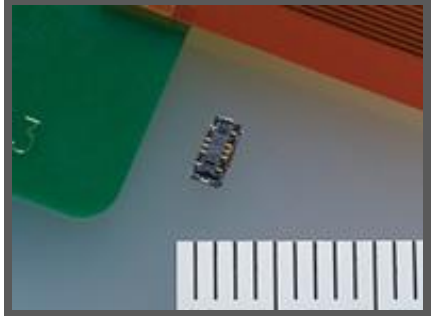
- FY2030 Cradle-to-gate PCF (Scope 1, 2, 3 upstream): 46% reduction compared to FY2013
- In-house, GHG reduction (Scope 1, 2) + Recycled raw material input

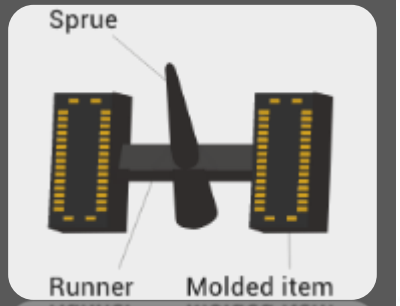


Achieved quality maintenance even with 80% recycled LCP material

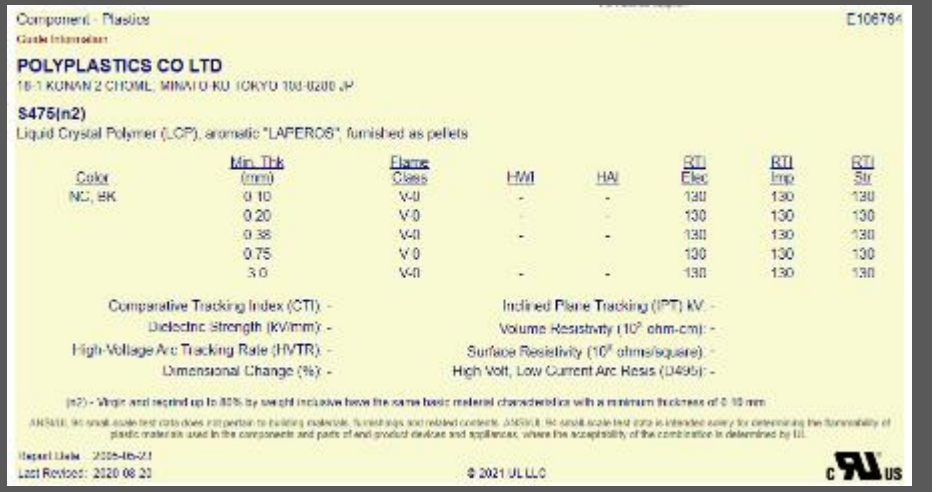
In response to customer needs for in-house recycling in the manufacturing process, LAPEROS® LCP grade S475 has additionally acquired UL certification*, which certifies that it has the same quality as virgin materials even if it contains 80% recycled materials.

* Certification by UL, a third-party product safety/environmental evaluation organization, that indicates that the product conforms to the safety requirements for North America.





Yellow Card (UL certification document)



Component - Plastics E106764

Guide Information

POLYPLASTICS CO LTD

18-1 KONAN 2 CHOME, MINATO-KU TOKYO 108-0200 JP

S475(n2)

Liquid Crystal Polymer (LCP), aromatic "LAPEROS", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.10	V-0	-	-	130	130	130
	0.20	V-0	-	-	130	130	130
	0.38	V-0	-	-	130	130	130
	0.75	V-0			130	130	130
	3.0	V-0	-	-	130	130	130

Comparative Tracking Index (CTI): -
Dielectric Strength (kV/mm): -
High-Voltage Arc Tracking Rate (HVTR): -
Dimensional Change (%): -

Inclined Plane Tracking (IPT) kV: -
Volume Resistivity (10^x ohm-cm): -
Surface Resistivity (10^x ohms/square): -
High Volt, Low Current Arc Resis (D495): -

