TOHO TITANIUM CO.,LTD.

INTEGRATED REPORT 2022

TOHO TITANIUM
CHANGES THE WORLD

Management Philosophy

The Toho Titanium Group pursues the infinite possibility of titanium and related technologies, and contributes to building a sustainable society by continuously supplying excellent products and services.

Fundamental Code of Conduct

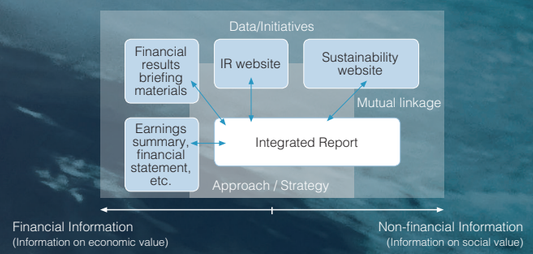
To put our Management Philosophy into practice, we adhere to the following three Fundamental Policies.

1. We give the highest priority to safety and compliance and operate a healthy and fair business.
2. We practice innovation and creativity to achieve continuous growth for our employees and organization.
3. We enhance communication with all stakeholders including customers, local communities, and shareholders, to develop relationships of mutual trust and symbiosis.

Editorial Policy

Readership
This Integrated Report has been compiled with the following stakeholders in mind: shareholders and investors, customers, business partners, employees and their families, students and job applicants, and members of local communities and society.

Our Stance on Information Disclosure
This Integrated Report emphasizes the Toho Titanium Group's approach to and strategy for value creation in the form of stories, and is positioned as a communication tool to help our stakeholders understand our growth potential and our contribution to a sustainable society.
For detailed performance information and ESG-related data, please refer to the latest information on the "Investor Relations" and "Sustainability" pages of our website, as well as the Integrated Report.



Period Covered
As a general rule, this report includes results for fiscal 2021 (April 1, 2021 to March 31, 2022), but some information on past initiatives and fiscal 2022 status is included where necessary.

Scope of Coverage
In principle, all domestic and overseas business sites of the Toho Titanium Group are covered.
Toho Titanium Co., Ltd.:Headquarters, Chigasaki Plant, Hitachi Plant, Kurobe Plant, Wakamatsu Plant, and Yahata Plant
Group Companies: Toho Technical Service Co., Ltd.
Toho Material Co., Ltd.
TOHO WORLD Corporation
Toho Titanium Europe Co., Ltd. (UK)
Toho Titanium America Co., Ltd. (US)

Future Outlook
Please be aware that the information contained in this Integrated Report may include our future strategies, forecasts and views, and that actual results may differ materially from these forecasts due to various changes in the environment and other external factors.
Note:
Disclosure Policy and Disclaimer
www.toho-titanium.co.jp/en/ir/disclosure/

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PRESIDENT MESSAGE

Through our "Three Pillars," we pursue sustainability by turning risks into opportunities.

President and Representative Director
Yasuji Yamao

It has been a year and a half since I became president of Toho Titanium. Although the economy is gradually recovering from the COVID-19 pandemic, the invasion of Ukraine by Russia has since broken out, and uncertainty in the business environment persists, with alternate adverse and favorable winds. The past year has brought home to me the critical importance of our "Three Pillars" in times of such drastic change. I feel that establishing our titanium metals, catalysts, and chemicals businesses as these Three Pillars is working in very favor of further developing our competitiveness and resilience.

The "Three Pillars" Enabling Sustainable Growth

In our titanium metal business, titanium tetrachloride produced from titanium feedstock is reduced to manufacture titanium sponge, which is melted to produce titanium ingots and high-purity titanium for semiconductors. We also manufacture and sell catalysts and other chemical products by utilizing the by-products generated in these processes.

The main destinations of the titanium metal business are the aircraft industry, which accounts for about half of the business, and plants and other general industries. In fiscal 2020, when economic activity came to a halt due to the COVID-19 pandemic, our sales volume of metallic titanium products declined significantly as the sharp drop in air passenger volume stalled aircraft manufacturing and maintenance needs, and plant construction progress was also delayed. However, the business environment was drastically changed with the invasion of Ukraine that broke out in February 2022. One of the world's two major aircraft manufacturers suspended purchases from Russia's VSMPO-AVISMA, which holds the world's top share of titanium for aircraft, while the other has indicated that it will reduce its purchases over the medium- to long-term. This supply constraint has placed the spotlight on Japanese manufacturers as a source. With only two domestic titanium sponge producers in Japan, there is a need to meet surging replacement demand, and aircraft demand is also showing signs of recovery. Having thus turned the corner, titanium production is in a tight condition now.

On the other hand, the main customers of the catalysts for polyolefin polymerization handled by our catalyst business are manufacturers of resin products such as packaging materials and automobile interiors and exteriors. During the COVID-19 pandemic, although production in the automobile industry contracted, strong demand for medical and hygiene products including non-woven masks helped ensure solid sales. In the chemicals business, our main product is ultra-fine nickel powder used for the internal electrodes of multilayer ceramic capacitors. The strong performance was due to a significant increase in stay-at-home demand for electronic devices such as PCs and smartphones.

In this way, until fiscal 2021, our mainstay titanium metal business, which had suffered due to COVID-19, was supplemented by our second most important business, catalysts, as well as chemicals, our third most important. In fiscal 2022 and beyond, amid the gathering storm clouds of ongoing global inflation and China's slowing growth rate, we must make prudent business decisions without becoming overly confident in the special demand for our titanium metal business. Since it is impossible for all business areas to remain strong, we will first ensure overall financial stability by pursuing our Three Pillars portfolio without placing too much emphasis on any one business. Only then can the potential for sustainable growth be developed in a robust manner. We are convinced that these Three Pillars comprise the greatest assets inherited from our of about 70 years, and also represent the greatest strengths of the Toho Titanium Group.

Progress and Challenges for the Medium-term Management Plan

As a result of such risk diversification, we expect to exceed our initial target for fiscal 2022, the final year of our three-year Medium-term Management Plan. ROE, which we regard as our most important indicator, is also expected to reach approximately 14%. We are relieved that we are on track to achieve our goals, overcoming fluctuations in the supply-demand balance, raw material prices, and exchange rates, by steadily investing in growth while maintaining a stable equity ratio of about 50%.

Medium-term Management Plan (FY2020 to FY2022) Key Indicators

Key Indicators	FY2020 (results)	FY2021 (results)	FY2022 (forecast)	FY2022 (target)
Sales (Unit: ¥100 million)	361.6	555.2	806.0	580.0
Ordinary profit (Unit: ¥100 million)	△4.2	51.8	100.0	60.0
Current net profit attributable to the owners of the parent (Unit: ¥100 million)	△31.6	37.0	70.0	40.0
ROE (%)	△6.8	8.1	13.8	8.0
Equity ratio	48.6	47.9	49.3	52

In the current Medium-term Management Plan, we have set forth five basic themes: priority investment in growth areas, early profitability of the Saudi joint venture (ATTM), a renewal plan for the Chigasaki Plant, creation of new businesses, and promotion of ESG management.

First, with regard to investment in growth areas, we have made steady progress with the expansion of production capacity in the catalysts and chemicals businesses, which represents 80% of the cumulative total 18 billion yen investment plan for the three-year term of the Medium-term Management Plan. The fourth ultra-fine nickel powder production facility within the Wakamatsu Plant was completed in April 2021, and the new catalyst production facility within the Chigasaki Plant started commercial production in November 2022. As a result of these investments, the production capacity of the chemicals business has increased by approximately 60% and that of the catalysts business by approximately 50% up to now. We plan to continue expanding these operations through the next Medium-term Management Plan, which will considerably strengthen our profit base. Through the next Medium-term Management Plan, we will also focus on BCP measures to fulfill our responsibility to supply our customers around the world, and on technological development to improve the performance of our catalysts to further add value to our business.

Meanwhile, we continued to face challenges in the early monetization of ATTM, a project to expand the capacity of our titanium business. Due to the COVID-19 pandemic that struck shortly after the start of operations in fiscal 2019, ATTM's titanium sponge manufacturing plant was only operating at about 40% of capacity utilization, resulting in a very difficult situation in fiscal 2020, with impairment losses recorded. With the Chigasaki and Wakamatsu Plants operating at full capacity in response to the special demand, we need to raise the operating rate of ATTM as soon as we can in order to meet further increases in demand, and we are hurrying preparations to go into full operation during the first half of 2023. Since ATTM is an equity-method subsidiary, we expect it will take some time before the increased revenues will be realized in the Group's consolidated results. We will achieve profitability as soon as possible by maintaining a high operating rate and ensuring that sales prices are appropriate.

