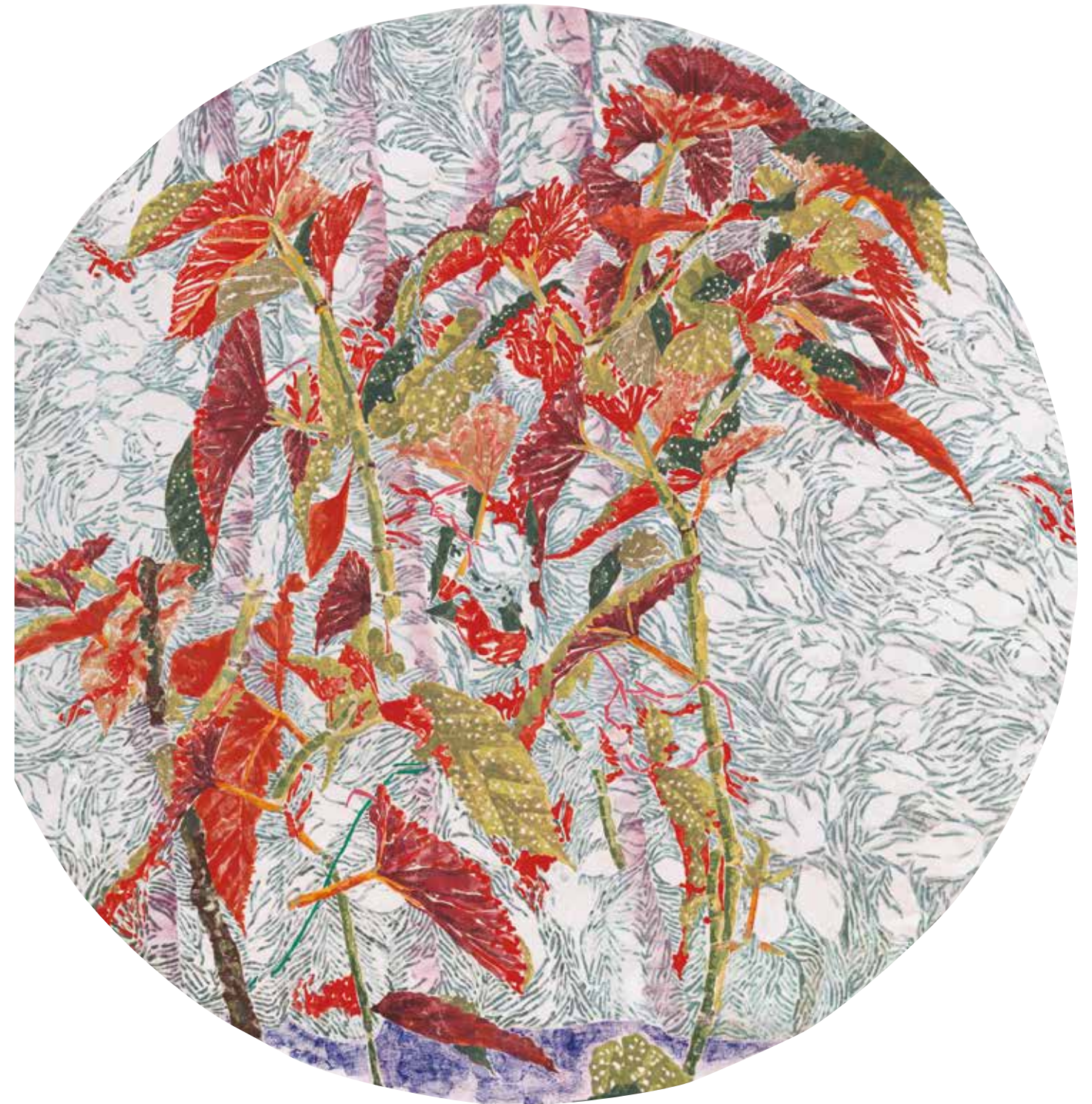


‘TORAY’
Toray Engineering



Taking on the challenge of creating new values through Technology, Engineering & Know-how.

Toray Engineering was founded to take on the responsibility of providing and maintaining the Toray Group's production equipment. We have expanded our business areas by leveraging Technology, Engineering, and Know-how that we have fostered over the years. Currently, we provide high-quality, advanced solutions to customers in a wide range of industries, such as chemicals, films, medicine, semiconductors, FPDs, secondary batteries, and foods. Our guiding principles are "respect", "engage", and "trust". Based on this culture and the system of collaboration, both within and outside the company, we proactively tackle the issues our customers are facing, and make full use of our technology and knowledge to ensure the success of every project. We will continue to create new values through our business and strive to contribute to society.

Our Business Areas

We provide solutions that transform society based on two businesses: Engineering Business, which handles everything from plant and factory automation (FA) to maintenance, and Mechatronics & Fine Technology Business, which develops manufacturing, inspection, measuring equipment, and software.



solution 1 Plant



We manage plant construction in the pharmaceuticals and life sciences, field of fine chemicals. Aside from Engineering, Procurement, and Construction (EPC) we also engage in Maintenance Business, support for overseas expansion of production bases, as well as process development.

Engineering (E)

Basic Engineering

We accurately understand customer needs, formulate engineering flows, layouts, and equipment lists with an emphasis on ease of use, to which a user-oriented engineering company is specialized, as well as calculate the cost.

Detailed Engineering

We design all necessary facilities for construction, equipment, piping, electricity, instrumentation, and production management, with safety, operability, and maintainability in mind.

Procurement (P)

We leverage the Toray Group's purchasing power to reduce costs. We secure an appropriate lead time according to the progress of the plant design and perform just-in-time procurement.

Construction / Pre-operation Testing (C)

We carry out construction work and complete the plant while thoroughly controlling safety, delivery dates, and quality. In addition, a pre-operation testing is conducted under the supervision of personnel who understand the customer's needs and design philosophy. The plant is handed over only after confirming that the plant's performance is satisfactory.

Maintenance

We support the safe and stable operation of factory facilities through regular maintenance and equipment diagnosis.
➔See Page6 for details.

Support for Overseas Expansion

We support our customers' overseas expansion by leveraging our experience in plant construction overseas. We provide a variety of support services using our local subsidiaries in China, Taiwan, South Korea, and Malaysia.

Quality Assurance

We are continuously improving our quality management systems (QMS) based on ISO9001. We build quality from the plant design and construction stages, and strive to improve total plant quality from construction work, all the way up to operation and maintenance.

Two Focus Areas where Toray Engineering Has Outstanding Knowledge and Experiences

Pharmaceuticals and Life Sciences

We have a proven track record in a wide variety of pharmaceutical plants, and have worked on many projects that require advanced knowledge, experience, and technical capabilities, such as sterilization and containment of chemical hazards.



