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December 17, 2024

Kuraray Management Briefing

KURARAY CO., LTD.



Today's Theme

Growth opportunities for GenestarTM

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President and Representative Director

Yoji Ikemori

Managing Executive Officer
President of Isoprene Company and
General Manager of Genestar Division



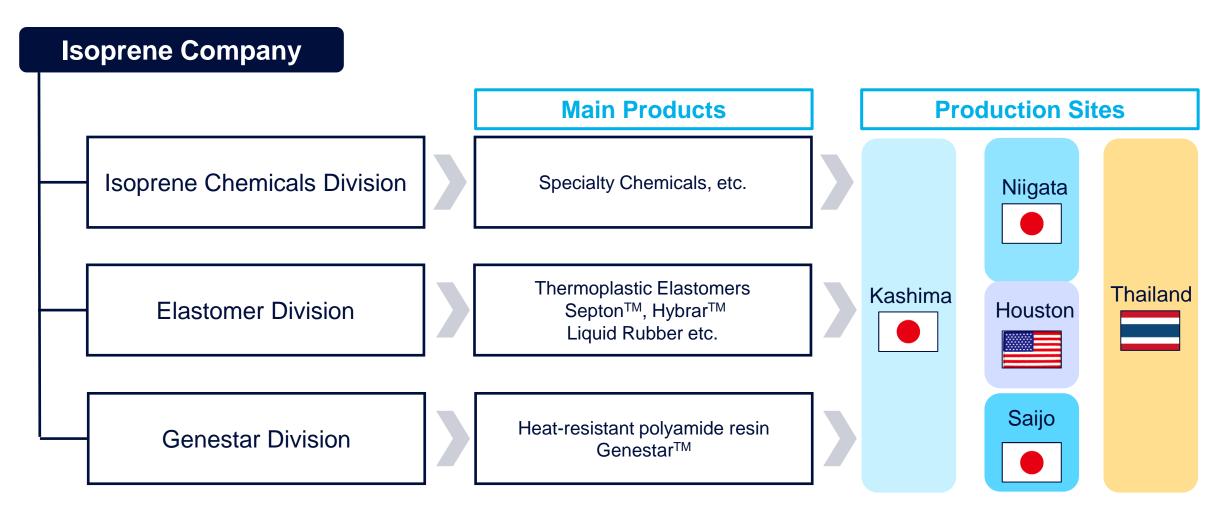
Growth opportunities for GenestarTM



Overview of Isoprene Company



Overview of Isoprene Company Business



Business development using C4 fractions (butadiene and isobutylene) as raw materials

Overview of Production Site in Thailand

Place : Map Ta Phut, Rayong Province, Thailand

(WHA Eastern Industrial Estate within the petrochemical complex)

Start of operation : In stages from February 2023

Production Capacity : Kuraray Advanced Chemicals(Thailand)

Isobutylene derivative MPD (production capacity: 5,000t/y)

: Kuraray GC Advanced Materials

Hydrogenated styrenic block copolymer Septon™ (production capacity 16,000t/y)

Heat-resistant polyamide resin Genestar™ (production capacity 13,000t/y)

Investment amount : Approx. 60 billion JPY (Kuraray's expense: approx. 40 billion JPY)

****Calculated using the exchange rate as of the date of the investment decision, December 26, 2018)**

Thailand NAKHON SURIN RATCHASIMA SI SA KET Phra Nakhon Si Ayutthaya เหตุบาลบลุร พระบลรสริมุยมา สมบุร Bangkok กรุงเทพบุทหาบคร RATCHABURI Pattaya itv aywint Si SA KET Cambodia PRACHUAP

[New Production Site in Thailand]



Thailand Business Scheme

GC*1

Brand strength in Thailand/Southeast Asia

GC

PTT Group

Butadiene

Utilities, etc.

Isobutylene

Kuraray

Production technology, R&D and marketing capabilities

Sumitomo Corporation

Global sales channel

Kuraray GC Advanced Materials Kuraray (53.3%), GC (33.4%), Sumitomo Corporation (13.3%)

GenestarTM Production capacity 13,000 t/y

Septon[™] Production capacity 16,000 t/y

Kuraray Advanced Chemicals (Thailand) Kuraray (100%)

MPD Production capacity 5,000 t/y

Global business expansion



Genestar™

^{*1} PTT Global Chemical Public Company Ltd.