The Chigasaki Plant renewal is progressing as planned. We are preparing for increased demand with efforts rooted in the safety and security of employees and local communities through safety and environmental measures, as well as work environment improvements at our aging plants. We are also strengthening our quality control system by establishing a new analysis center.

Our efforts to seek out ways of creating new businesses are also progressing steadily. Among these, WEBTi®, used in the gas diffusion layer of water electrolysis hydrogen production equipment, has advanced to the mass production phase, and we have high expectations for it as a new pillar of our efforts to address climate change and contribute to a recycling-oriented society. We will continue to seek out fourth and fifth pillars by linking the needs of society with our seeds of technology. We will also promote the use of new technologies such as AI and IoT in our production processes to foster new competitive strengths.

Thoroughgoing On-site Risk Management

As we implement these growth measures, one of the major challenges we face is that while we are a stable company that has existed for about 70 years, we do not have enough of the sense of crisis it takes to deal with fluctuations in the global market. Coincidentally, this past year happened to be an opportune time to boldly take a scalpel to our company-wide risk management effort, as geopolitical risks became more apparent and each employee experienced firsthand the changes our environment is undergoing.

First, we asked each business division to imagine the various possible risks and carefully identify each of them. For each of these risks, we have introduced a monitoring system with quantitative targets and action plans, and we are steadily implementing countermeasures. Another significant achievement was the establishment of a mechanism to counter the risk of fluctuations in the price of nickel metal used by our chemicals business, based on the experience with copper futures trading I gained in my previous position. We prepared risk hedging through futures trading in the LME market during the last fiscal year, and started implementing it in April 2022. Nickel prices, which soared to abnormal heights during the Ukraine crisis, plummeted after April as the conflict became more protracted. In the nick of time, we were able to avoid a revenue loss in the hundreds of millions of yen. I sense a positive response from our employees on the front lines, who now share in the critical importance of always anticipating future risks and taking countermeasures, rather than allowing ourselves to become overconfident amid seemingly good performance.

ESG Management, Identifying and Converting Future Risks into Opportunities

In this sense, our fifth basic theme, promoting ESG management, comprises the greatest application of risk management toward ensuring sustainability. The Group's basic policy on ESG management is to work toward solving social issues involving the company and our stakeholders through our business activities, to contribute to the sustainable development of society, and to enhance our corporate value over the long term. We have identified materialities based on this, and are working on each issue mainly through the ESG Promotion Committee and its Subcommittees.

On the environmental front, we are actively working to reduce CO_2 emissions under our 2050 Carbon Neutral Vision formulated in May 2021. Our new titanium smelting technology is at the core of this effort. In order to achieve decarbonization and resource recycling throughout the entire manufacturing process, we are working in collaboration with manufacturers of raw materials and mill products that make finished titanium products.

On the social front, we emphasize respect for human rights throughout our supply chain. Here, too, we tell our employees to consciously put themselves in the other person's shoes and use their imagination. The White Logistics initiative, for instance, starts by clarifying how long we have kept vehicles waiting for loading and unloading, and our human rights education in Saudi Arabia is in line with the basic attitude of professionals who respect different local conditions and ways of thinking in order to work comfortably. We take pride in our sincere and earnest corporate culture, which has always valued sports support and community service activities. It should be natural for us to build cumulatively on these efforts.

I also think that the strengths of the Three Pillars have applications in the domain of human resource development. My intention is for the exchange of human resources across business divisions to be more flexible than ever, so that employees can be stimulated by the diverse working environments and have opportunities for further growth. This is necessary to develop management personnel who can accurately understand in domestic terms the strengths and challenges of our three businesses, each of which operates on its own unique terms. In addition, we also want to cultivate world-class human resource capabilities by encouraging the acquisition of qualifications and creating a system to study technology at overseas research institutions. We will continue to work ambitiously through our next Medium-term Management Plan, leveraging the strengths of our Three Pillars as a way to increase the number of career path options, and to further expand the possibilities for the utilization of human resources.

In order to identify environmental and social issues and flexibly identify business opportunities, we are focusing on improving risk management in terms of governance. In addition to promoting governance reforms in line with market requirements, we have established an appropriate conflict of interest management system to protect minority shareholders as a listed subsidiary. We will continue to work with Outside Directors to improve the transparency and effectiveness of management.

Toward Rebuilding the Ideal We Envision for 2030

In 2023, we will celebrate the 70th anniversary of our company's founding. In the next Medium-term Management Plan, we will pursue sustainability from a longer-term perspective with an eye toward becoming a "100-year company." Therefore, in addition to updating the ideal we envision for ourselves in 2030, an important future milestone, we intend to set new quantitative targets in order to unify the Group as a whole along one vector.

Now that we are experiencing a paradigm shift amid our coexistence with COVID-19 and increasing mobility of human resources, the relationships of trust that companies and employees need to build can be expected to have a different quality than the loyalty of the past. Moving forward, I believe that we should build relationships in which we discuss and pursue growth potential together, while respecting the power of the individual. That is why it is necessary to establish clear goals that employees with diverse values can aim for in common. In order for our employees to work comfortably and enthusiastically, and for the company to continue to grow, we would first like to deepen the dialogue within the company.

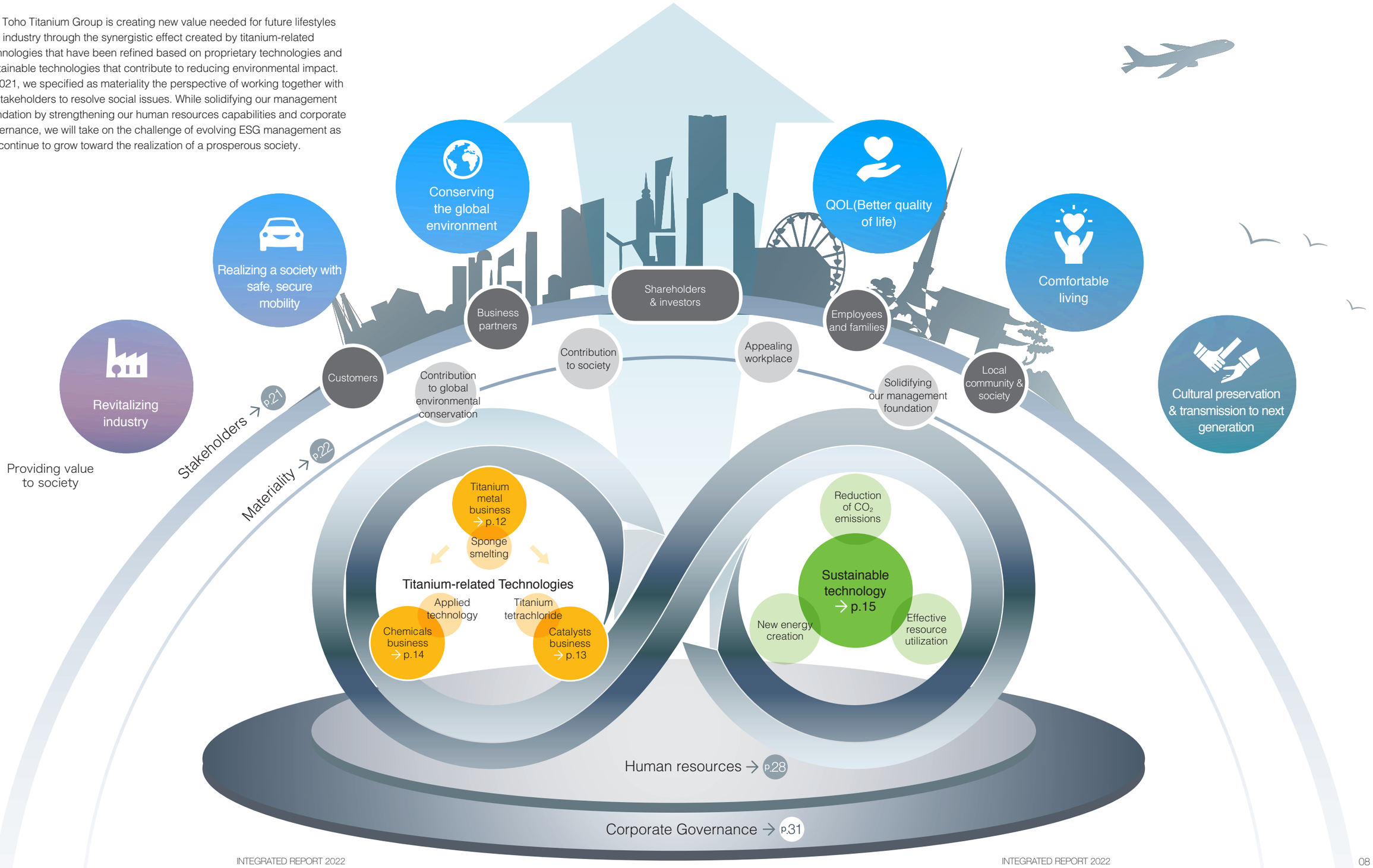
We will leverage our Three Pillars of strength, both offensively and defensively, and contribute to a sustainable society through continuous reform out of a constant desire to bring about transformation. I ask for your continued support as we boldly and flexibly take on the challenge of maximizing corporate value to meet the expectations of our stakeholders.