■ Response to High Potency Active Pharmaceutical Ingredients

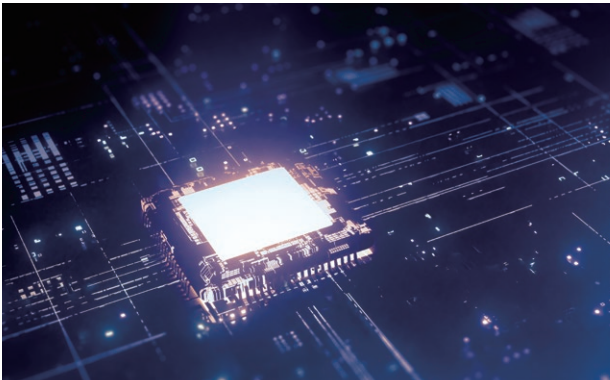
We utilize advanced "containment" technologies to safely handle high potency active pharmaceutical ingredients. We offer plants that factor in safety and workability for operators.

■ Regulation Compliance

By handling the production equipment and construction in accordance with the latest PIC/S GMP standards, as well as by carrying out the project with the same team members from design to construction and delivery, we are able to respond to customer needs in a more detailed manner.

Fine Chemicals

We manage manufacturing plants of high-performance chemicals such as functional resins, fine powders, and electronic materials. From the customer's perspective, we provide proposals for plants that meet strict technical requirements while achieving short delivery times, low costs, and high quality.



■ High-mix, Low-volume Production / Multi-purpose Plant

We pursue thorough contamination countermeasures, as well as ease of cleaning and product switching, which are essential for high-mix, low-volume production and multi-purpose plants. We provide plants that are easy to manage and have high production efficiency.

Working on Advanced Process Development through Open Innovation

■ Membrane Separation Technology

The effective combination of filtration membranes allows us to create separation and recovery systems with high cost performance. We contribute to energy and resource conservation by reusing wastewater and recovering valuable materials from solutions.



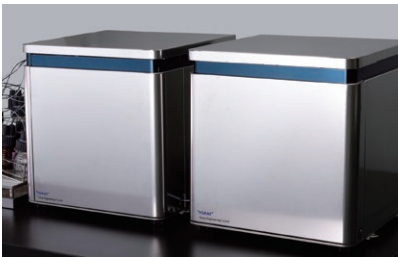
■ Microchemical Plants

We are developing equipment for the continuous production of liposomes, which is used as a transport technology for drugs and other substances within the body. This equipment can be applied to products such as functional foods, functional cosmetics, and quasi-drugs.



■ Nucleic Acid Synthesizer

We are developing highly efficient nucleic acid synthesizers. We are moving forward for development of a mass production plant with explosion-proof specifications, with the aim of meeting the needs for mass production of nucleic acid drugs.

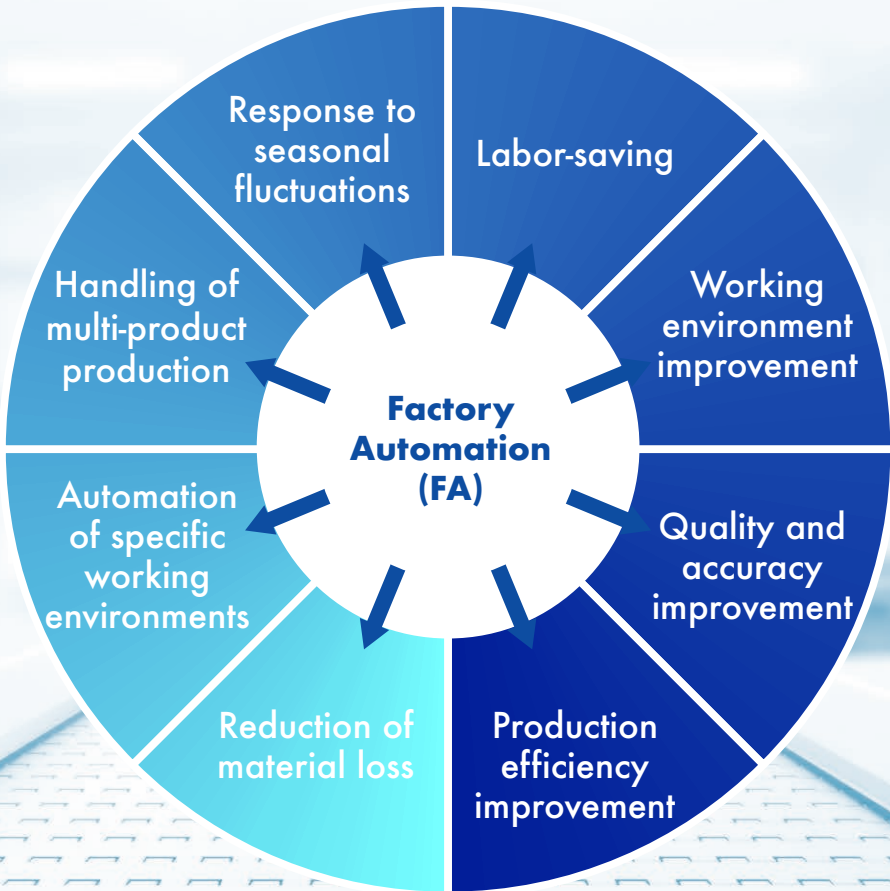


solution 2 Factory Automation



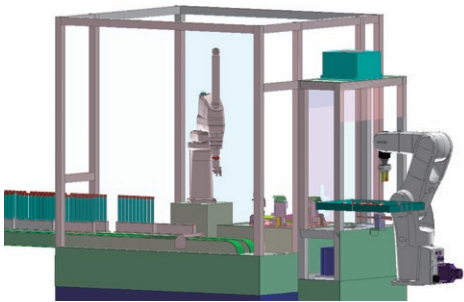
We create and propose FA solutions to meet various needs of society and companies, aiming to further maintain and improve productivity through efficiency and labor savings at production sites. We also contribute to our customers' production activities in a wide range of industries such as pharmaceuticals, chemical products, food, home electronics / electronics parts, and automobile/aircraft parts.

Solving various social and corporate issues with factory automation



Factory Automation (FA) System

We offer high-value-added automated production line solutions such as product traceability, quality control, IoT, AI-powered correction, and preventive maintenance. We also contribute to improvement of the quality and efficiency of production lines.



