



Key Person Interview **1**

Toward a Business That Solves Customers' Environmental Challenges and Contributes to Society

Stevan R. Schott

Executive Officer,
General Manager of Calgon Carbon Division,
President of Calgon Carbon Corporation

Overview of Calgon Carbon Corporation

Founded in 1942, Calgon Carbon is an activated carbon manufacturer headquartered in Pittsburgh, Pennsylvania, U.S.A. Today, it is a global leader in the manufacture of activated carbon from bituminous coal with over 1,400 employees managing sales and production bases across the globe, and is also among the top players globally in reactivation services for spent activated carbon and sales of activated carbon from coconut shells. To strengthen its activated carbon portfolio further, it acquired a production facility for activated carbon from wood in Parentis-en-Born, France in 2016. From that acquisition, Calgon Carbon was able to offer a comprehensive line of activated carbon, including wood activated carbons; enabling them to supply products to a wider range of applications as a true market leader.

Additionally, through its acquisition by Kuraray in March 2018, Calgon Carbon gained a new advantage and further enhanced its presence in activated carbon-related markets,

particularly throughout Asia. The integration with Kuraray's Carbon Materials Division has been under way for the past two years, producing favorable results steadily. We are promoting business integration while creating new value by sharing and integrating technological capabilities and know-how possessed by both companies in areas such as research & development, manufacturing, and sales.



Calgon Carbon headquartered in Pittsburgh, Pennsylvania, U.S.A.

Contributing to the Achievement of "PROUD 2020" through Growth and Synergy

As a member of the Kuraray Group, Calgon Carbon is cognizant of two challenges in executing the "PROUD 2020" Medium-Term Management Plan.

The first is "growth." We are pushing forward with initiatives to accelerate growth in various locations, including our efforts in France to strengthen the business of activated carbon from wood, having our sights fixed on global automotive markets. Demand for activated carbon has been increasing in various countries throughout the world spurred on by global environmental issues. In particular, in the United States, we expect our sales of activated carbon and related equipment in the drinking water segment to almost double compared to five years ago by the time "PROUD 2020" completes, in response to

increased demand for activated carbon in the segment due to stricter regulations for certain chemicals affecting drinking water in recent years, and are considering to increase the production of activated carbon from bituminous coal to serve drinking water and other markets that are expected to continue growing globally.



CALFLEX™ (activated carbon sheet)



ZORFLEX™ (activated carbon cloth used for wound care)

We are also working to enter new domains and expand a group of new products that can be expected to grow going forward, such as developing CALFLEX™, an activated carbon sheet, and promoting sales of our ZORFLEX™ activated carbon cloth used for wound care applications.

Calgon Carbon intends to contribute to the steady growth of the Kuraray Group as a whole by carrying out these measures.

The second is “synergy.” Kuraray and Calgon Carbon Corporation are working to share resources and build a collaborative system in a manner where the strengths of each of our companies can be put to good use, which should lead to the early realization of various synergies. For example, with regards to the production of activated carbons for automobile markets, introducing Kuraray’s production technology along with research & development capabilities is allowing us to develop high-quality products.

Additionally, in Japan, we are working to enhance thermal processes, aiming to further improve the performance of our activated carbons.

On the sales front, we transferred business dealings with Calgon Carbon’s Japan and Asia-based customers to



Kuraray, while transferring Kuraray’s Carbon Materials customers in the United States and Europe to Calgon Carbon, to achieve improved efficiency in customer response and to better position us for future growth.

In addition, both companies seek to foster a sense of unity by gaining an understanding of each other’s corporate culture and business practices and building harmonious ties through personnel and technology exchanges. Going forward, we will create additional synergies and contribute to the expansion of the Group’s businesses through the joint development of products targeting growth markets.

Elevating Carbon Materials Business to One of the Group’s Core Businesses

We believe a role that Calgon Carbon, the largest player in activated carbon globally, should play within the Kuraray Group, which has a number of products with a leading market share, is to become one of the Group’s core businesses through business integration with the Carbon Materials Business Division. Toward the realization thereof, we will grow our industry-leading position by capturing the needs of global activated carbon markets with a long-term perspective and expand our business through innovation.

The mission of Calgon Carbon is to provide safe, clean water and air to society through activated carbon and solve environmental issues that customers are facing. Such contribution to the environment also conforms with Kuraray’s Corporate Statements. In particular, our industry leading reactivation services for the recycling and reuse of granular activated

carbon can be said to be a business that contributes significantly to environmental protection because this not only reduces waste but also involves less energy consumption and lower carbon dioxide emissions relative to the commonly used virgin activated carbon manufacturing processes. In fact, as demand for reactivated carbon is growing in Europe and the United States, Calgon Carbon is considering expanding its facilities for recycling and reactivating granular activated carbon.

