

## Innovation

## Message from the CTO



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Senior Vice President  
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## Enabling a prosperous new era for the Mitsubishi Chemical Group through market-focused innovation

## Maximizing the velocity of market-focused R&amp;D

The MCG Group has reached a turning point in our ambitious transformation into a focused, world-leading provider of specialty materials and solutions. We are pivoting our innovation and R&D efforts in several important ways to achieve this vision.

First, we are adapting our innovation framework to emphasize a market-oriented approach centered on the key markets in our “Forging the future” corporate strategy. Authority for late-stage R&D is now delegated to the relevant business groups in a less centralized model. At the same time, we are developing long-term, integrated innovation strategies that leverage internal R&D resources and global open innovation partners to create a robust pipeline of new business opportunities. Underlying these market-facing R&D efforts are our technology platforms, which reflect long-term core competencies enabling business growth across multiple markets.

However, the portfolio “content” of our innovation pipeline is only part of the equation. Maximizing the “velocity” through that pipeline is equally important. As we shift to a market-driven approach, the seamless sharing of information and collaboration from early-stage research to late-stage development becomes even more essential. We are accelerating the creation of data infrastructure to make our R&D more interconnected and efficient. And we are deploying advanced modeling, simulation, and automation to speed up our acquisition of new knowledge.

Innovation in specialty materials requires a departure from our historical R&D mindset. In contrast to commodity products, in which development is mostly incremental, we must shift our emphasis toward creating entirely new value propositions. This requires a willingness to try new things and rapidly learn from failure. It also implies an increased use of open innovation with a global network of partners. In addition to our core areas of chemical science, we will strengthen our strategic position in emerging technologies that may transform our entire industry, most notably in biology and information science.

## Expanding our innovation capabilities

Innovation also plays a crucial role in fulfilling our commitment to “KAITEKI.” Sustainability issues are fundamentally global, highlighting the need to leverage resources beyond our current Japan-centric system of research bases. We are actively seeking to bring more international talent into our laboratories in Japan, and we are considering approaches to establish our innovation presence overseas in specific locations where world-class talent is clustered.

The first word in our new corporate slogan is “Science.” This reflects the reality that no element is more important to the successful transformation of our company than innovation. I am deeply committed to expanding our innovation capabilities to enable a prosperous new era for the MCG Group.

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## Innovation

## Innovation Strategy

## Accelerating growth by combining in-house R&amp;D with open innovation

At the Mitsubishi Chemical Group, a strong R&D capability is our cornerstone, but we define innovation much more broadly than this. We promote innovation by strategically combining in-house R&D with open innovation, including collaboration with academia, startup companies, corporate partners, and government agencies.

We emphasize four key points to further enhance the quality and speed of our innovation.

## Guiding principles for innovation

## End-Market Focus

- Integrated innovation strategies driving an optimal balance of internal R&D and open innovation for each focus market
- Agile product development in collaboration with end customers to deliver value at speed
- Flexibility to meet the changing demands of key markets: today, tomorrow, and the day after tomorrow

## New Digital Capabilities

- Next-generation computational technologies enabling large-scale and high-throughput simulations
- Materials informatics to accelerate the introduction of new materials and products
- Quantum computing and AI for the information-driven chemical industry of the future

## More Efficient Processes

- Seamless transition between long-term research platforms and late-stage product development
- Experimental data platform to create a virtual research organization that transcends physical location

## New Business Fields

- Systematic creation of the next generation of high-profit, high-growth business clusters
- "Innovation Sandbox" to rapidly test the validity of new ideas beyond the scope of our current business

## Strategic partnerships with startups around the world to accelerate innovation

The MCG Group creates opportunities for group-wide business growth through strategic investments and partnerships with promising startup companies worldwide.