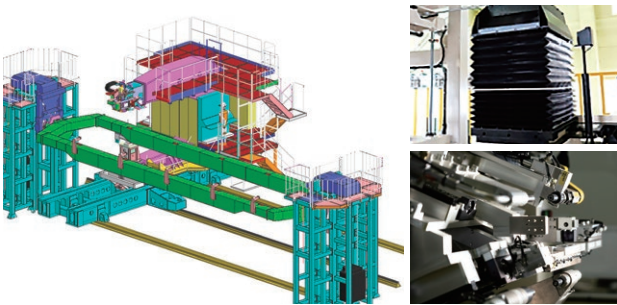
EV/HEV Production Equipment

We provide optimal production equipment by integrating underlying technologies, such as powder and liquid coating technologies, pre-heating, hardening, and cooling processes, as well as automated inspection processes, with our know-how of reducing material loss and saving space.



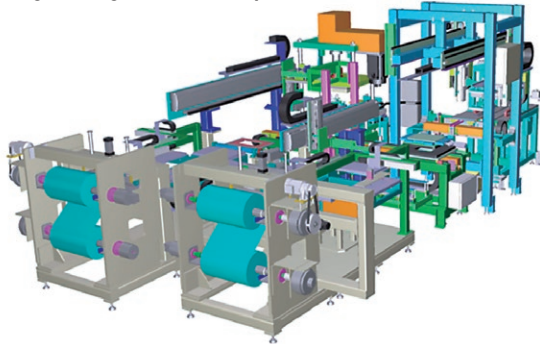
Aircraft Production Equipment

We have 30 years of experience in the field of aircraft production equipment which requires high precision and high reliability. We have a variety of testing equipment, including automatic assembly riveters to pursue the next generation of processing technologies.



Fuel Cell and Solid Battery Production Equipment

Factoring in the production process, material properties, and production environment, we provide equipment specialized in fuel cell and solid battery manufacturing by combining underlying component technologies such as coating, drying, pressing, cutting, and assembly.



solution 3 Maintenance

Regular maintenance is necessary for the production equipment to keep its safety and capability of continuous and efficient manufacturing. We have been engaged in Maintenance Business for over 40 years at numerous factories including those of the Toray Group. We support the maintenance and improvement of productivity and quality of production facilities by providing speedy and in-depth technology and services.

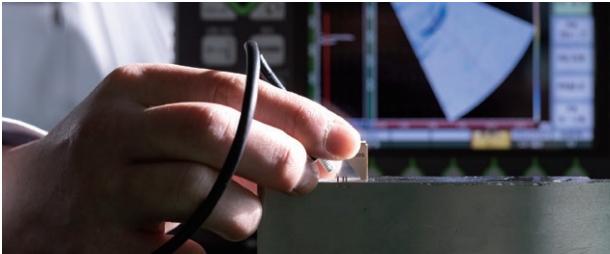
Equipment Maintenance

Based on the know-how and achievements in equipment diagnostics we have cultivated over many years in the maintenance of production equipment, we assure stable operation of plant production facilities, from both predictive and preventive perspectives.

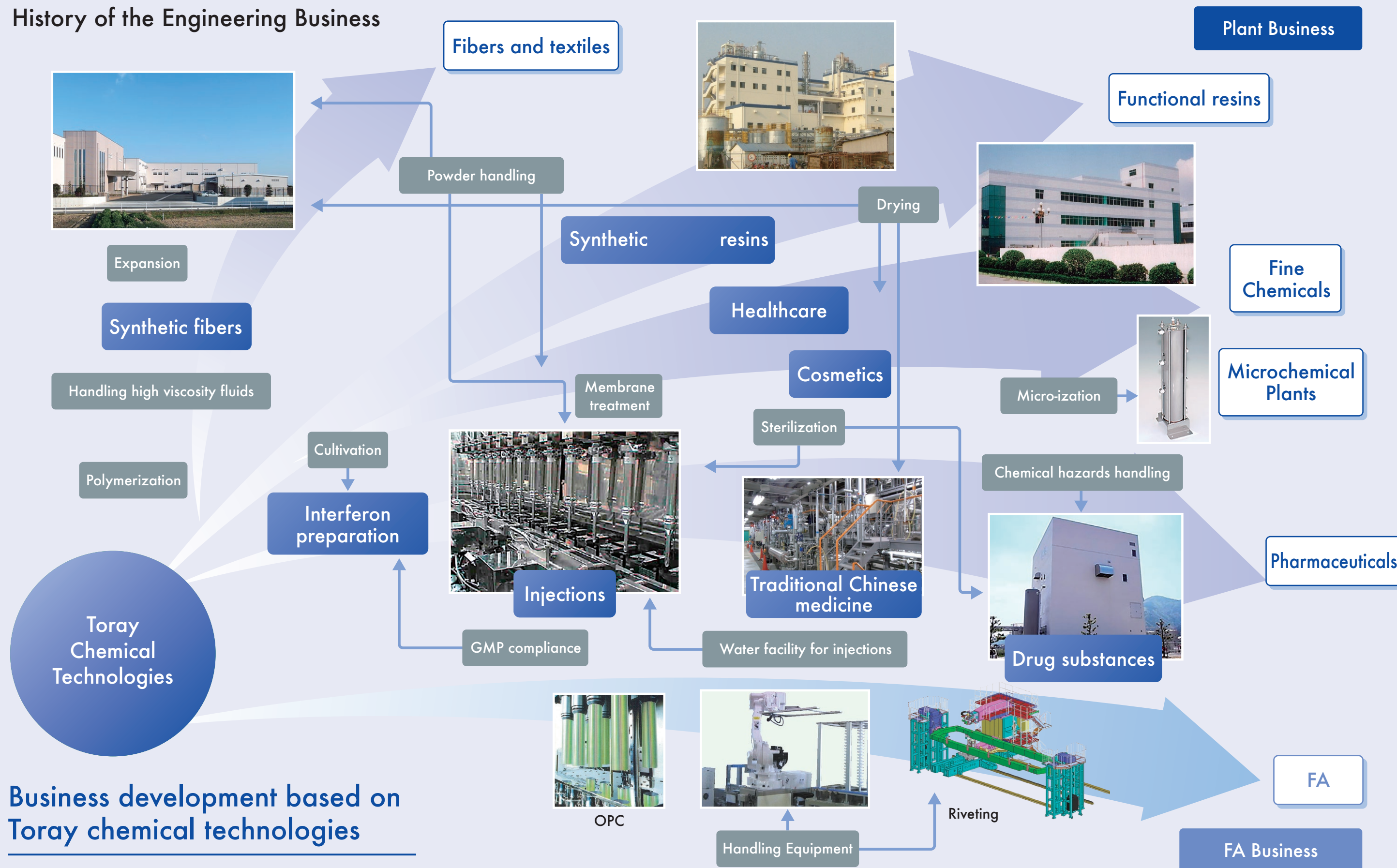


Equipment Diagnostics

Based on our experience with numerous factories, we conduct various inspections, analyze the causes of problems such as corrosion and damage, and propose solutions. We also provide training services for equipment diagnostic technologies.

