Performance Products Domain

We are maximizing *KAITEKI* Value by providing differentiated, high-performance solutions utilizing the Group's wide range of products and technologies.

Business Lines by Segment

Electronics Applications

With technologies such as material design, processing, and device-making, our high-value-added products centered on information technology and electronics are provided in a wide array of areas.

Designed Materials

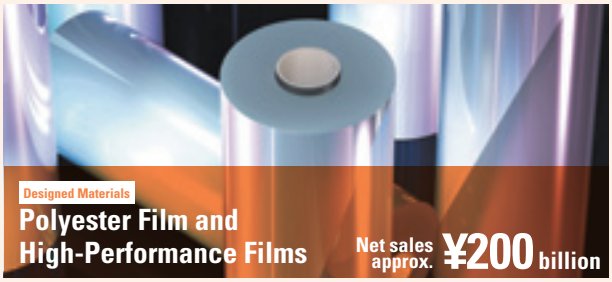
Based on solid technologies including molecular design technology, functional design technology, and polymer processing technology, accumulated over many years, the Designed Materials segment is developing a variety of products such as composite materials, inorganic chemicals, polymer processing products, and films.

Hiroaki Ishizuka
President and Chief Executive Officer, MCC

Takumi Ubagai
President and Chief Executive Officer, MPI

Hitoshi Ochi
President and Chief Executive Officer, MRC

Main Businesses and Products

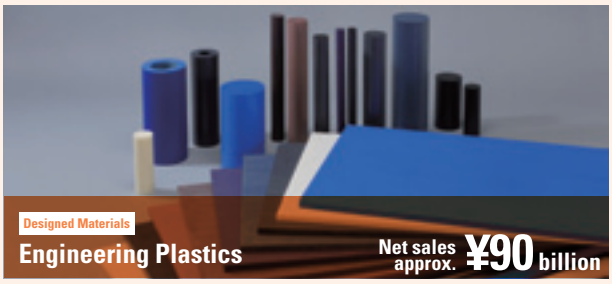


Fusion of three core technologies

We combine the MCHC Group's proprietary material technologies, long-standing film production technologies, and various high performance technologies in an optimal way to provide numerous high-value-added products that have secured a significant share of their respective markets.

Developing business with two types of carbon fiber materials

We have capabilities in both pitch-based and PAN-based carbon fibers. These are the basic materials in a unified product chain extending from intermediate materials to mold processed products, which is utilized in a wide array of applications including aircraft, satellites, automobiles, wind turbines, pressure vessels, industrial materials, and sporting goods.



Bases in 20 countries

The Quadrant Group is a global leader in high-performance plastic materials. With bases in 20 countries it is engaged in businesses such as engineering plastic processed products, glass fiber composite materials, and molded products.

Providing three key materials

We respond to increasing customer needs based on high technical capabilities, which comprehensively cover all processes from materials development to safety evaluations, and utilize our global supply network to provide the three key materials for lithium-ion rechargeable batteries: electrolytes, anode materials, and separators.

Opportunities and Risks

Strengths

- Ability to create solutions for saving and storing energy by leveraging the Group's extremely broad technology base and business foundation
- Strong market position in high-performance films, especially for optical applications
- Strong market position for wide businesses ranging from high-performance engineering plastic materials to mold processing field
- Dual carbon fiber product line and capability to meet market needs ranging to molding solutions

Growth Opportunities

- Market needs becoming more sophisticated and diverse as the Green Business market expands
- Business network capable of responding to growing global demand (high-performance films, high-performance engineering plastics, carbon fibers)
- Expanding demand for carbon fiber (particularly in automobiles, wind turbines, pressure vessels and other industrial sectors)

Risks

- Unexpectedly rapid technological innovation and changes in market conditions, especially in the electronics field
- Competing products in high-performance films, high-performance engineering plastics and carbon fibers
- Need to build a global supply framework for carbon fibers to respond to sharp growth in demand
- Growth in high-performance film in the flat panel display (FPD) field is expected to be the impact of short-term demand, changing technologies and deceleration of growth for the medium- to long-term

Review of Segments in Fiscal 2015

Refer to page 76 for a breakdown of performance by segment.