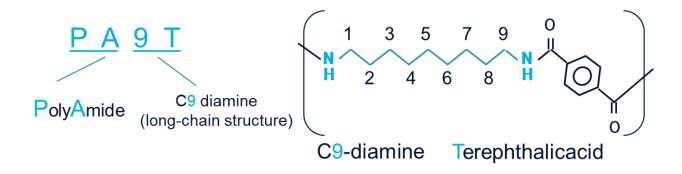
^{*2} The numbers in parentheses indicate investment ratios.

Growth Opportunities for GenestarTM



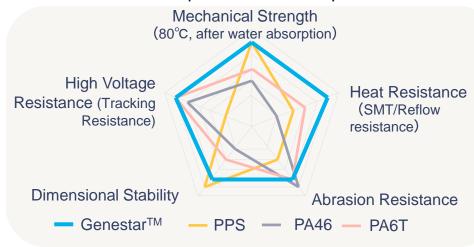
What is Genestar™?

 Heat-resistant polyamide resin (PA9T) developed from Kuraray's unique monomer



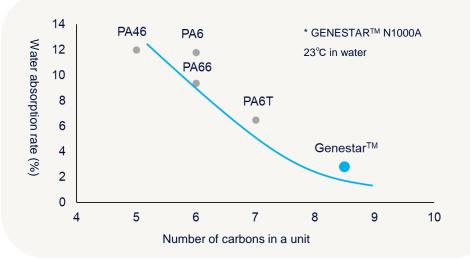
- Adoption of GenestarTM is expanding across various fields due to its well-balanced high physical properties, such as strength, heat resistance, and abrasion resistance.
- Exhibits the lowest level of water absorption among heat-resistant polyamides.

【Genestar™ Comparison with Competitive Resins】



Genestar[™] shows well-balanced property

[Polyamide Resin Water Absorption Comparison]

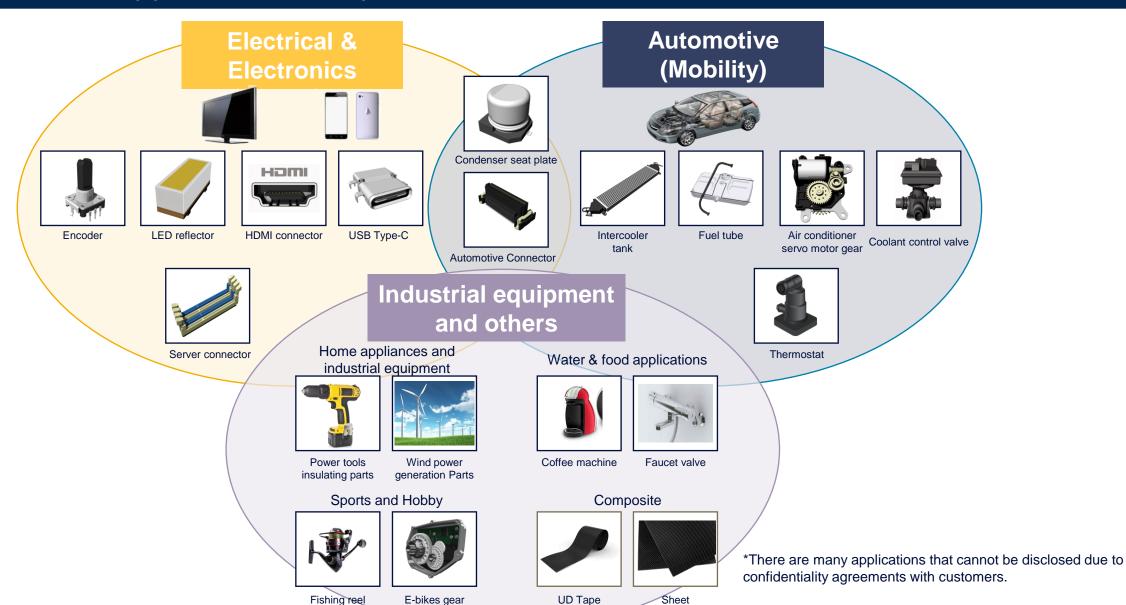


Sales & Marketing and Technical Service Network



- Established a BCP system by operating production at two locations in Japan and one location in Thailand
- Accelerating global expansion by leveraging our global network of 13 locations in 10 countries