(n2) - Virgin and regrind up to 80% by weight inclusive have the same basic material characteristics with a minimum thickness of 0.10 mm

ANSI/UL 94 small scale test data does not pertain to building materials. Foamed materials and related contacts. ANSI/UL 94 small scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2005-05-27
Last Revised: 2020 08 20

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Achieved regrind ratio up to 80% for LCP material

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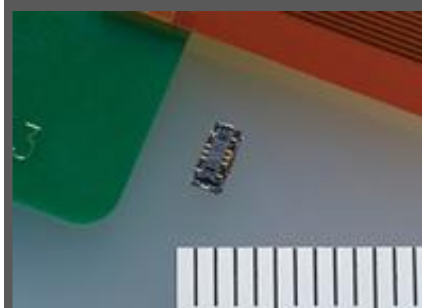
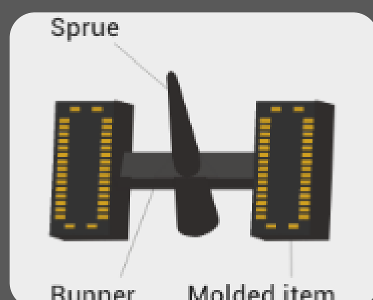
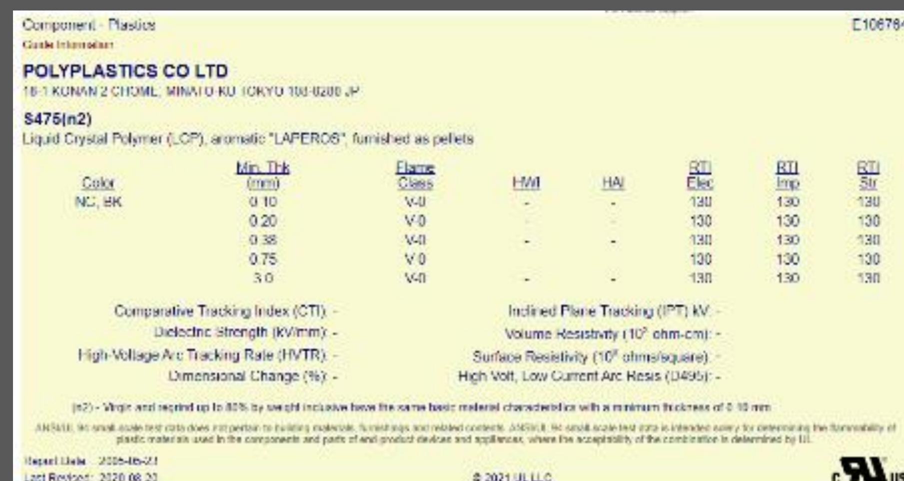
- LAPEROS®LCP has high fluidity, excellent heat resistance, mechanical strength, and high dimensional accuracy.
- The number of sprues and runners that are discarded after device molding increases as devices become smaller, and the disposal rate increases. We responded to customer's request of regrind ratio up to 80%.
- Social demands regarding the effective use of resources will continue to grow. <u>We are planning to acquire UL certification for other grades with a high recycled material ratio so that they can be used with peace of mind even with a high recycled material ratio.</u>





Yellow Card (UL certification document)



Component - Plastics E106764

Guide Information

POLYPLASTICS CO LTD

16-1 KONAN 2 CHOME, MINATO-KU TOKYO 108-8280 JP

S475(n2)

Liquid Crystal Polymer (LCP), aromatic "LAPEROS", furnished as pellets

Color	Min. Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	0.10	V-0	-	-	130	130	130
	0.20	V-0	-	-	130	130	130
	0.38	V-0	-	-	130	130	130
	0.75	V-0			130	130	130
	3.0	V-0	-	-	130	130	130

Comparative Tracking Index (CTI): -
Dielectric Strength (kV/mm): -
High-Voltage Arc Tracking Rate (HVTR): -
Dimensional Change (%): -
Inclined Plane Tracking (IPT) kV: -
Volume Resistivity (10^x ohm-cm): -
Surface Resistivity (10^x ohms/square): -
High Volt, Low Current Arc Resis (D495): -