The Toho Titanium Value Creation Process

The Toho Titanium Group is creating new value needed for future lifestyles and industry through the synergistic effect created by titanium-related technologies that have been refined based on proprietary technologies and sustainable technologies that contribute to reducing environmental impact. In 2021, we specified as materiality the perspective of working together with all stakeholders to resolve social issues. While solidifying our management foundation by strengthening our human resources capabilities and corporate governance, we will take on the challenge of evolving ESG management as we continue to grow toward the realization of a prosperous society.

Management Philosophy

The Toho Titanium Group pursues the infinite possibility of titanium and related technologies, and contributes to building a sustainable society by continuously supplying excellent products and services.



Quality Management that Achieves Value Creation

Our Group commitment to quality improvement

Initiatives to improve customer satisfaction

At the Toho Titanium Group, we work hard to provide products and services that place the highest priority on quality so that we can continue earning the trust of our customers. We aim to improve customer satisfaction by accurately identifying customer needs and continuously realizing product and process improvements. We also conduct environmental impact assessments considering the entire product lifecycle, including products under development, and when design specifications are changed, we evaluate whether or not any changes in environmental impact will result.

Toho Titanium Group Fundamental Quality Policy

We recognize that we have a mission with respect to society, which is to continue providing superior products and services.
We act in accordance with this Fundamental Quality Policy to help realize a sustainable society.

1. Compliance	We will ensure compliance with legal requirements and act with high ethical standards.
2. Meeting customer expectations	We will not only correctly identify customer needs and provide accurate information on quality, but also provide products and services that are trusted and satisfactory.
3. Continuous improvement	We will promote continuous improvement of quality and service through our quality management system.
4. Human resource development	In our efforts to develop human resources, we will foster a keen awareness and sense of responsibility for quality and service, developing personnel who take the initiative in pursuit of quality.
5. Concern for safety and environment, and providing information	We will create products that reflect our concern for safety and environmental compatibility, and we will provide the appropriate information.

Quality Control Initiatives

We have acquired ISO 9001 certification, an international standard for quality management systems, and have established a world-class quality management system that is appropriate for a global company supplying products that customers can use with confidence. In particular, we have obtained certification under JIS Q 9100, one of the international standards for quality control systems, for our titanium sponge and titanium ingots, enabling us to promise stable quality that meets the high quality control requirements of the aerospace industry and other industries.

ISO 9001 Certification

Starting with ISO 9002 certification of our Catalyst Division in 1996, we achieved ISO 9002 certification for all titanium divisions in 1998, and by 2001, we had expanded certification to ISO 9001 for our main titanium and electrical materials products, with certification for the scope of registration shown on the right.

We will continue to expand our quality management system, promote certification, and strive to further build trust and increase satisfaction among our customers.

■ Business sites certified under ISO 9001:2015

Headquarters, Chigasaki Plant,
Hitachi Plant, Yahata Plant,
Wakamatsu Plant, and Kurobe Plant

■ Scope of Certification

Design, development and manufacture, as well as liquification under contract of titanium tetrachloride, titanium sponge, high-purity titanium (sponge, ingot and billet), titanium ingot, high-purity titanium dioxide, titanium suboxide, propylene polymerization catalyst, ultra-fine nickel powder, magnesium chloride, titanium trichloride solution, and titanium tetrachloride solution.

Implementation of a quality management system for the aerospace industry

We received JIS Q 9100 certification one of the quality system standards for aerospace applications for titanium sponge in 2003, and in 2010, we expanded the scope of certification to include titanium ingots. We will continue our efforts to provide better quality and service.

■ Business sites that have obtained JIS Q 9100:2016 certification

Headquarters, Chigasaki Plant,
Yahata Plant, and Wakamatsu Plant

■ Scope of Certification

Design, development and manufacture of titanium sponge and titanium ingot

Supply chain management

Strengthening linkage and collaboration with business partners

Based on the Guidelines for Business Conduct and Promise to Business Partners (Transaction Principles) within our Fundamental Purchasing Policy, the Group will strive to build relationships of trust with business partners through fair and equitable transactions as well as legal compliance and environmental conservation.

Fundamental Purchasing Policy

Guidelines for Business Conduct	Transparency	We will be open and transparent in our dealings.
	Fairness	We will base our selection of suppliers on fair evaluation.
	Legal compliance	We will comply with all applicable laws and regulations, and will conduct our business not only in accordance with the letter of individual provisions of laws and regulations, but also with a respect for the spirit of the law.
	Environment conservation	We place importance on the environment and actively promote "Green Purchasing" practices.
	Mutual trust	We will build relationships of trust with our business partners through transactions based on equal partnership.
	Ethics	We will maintain appropriate relationships with business partners based on strict ethical viewpoint. We will sever all relationships with Antisocial Forces and conduct sound purchasing activities. We will not engage in any transactions that exploit an advantage of ours to the unfair advantage or disadvantage of others.
Promise to Business Partners (Transaction Principles)	Fair opportunity for entry	We will provide fair entry opportunities for those who wish to transact business, and we will respond sincerely to trade offers.
	Fair evaluation	Selection of suppliers will be based on fair evaluation of quality, price, delivery time, and performance.
	Confidential information management	We will strictly manage and maintain the confidentiality of information obtained for administrative purposes in the course of purchasing transactions.
	Clarity of reasons for selection	For business partners who were not selected for orders due to competing inquiries, etc., we will, upon request, clarify the fact that they were not selected and the reason for not being selected.

Green Procurement

As part of our efforts to protect the environment, we actively promote "Green Procurement" practices. We strive to do business with partners that are proactive in their environmental responses including reduction of the environmental impact related to the manufacture, use, and disposal of their products and the provision of services to our Group as well as purchasing of goods that have less environmental impact on the global environment,

Fair Trade (activities for compliance with the Subcontracting Law)

The Group considers the deepening of relationships of trust with business partners to be extremely important, and we are particularly committed to strict compliance with the Subcontracting Law, engaging in ongoing measures to ensure the proper and smooth operation of subcontracting transactions.

Initiatives to eliminate Antisocial Forces

We are continuously working to eliminate Antisocial Forces. Our Code of Conduct emphasizes fair trade and the promotion of sound business practices. We also conduct surveys of business partners on the status of implementation of measures to prevent involvement with Antisocial Forces, and we follow up with them on an ongoing basis.

Responsible Mineral Procurement → p.27

Procurement BCP Initiatives

We are working on procurement BCP to prepare for the risk of business shutdown due to natural disasters such as earthquakes, windstorms, and floods, as well as fire and power outages. We are advancing the diversification and multiple decentralization of procurement sources to minimize procurement risks.

Participation in the "White Logistics" Promotion Movement

In March 2022, we endorsed the objectives of the "White Logistics" promotion campaign developed by the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of Economy, Trade and Industry, and the Ministry of Agriculture, Forestry and Fisheries, and submitted a Declaration of Voluntary Action.

The White Logistics campaign aims to address the growing shortage of truck drivers, secure stable logistics services necessary for people's daily lives and industrial activities, and contribute to the growth of the economy. Through the campaign, we are working to (1) improve productivity and efficiency of transportation, and (2) create labor environments that are comfortable for all workers including female and elderly (over 60) drivers. Participating companies are required to formulate, declare, and implement a "Declaration of Voluntary Action," which includes itemized and detailed voluntary efforts to improve logistics. To date, approximately 1,400 companies have endorsed the campaign. We have declared the following eight points as our own initiatives.