## Overview of collaboration with startups receiving Group investment

Startup company	Specialty and scope of collaboration
 AddiFab ApS	<b>Specialty:</b> Agile manufacturing solution combining additive manufacturing and injection molding for specialty products <b>Collaboration:</b> Joint development of additive materials <b>Exit:</b> Acquired by Nexa3D
 DAIZ	<b>Specialty:</b> Plant-based proteins and products as a substitute for traditional food products <b>Collaboration:</b> Development of alternative protein ingredients
 DIGILENS	<b>Specialty:</b> Holographic waveguide display technology for next-generation Augmented Reality/Virtual Reality devices <b>Collaboration:</b> Development of plastic waveguides for AR/VR devices
 ERIDAN	<b>Specialty:</b> 5G radio frequency communication technology leveraging gallium-nitride semiconductors for energy and spectrum efficiency <b>Collaboration:</b> Development of applications for gallium-nitride substrates in 5G communications networks
 Fluence Analytics	<b>Specialty:</b> Continuous monitoring and optimization of industrial and laboratory systems <b>Collaboration:</b> R&D efficiency and continuous process improvement <b>Exit:</b> Acquired by Yokogawa Electric
 Lactips	<b>Specialty:</b> Water-soluble and biodegradable bio-derived polymer raw material substitute for film and plastic applications <b>Collaboration:</b> Development of green materials for customer needs
 Lingrove	<b>Specialty:</b> Plant-based sustainable composites and materials to replace wood in automotive and industrial applications <b>Collaboration:</b> Development of bio-based composite solutions
 Myoridge	<b>Specialty:</b> Custom-made, serum-free cell culture media for pharmaceutical, regenerative medicine, and food applications <b>Collaboration:</b> Material development for cell culture-related markets
 PRIME ROOTS	<b>Specialty:</b> Koji-based food products as a substitute for traditional meat products <b>Collaboration:</b> Development of alternative protein ingredients and geographic expansion

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## Innovation

# Innovation Strategy








### Leveraging our technology advantage in key focus markets

We have developed our technology portfolio over many decades, and the resulting intellectual capital is a principal driving force of our Company.

As part of our transformation into a world-leading enterprise supplying specialty materials and solutions, the MCG Group will concentrate its technical strengths in relevant areas.

In addition to these technology platforms that embody our long-term competitive advantage, we will build on existing products and technologies, creating new innovations to strengthen our presence in each of our focus markets.

### MCG Group technologies and products matched to focus markets

							
	<b>EV/Mobility</b>	<b>Digital</b>	<b>Food</b>	<b>Medical</b>	<b>Building/Infrastructure</b>	<b>Consumer Goods</b>	<b>Industrial</b>
<b>Key Trends</b>	<ul style="list-style-type: none"> <li>• Electrification</li> <li>• Lightweight materials</li> <li>• Modern design</li> </ul>	<ul style="list-style-type: none"> <li>• Speed and complexity</li> <li>• Miniaturization</li> <li>• Smart homes and applications</li> </ul>	<ul style="list-style-type: none"> <li>• Nutrition and health</li> <li>• Reducing food waste</li> <li>• Processability</li> </ul>	<ul style="list-style-type: none"> <li>• Longevity</li> <li>• Quality of life</li> <li>• Tailored implants</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficiency</li> <li>• Modular construction</li> <li>• Insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Personalization</li> <li>• Sustainability</li> <li>• Renewable resources</li> </ul>	<ul style="list-style-type: none"> <li>• Smart materials</li> <li>• Remote operation</li> <li>• Robotics and automation</li> </ul>
<b>MCG Group Products and Technologies</b>	<ul style="list-style-type: none"> <li>• Battery materials</li> <li>• Composite materials</li> <li>• Specialty polymers and compounds</li> </ul>	<ul style="list-style-type: none"> <li>• Semiconductor materials, equipment, and components</li> <li>• Fab cleaning services</li> <li>• Display films and materials</li> </ul>	<ul style="list-style-type: none"> <li>• Emulsifiers</li> <li>• Vitamins and nutrition</li> <li>• Gas barrier films</li> <li>• Probiotics</li> </ul>	<ul style="list-style-type: none"> <li>• AI-powered drug discovery</li> <li>• Biomodality-related technologies</li> <li>• Biocompatible materials</li> </ul>	<ul style="list-style-type: none"> <li>• Construction materials</li> <li>• Additives for adhesives and coatings</li> <li>• Façade design materials</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon fiber composites</li> <li>• Water soluble polymers</li> <li>• High-performance water filtration</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial processing films and membranes</li> <li>• Oxygen combustion technology</li> <li>• Additive manufacturing technology</li> </ul>