Electronics Applications

Net Sales

¥115.6 billion

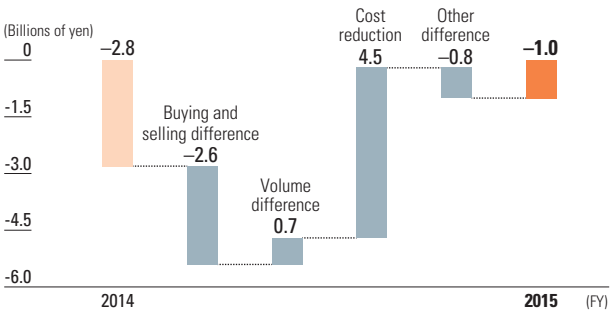
YoY -2.6%

Operating Loss

-¥0.9 billion

YoY +63.7%

Contributing Factors to Operating Income
(Figures disclosed in MCHC operating summaries)



Designed Materials

Net Sales

¥852.5 billion

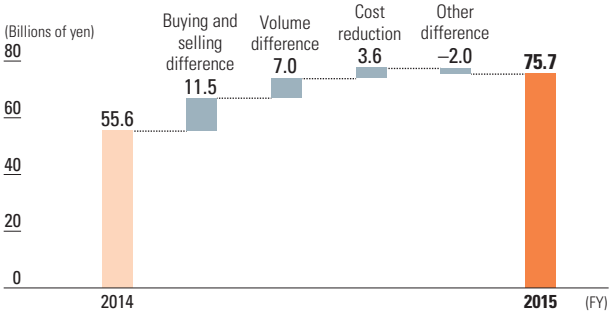
YoY +4.1%

Operating Income

¥75.7 billion

YoY +36.1%

Contributing Factors to Operating Income
(Figures disclosed in MCHC operating summaries)

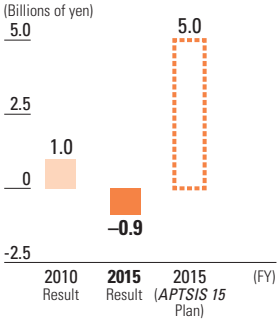


(Notes) 1. Other difference includes accounting period alterations.
2. In fiscal 2015, some businesses were moved from the Chemicals and Others segment to the Designed Materials segment and Polymers segment. Accordingly, figures for fiscal 2014 have been restated to facilitate comparisons.

APTSIS 15 Step 2 Review and Forecast

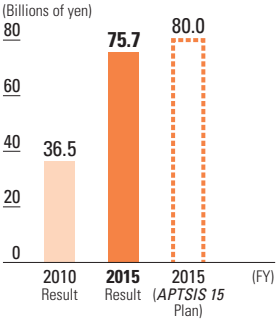
Electronics Applications

Operating Income



Designed Materials

Operating Income



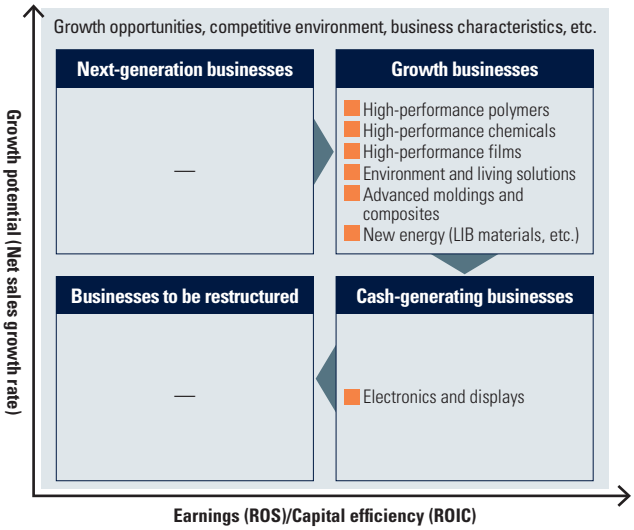
In Electronics Applications, delays in achieving profitability in new next-generation growth businesses resulted in falling ¥6.0 billion short of the *APTSIS 15* operating income target.

Designed Materials saw films for optical applications and engineering plastics grow significantly, but aqua solutions and other areas did not grow as initially forecast, resulting in a ¥4.3 billion shortfall against the *APTSIS 15* operating income target.

Market conditions change rapidly in the business environment encompassing our segment, but looking ahead, we will grasp customer needs more accurately and provide solutions to accelerate global development and advance technical innovation.