(n2) - Virgin and regrind up to 80% by weight inclusive have the same basic material characteristics with a minimum thickness of 0.10 mm

Last Revised: 2020-08-20

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DURACIRCLE™ Recompounding

DAICEL
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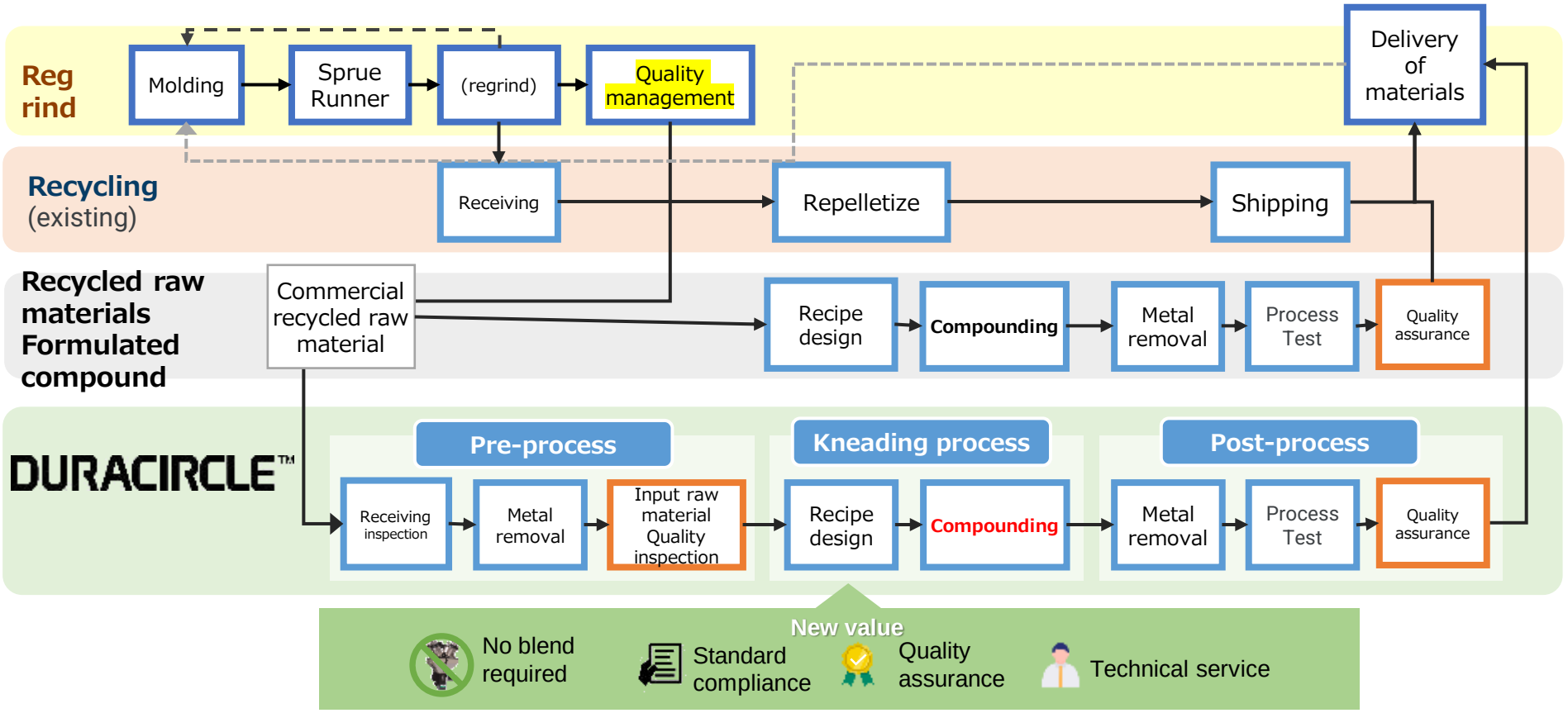