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**Innovation**

**Intellectual Property Strategy**

**An intellectual property strategy to support growth**

**Basic policy**

The Mitsubishi Chemical Group positions patents, trademarks, copyrights, expertise, data, and other intellectual property as important management assets. We aim to boost corporate value by effectively using these assets through collaboration with other companies, licensing, and other activities through which we can exploit our competitive advantage.

When our intellectual property rights are infringed, our approach is to confront the situation squarely and take appropriate action. Equally, we respect the intellectual property rights of other companies and act so as not to infringe on valid intellectual property rights belonging to other parties.

**Basic policy**

- Increase corporate value through the effective use of intellectual property
- Respond with appropriate action to third-party infringement of our intellectual property rights
- Respect the valid intellectual property rights of other parties

Securing competitive advantage, joint projects with other companies, licensing, etc.

**Intellectual property management system**

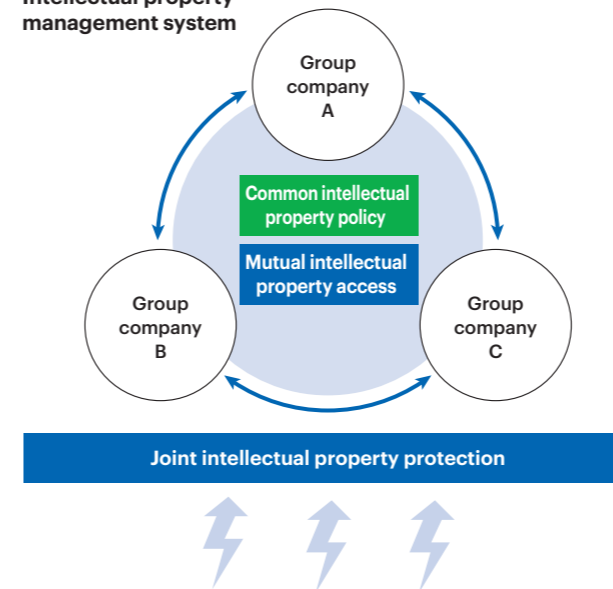
In line with our overall “One Company, One Team” corporate philosophy, the MCG Group is implementing the intellectual property management system described below.

First, to maximize the value of the MCG Group’s

intellectual property portfolio, we promote mutual access to intellectual property among MCG Group companies. We have also devised frameworks and regulations through which we work together to respond to third-party intellectual property claims.

We have formulated an intellectual property policy that is applied uniformly by domestic and overseas Group companies, enabling us to pursue global intellectual property activities founded on a shared approach.

**Intellectual property management system**



**Intellectual property strategy**

The MCG Group sells a highly diverse range of products, from basic materials to performance products for specific applications, and the situation for different products can vary widely. Accordingly, a major feature of our intellectual

property strategy is to develop a strategy specific to each product.

Our intellectual property division works together with business and R&D divisions to set business targets for divisional products. We then configure an intellectual property approach based on an accurate understanding of the market conditions, technology trends, and intellectual property environment. The result is codified and implemented as our intellectual property strategy. Progress is regularly monitored, and a plan-do-check-act (PDCA) cycle is performed.

As one example of the results achieved by our intellectual property strategy, MCG was selected for inclusion (at the 89th position) in “Exploring the Global Sustainable Innovation Landscape: The Top 100 Companies,” a report issued by LexisNexis Intellectual Property Solutions.

**Intellectual property strategy**

