



Vice President and Executive Officer
General Manager,
Advanced Performance Materials
Business Headquarters
Hiroyuki Morishima

Functional Materials

Basic Policies of the 2018 Medium-term Management Plan
Strengthen key businesses through Niche and Cluster strategies

Strengths

- A wide array of material technologies
- Product functions and design excellence of product forms
- Semiconductor packaging materials, process technologies and state-of-the-art simulation evaluation facilities
- Ability to offer proposals suited to customer needs

Weaknesses

- Delay in taking actions toward the diverse needs by overemphasizing the self-sufficiency principle
- Dispersion of development/marketing resources through multi-axial deployment of businesses

Opportunities

- Growth in the semiconductor package market
- Increased environmental regulations and raised environmental awareness
- High value-added products expected

Threats

- Increased competition (products, services, and prices) in main product areas
- Decelerated growth rate of Chinese economy

Outcomes and Strategies of the 2018 Medium-term Management Plan

FY2016 Progress	Initiatives for FY2017	Goals for FY2018	Goals for the 10-year Strategy
<p>Niche products</p> <p>Anisotropic conductive films</p> <ul style="list-style-type: none"> • Started mass production and sale of new products for high-definition displays <p>CMP slurries</p> <ul style="list-style-type: none"> • Adopted new products for next-generation semiconductor processes • Developed and began sale of nanoceria slurry, which reduces abrasion <p>Carbon anode materials for lithium ion batteries</p> <ul style="list-style-type: none"> • Secured demand for automotive applications and enhanced production capabilities <p>Cluster businesses</p> <p>Semiconductor packaging materials</p> <ul style="list-style-type: none"> • Sharply increased sales of packaging materials • Launched collaborative project to create next-generation packaging • Decided on relocation and expansion of Open Laboratory <p>High functional resins</p> <ul style="list-style-type: none"> • Completed grand design for cluster strategy 	<ul style="list-style-type: none"> • Expand share by increasing sales of new products • Increase sales of nanoceria slurry • Further enhance production capabilities • Develop and commercialize next-generation packaging materials and processes • Launch new businesses through use of Open Innovation • Propose optimal solutions for automotive applications 	<p>Niche and Cluster Strategies that take advantage of M&As and alliances have had impact, and business is expanding at a pace exceeding the market growth rate.</p> <ul style="list-style-type: none"> • Semiconductor packaging materials: de facto standardization is achieved in next-generation packaging technology through collaborative creation using outside resources • High functional resins: adhesives and insulating varnishes have entered the U.S. and European markets and sales have increased • Niche products: global top share has been maintained and expanded by erecting higher barriers for entry 	<p>Establish top-class profitability and scale, and become a functional materials manufacturer with a global presence</p> <ul style="list-style-type: none"> • Capture the overwhelming No. 1 position in semiconductor packaging materials • Become one of the world's top-class manufacturers of high functional resins • Expand highly profitable businesses organically or inorganically in growing markets

M&A/Alliance strategies

The Functional Materials Business will focus on "expanding alliances across the entire value chain" and "gaining global competitive advantage through increased scale," and will acquire technologies, business platforms and foundations from outside resources.

ROIC (FY2016)

30.1%

(FY2018 Target: 27%)

ROIC is managed by referring to the ROIC of our competitors. We plan to further improve our ROIC going forward.

Fiscal Year 2016 Progress

In Niche products, the Company, in keeping with the trend for higher definition flat panel displays, commenced the mass production of a new type of anisotropic conductive film that enables the connectivity of even smaller microcircuits with higher reliability. The sales of nanoceria slurry, which reduces abrasion, was also commenced. Additionally, the production capacity for carbon anode materials for lithium ion batteries was augmented in anticipation of the widespread use of electric vehicles. In the Cluster businesses, sales of semiconductor packaging materials increased sharply in the packaging materials cluster, while a collaborative creation project of next-generation semiconductor packaging began, led by the Company in concert with materials manufacturers and equipment manufacturers. In conjunction with this project, the Company decided to relocate its Open Laboratory for Semiconductor Packaging Materials, a R&D base, to a more convenient location in Kawasaki, Kanagawa Prefecture.

ture, with the goal of improving the efficiency of R&D. In the high functional resins cluster, the grand design for the strategy to be deployed from fiscal year 2017 was completed.