The Kuraray Group has been making contributions to society for many years through its businesses that help solve environmental issues. We will further enhance our position as a leader in the activated carbon market through the integration with Kuraray’s Carbon Materials Division and walk hand in hand with the Group while setting to “achieving what no one else can” for the environment as our mission.

System of Reactivation Business for Activated Carbon





Key Person Interview 2

Pursuing Further Growth and Originality as the Kuraray Group's Founding Business

Yoshimasa Sano

Director and Senior Managing Executive Officer,
President of Fibers and Textiles Company

Fibers and Textiles Company That Originated from Our Founding Business

Kuraray's Fibers and Textiles Company has three divisions: the Fibers and Industrial Materials Division, which accomplished the commercialization of KURALON™, a national-level project at that time, at the current Okayama Plant in 1950 and celebrates the 70th anniversary of KURALON™ operations in 2020. The Clarino Division that makes CLARINO™ man-made leather, which became the first in the world to succeed in the commercialization of a substitute for natural leather in 1964. The Consumer Goods and Materials Division, which consists of Kuraray Kuraflex Co., Ltd., which introduced the latest cutting-edge nonwoven fabric technology at that time in Japan, and Kuraray Fastening Co., Ltd., which manufactures and sells hook-and-loop fasteners called MAGIC TAPE™. It was created in 1984 through an absorption-type merger with Nippon Velcro Co., Ltd.

The founding business of the Kuraray Group is rayon (regenerated cellulose fiber); however, KURALON™ has become the major product of Fibers and Industrial Materials Division and the origin of the elemental technology of the Kuraray Group. The commercialization of KURALON™ originated from the strong desire of President Soichiro Ohara to be the first in the world to commercialize synthetic fiber after the war. KURALON™ has been widely used for seaweed cultivation nets and fishing nets, etc., improving the productivity of the fishing industry considerably. Additionally, its superior alkaline resistance has allowed it to be used widely as a reinforcing agent for cement,

mortar, etc. and as a substitute fiber for asbestos, which is carcinogenic.

Following the successful commercialization of the entirely domestically-produced synthetic fiber KURALON™, CLARINO™ man-made leather was born as "post-KURALON™." CLARINO™, which is light weight, highly durable, and has a long life, has been adopted in a wide range of areas including school backpacks, sports shoes, golf equipment, and interior materials for luxury cars, and is highly regarded for its high-end functionality and quality by luxury brand manufacturers globally.

Further, nonwoven fabric KURAFLEX™ is highly valued for its high quality and hygiene for use in business-use counter cloths, cosmetic items, masks, and so on. Additionally, MAGIC TAPE™ maintains stable demand in various markets as the top Japanese brand.



Okayama Plant

Pursuing Proprietary Technologies and Developing High-Value-Added Products

The Kuraray Group has a corporate culture that pursues proprietary technologies to develop high-value-added products.

Fibers and Industrial Materials Division developed KURALON K-II™, which was produced using the world's first solvent/wet cooled-gel spinning method acquired

through the commercialization of KURALON™, and is adopted in water-soluble nonwoven fabric used in an embroidery process as well as high-strength cement reinforcement materials. It also accomplished the efficient production of industrial filaments by developing VIP (Vinylon Innovative Process), a revolutionary manufacturing process, thereby broadening the scope of the domains of its adoption primarily around the uses for rubber materials. It commercialized high-strength polyarylate fiber VECTRAN™ as a new functional fiber for the first time in the world in 1990, which added to the available options for materials, and its superior characteristics such as low moisture absorption, high tenacity, superior dimensional stability, and high abrasion resistance enable it to contribute to the development of various industries.

The Clarino Division developed CATS (Clarino Advanced Technology Systems), a new production system, in addition to developing materials with a texture like that of natural leather and improved functionality. Its environmentally friendly products that achieve reductions in VOC (volatile organic compounds), which match the needs of environmentally conscious customers, have earned a high reputation.

In the Consumer Goods and Materials Division, Kuraray Kuraflex Co., Ltd. developed meltblown nonwoven fabrics that have been utilized in mask filters and coffee filters for which superior filtration efficiency is required. Kuraray Fastening Co., Ltd. developed molded hook fasteners with at least three times the adhesive strength of previous hook-and-loop fasteners, MAGILOCK™, which are used in a wide range of industrial material areas.