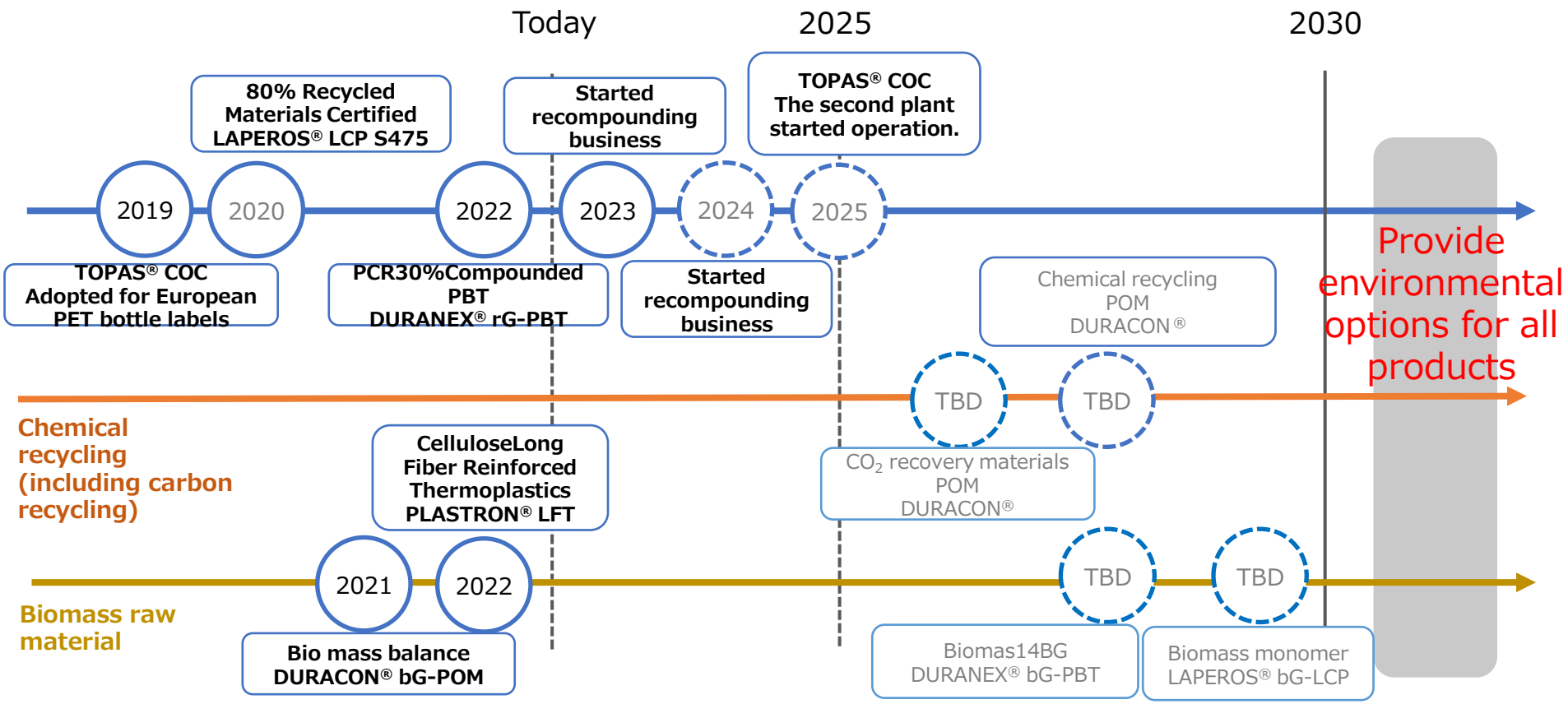
We will start a "recompounding" business that uses waste engineering plastics as raw material under controlling compounding process equivalent to that for virgin products.



Timeline for provision of environmental solutions



Notes Regarding Forward-Looking Statements

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