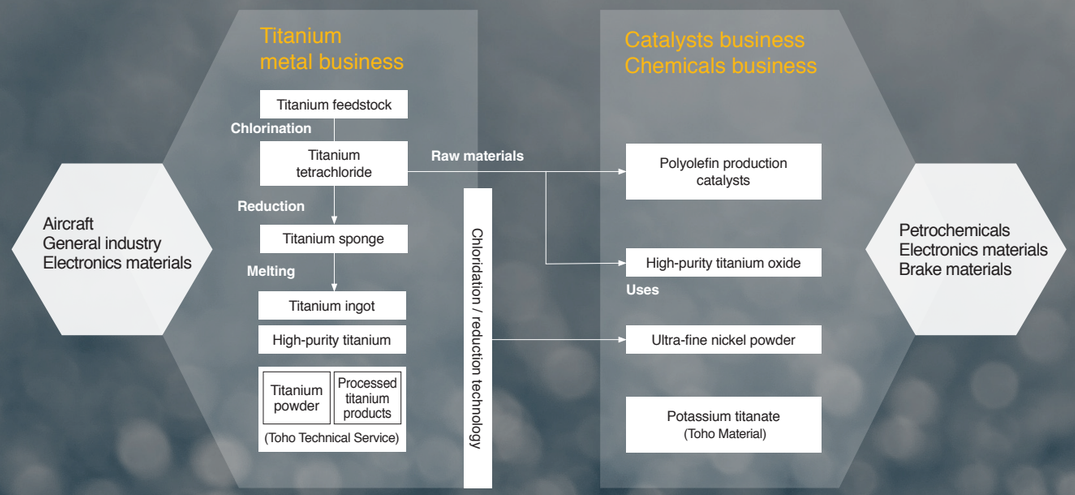
(Excerpt)
1. Proposals for and cooperation in logistics improvement
2. Separation of work tasks other than driving
3. Improvement of facilities on the part of shippers
4. Modal shift to ships and railroads
5. Introduction of fuel surcharges
6. Consideration of legal compliance when selecting contract counterparts
7. Proactive use of logistics companies that are involved in work-style reforms, etc.
8. Safety measures during loading and unloading operations

「ホワイト物流」推進運動 賛同企業

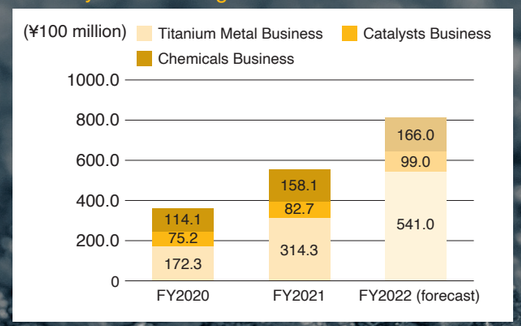
Titanium-related Technologies

Business overview

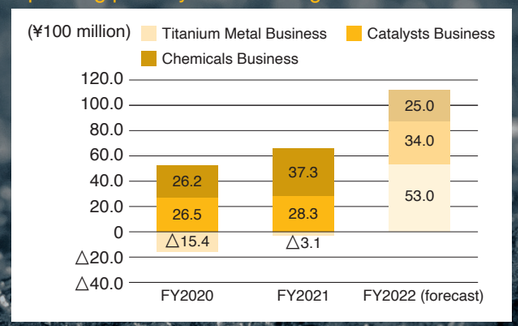
As one of the world's leading titanium manufacturers, the Toho Titanium Group operates three businesses: our titanium business, in which we manufacture and sell titanium metal, and which serves as the basis for catalysts and chemicals business operations. By accurately identifying market needs and pursuing the unlimited potential of titanium products and related technologies, we will contribute to our customers' product and business development, thereby achieving sustainable growth for our Group.



Sales by business segment



Operating profit by business segment



Note: Beginning with fiscal 2022, the company has switched to a calculation method that allocates company-wide general and administrative charges to each segment based on reasonable criteria, except for general and administrative charges related to research and development, which are primarily used to create and promote new businesses. This was done in order to better evaluate and manage the performance of each reportable segment. The figures in this Integrated Report are based on the calculation method after the change.

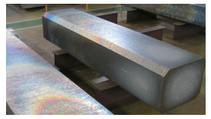
Titanium metal business

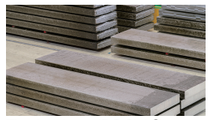
Expanding domains of application with stable quality metallic titanium

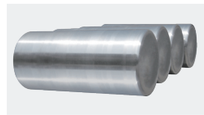
In the titanium business, in addition to titanium sponge and titanium ingots melted and cast from titanium sponge, we also have a wide range of value-added products such as DC Slab® and titanium powder, each of which has strong advantages as a material.
With high quality and reliable supply, we provide titanium products that satisfy our customers.

Main Products


Titanium sponge


Titanium ingot (rectangular)


Titanium ingot (DC Slab®)


High-purity titanium ingot (round)


Titanium powder

Market Environment and Overview of the Current Fiscal Year

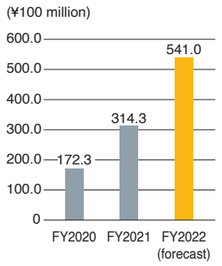
Demand for aircraft applications for overseas markets began to recover in fiscal 2020, during which demand had fallen due to the COVID-19 pandemic, and demand for general industrial applications for domestic markets also showed signs of recovery. Together with high-purity titanium for semiconductor applications, which remained strong, titanium sales volume in fiscal 2021 increased significantly.

Demand for titanium sponge for the aviation industry is expected to continue to recover in fiscal 2022, and the impact of Russia's invasion of Ukraine on the supply chain is expected to further increase demand. Since the production of titanium sponge at our domestic sites has been at near full capacity since January 2022, we are planning to meet increasing demand by raising production volume at our affiliated titanium sponge manufacturing joint venture in Saudi Arabia, Advanced Metal Industries Cluster and Toho Titanium Metal Co, Ltd. (ATTM).

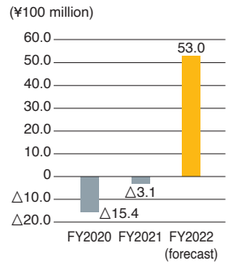
On the earnings side, meanwhile, costs are rising significantly due to soaring prices for titanium feedstock, sub-materials, and transportation costs, which are putting significant pressure on margins. But we are also revising prices to compensate for the cost increases, and we expect to continue to increase sales and profits in fiscal 2022 as we did in fiscal 2021.


Titanium sponge plant in Saudi Arabia (ATTM)

Net sales



Operating profit



Growth Strategy

1 Strengthening the Profit Base

- Stable procurement of titanium feedstock through mining investment, etc.
- Technology development and early commercialization of high-value-added products

2 Improving Profitability Through Sales Channel Expansion

- Strengthen alliances with major customers to secure sales volume (long-term contract revision with Timet)
- New customer development in the China market, etc.
- Strengthen and expand the high-purity metals business

3 Expansion of Supply Capacity for Titanium Products

- Early increases in operating rates and productivity improvement at ATTM (titanium sponge)
- Improved facility operating rates at Yahata and Chigasaki Plants (titanium ingot)

Catalysts business

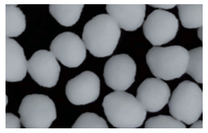
Contributing to Value-added Polyolefins

Taking advantage of our in-house procurement of titanium tetrachloride and magnesium chloride, we develop, manufacture (including contract manufacturing), and sell catalysts for the production of polyolefins (PO) such as polypropylene (PP) and polyethylene (PE), which are general-purpose plastics, and polybutene-1 (PB-1) and polyolefin elastomers (POE). We also process and sell magnesium chloride as a raw material for catalysts and pharmaceutical intermediates.
Our main product, "THC Catalyst," receives high marks from PO manufacturers for its performance and quality stability.

Main Products

PO production catalysts

- THC-C
- Catalyst for high-rigidity PP
- Catalyst for impact copolymer
- Environmentally friendly non-phthalate catalyst
- Catalysts for PE, PB-1, POE, etc.



THC catalyst

Raw materials for catalyst supports and pharmaceutical intermediates

- Magnesium chloride powder
- Magnesium chloride lump
- Magnesium chloride powder/titanium trichloride mixture

Catalyst raw materials

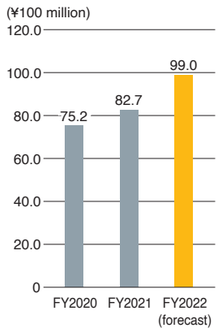
External donor for PP production

Market Environment and Overview of the Current Fiscal Year

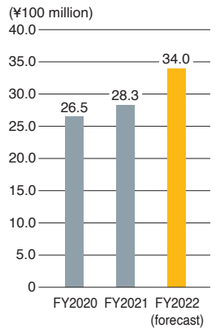
Demand for polypropylene (PP) remained firm, mainly due to increased demand for packaging and medical applications, although demand for automotive and construction applications declined due to the COVID-19 pandemic. Sales of our polyolefin catalyst products have also increased as a result. We expect to maintain strong performance in fiscal 2022, and despite cost increases due to the operation of a new plant, etc., sales and profits are expected to increase.