Total solutions through the collaborative project to create next-generation semiconductor packaging

Process	Chip lamination			Sealing				Debonding	Circuit formation		
Equipment	Mounter	Temporary/fixing material	Carrier	Mold	Grinder	Molding compounds	Mold release film	Debonder	Exposure system	Photosensitive dry film	Insulating film
Materials											
Hitachi Chemical	—	○	—	—	—	○	○	—	—	○	○
Collaborative creation (Materials/Equipment)	○	○	○	○	○	○	—	○	○	—	—

Key Measures for Fiscal Year 2017

Strengthen key businesses through Niche and Cluster Strategies

In Niche products, we will focus on growing fields in an effort to realize further growth. In display-related products, we will focus on increasing sales of the new type of anisotropic conductive film, while at the same time concentrating our efforts on the early launch of a new type of film capable of enhancing the productivity of touch panels, the color of LCD displays, and expand our share through increased sales of new products. In terms of carbon anode materials for lithium ion batteries, we are considering further enhancement of production capabilities in order to meet increasing demand.

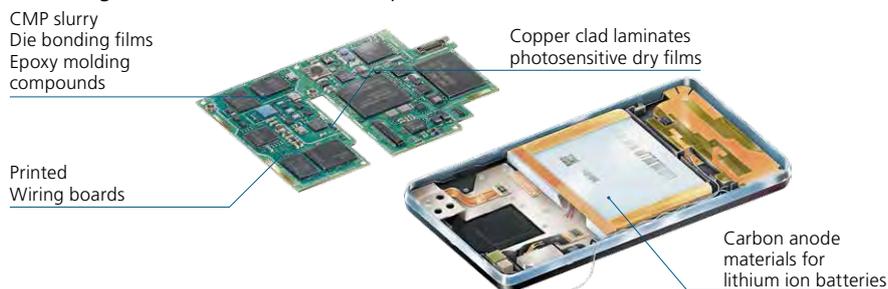
Meanwhile, in the Cluster businesses, we are proactively promoting collaborative creation with outside resources in the semiconductor packaging field in order to accelerate our efforts to establish new semiconductor packaging processes. In addition, we have started the relocation of the Open Laboratory as planned. Additionally, in the high functional resins field, we are launching new businesses through the use of Open Innovation including alliances with other companies.

Strengthening our capabilities to create customer-tailored proposals through our Open Laboratory

The Open Laboratory is equipped with state-of-the-art production facilities and evaluation equipment used in the back-end process of semiconductor manufacturing. At the Open Laboratory, engineers from our customers, suppliers and equipments and materials manufacturers can join in to produce and evaluate prototypes of semiconductor packaging. The Company is aiming to become a solutions provider for process development and solidify its position in the industry.

Product examples: Materials field geared toward people-friendly IT interface devices and systems

Hitachi Chemical is taking advantage of state-of-the-art material technologies to develop products that will contribute to solving various problems. For example, many of the crucial components of semiconductors, which act as the brain for electric and electronic equipment, use Hitachi Chemical products. Going forward, Hitachi Chemical will aim to "Improve Quality of Life (QOL)" and "Realize the Sustainable Environment" and further accelerate the development of materials that will contribute to faster and larger-volume telecommunications through the expanded use of IoT and big data, and to higher definition, higher function and more compact 8K TVs and wearable devices.



For information on the expansion and the relocation of the Open Laboratory for Semiconductor Packaging Materials, refer to P.06.

Major Products

Anisotropic Conductive Films

These are circuit connecting materials for displays. Both electrical conductivity and insulation property are achieved while these films connect batches of very small electrodes in micrometer order. Widely used in smart phones, LCDs and other devices, these films make higher definition images and smaller, thinner devices.



CMP Slurries

These are polishing liquids to make course surfaces smooth when semiconductor circuits are formed. Utilizing both inorganic and organic material technologies, the mechanical action of polishing grains and the chemical action of liquid components are optimized. High-speed polishing is attained, minimizing wafer flaws.



Carbon Anode Materials for Lithium Ion Batteries

Graphite materials are the keys to larger capacity and longer life of lithium-ion batteries. Our carbon synthesis technology and particle design technology gained in the development process of carbon brushes are used in the design of internal structures for efficient inward and outward movement of lithium ions.