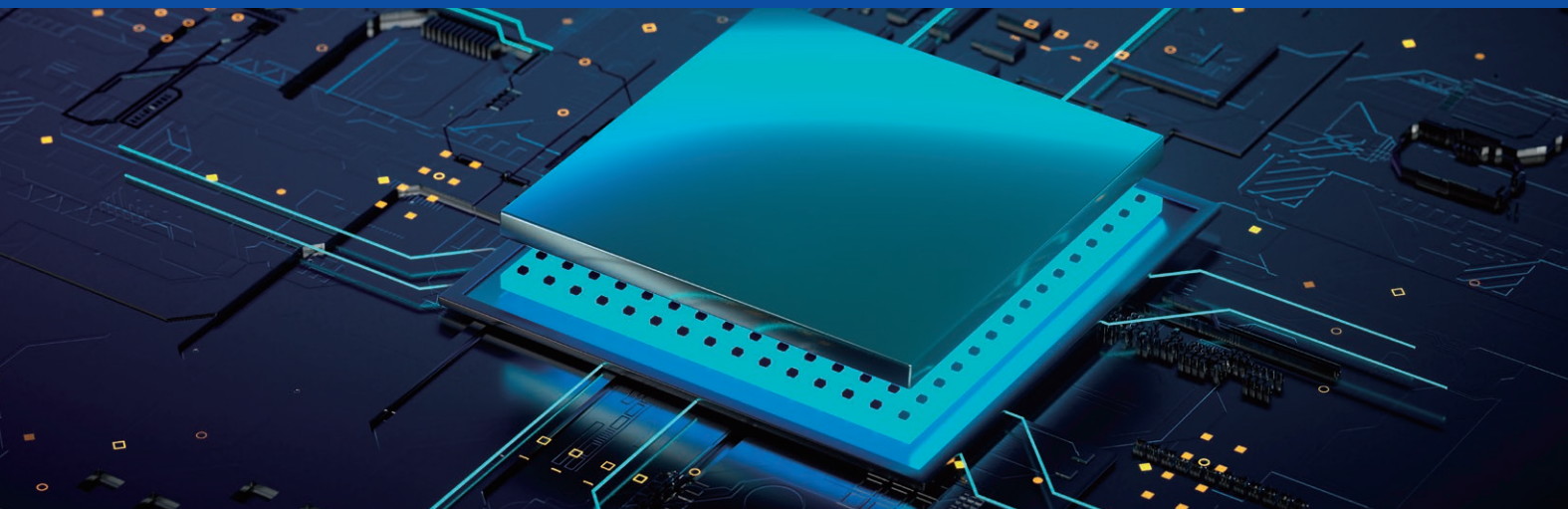


History of the Engineering Business



Business development based on
Toray chemical technologies

solution 1 FPD, Semiconductor Production Equipment



With our mechanical technology in the textile and film fields serving as the backbone, we have developed unique technologies such as high-precision coating technology and laser technology. In the field of FPD and semiconductor manufacturing, we provide a number of unique and industry-leading cutting edge solutions.

Coating Equipment

FPD

Semiconductor

■ Slit-nozzle Coater

Our unique nozzle and pump technology achieves high coating uniformity. We boast the world's top market share for slit nozzle coaters.



■ Inkjet Coater

High-precision patterning is achieved using image processing and position control technologies. Compatible with a wide range of substrates and applications, from semiconductor wafers to large flat panel display (FPD) glasses.



Laser Processing Equipment

FPD

Semiconductor

Our laser technology features the ability to synchronously control the optical system and precision stage. We handle a wide range of needs in a variety of industries for various processing such as patterning, trimming, and lift-off, as well as sheet-to-sheet and roll-to-roll transfer.



Semiconductor Mounting Equipment

Semiconductor

We provide high-precision flip chip bonders used for mounting semiconductor packages.

We are the first in the industry to adopt thermal compression bonding (TCB). We contribute to the manufacturing of high-end semiconductors.



Semiconductor Inspection Equipment

Semiconductor

■ Optical Semiconductor Wafer Inspection System

We developed a proprietary "good learning algorithm (Die-to-Statistical Image (DSI) comparison method)". We meet the needs for 100% automatic inspection of wafers with hybrid high-speed, high-sensitivity inspection that makes full use of optics.



■ Electron Beam Semiconductor Wafer Pattern Verification System

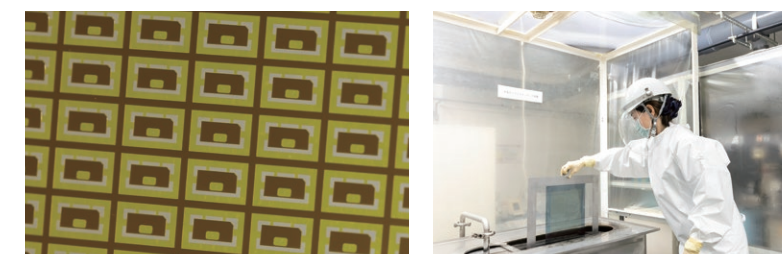
Using wide-field electron microscope images with high acceleration voltage (up to 50 kV), we achieve highly sensitive and high-speed defect inspection and multi-point measurement for cutting-edge 3D devices.