We sell catalysts for the production of PP resin, which is indispensable for everyday products around us.

Net sales



Operating profit



Growth Strategy

1 Responding to Increased PP Demand

- Global demand for PP is expected to grow at an annual rate of 3% to 4% over the medium- to long-term, and we aim to grow faster than the market by increasing production at existing facilities and vertically launching production after constructing a new plant.

2 Responding to Customer Needs

- Continue to renew existing products, launch new products, and develop new markets in order to maintain premiums and remain competitive
- Expand sales of catalysts for high-value-added PP production, including high-rubber ICP products
- Promote development of environmentally friendly catalysts

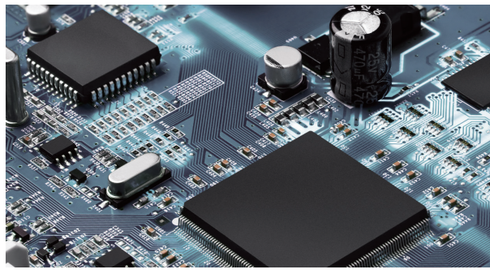
TOPIC

Operation of New Catalyst Production Facility Begins at Chigasaki Plant

Construction of a new catalyst production facility at the Chigasaki Plant began in May 2020, and commercial operation started in November 2022. In addition to responding to the increasing demand for PP, we are designing environmentally friendly catalyst manufacturing processes to strengthen our response to chemical substance regulations, which have increasingly been the focus of attention in recent years.

New catalyst production facility within the Chigasaki Plant

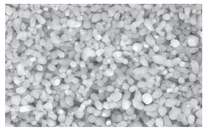
Chemicals business



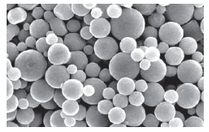
Powder manufacturing technologies supporting the evolution of electronic component materials

In the Chemicals business, we manufacture and sell high-purity titanium dioxide used in multilayer ceramic capacitors (MLCCs), positive temperature coefficient (PTC) thermistors, dielectric resonators and other products. We also manufacture and sell ultra-fine nickel powder and other electronic component materials.
In particular, ultra-fine nickel powder is used for high-end MLCC electrodes, taking advantage of its characteristic small particle size distribution range. We will further refine our powder manufacturing technology with high levels of quality stability to meet growing demand in the markets for telecommunications equipment, in-vehicle electrical components, and electronic equipment.

Main Products



High-purity titanium oxide



Ultra-fine nickel powder

Applications

Internal electrode material (nickel powder)

Electroceramics

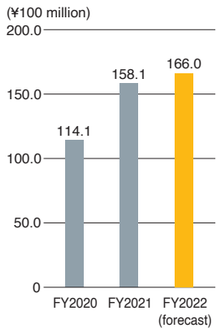
Pharmaceuticals

Optical materials

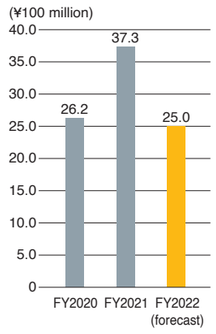
Market Environment and Overview of the Current Fiscal Year

Sales volume in fiscal 2021 was significantly higher than the previous year, mainly due to increased demand for 5G communications and automotive-related products, in addition to recovery in demand for multilayer ceramic capacitors (MLCCs), the primary application of our main product, ultra-fine nickel powder, from the decline in demand caused by the COVID-19 pandemic in the first half of fiscal 2020.
The first half of fiscal 2022 will be a phase of temporary inventory adjustment due to a shortage of semiconductors and a buildup of distribution inventories. Although a recovery is expected in the second half of the year, sales volume is expected to increase only slightly, and profits are expected to decrease due to higher costs associated with the operation of our new plant and other factors.

Net sales



Operating profit



Growth Strategy

1 Sales Expansion Initiatives

- Deepen relationships with key customers (strengthen position as development partner)
- Approach new customers and develop high-value-added products for existing customers
- Develop nickel powder for MLCCs of the next-generation and beyond

2 Ensuring Production Capacity

- Make steady progress on new nickel powder plant construction, and early realization of that potential
- Consider concrete plans for the next phase of expansion (nickel powder plant No. 5)
- Consider renovation of existing plants to accommodate new products

TOPIC

New Nickel Powder Production Facility Starts Operation at Wakamatsu Plant

In April 2021, construction of a new nickel powder production facility (Nickel Powder Plant No. 4), which had been underway at the Wakamatsu Plant, was completed. In order to establish a supply system for nickel powder to meet the growth of the market for small-sized large-capacity MLCCs, customer evaluation was completed in the first half of fiscal 2021, and mass production began in the second half of the year. We plan to gradually increase the operating rate in fiscal 2022.

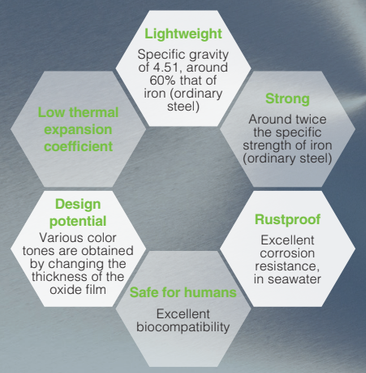
Nickel Powder Plant No.4 within the Wakamatsu Plant

Technologies that Contribute to Sustainability

R&D Enhancing the Value of Titanium, the Metal of the Future

At Toho Titanium, we have expanded our business domain by responding to the evident needs of our customers, and by steadily developing technologies to enhance the value of titanium with the various characteristics of which include light weight, strength, and compatibility with the human body. Furthermore, we are now promoting the development of new products that contribute to resource utilization, the spread of clean energy, and reduction of environmental impact, thereby contributing to the development of a sustainable society.

Advantages of Titanium



Titanium Challenges

High manufacturing costs and environmental impact

The current titanium smelting technique (Kroll method) uses batch production, a complex process that consumes large amounts of electricity, resulting in high production costs. In addition, the burning of coke produces large amounts of CO_2.

Difficult to process

Titanium has high strength, which makes it difficult to cut, press, and weld. In addition, because its thermal conductivity is low, heat does not escape during machining, causing cutting heat to build up, thus making tools more prone to wear, and metal fires more likely to occur. Processing methods and advanced technologies suited to the characteristics of the material are therefore required.

Toho Titanium Takes Pride in Sustainable Technology

Reduction of CO_2 emissions

- New energy-saving titanium production process enabled by introducing new technology: "Development of New Titanium Smelting Method" →page 19.
- Reduce CO_2 emissions in our customers' value chains by providing titanium and products using related technologies

Effective resource utilization

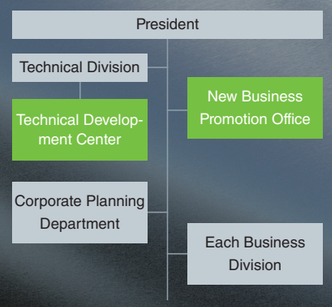
- Reduction of material loss through improvement of existing processes and products, and development of new processes and products
- Promote reuse of low-cost titanium scrap

New energy creation

- Support the creation of next-generation energy sources such as renewable energy and hydrogen energy

R&D Organization

We conduct our research and development work under a policy of strengthening and building a management foundation through the pursuit of quality. In collaboration with engineers from each Business Division, the Technology Division leads the development of new technologies and products in line with business strategies.



FOCUS
New titanium smelting method → p.19
Toward a pilot-scale validation test
Innovative titanium production technology significantly reduces CO_2 emissions, aiming for carbon neutrality

CASE 1

Reduction of CO_2 emissions | New energy creation

Helping realize a hydrogen-based society with porous titanium sheet

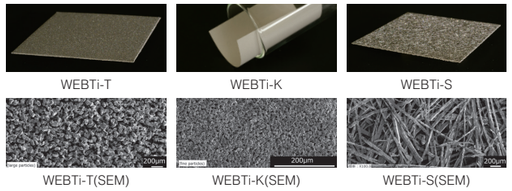
Utilization of WEBTi® porous titanium sheet for hydrogen production equipment

We have developed WEBTi®, a thin metallic titanium sheet with numerous micropores.

