



Energy & Functional Materials

Contribute to Solving Environmental and Energy Issues through Research and Development with a Long-term Perspective and the Resulting Innovative Technologies

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Primary Focus SDGs



Business Activities

The Energy & Functional Materials Sector sells high-performance materials, such as battery materials and super engineering plastics, and provides solutions to improve the performance of eco-friendly products, such as electric vehicles.

Core Competence

A major core competency of this sector is its global business development capability, as shown by products where we hold the top global market share, such as high-purity alumina and resorcinol, and also by our separators for lithium-ion secondary batteries, which offer world-class heat resistance. The above products are also the results of our other core competencies: our research and development capabilities as well as our evaluation, manufacturing, and process technologies.

Basic Strategy

This sector's medium-term strategy is to continue to expend every effort in investing its management resources specifically in those fields in which Sumitomo Chemical can offer comparative advantages technologically, and where growth can be expected in those businesses. At the same time, we are working to restructure businesses that have become unprofitable.

Initiatives in Fiscal 2019

In fiscal 2019, sales of resorcinol were solid. In the area of cathode materials for lithium-ion secondary batteries for vehicle use, where growth is expected, Tanaka Chemical Corporation, our subsidiary, concluded an agreement with a European battery manufacturer to sell and support the technology to manufacture precursors for cathode materials.

Issues in the Future

For separators and cathode materials for battery components, we are accelerating development in order to commercialize next-generation secondary batteries, in addition to strengthening competitiveness with technological development. For super engineering plastics, we are promoting development of 5G substrates and automotive component applications to expand sales. We are thoroughly pursuing business opportunities, including M&A, from a mid- to long-term perspective to increase our presence, particularly in these growth areas. We will secure and enhance stable profitability by improving our sales portfolios and thoroughly rationalizing production costs.

Long-term Vision

Our aim is to contribute to solving global environmental and energy issues through research and development with a long-term perspective and the resulting innovative technologies.

Corporate Business Plan for FY2019-FY2021

Action Plan	Major Issues	Corporate Business Plan for FY2019-FY2021: Sector Goals FY2021 Target			
		FY2019	In Comparison to FY2018		
(Billions of yen)					
● Expand sales of core products (battery materials, super engineering plastics, etc.), accelerate R&D	● Create new businesses in the fields of environment and energy and high-performance materials	Sales revenue	255.0	-27.8	390.0
● Shift to high value-added products		Core operating income	20.3	-2.6	31.0
● Improve profitability in underperforming businesses and products		Sales revenue of SSS*-designated products	47.8	-6.9	95.0
* Sumika Sustainable Solutions					

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SWOT Analyses of the Major Businesses

- Superior product performance using differentiated technologies
- Reliability of products proved in use by customers



- Relatively small business
- Cost competitiveness

- Sophistication of performance requirements against the backdrop of increasing battery capacity
- Expansion of the environment- and energy-related markets

- Market decline due to change in EV promotion policies
- Paradigm shift in secondary batteries

Product Introduction

■ Advanced Polymers Business [Liquid Crystal Polymer (LCP) and Polyether Sulfone (PES)]

LCP	LCP is a super engineering plastic, which features excellent heat resistance, fluidity, and dimensional stability, and which is mainly used in electronic components, such as connectors.
PES	PES is a super engineering plastic, which features excellent heat resistance, creep resistance, dimensional stability, flame retardance, and water resistance, and which is used in applications such as carbon fiber composite materials in aircraft.



Super engineering plastics

■ Specialty Chemical Business [Resorcinol, High Polymer Additives, Dyes, and Emulsions]

Resorcinol	Resorcinol is a raw material for adhesives for tires and ultraviolet absorbers, which Sumitomo Chemical supplies all over the world.
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Resorcinol

■ Inorganic Materials Business [High Purity Alumina, Low Soda Alumina, Aluminum Hydroxide, and High Purity Aluminum]

High Purity Alumina	Sumitomo Chemical's high purity alumina has a purity of 99.99% or more, and is used in lithium-ion secondary battery components.
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Alumina products

■ Battery Materials Business [Separators and Cathode Materials]

Separators	Separators are safety components, isolating the positive and negative electrodes of batteries and ensuring ion conductivity between the electrodes by preserving the electrolyte and preventing short circuits.
Cathode Materials	Cathode materials are used in functional components, releasing and accepting lithium ions when batteries are charged or discharged, and they are manufactured and marketed mainly by our subsidiary, Tanaka Chemical Corporation.



Pervio® separators for lithium-ion secondary batteries

Market Environment and Strategy for Major Businesses

■ Advanced Polymers Business

LCP and PES share common features including heat resistance, fluidity, and flame retardance, and demand for both is expanding because they are expected to reduce the weights of products in downstream applications and reduce processing costs. New uses have been cultivated for LCP, such as a 5G substrate, taking advantage of the superior electrical properties of LCP. For PES, new uses are envisaged in automotive components.