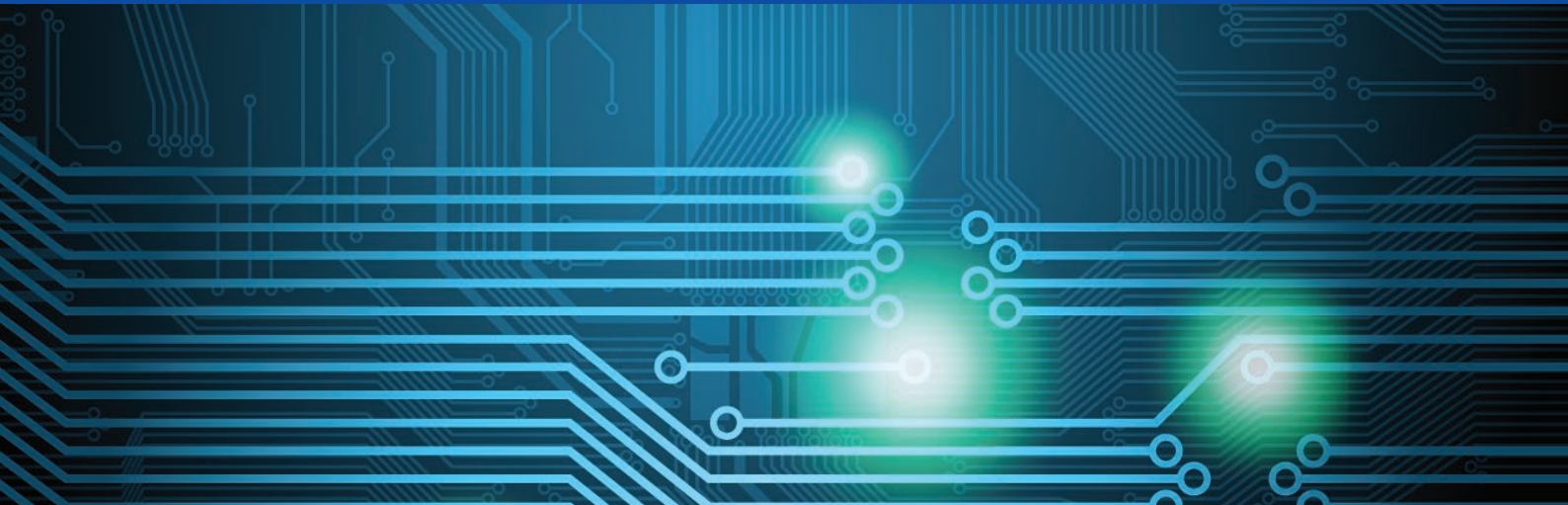
Microfabrication Technique

Polyimide etching

We have developed a revolutionary technology that safely achieves the difficult etching of polyimide films. By applying this technology, we can handle prototyping and contract processing of fine pattern flexible printed circuits (FPCs) for medical and electronic devices.



solution 2 Converting System

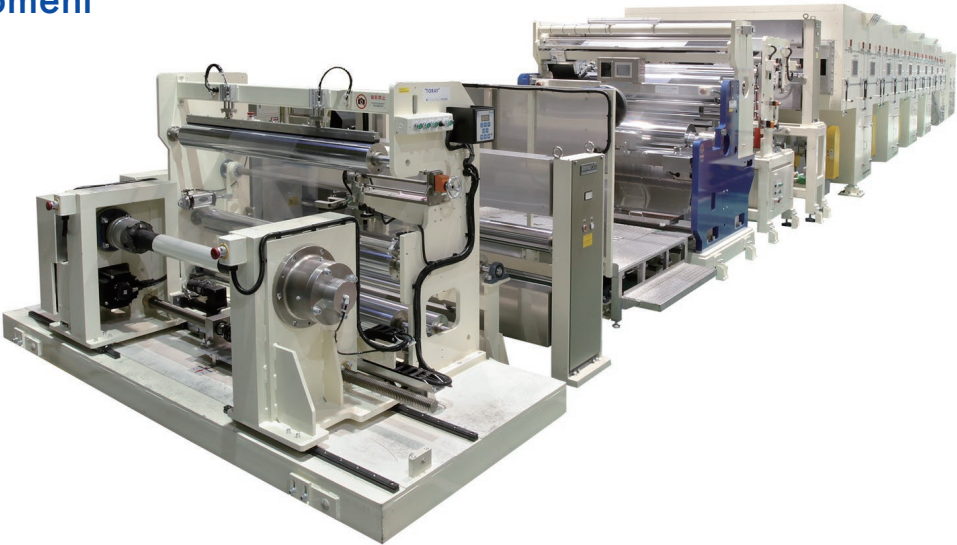


Based on our converting technology cultivated in the film field, we have developed manufacturing technology suitable for advanced materials such as high-performance films, lithium-ion batteries, and flexible devices. With advanced film handling technology, we provide cutting-edge solutions that meet the diverse needs of our customers.

Coating Equipment

Lithium-ion Battery

As a pioneer in slit-die coating and intermittent pattern coating technology, many battery manufacturers have adopted our equipment. We will continue to meet the increasingly advanced needs of our customers by making full use of our automatic control technologies. We will continue to meet the increasingly advanced needs of our customers by making full use of our automatic control technologies.



Deposition Equipment

Flexible device

We offer coaters, slitters, and laminators that have a proven track record in many fields, as well as roll-to-roll dry deposition equipment that supports a variety of deposition methods.



Film Production System

PET film

We provide optimal equipment for high-quality film production. This is also compatible with super engineering plastics.



solution 3 Measuring Equipment

We have a wide lineup of measurement, analysis, and process equipment, from oxygen analyzers used in the semiconductor manufacturing and food processing fields, to water quality analyzers used in river water quality monitoring. We provide customers optimal solutions to monitor and improve their processes.

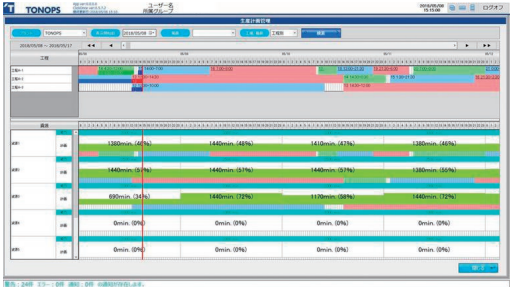
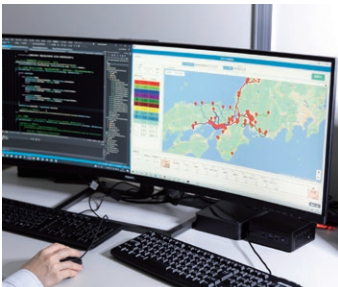


solution 4 Software

We offer MES (Manufacturing Execution System) and CAE (Computer Aided Engineering) systems that granularly meet different customer needs by leveraging our unique perspective, which covers a wide range of business fields, from plants to FA and development. We contribute to more efficient production management and product development.

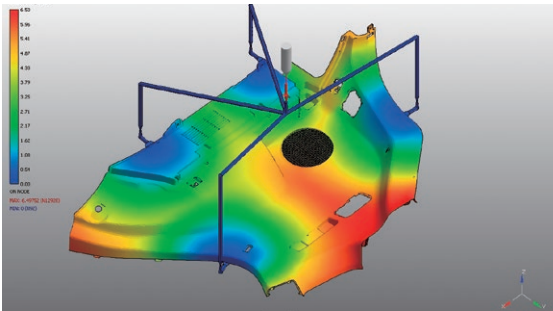
Factory / Production Management, Logistics Optimization System

With flexible customization and the use of AI, we achieve on-site management and logistics optimization. We have an extensive track record of implementation in a wide range of industries, including chemicals, semiconductors, pharmaceuticals, and automobiles.