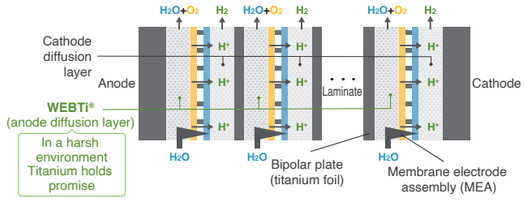
WEBTi® is a new material that combines the characteristics of porous metals, which include liquid permeability and electrical conductivity, with the high corrosion resistance, strength and other advantages of titanium. It is intended for use in electrode materials, diffusion layers and filters in highly corrosive environments.

In recent years, it has shown particular promise for use as an anode-side diffusion layer in polymer electrolyte membrane (PEM) water-electrolysis hydrogen production equipment. Water-electrolysis hydrogen production equipment is indispensable for building a hydrogen society, which is expected to be a game-changing development in reducing CO_2 emissions. We will help reduce CO_2 emissions by implementing WEBTi® in PEM water-electrolysis hydrogen production equipment as soon as possible.

The WEBTi® Lineup



Structure of the PEM water-electrolysis hydrogen production equipment



CASE 2

Reduction of CO_2 emissions | Effective resource utilization

Greatly Simplified Titanium Foil Manufacturing Process

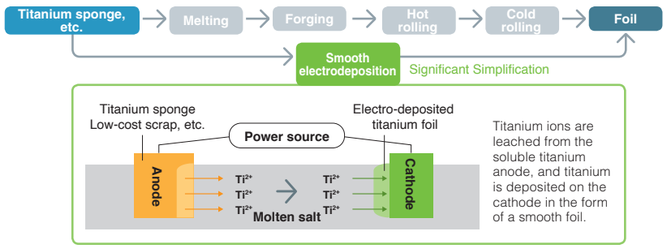
Direct Titanium Foil Production with Smooth Electrodeposition

In general, titanium foil is manufactured by melting and forging raw materials such as titanium sponge, followed by a number of processing steps such as hot and cold rolling.

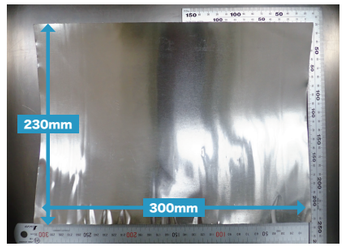
The smooth electrodeposition method that we are currently developing is a manufacturing process that can significantly eliminate steps of fabrication by electrodepositing the raw material in foil form through molten salt electrolysis. As a result, reduction in CO_2 emissions can be expected through energy-saving manufacturing process. Furthermore, since the electrodeposition also has a refining effect, low-cost titanium scrap can be used as raw material, leading to resource conservation.

We have established the technology for manufacturing titanium foil of A4 paper size and approximately 100 μm thickness using this process, and will continue to develop the technology with the aim of commercializing it. Taking advantage of titanium's high corrosion resistance, it is expected to be used in bipolar plates for PEM water-electrolysis hydrogen production equipment and anti-corrosion films for steel structural buildings, thereby contributing to the maintenance and preservation of social infrastructure.

Smooth Electrodeposition Significantly Simplifies Titanium Foil Manufacturing Process



Electro-deposited titanium foil with A4 dimensions



CASE 3

Reduction of CO_2 emissions

Effective resource utilization

Near Net Shaping Simplifies Processing

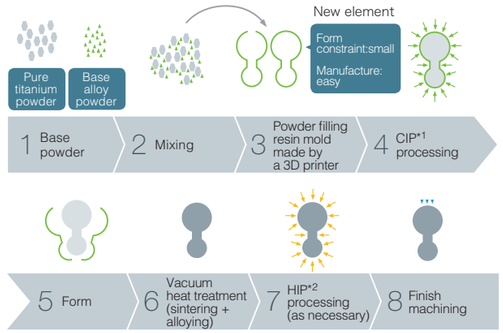
Production of Titanium Alloy Parts by Blended Elemental Powder Metallurgy

Because titanium alloys are difficult to cut, the burden of manufacturing parts with complex shapes is high, and the material is relatively expensive, so improving yield is a major issue.

We have developed a near-net-shape manufacturing technology based on the blended elemental powder metallurgy, in which pure titanium powder and base alloy powder are mixed, placed into a mold, compressed and molded, then sintered and alloyed. Although this technology itself has existed for some time, we can easily manufacture molds of complex shapes by using resin molds made with 3D printers.

This process enables the production of titanium alloys with a variety of high-performance properties and a near-net-shape that is closer to the final shape. As a result, titanium alloy parts of various types in small quantities can be manufactured efficiently, leading to reduction of material loss and of processing energy use.

Near-Net-Shape Production Process
Using Blended Elemental Powder Metallurgy (under development)



*1 Cold Isostatic Pressing
*2 Hot Isostatic Pressing

CASE 4

Reduction of CO_2 emissions

New energy creation

All-Solid-State Batteries Promote Clean Energy

LLTO™ Technology Improves Performance of Lithium-ion Batteries

High-capacity, high-performance, safe batteries are essential in expanding the deployment of clean energy, electricity generated from renewable energy sources, as called for in SDG No. 7: "Affordable and Clean Energy." The lithium-ion batteries that have been widely used in the past have used liquid as the electrolyte, which has presented challenges in terms of capacity and safety. All-solid-state batteries using solid electrolyte are attracting the most attention as the next-generation battery.

We have focused our development work on lanthanum lithium titanate (LLTO™), an oxide-based solid-state electrolyte. It is chemically very stable, and is expected to be used in multilayer (chip-type) all-solid-state batteries and large batteries for automotive use in the future.

LLTO™, currently achieves ionic conductivity of $5\times10^{-4}Scm^{-1}$ at 27°C in plate form, demonstrating the characteristics of high ionic conductivity among oxide-based solid electrolytes. We will continue to develop all-solid-state batteries for practical use.

Structure of an all-solid-state battery with LLTO™

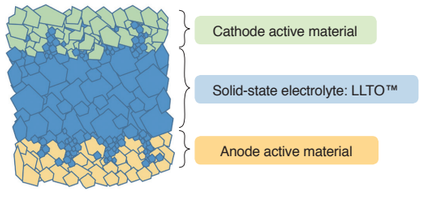
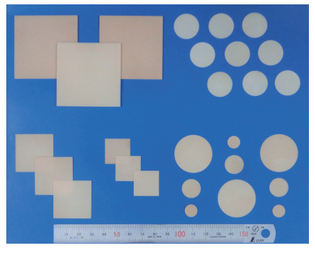


Plate LLTO™ (LLTO™ in plate form)



INTELLECTUAL PROPERTY STRATEGY

IP Strategy

We aim to be aggressive with our intellectual property, which is the core of our competitive strength.

General Manager, Intellectual Property Department, Technology Division
Masakatsu Ikisawa

Leading the strategic use of intellectual property to turn R&D results into business advantages

As a company whose core competence lies in advanced titanium-related technologies, securing and fostering intellectual property is an important initiative that is at the core of our competitiveness. The Intellectual Property Department continuously files strategic patent applications, provides IP education for engineers, and steadily performs invention discovery activities.

With regard to patent applications, we set annual targets for the number of applications and for acquisition of know-how based on the progress of our business strategy and development themes. In fiscal 2021, we obtained rights on 40 Japanese patents. This is approximately double the number of patents obtained annually in recent years, and is one example of the tangible results of our department's recent efforts. For example, we have established a network of patents for porous titanium-related technologies, the market for which is expected to expand in the future. In this way, we have raised the bar to market entry higher than ever for other companies. Furthermore, for new products that we and our subsidiary Toho Technical plan to manufacture and sell, we have acquired the relevant patent rights and necessary trademark rights to ensure certainty and superiority in business implementation.

It is also very important to know from the early stages of research and development how competitors are obtaining patents, and to keep in mind the need to obtain rights in an efficient and effective manner. In order to build the results of our R&D efforts into patent rights with breadth and strength, we exchange information with engineers frequently and intensively, sometimes taking advice from outside patent attorneys. In addition, our staff members serve as lecturers, providing IP education about once every one to two months on the subject of precedents in IP litigation to help them acquire knowledge about intellectual property, which is typically lacking among engineers. We also invite attorneys with extensive experience in patent infringement litigation to give lectures. This way we focus on the improvement of our intellectual property capability.