VECTRAN™ (Ropes, cables, slings, etc.)

Building a Portfolio of High Value-Added Products toward the Beginning of a New Era for the Fibers and Textiles Business

The Kuraray Group's current "PROUD 2020" Medium-Term Management Plan sets out as its basic policy that it seeks to contribute to society through the provision of high-performance, highly functional, distinctive products manufactured through a process optimal for the environment and cost with production/development/sales working together as one, and that it seeks to grow in a sustainable manner.

Organizationally, we want to transform ourselves into an organization with high expectations for the potential of changing the future, accepting diversity, and allowing ourselves to take on challenges even further, so that we maintain a heightened perspective that goes beyond an extension of what we have been doing, particularly in the current times of uncertainty.

On the product front, we strive to offer precise solutions to social issues. For example, while digital transformation is getting under way in various industries with the commencement of the fifth generation of high-speed communication, the value of high-strength polyarylate fiber VECTRAN™ and ultra-thin nonwoven fabric VECRUS™ is becoming more recognized in the optical cable and electrical and electronic areas related thereto, and we will further enhance our supply system and technological

capabilities to expand sales. The value of CLARINO™ and MAGIC TAPE™ is also increasing further as environmentally friendly products. Going forward, we intend to develop products using recycled materials and biomass materials, among other things, to make significant contributions to building a circular society. As for KURALON™ and KURALON K-II™, we will implement new measures, such as improving performance, reducing costs through process innovation, and developing a mechanism to help accelerate sales, in order to achieve further expansion in the existing areas such as FRC (fiber reinforced cement) and rubber materials.

We will celebrate the 100th anniversary of our foundation in 2026. Toward the anniversary, on the premise of an expansion strategy, we will work on the development of competitive products using unique materials and sales activities with the intention of "further enhancing the added value and functions of a fiber string," which should be appropriate for the fibers and textiles business of a Specialty Chemical Company. We will strive to build a portfolio of high-value-added products, which should lead to the beginning of a new era for the fibers and textiles business.



Key Person Interview 3

Aiming to Realize the Safe and Stable Production of the Plants and Hone Our Technological Capabilities

Akira Omura

Managing Executive Officer,
Officer Responsible for Technology Division, Officer
Responsible for Plants in Japan, Officer Responsible for
Environmental and Industrial Safety Management Center

Organization and Mission of the Technology Division

As the market environment surrounding economic activities is changing rapidly and growing increasingly severe as its needs are becoming more diversified and advanced, intensifying the technological competition within the industry, the superiority and competitiveness of our products are being tested. Not only paying due consideration to the global environment but also supplying high-quality products in a timely manner as part of a manufacturer's responsibility and achieving a high level of productivity and safety in the manufacturing process are expected.

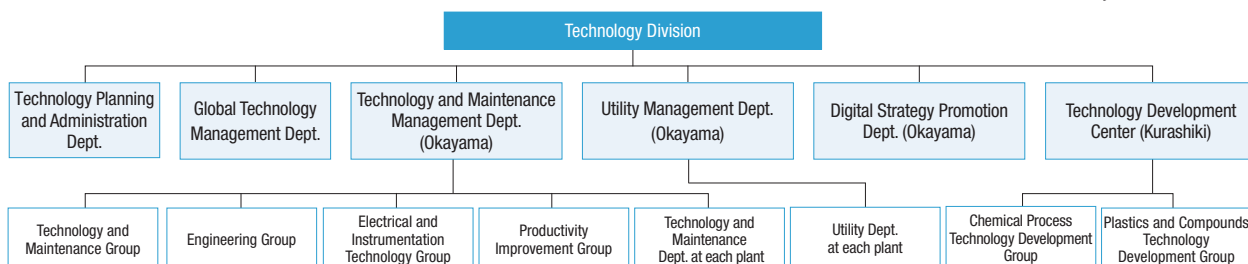
In order to respond to those demands, the Technology Division works to establish a system that enables the stable supply of competitive products by strengthening our technological platform through technology development and capital investment in domestic manufacturing activities as well as the development of engineers, and contributes to the expansion and globalization of the Company's core businesses, as well as the early creation and development of new businesses. In addition, at overseas bases, we have an organizational structure in place that consists of the Technology and Maintenance Management Department/Technology and Maintenance Department, Utility Management Department/Utility Department, Digital Strategy Promotion Department, Global Technology

Management Department, and Technology Development Center, with a view to supporting the development of new technologies, promoting new plant construction projects, and providing advanced technical assistance for facility management and troubleshooting.