GenestarTM Application Examples



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Genestar™

Market Trends and Market Development of Genestar™

	Market trends			×	Driving force Component trends		×	Advantages of Genestar™		→	Expanding adoption of Genestar™	
	Market Trends			•	Driving force Parts Trend		•	Target parts	Material Needs	•	Advantages over competing resins	
Automobile	Envir	Stricter regulations (CO ₂ reduction /fuel evaporation)			Computerization Weight reduction	Miniaturization Resinization		Gear	Dimensional stability High temperature strength		PA46/6T POM	Dimensional stability Strength
	Environment				Exhaust gas/ fuel evaporation reduction	Resinization High barrier		Fuel tube	Barrier property		PA11/12	Fuel barrier property
	Safety	CASE*			Computarization	More electronic		Automobile	Dimensional stability Strength SMTcapability		PA46/6T	Dimensional stability
	ety				Computerization	parts		connector		LCP	Strength	
Next-gen. automobile	EV	Extended cruising range	Better electricity (fuel)		Thermal	Precise control		Cooling valve	Dimensional stability Forced extraction Laser welding Physical stability	PPS	Forced extraction	
			efficiency		management						PA6T	Dimensional stability
			Car body weight reduction		Multimaterial (Iron, aluminum, resin)	Resinization (CFRTP)		Body structure materials		PA6	Physical stability	
		Reduction of charging time			Fast charging	High-voltage implementation		High voltage components	High voltage resistance Insulation stability		PPS	High voltage resistance
					(High voltage)					•	PA46/PA6T	Insulation stability
_	$\overline{}$	High speed/capacity communication			5 G	Advancement of SMT	Server	Dimensional stability		PA46/6T	Dimensional stability	
nach	E C				communications Generative AI			Connectors	Strength Heat resistance		LCP	Strength
machinery	communication Advanced, Multifunctional				Higher output of	High current Miniaturization		Industrial	High voltage resistance Dimensional stability		PPS	High voltage resistance
<u> </u>		Multifunctional Industrial Equipment			power modules			equipment			PA6T	Dimensional stability

*CASE : Connected, Autonomous, Shared, and Electric

Mobility 1 Thermal Management Components

Market Trends

Driving Force

Parts Trend

Material Needs

Better electricity (fuel) efficiency (Extension of cruising range)

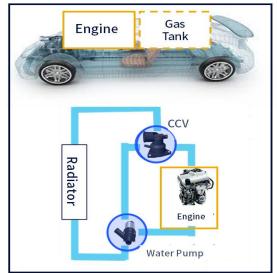
Thermal management

Precise control

Dimensional stability Forced extraction Laser welding

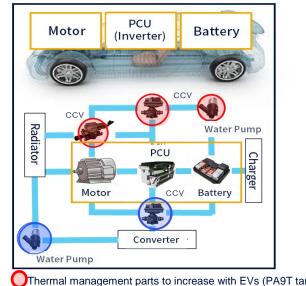
- Increasing number of thermal management components for more efficient thermal management to extend cruising range
- Progress in the use of plastic parts for weight reduction of car body
- Expanding adoption by leveraging GenestarTM's dimensional stability, strength and laser transparency

[ICE Vehicle Thermal Management Components]

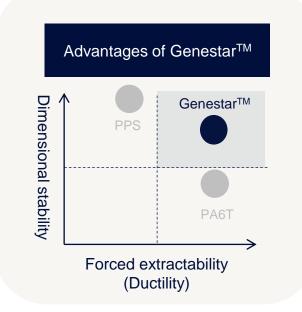


※CCV: Coolant Control Valve

[BEV/HEV Thermal Management Components]



Thermal management parts to increase with EVs (PA9T target parts)



Mobility ② Gear Parts for Automobile and Other Uses

Market Trends

Driving Force

Parts Trend

Material Needs

Stricter regulations (CO2 reduction)

Weight reduction

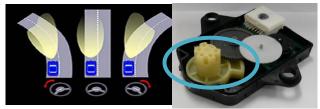
Miniaturization Resinization

Dimensional stability
Strength

- Progress in vehicle weight reduction through miniaturization and resinization to comply with stricter CO2 emission regulations.
- Increase in gear parts due to the advancement of functionality and electronic control of vehicles
- Miniaturization and resinization of gears by leveraging GenestarTM's dimensional stability and strength.