Resin Injection Molding CAE Simulation Systems

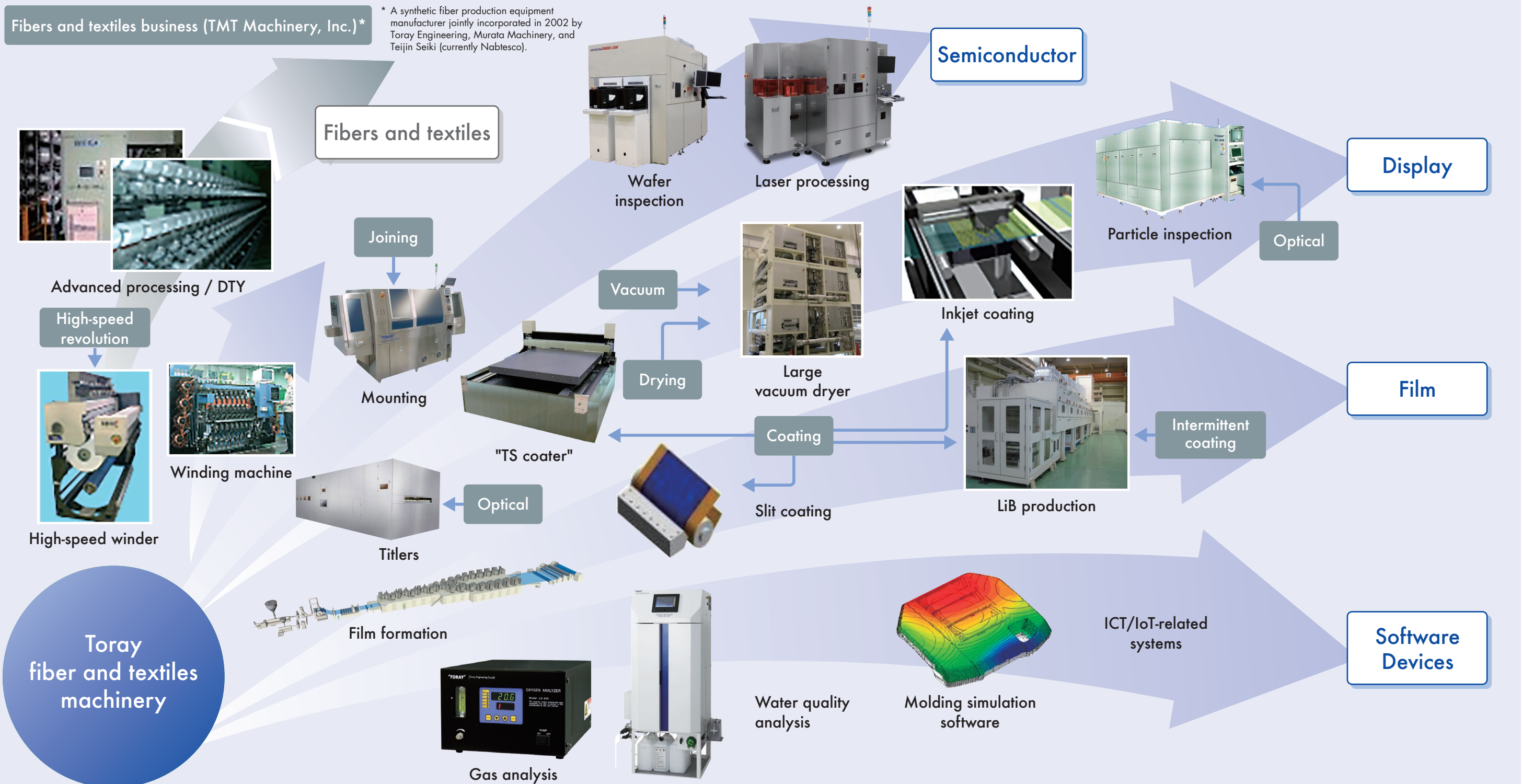
Including 3D TIMON™, our resin flow analysis software, we provide solutions that can be used throughout the entire process from the development to production of resin products.



History of Our Mechatronics & Fine Technology Business

Fibers and textiles business (TMT Machinery, Inc.)*

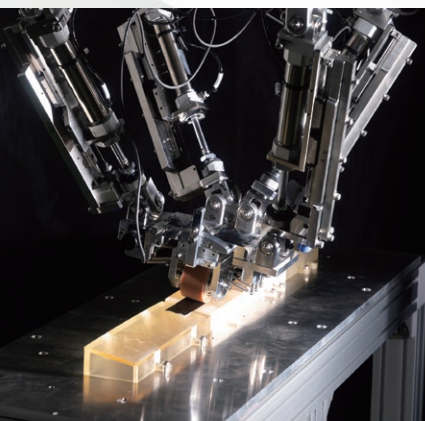
* A synthetic fiber production equipment manufacturer jointly incorporated in 2002 by Toray Engineering, Murata Machinery, and Teijin Seiki (currently Nabtesco).



Business development based on Toray's fiber and textiles machinery and film production technologies



Through open innovation, we create values that transform society.



SI innovation 01 AFP/ATL* Equipment

Carbon fiber composite material (CFRP) is a material that is gaining wide attention, especially in the automotive and aviation fields, because of its strength and light weight. The automotive industry has expanded its application of CFRP parts. We have developed a device that stably attaches tape-shaped CFRP (prepreg) impregnated with thermosetting resin to parts with complex shapes. We are contributing to the expansion of CFRP usage scenarios.

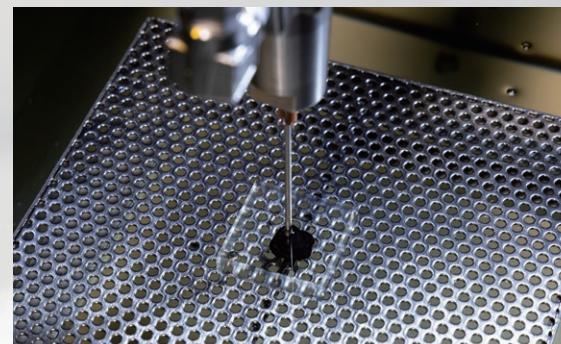
*AFP/ATL (Automated Fiber Placement/Automated Tape Layout)

SI innovation 02 Composite-material 3D Printer



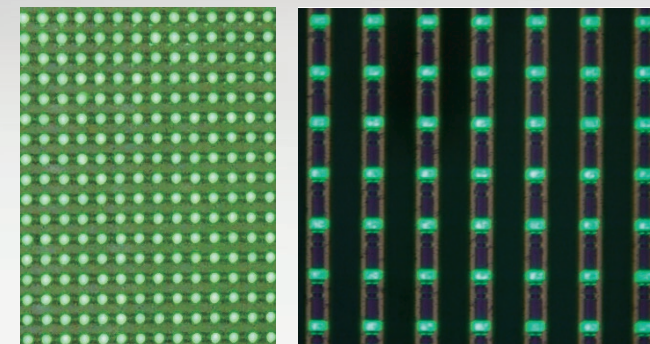
Conventional 3D printers have had the problem of producing anisotropy* in molded products due to their process characteristics. In order to solve this problem, we have developed a completely new 3D printing process called the "core shell method." This enables molding that takes advantage of the inherent strength of carbon fiber reinforced resin. It is expected to be used in the production of completely custom-made products such as healthcare-related products and high-mix, low-volume parts for automobiles and aircraft.