Growth Strategies

Business Portfolios (by Business Unit)



Policy

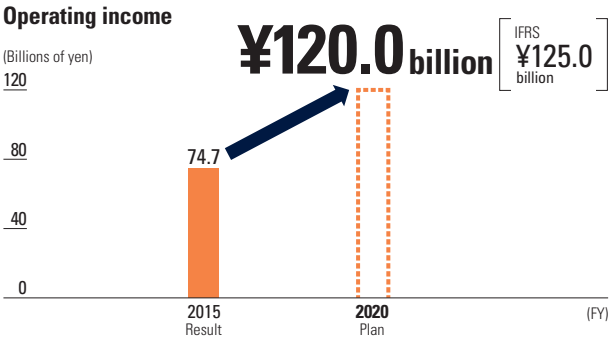
- **Accelerate growth by generating synergies, and supply high-performance products/solutions globally to growth markets**

Key Strategies

- **Expand high-performance, high-value-added products business and solutions business**
- **Accelerate global development**
- **Strengthen innovation by integration of three chemical operating companies**
- **Achieve profitability of new energy businesses at an early stage**

Plan Values *APTSIS 20* Five-Year Plan (J-GAAP)

Operating income



Investment amount (Five-year plan, total)

¥390.0 billion

R&D investment (Five-year plan, total)

¥170.0 billion

APTSIS 20 Action Plans

High-Performance Polymers
Expand global market share in performance polymers (increase sales by 50%)

High-Performance Chemicals
Increase sales by 1.5x in the food ingredients business from the acquisition of Eisai Food & Chemical Co., Ltd.

Electronics and Displays
Secure 30% share of polyester film for FPDs in fiscal 2020

High-Performance Films
Increase ratio of overseas sales to 35% in fiscal 2020

Environment and Living Solutions
Aim for net sales of ¥100 billion in aqua and separator solutions fields

Advanced Moldings and Composites
Increase sales of high-performance engineering plastic products by 20% above current levels in fiscal 2020 through M&A in the aircraft and medical fields as well as business expansion in developing countries

New Energy
For lithium-ion battery materials, secure shares of 40% in electrolytes and 20% in anode materials by fiscal 2020 in growing target markets (automobiles)

FOCUS | High-Performance Films

Priority Measures

Securing a leading position in Japan and accelerating global business development with higher-performance products

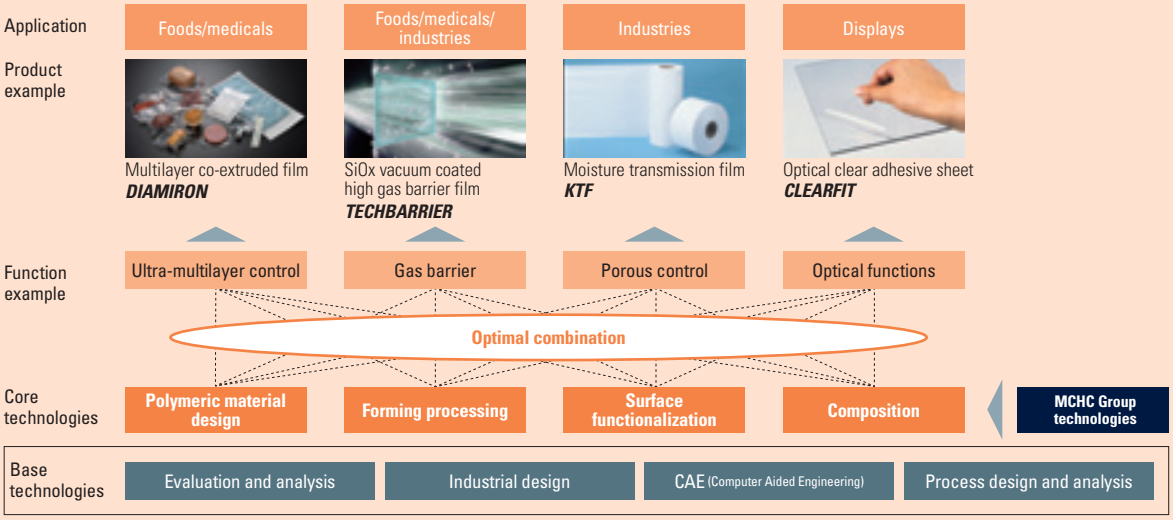
In the field of high-performance films, we offer a wide variety of high-value-added products with added functionalities, such as gas barrier, porous control, multiple layers, and optical properties, applied through the optimal combination of technologies that are a source of strength for the MCHC Group, including polymeric material design, formation and processing, surface treatment, and composition. These products contribute to earnings with high market shares in foods, industries, medicals and displays.

Demand in the Japanese market is likely to weaken as the population declines. This has made it necessary to establish a highly efficient business structure able to stably generate earnings.