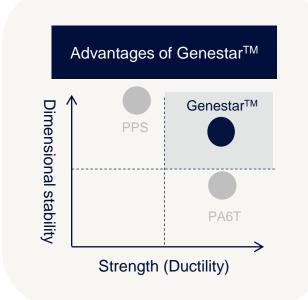
(Conventional) General-engineering plastics Insufficient strength. Difficult to miniaturize gears (Miniaturization) By GenestarTM 40% smaller component by gear miniaturization

Headlamp actuator gear



Located directly under the heatgenerating headlamps, requiring heat resistance and strength in hightemperature environments exceeding 100°C

*Headlamp actuator Improves visibility during cornering by directing light towards the steering direction. Increasingly common in general vehicles.



Genestar™

Mobility 3 Fuel Tube for Automobiles and Other Uses

Market Trends

Driving Force

Parts Trend

Material Needs

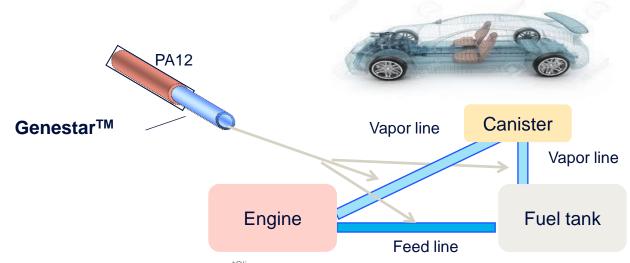
Stricter regulations (Reduction of fuel evaporation)

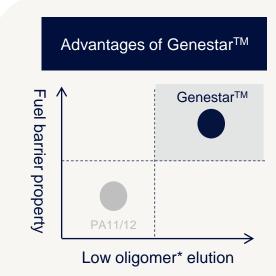
Exhaust gas/ fuel evaporation reduction

Resinization High barrier

Fuel barrier property

- Increasing need for fuel line barriers due to further stricter emission regulations
- Adoption of GenestarTM is expanding due to its high fuel barrier property
- Extrusion moldability + high barrier material characteristics have led to increasing use in various tube/pipe applications other than automobiles





*Oligomers

A low molecular weight component of a polymer (macromolecule). In order to improve combustion efficiency, injectable fuels are increasingly atomized, and oligomers eluted from piping resin into fuel may cause clogging of injection holes.

Mobility 4 Automobile Connectors

Market Trends

Driving Force

Parts Trend

Material Needs

CASE*

Computerization

More electronic parts

Dimensional stability
Strength
SMT capability

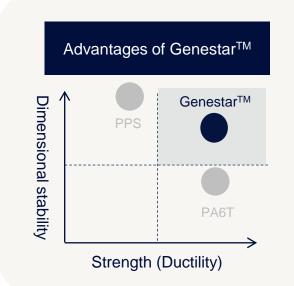
- Increased number of electrical components due to progress in automotive CASE
- SMT for automotive electrical components saves space, reduces size, and improves productivity
- The dimensional stability and strength of GenestarTM have been highly appreciated and its adoption has expanded











*CASE: Connected, Autonomous, Shared, and Electric



Genestar™

Mobility (5) High-voltage components (EV)

Market Trends

Driving Force

Parts Trend

Material Needs

Reduction of charging time

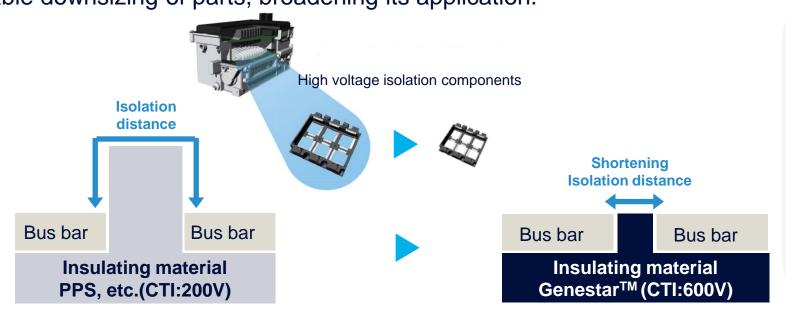
High-voltage component (Insulation)