*Anisotropy: Varying physical properties depending on the direction.



SI innovation 03 Molecutideser™

We developed the "Molecutideser™", a device that performs highly accurate and efficient synthesis of nucleic acids. We contribute to the mass production of nucleic acid medicines, which are expected to be the next-generation therapeutics for cancer and rare diseases. In addition to aiming to achieve a nucleic acid manufacturing plant through technical cooperation with other manufacturers, we are also investing in a nucleic acid drug manufacturing startup and working on further joint development.



Magnified photo of MicroLED

DI innovation 02 MicroLED Display Manufacturing Technology

The size of a MicroLED chip is only a few tens of micrometers. Since a huge number of chips are used in a single display, variations in luminance and wavelength from chip to chip have been an issue. Thus, we developed a unique technology that determines the light emitting tendency of each chip and controls the arrangement of the chips so that the light emitting and coloring of the entire display becomes natural. We have achieved quality improvement and stabilization of MicroLED displays.



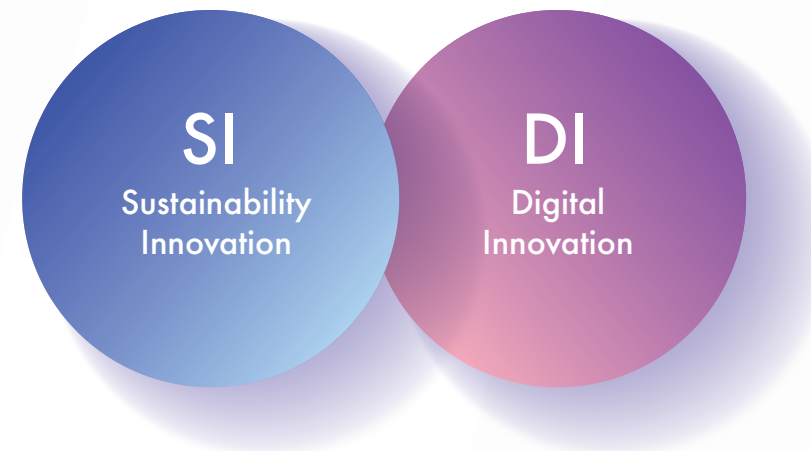
Laser Lift-Off Transfer Equipment "RAP-LLO™"

DI innovation 01

Laser-Based Transfer Technology for Semiconductor Devices

By applying laser transfer technology developed for the mass production of MicroLED displays, we have achieved handling of extremely thin and minute chips, which was difficult with conventional technologies. In preparation for the post-5G era, we will contribute to the development and production of cutting-edge semiconductors and aim to make them commercially available for 3D stacking and silicon photonics applications.

In our development efforts, we are focusing on two areas of growth as priority areas: "Sustainability Innovation (SI)," which contributes to the realization of a sustainable society, and "Digital Innovation (DI)," which contributes to improving convenience and productivity by leveraging digital technology. By making full use of open innovation methods through collaboration with universities, research institutes, companies, ventures, and startups, we will work to create new businesses that go beyond the framework of existing businesses from a more flexible perspective, and strive to develop engineering that contributes to the future of society as a whole.

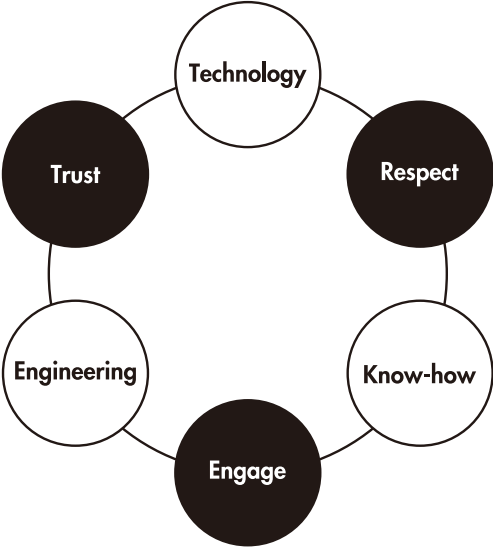


Open Innovation

TRENG

Solution by Technology, Engineering & Know-how

Toray Engineering formulated a term "TRENG" representing a "knowledge creation business" that consolidates the wisdom of each group employee, working together to resolve issues. "TRENG" consists of three main elements: "TRUST", "RESPECT," and "ENGAGE," which embody the culture (guiding principles) that Toray Engineering values. We earn a high level of trust by respecting our customers (Respect) and fulfilling our promises (Engage). We have used this as a source of energy to integrate into our work that exceeds expectations. Through the combination of TRENG and Toray Engineering's values of technology, engineering, and know-how, we will create new value for tomorrow's society.



Corporate Philosophy

Contributing to society through the creation of new value with innovative ideas, technologies and products

Corporate Missions

- | | |
|----------------------|---|
| For our customers | To provide new value to our customers through high-quality products and superior services |
| For our employees | To provide our employees with opportunities for self-development in a challenging environment |
| For our shareholders | To provide our shareholders with dependable and trustworthy management |
| For society | To establish ties and develop mutual trust as a responsible corporate citizen |

Corporate Guiding Principles

- | | |
|--|---|
| Safety and Environment | Placing top priority on safety, accident prevention and environmental preservation in order to protect the safety and health of employees, customers and local communities and contribute to building a sustainable society |
| Ethics and Fairness | Acting with fairness, high ethical standards and a strong sense of responsibility while complying with laws, regulations and social norms to earn trust and meet social expectations |
| Customer-Focus | Providing solutions of high value to customers, and pursuing customer satisfaction and the world's highest level of quality |
| Innovation | Achieving continuous innovation in all corporate activities, and aiming for dynamic evolution and growth |
| Strong <i>Genba-Ryoku</i>
(Workplace Competency) | Learning from one another and making self-driven efforts to leverage technologies and expertise in order to strengthen workplace competency, which is the foundation of our corporate activities |
| Cooperation and Co-creation | Forming integrated internal linkages and strategic alliances with external partners, and evolving together with society by creating new value |
| Emphasis on Human Resources | Providing motivating work environments where employees can demonstrate their abilities, and building a vibrant corporate culture |
| Information Disclosure | Appropriately disclosing corporate information and enhancing communication with stakeholders in order to maintain management transparency |
| Respect for Human Rights | Fulfilling our responsibility to respect human rights as a good corporate citizen |

Toray Engineering Co., Ltd. Network (Offices and Plants)