We promote technological exchange from a broad perspective while linking it to management strategies, thus strengthening our own intellectual property

While this knowledge of IP is obviously important for engineers, it is also crucial for the managers and executives who support engineers to gain a deep understanding of IP strategies that are consistent with business strategy. For this reason, our department analyzes the technology development trends of other companies and uses the results as a basis for the IP landscape method of identifying the areas in which the company should focus its efforts.

Traditionally, there has been a passive aspect to the work of this department, with the department's role being to obtain rights to inventions created through research and development. By making use of the IP landscape, however, it is now possible to actively formulate IP strategies by comparing our IP capabilities with those of other companies and specifying the content and scope of patents to be acquired in the future. In the future, I hope to enthusiastically create business out of intellectual property, contributing to management by actively making proposals to business divisions to obtain patents as we seek out and narrow down new business opportunities.

In technology development, meanwhile, we place the highest priority on the early commercialization of development results. To this end, we need to actively consider the introduction of missing technologies from outside sources, without being restricted to in-house development. For example, we are currently conducting joint research with our parent company, JX Nippon Mining & Metals Corporation, on several individual themes, in addition to technology exchanges through technical conferences. In addition, we are collaborating with an overseas start-up company to develop metallic materials, and joint research with several universities is underway.

However, it is essential that we draw up the overall plan ourselves and ask outside parties to provide the missing pieces of technology based on our core technologies. I believe that our first priority should be to improve our competitiveness, rather than engaging in open innovation without due consideration.

SPECIAL FEATURE

Social Value Created by
Toho Titanium's Technological Capabilities

New titanium smelting method

Toward a pilot-scale validation test

Development of a new titanium smelting technology that significantly reduces energy consumption and CO_2 emissions. Technological development toward putting this innovative new technology into use has reached the demonstration development phase of the NEDO Strategic Innovation Program for Energy Conservation Technologies. In the demonstration development phase, we are working to identify issues and develop solutions through pilot-scale tests to enable the actual use of this smelting method. We are also collaborating with upstream manufacturers of raw materials such as titanium feedstock and aluminum, as well as downstream manufacturers of mill products such as sheets and rods, in order to take initiatives to reduce CO_2 emissions throughout the supply chain and to develop waste reduction technologies through recycling within the supply chain, resulting in a true carbon-free titanium.

Anticipated Results

- The new smelting method reduces direct CO_2 emissions from the titanium smelting process to zero.
- A major energy conservation effect is anticipated, as the introduction of this new smelting method has the potential to reduce the domestic power consumption required for the production of metallic titanium by up to 75%.
- While various industrial products have been designed with the intent of reducing CO_2 emissions from the manufacturing process and during use, titanium products manufactured with this newly developed technology can help create products with low environmental impact in both name and reality, including the materials used.

CO_2 emitted from titanium smelting (estimated)

100% reduction

- Use of the new smelting method (80% reduction)
- Use of green electricity (20% reduction)

[Development Phase]

2017
Joint Basic Research with UAT, LLC. begun

2019.7
Selected for the NEDO Strategic Innovation Program for Energy Conservation Technologies (Practical Application Development Phase) and began full-scale technology development

2021.7
Entered the demonstration development phase of the NEDO program and started pilot-scale testing for practical use

2025
Toward practical application

Shifting from a process based on the Kroll method consuming large amounts of electricity and emitting large amounts of CO_2 to a new low-energy smelting method

Use of titanium, a metal characterized by its light weight, high strength, and high corrosion resistance, is expanding and getting more diversified year by year. Titanium feedstock is widely available around the world, but the smelting process currently being used to convert it into titanium metal is a complex technique based on a particular method called the Kroll method.

Developed 80 years ago, the Kroll method begins by having titanium feedstock, chlorine gas and coke react at approximately 1,000°C to produce titanium tetrachloride. At the same time, CO_2 is produced and emitted into the atmosphere. The resulting titanium tetrachloride is further purified and then is made to react with magnesium to produce a porous titanium material called titanium sponge. The byproduct magnesium dichloride is recovered in high yield, then electrolyzed into magnesium and chlorine for reuse.

Since this Kroll-based smelting process consumes a large amount of electricity, the total CO_2 emission, combined with that from electric power generation, amounts to approximately 9 tons of CO_2 emitted per ton of titanium produced. Various alternatives to the Kroll smelting method have been studied, but none has yet been put into use. In order to build a low-carbon society, there is an urgent need to reduce CO_2 emissions from the smelting process.

Applying advanced specialized technology to establish a new low-energy, high-efficiency smelting technology

The new smelting technology that Toho Titanium is developing in collaboration with Universal Achemetal Titanium, LLC (UAT, LLC.) of the United States is a smelting process that has the potential to reduce CO_2 emissions virtually to zero. We also aim at reducing electric power consumption by approximately 75%.

As a result of research supported by the New Energy and Industrial Technology Development Organization (NEDO), we have determined that this technology is extremely promising in terms of manufacturing cost, energy consumption, and CO_2 emissions reduction. We have moved into the demonstration development phase, which began in fiscal 2021 with pilot-scale tests. Nippon Steel Corporation is also participating in this phase, conducting integrated manufacturing feasibility tests for mill products such as sheets and bars, which are manufactured through melting and rolling after the smelting.

In this development, it is necessary to utilize knowledge of basis sciences such as thermodynamics, electrochemistry, mechanical engineering, and electrical engineering to solve highly challenging technical issues of high-temperature smelting reactions and molten salt electrolysis, and to design processes and facilities suitable for actual implementation. Our aim is to put the new smelting technology into actual use by 2025 by making full use of our highly specialized technologies and by devoting all of our energies to the development. Furthermore, through measures centered on the new smelting technology, the Group as a whole aims to reduce CO_2 emissions by 40% from 2018 levels by 2030, and to achieve carbon neutrality (net zero CO_2 emissions) by 2050.

Technology under Development

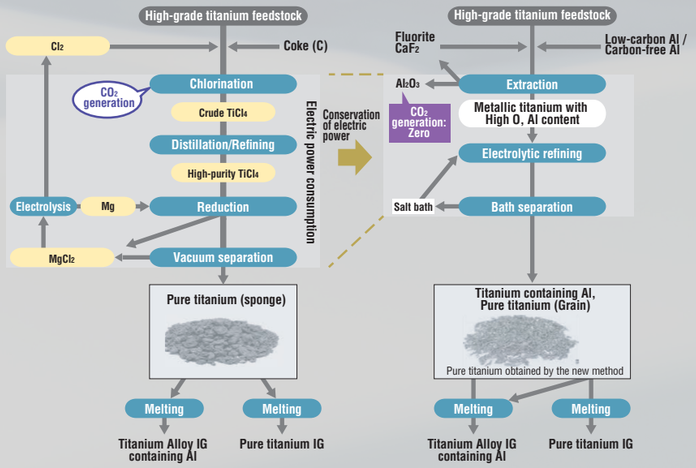
This technology consists of two major processes: In the first process, titanium feedstock is converted into an electrically conductive material, and in the second process, it is electrolytically purified. Finally, residual salt is removed to finish the product.

Specifically, granular titanium feedstock, calcium fluoride (fluorite), and metallic aluminum are first mixed and made to react at high temperatures to produce an electrically conductive titanium alloy containing oxygen and aluminum. Slag consisting of the byproducts aluminum oxide and calcium fluoride is separated by flotation, so the titanium alloy can be easily recovered in isolation.

Next, we use a proprietary electro-refining process, in which titanium ions are mainly dissolved from the titanium alloy into the salt bath, and deposited as dendritic solid metal titanium on the cathode. After vacuum separation or rinsing, we obtain metallic titanium with few impurities, equivalent to current commercially pure titanium sponge.

This promises to be an excellent smelting method that is simpler than the existing method, uses almost no hazardous substances, consumes only about 1/4 of the electricity, and produces no CO_2.

	Current process based on Kroll method	➡	New process
Number of steps	6	➡	4
Electricity consumption	High	➡	1/5 to 1/4 of the current process (Note: electric power used to produce ore, aluminum, salt baths and other substances is not taken into account.)
Use of hazardous substances	Yes (Cl_2 gas, molten Mg, $TiCl_4$, etc.)	➡	No
CO_2 generation	Yes	➡	Zero



Project Member's Voice

Technical Division
Technical Development Center
Daisuke Suzuki

Creating an energy-efficient, carbon-neutral titanium smelting process to provide the world with environmentally friendly titanium with excellent properties

The development of a new titanium smelting technology is being undertaken by a company-wide development team led by the Technical Development Center. I work in the Technical Development Center, leading the Chemical Metallurgy Group. In this project, I have been able to make great use of the electrochemical expertise and process development experience I acquired during my first 16 years of employment with the company. I feel a strong sense of fulfillment in developing this technology, which could contribute not only to our company but also to the titanium industry and to the development of humanity as a whole, and I am working hard every day with my group members toward putting this technology into use.