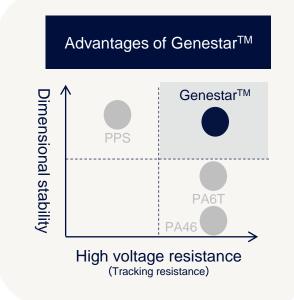
Downsizing by shortened insulation distance

High voltage resistance Insulation Stability

- To reduce charging time (fast charging), EVs will increasingly adopt high-voltage systems of 800V or more.
- Increasing needs for materials with high voltage (tracking) resistance for high-voltage components for safety and miniaturization

■ The high-voltage resistance and low water-absorption properties of GenestarTM provides stable insulation enable downsizing of parts, broadening its application.





Electrical and electronics Connectors for servers

Market Trends

Driving Force

Parts Trend

Material Needs

High speed/capacity communication

5G communications Generative Al

Advancement of SMT

Dimensional stability
Strength
Heat resistance

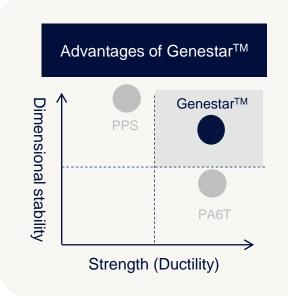
- Demand for servers is growing rapidly due to high-speed, large-capacity communications (e.g., 5G communications) and support for generative AI.
- Connectors for servers standardized with SMT, thus high heat resistance is essential
- ◆ The dimensional stability (low water absorption) and strength of Genestar[™] are highly appreciated and became de facto





Servers Connectors (DDR connector)

※DDR: Double-Data-Rate



Industrial Equipment

Various Parts

Market Trends

Driving Force

Parts Trend

Material Needs

Advanced, Multifunctional Industrial Equipment

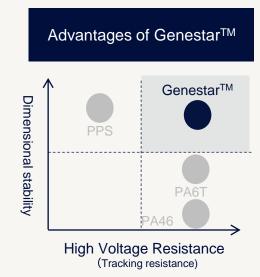
Higher output of power modules

High current Miniaturization

High voltage resistance Insulation Stability

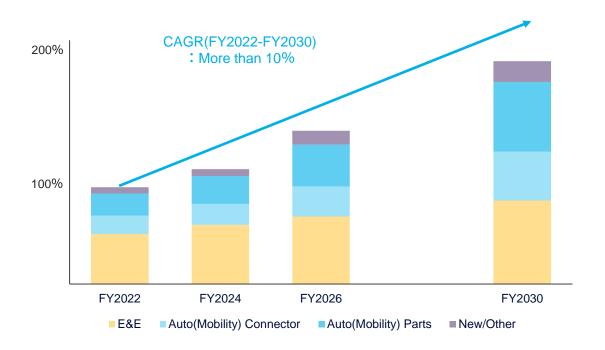
- Increasing power modules due to advancement and multifunctionalization of industrial equipment (electric railway, wind power generation, etc.)
- Expanding needs for high-voltage resistance (tracking resistance) materials to save space
- The high-voltage resistance and low water-absorption properties of the GenestarTM enable downsizing of parts and increasing adoption





Future Development of Genestar Business

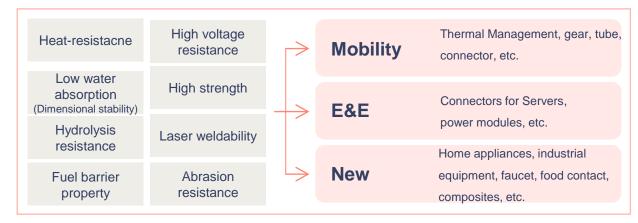
Growth Forecast* of Genestar Business



^{*}Image of sales volume expansion with FY2022 as 100%

Achieved CAGR of 10% (FY 2022-2024) Continued 10% growth is expected

- Increased adoption of auto parts due to weight reduction, electronic control, and electrification(EV)
- Further expansion into global markets including EU, US, and Asia
- Consideration of second phase expansion of Thailand plant





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- All figures are rounded to the nearest hundred million yen.
- The performance forecasts, outlooks, and business plans described in this document are based on current assumptions and estimates regarding future business environments and economic conditions. Please be aware that actual performance may differ from these projections.