■ Battery Materials Business

Our separators have been highly regarded by battery manufacturers for their outstanding heat resistance, reliability and safety, and they are particularly suitable for high-capacity batteries. As such, demand is growing for eco-friendly cars, such as electric vehicles, and the production capacity of a plant in South Korea, set up in autumn 2016, has been expanded in a phased manner. For cathode materials, we are targeting eco-friendly cars, and are developing new products with high capacity and low electric resistance while also expanding our production capacity.

Value Creation Model: Separators

System for Providing Added Value

Major Management Resources (Input)

Intellectual Capital

Sumitomo Chemical holds a basic patent for the aramid coating process. With this patent, we are able to provide added value to customers that is unlike that of ceramic separators from other companies.

Human Capital

Sumitomo Chemical has operators with advanced techniques and experience to produce high quality products. We are focusing on technical guidance from veteran to novice operators so as to pass on the techniques.

Value Chain



Suppliers

Raw material manufacturers for base film and aramid resin



Sumitomo Chemical Ohe Works



SSLM Co., Ltd.

Sumitomo Chemical's Competitive Advantages

Competitive Conditions in the Market

The use of coated separators has become mainstream for automotive lithium-ion secondary batteries. In addition to Sumitomo Chemical's aramid separators, coated separators also include ceramic separators, and the majority of the several dozen separator manufacturers around the world manufacture ceramic separators. However, there are only a limited number of manufacturers capable of producing separators used for high capacity automotive batteries like ours.

Competitive Advantages

Since our aramid separator is superior to ceramic separators in safety (heat resistance) and can reduce the overall weight of an electric vehicle by a couple of kilograms, it is highly regarded by customers.

Initiatives to Enhance Competitive Advantages

In order to further strengthen the superiority of our aramid separator, we are conducting research to enhance the strength of the separators and reduce their thickness. In addition, we are working on development to improve the performance of the separators by using the optimal composition of aramid resin.

Major Processes Generating Competitive Advantages

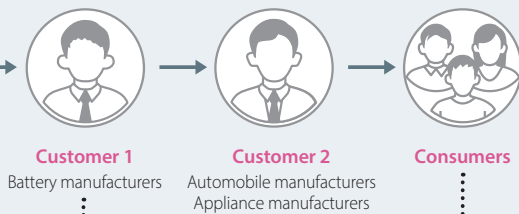
Production: Sumitomo Chemical is not only conducting research and development of separators but also working on improving productivity. We are capable of applying a uniform aramid coating with industry-leading speed, while maintaining high quality. Productivity at the plant of SSLM in South Korea has tripled since 2015 due to factors such as more advanced techniques, accumulated experience, and improvements in coating equipment. We expect further productivity improvement in the future.

Earnings Structure and Role in Driving Income

With the spread of eco-friendly vehicles, the separator market is also expanding. Sumitomo Chemical aims to expand sales through increased demand from existing customers as well as reaching out to new customers. In addition, we are considering increasing the production capacity of our in-house base film, which offers outstanding cost competitiveness.

Added Value Provided to Society

Sumitomo Chemical purchases raw materials, and manufactures substrates for separators and aramid resin. The company produces aramid separators by coating both substrates manufactured in-house and purchased substrates with aramid resin. Battery manufacturers combine these separators with other components to make lithium-ion secondary batteries, which are widely used in automobiles and energy storage systems (ESS).



Customer and Consumer Needs

Customers and consumers are demanding eco-friendly vehicles with long cruising ranges and low fuel consumption. Safe, high capacity batteries are indispensable for that sort of vehicle. For this reason, our direct customers, the battery manufacturers, seek to manufacture batteries that provide that performance at the lowest possible cost.

Providing Customer Value

In order for battery manufacturers to make safe, high capacity products, Sumitomo Chemical provides thin separators with high heat resistance. Furthermore, we strive to improve productivity in order to provide products with outstanding cost competitiveness. In addition, the company elicits new needs from customers in regular meetings, and works to develop products to meet those needs.



Contributing to Measures Against Climate Change through the Separator Business

Sumitomo Chemical has raised "contribution to reducing environmental impact" as one of the material issues to be addressed as management priorities. With more rigorous environmental regulations being put in place all over the world, the shift to eco-friendly cars is accelerating. Eco-friendly cars loaded with lithium-ion secondary batteries can reduce energy consumption as compared with gasoline cars. Separators are essential components in creating highly safe lithium-ion secondary batteries, and are indispensable for eco-friendly cars to gain ground. The company contributes to measures against climate change through its separator business.



Pervio® separators for lithium-ion secondary batteries