- | | |
|--|--|
| Headquarters
6th Floor, Yaesu Ryumeikan Bldg.,
3-22, Yaesu 1-chome, Chuo-ku, Tokyo 103-0028
TEL: +81-3-3241-1541 FAX: +81-3-3241-1553 | Yokohama Technical Center
Kaneko No. 2 Bldg.,
2-6-23 Shin-Yokohama, Kohoku-ku Yokohama, Kanagawa 222-0033 |
| Second Headquarters
1-1, Sonoyama 1-chome, Otsu, Shiga 520-0842
(Inside the Toray Industries, Inc., Shiga Plant)
TEL: +81-77-533-7201 FAX: +81-77-533-7202 | Tokyo Office
13th Floor, Marunouchi Trust Tower North Bldg.,
8-1, Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-0005
TEL: +81-3-5962-9771 FAX: +81-3-5962-9778 |
| Seta Plant
1-45, Oe 1-chome, Otsu, Shiga 520-2141
TEL: +81-77-544-1611 FAX: +81-77-544-1661 | Osaka Office
2nd Floor, Manulife Place Dojima Bldg.,
4-19, Dojimahama 1-chome, Kita-ku, Osaka, Osaka 530-0004
TEL: +81-6-6347-0287 FAX: +81-6-6347-0288 |
| FA Innovation Center
1F Hiiragi Bldg.,
1014-1 Nakatokari, Nagaizumi-cho, Sunto-gun, Shizuoka 411-0942
TEL: +81-55-960-8000 FAX: +81-55-960-8011 | Nagoya Office
23th Floor, Global Gate Bldg.,
60-12, Hiraike-cho 4-chome, Nakamura-ku, Nagoya, Aichi 453-6123 |

Domestic Subsidiaries

- | | |
|---|--|
| Toray Engineering West Co., Ltd.
Head Office: 4th Floor, Kansai Technical Center, 1-1,
Sonoyama 1-chome, Otsu, Shiga 520-0842
(Inside the Toray Industries, Inc., Shiga Plant)
TEL: +81-77-534-0956 FAX: +81-77-534-4693 | TASMIT, Inc.
Head Office: Kaneko No.2 Bldg.,
2-6-23 Shin-Yokohama, Kohoku-ku, Yokohama,
Kanagawa 222-003
TEL: +81-45-507-3330 FAX: +81-45-507-3340 |
| Toray Engineering Central Co., Ltd.
Head Office: 9-1, Oe-cho, Minato-ku, Nagoya, Aichi 455-0024
(Inside the Toray Industries, Inc., Nagoya Plant)
TEL: +81-52-613-5243 FAX: +81-52-613-5364 | TRENG F Products, Inc.
Head Office: 6th Floor, Yaesu Ryumeikan Bldg.,
3-22, Yaesu 1-chome, Chuo-ku, Tokyo 103-0028
TEL: +81-3-6262-7875 FAX: +81-3-6262-7876 |
| Toray Engineering P Frontier Co., Ltd.
Head Office: 13th Floor, Marunouchi Trust Tower North Bldg.,
8-1, Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-0005
TEL: +81-3-5962-9774 FAX: +81-55-989-3674 | Kitakyushu TEK & FP LLC
Head Office: 10-20 Koyomachi, Wakamatsu-ku, Kitakyushu,
Fukuoka 808-0002
TEL: +81-93-701-8733 |
| Toray Engineering D Solutions Co., Ltd.
Head Office: 6th Floor, Yaesu Ryumeikan Bldg.,
3-22, Yaesu 1-chome, Chuo-ku, Tokyo 103-0028
TEL: +81-3-3548-9500 FAX: +81-3-3548-9505 | HKK & TEK LLC
Head Office: 1-9 Kukinohama, Wakamatsu-ku, Kitakyushu,
Fukuoka 808-0054
TEL: +81-93-701-8733 |

Overseas Subsidiaries (Listed in order of establishment)

- | | |
|--|--|
| Toray Engineering (Korea) Co., Ltd.
Room 512, 10, Yatap-ro 81 beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do (Amigo Tower, Yatap-dong), 13497, Korea
TEL: +82-31-622-0060 FAX: +82-31-622-0069 | Toray Engineering Co., Ltd. Taiwan Branch
6th Floor, No. 451 Changchun Road, Songshan District,
Taipei 10547, Taiwan
TEL: +886-2-2547-1000 FAX: +886-2-2716-5050 |
| Toray Engineering (Shanghai) Co., Ltd.
Room 01, 36th Floor, Zhao Feng Plaza, 1027 Chang Ning Road,
Chang Ning Area, Shanghai 200050, China
TEL: +86-21-5241-7700 FAX: +86-21-5241-6368 | Toray Engineering Europe GmbH
Leopold str. 23, 80802 Munich, Germany
TEL: +49-89-244-423-082 |
| ROSEK (Malaysia) Sdn. Bhd.
Block B, Plot 117-119 & 200-202,
Prai Free Industrial Zone 1, 13600 Prai, Penang, Malaysia
TEL: +60-4-384-1973 FAX: +60-4-398-1705 | |

Corporate Outline

Corporate Name	Toray Engineering Co., Ltd.
Established	August 10, 1960
Head Office	6th Floor, Yaesu Ryumeikan Bldg., 3-22, Yaesu 1-chome, Chuo-ku, Tokyo 103-0028, Japan
Paid-in Capital	1,500 million JPY
Sales (consolidated)	129.6 billion JPY (FY2023)
Number of Employees (consolidated)	2,088 (as of March 31, 2024)

Board of Directors

Chairman of the Board	Yasuo Suga
CEO&COO	Takashi Iwade Executive Officer, Corporate Strategic Planning Dept., Growing Together Promotion Dept.
Senior Vice President (Member of the Board)	Kazuhiko Fujita Vice President, Research & Development Div. and Executive Officer, Information System Div., Quality Assurance & Security Trade Management Dept.
Senior Vice President (Member of the Board)	Masaya Kitano Vice President, Engineering Business Div.
Vice President (Member of the Board)	Hisayuki Aoi Executive Officer, Auditor Dept., CSR Div., General Affairs & Human Resources Div., and Vice President, Finance & Controller's Div. and General Manager, Finance Dept.
Vice President (Member of the Board)	Satoru Mizutani Executive Officer, Global Business Promotion Div., and Vice President, Procurement Div.
Vice President (Member of the Board)	Koji Mishima Vice President, Engineering Business Div., and General Manager, Sales Management Dept., Engineering Business Div.
Vice President (Member of the Board)	Kenji Sato Vice President, Mechatronics & Fine Technology Business Div., Executive Officer, Mechatronics & Fine Technology Business Div. Subsidiaries, and President, TASMIT, Inc.
Vice President (Member of the Board)	Toyoharu Terada Special Assistant to CEO&COO
Vice President (Member of the Board)	Nobuyuki Inohara
Vice President (Member of the Board)	Hiroyuki Matsuda
Auditor	Sadao Nakayama
Auditor	Masahiko Okamoto
Auditor	Isamu Nakabayashi

Company Overview

Toray Engineering Co., Ltd.