In particular, the Technology Development Center is working to develop production technologies and processes aiming at the creation of new businesses and enhancement of the core business. The Chemical Process Technology Development Group is in charge of development of chemicals/polymers area, and the Plastics and Compounds Technology Development Group is in charge of development of molding area including film sheet and fiber. We work on process development based on principles and promote efficient and highly precise development, while making good use of CAE techniques (including thermo-fluid analysis and structural analysis) and process simulation techniques, to support the development efforts of the respective businesses and Research and Development Divisions.



CAE analysis



Introduction and Promotion of Digital Technologies

Digital technologies have been spreading throughout society at an amazing speed, and their introduction is

growing in scope in the chemical industry as well. The Company is also introducing digital technologies

aggressively to realize stable supply through improved operational efficiency and productivity, and in R&D activities for developing new materials.

The Company established the Digital Strategy Promotion Department within Technology Division in 2018 as the first step to initiate verification of the effects of various themes under which digital technologies were introduced.

In the production technology area, we are aiming to replace operations that depend on skilled workers, such as the prediction of abnormalities, estimation of causes of abnormalities, and visual inspection of products at production plants, with digital technologies. In addition, we have

started to run cutting-edge digital tools, such as AI, on a trial basis for technology succession and improved operational efficiency. We will strive to increase the scope and depth of the application of digital technologies, keeping the development of digital talent in mind as well.

In the R&D area, we are working on the verification of MI (Material Informatics). MI is an analytical technology that predicts unknown physical property values based on existing experimental data and through machine learning, or that proposes ideas for material design to obtain desired physical properties, and is currently in the experimentation and verification stage.

Technical Assistance for Solving Issues

A fire caused injuries broke out at a plant in the United States for EVAL™ in May 2018. The Technology Division launched initiatives with regard to the improvement of safety levels at overseas plants, together with the Vinyl Acetate Resin Company, which is in charge of that business. In fiscal 2019, under the support of the Technology Division, the Vinyl Acetate Company led the safety audits of each company outside of Japan, which identified the following three issues, and is working to revise safety measures and provide technical assistance.

- (1) Improvement of the management system
- Revise concrete methods for change management and ensure post-change confirmation
 - Further clarify the authority in writing to grant permission and approval for specific work by adding concrete situation

- (2) Enhancement of training and drills
- Further enhance training provided for higher risk items (sources of danger) at plants
 - Revise and improve the emergency response manual, and ensure that employees are completely familiar with its contents
- (3) Expansion of risk assessment
- Introduce HAZOP (discovering and responding to sources of danger) to non-regular (start-up, shut-down) work
 - Reduce the number of work operations that have not been standardized in writing to zero

Additionally, from 2020 onward, we plan to roll out those improvement support activities to other overseas bases, including Calgon Carbon Corporation, which is a new member of the Kuraray Group, and a new isoprene-related plant currently under construction in Thailand.

The Technology Division for a “Specialty Chemical Company with Sustainable Growth”

In order to thrive in a market environment that is rapidly changing due to the progress of digital innovation and intensifying global competition, it is necessary to take on the challenges of integrating various technologies beyond the boundaries of industry sectors/domains as well as technology innovation to create new businesses for future growth, in addition to further strengthening the competitiveness of core businesses.

The creation of new businesses requires “timely development of production technologies that underpin differentiated products” with absolute competitiveness, and the Technology Division is working on the development of production processes swiftly and precisely in a cross-organizational project structure while making good use of simulation techniques. Further, with regard to the enhancement of the competitiveness of the core businesses, we steadily undertake capital investment required for further expansion of the core businesses, as we constantly work to strengthen our safety capability, provide a safe work environment, and ensure appropriate facility management as well as the maintenance and upgrading of aging facilities under the guiding principle,

“Safety is the cornerstone of everything we do.” In addition, we will promote initiatives for increased productivity, quality improvement, cost reduction, increased operational efficiency, and improved work styles by applying new technologies, including digital technologies.

As generational change is progressing and the number of overseas bases continues to increase, we believe it is also important to develop engineers who will shoulder the responsibility of the next generation. To that end, we provide training for technology development techniques, facility design operation, etc. in a planned manner and implement systematic rotation, such as assignment to overseas bases and project participation, which is intended to have engineers experience appropriate careers.

We will continue to aspire to be a “Specialty Chemical Company with sustainable growth” and become a company that is trusted by society, where all people can feel comfortable working, and also strive to hone our technological capabilities so that we can provide the world with technologies that help realize the safety and stable production of production plants.