To address these changes in the business environment for high-performance films, we aim to strengthen its earnings potential, a policy of its new medium-term management plan *APTSIS 20*, in the following three ways.

(1) Develop products with even better functionality, maintain and build on position as the market leader in Japan
(2) Establish sales and production structures in ASEAN markets likely to see strong growth, and in markets in Europe and the U.S. where there is demand for higher performance products
(3) Create an optimal market portfolio that fully leverages coordination among Group companies

Technology platform



POINT of VIEW | Solutions for Social and Environmental Issues

MOS Indices

S-3-1 Provide products and services that contribute to reducing GHG emissions

MCHC Group Target

Reduce 150 million tons CO_2 equivalent of GHG emissions in fiscal 2020 by providing products and services

Carbon fiber and other products help reduce CO_2 emissions

We, through provision of automotive and LED lighting materials, contribute to reducing environmental burden and achieving a resource-circulating society. One-quarter the weight of steel and roughly 10 times stronger, the market for carbon fiber has growth potential on the back of stronger demand in the automobile, aerospace and industrial fields.

The MCHC Group is the only company in the world with technologies for producing both PAN-based carbon fiber, which excels in strength, and pitch-based carbon fiber, which excels in elasticity. Currently, our carbon fiber is mainly used in automobiles and aircraft to reduce weight, improving fuel economy and reducing CO_2 emissions as a result.

To more effectively utilize resources amid strengthening demand for carbon fiber products, we have commercialized a carbon fiber recycling operation with Shinryo Corporation, a fully owned subsidiary of MCC that engages in the environmental recycling business.

TOPICS "MoRoic Activities" to Improve ROIC with Participation of all MPI Group Employees

"MoRoic* Activities"

* **MoRoic:** Abbreviation of "Management of ROIC Improvement"

Portfolio management is a key measure for creating a high-growth, high-earnings business structure at the MCHC Group, which takes a hands-on approach to managing its business portfolio based on various indicators such as return on invested capital (ROIC), growth potential (sales growth rates), and profitability (ROS). It is crucial that not only management, but all members of the organization understand this key measure. The MPI Group has designated "MoRoic Activities" as front line activities that employees spontaneously or continuously undertake to improve ROIC-related indicators.

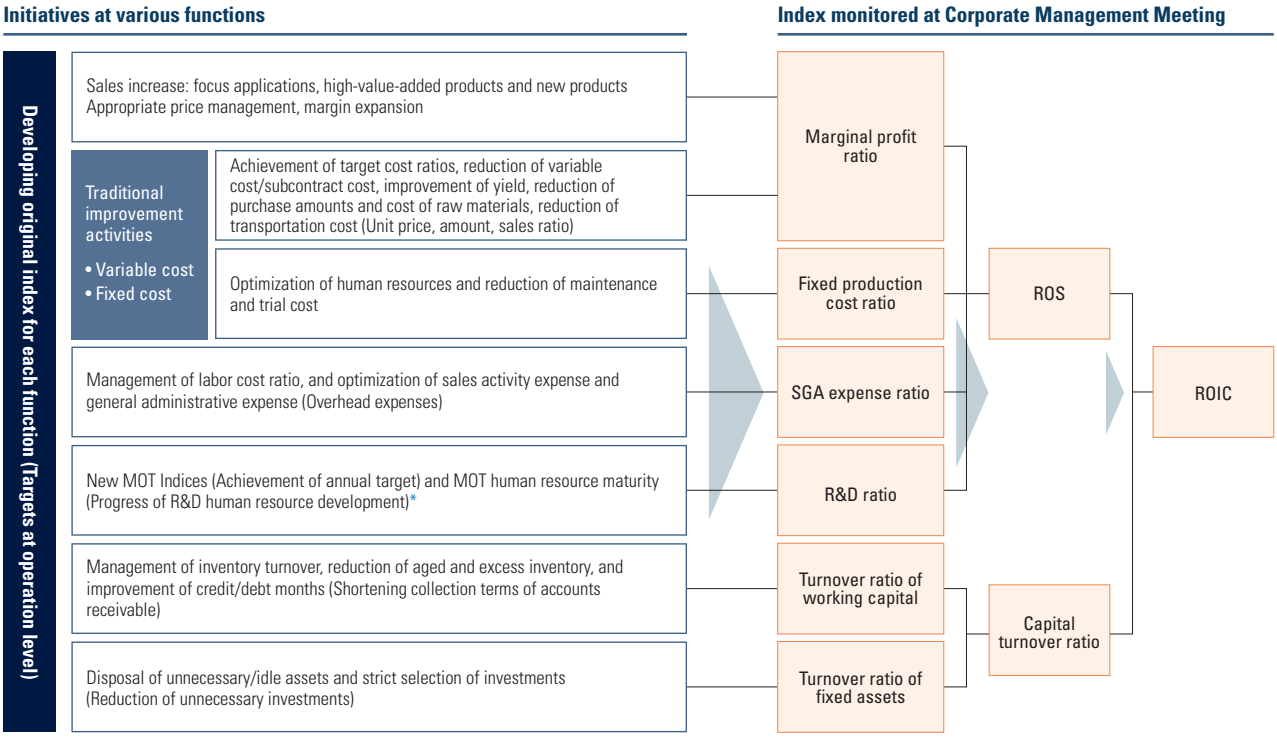
The main point of "MoRoic Activities" is that all employees participate. Actions taken by individuals and groups may have a small impact on ROIC, but when all employees act together, the impact on ROIC is significant. Based on this concept, all employees work in concert across divisions including sales and administration, in addition to traditional group improvement activities, mainly at production plants.

MPI has a large number of key plants in the Kansai region. "MoRoic" (i.e., moroikoka!! in Japanese) carries in it a nuance of the Kansai dialect, making it easier for many employees to remember.

The MPI Group has adopted ROIC as a business performance indicator. Each business division uses ROIC as a management benchmark for operations, and periodically submits reports to the Management Committee. In goal-setting meetings between managers and their employees, they discuss how individual goals can be tied to improving ROIC within the ROIC tree (see below). By drawing connections between individual goals and management objectives, awareness of ROIC improves and each employee is able to engage in "MoRoic Activities" more proactively.

MPI Group ROIC Tree

Management indicator for improvement in ROIC



* An independent indicator of "MoRoic Activity" to monitor improvements in the R&D ratio

Example of "MoRoic Activity"

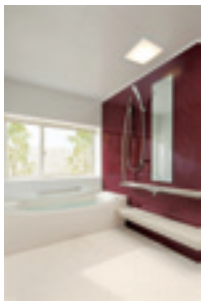
HISHIMETAL plastic film-laminated steel sheets

HISHIMETAL is plastic film-laminated steel sheets that combine the toughness of steel with the functionality of plastics and their superb properties for design. It is mainly used for exterior facing materials such as entrance doors and eaves, as well as interior materials including modular bathrooms, closet doors, curtain rails and other interior features. The breadth of its applications also extends to measuring instruments and vehicle interior decoration.

During processing and transportation, protective films are attached to *HISHIMETAL* to protect products against surface scratching.

It had been a struggle to reduce inventories of this protective film, because it comes in many varieties of sizes and functions. However, the participation of all employees in "MoRoic Activities" led to a reduction in inventories of the protective film, leading to an improvement in ROIC.

Improving ROIC requires either growth in profits (i.e., increasing the numerator of the ROIC equation) or a reduction in invested capital (i.e., decreasing the denominator of the ROIC equation). In the past, measures to improve ROIC tended to focus on increasing the numerator, which is easier to grasp quantitatively. Through "MoRoic Activities," however, employees now understand that decreasing the denominator of the equation also improves ROIC, refocusing their efforts on this facet. The MCHC Group seeks to foster high-earnings, high-efficiency management through activities like this.



Modular bathroom that uses *HISHIMETAL* as a wall material

Understanding the current situation of the protective film inventory

There was an excessive amount of the protective film inventory unable to fit into a single place, and thereby storing them in two separate warehouses. This caused unnecessary transfers of the inventory and also posed a risk to set off inventory management and clearance errors.

As a result of changing attachment process of protective film from off-line to in-line, there was a build-up of short-wound protective film (small roll inventory) that had to be disposed.

Initiatives for an improvement in ROIC

Contributing to an improvement of the turnover ratio for working capital

By reducing new films in inventory by reviewing the timing of placing orders and volume of orders, we were able to integrate two storage warehouses into one.

Inventory reduction **0.6** months to **0.2** months

Contributing to marginal income ratio by reducing losses

For short rolls that were in inventory, we adjusted width by re-slitting, and standardized control of type and size to make it easy to use for different processes, and were able to eliminate the short rolls within the entire process.

Loss inventory reduction **100**% attained

Shrinking the denominator (reduce invested capital) | **Increasing the numerator (expanding profit)**

Improved ROIC

ROIC tree (highlighted area) applicable to the *HISHIMETAL* case study