In actual development work, beyond my own expertise, it is necessary to make comprehensive use of various fundamental scientific technologies such as safety engineering, plant technology, metal physics, and computational science. I work in close collaboration with development members from various departments within the company, as well as with U.S. collaborators and stakeholders throughout the titanium supply chain. We also seek support from outside research institutes on technologies in which our company may not be self-sufficient, which allows us to improve the precision of our technologies and greatly expands our own knowledge and skills.

First of all, I hope we can make this innovative technology a practical reality by ensuring the execution of the pilot study currently under way, and by boldly tackling new issues that will be identified as the development phase progresses. Through the early realization of carbon-neutral titanium, we will also contribute to a sustainable global environment and a prosperous society with titanium.

New Titanium Smelting Technology Development Team

Promotion of ESG Management

The Toho Titanium Group will contribute to the development of a sustainable society by strengthening ESG initiatives and realizing solutions to various social issues through corporate activities.

Engagement with Stakeholders

www.toho-titanium.co.jp/en/csr/stakeholder-engagement/

At the Toho Titanium Group, we believe that building relationships of trust with stakeholders through dialogue is indispensable for our company's survival and sustainable development. We are committed to understanding the expectations and desires of our stakeholders and reflecting them in our corporate activities.

Basic Policy

Based on our Group's Management Philosophy, our basic policy on management is to work toward solving social issues involving the company and our stakeholders by engaging in business activities from the perspectives of the environment (E), society (S) and governance (G), so that we can contribute to the sustainable development of society and enhance our corporate value over the long term.

Promotion Structure

Materialities

In line with our defined materialities, we will work to resolve important issues surrounding our company and our stakeholders, contribute to the sustainable development of society, and aim to enhance our corporate value over the long term.

	Materiality	Related SDGs	Item	Goal	
E	Contribution to global environmental conservation	7, 9, 11, 12, 13	To realize a decarbonized society	Reduce CO_2 emissions by 40% from the 2018 level by 2030 and achieve carbon neutrality by 2050	p.23
			Development of environmentally safe products	Develop new materials, technological improvements, and new applications for multiple products with consideration for the environment and safety	
			Sustainable resource utilization	Reduce final waste disposal volume by 50% by 2040 compared to fiscal 2020. Reuse waste materials throughout the supply chain	
S	Contribution to society	3, 4, 5, 8, 10	Respect for human rights in the supply chain	Respect the human rights of all those involved in the supply chain	p.27
			Coexisting with local communities	Support social contribution and community revitalization in each region	
	Appealing workplace		Improving occupational health and safety in the workplace	Eliminate serious industrial accidents Create healthy work environments	p.28
			Diversity and inclusion	Ensure a diverse and inclusive workplace	
			Creating comfortable work environments	Realize vibrant work environments	
			Next-generation human resource development	Create a foundation to encourage personal growth of all employees and establishing education	
G	Solidifying our management foundation	16	Strengthening corporate governance	Resolutely apply the CG Code	p.31
			Operation of the Compliance Hotline	Achieve zero compliance complaints	
			Risk management promotion	Establish and appropriately implement the company-wide risk management system	

Contribution to global environmental conservation

To realize a decarbonized society

We recognize that climate change represents both risks and an important management mission for the Toho Titanium Group to gain new profit opportunities. We will work to mitigate and adapt to climate change through our business, actively contribute to decarbonization through technological innovation, and work proactively in good collaboration with stakeholders to achieve both medium- to long-term improvements in the Group's corporate value and sustainable development of society as a whole.

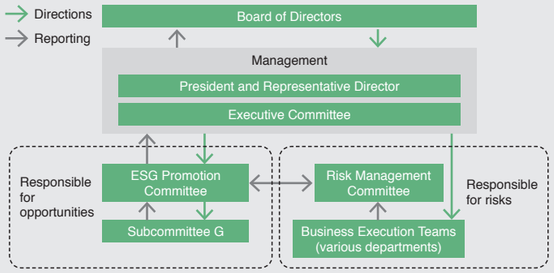
Through the reduction of GHG emissions across the whole value chain, we will also help achieve the goals set forth in the SDGs and the Paris Agreement. Our Group supports the Japanese government's decision to lead the country toward decarbonization, and will comply with all laws and regulations related to climate change. We also recognize the importance of climate-related financial disclosures, support the TCFD, and disclose information in line with the TCFD.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Information disclosure consistent with the four TCFD themes

01 Governance

Under the guidance of management, each business division and the Risk Management Committee will identify climate change risks and discuss measures to address them. In addition, the ESG Promotion Committee will take the lead in scrutinizing opportunities related to climate change and report and propose response measures and targets to management. The Risk Management Committee and ESG Development Committee continually work together to deepen discussions on business and sustainability strategies in terms of both climate change risks and opportunities, and to create a governance system to promote decarbonization.



Roles of each organizational layer and section

Board of Directors	The Board of Directors receives and oversees periodic reports (in principle twice a year) from the President or a Director appointed by the President on important matters related to climate change. In addition, the ESG Promotion Committee and Risk Management Committee discuss the progress of the metrics and targets for addressing climate change-related issues. The ESG Promotion Committee then reports to the Executive Committee, and a further report is made to the Board of Directors, thereby ensuring appropriate Board oversight.
Management	The Executive Committee regularly (in principle twice a year) deliberates important matters related to climate change, and the President or a Director appointed by the President reports to the Board of Directors. The Executive Committee also receives and approves reports from the ESG Promotion Committee regarding deliberations of the climate change risks and opportunities the latter has identified. The Risk Management Committee and the ESG Promotion Committee each have their respective responsibilities for the identified risks and opportunities. The Executive Committee receives regular reports (in principle twice a year) on the results of deliberations on matters related to climate change by the ESG Promotion Committee and the Risk Management Committee. It monitors progress in relation to the metrics and targets, and reviews and directs the company's strategies, business plans and risk management policies.
ESG Promotion Committee	The ESG Promotion Committee deliberates regularly (in principle twice a year) on matters related to climate change, and reports the results of its deliberations to the Executive Committee. The ESG Promotion Committee identifies opportunities related to climate change, then deliberates their level of impact, as well as measures by which to address the identified opportunities and targets. It reports its findings to the Executive Committee. It also reports to the Executive Committee on countermeasures for the identified risks reported by the Risk Management Committee. Thereafter, it monitors the progress of any opportunities approved by the Executive Committee.
Risk Management Committee	The Risk Management Committee meets regularly (in principle twice a year) to discuss company-wide risks (including climate change risk) and reports important risks to the Executive Committee. The Risk Management Committee identifies risks related to climate change, then deliberates their level of impact, as well as measures by which to address the identified risks and targets. It reports its findings to the ESG Promotion Committee. It subsequently monitors and manages risks recognized by the Executive Committee, ensuring that they are being addressed.

02 Strategy

The Group strives to understand the financial impact of climate change through scenario analysis. Based on the results of scenario analyses, we will formulate a specific transition plan to help achieve a low-carbon society, which is to be reflected in our Medium-Term Management Plan for the three-year period beginning in fiscal 2023.

Scenario Analysis

	Category		Risk/opportunity description	Driver	Time horizon: Short term (1 year)	Time horizon: Medium term (3 years)	Time horizon: Long term (2030 year)	Financial impact and response measures: IEA STEPS scenario IPCC RCP4.5 scenario [2.6°C scenario]	Financial impact and response measures: IEA NZE 2050 scenario [1.5°C scenario]
Risks	Transition risk	Market risk	Increase in raw material procurement costs	Lack of progress in China's introduction of renewable energy	○	○	○	Approx. ¥400 million/year Stabilize procurement of magnesium by diversifying suppliers and adjusting inventories. Respond to magnesium price fluctuations by shortening the contract period for titanium sales and providing for automatic cost adjustment items in contracts.	–
	Transition risk	Market risk	Decreased demand for titanium	Rising prices of carbon-free power		○	○	–	Approx. ¥600 million/year Develop and gradually implement a new titanium smelting process that significantly reduces electricity consumption and CO_2 emissions, and minimize the amount switched to carbon-free electricity. Promote measures to conserve energy and utilize waste heat, while promoting use of non-electrical energy from carbon-free sources. In the future, consider participation in renewable energy power generation projects in regional and inter-company collaborations.
	Physical risk	Acute risk	Suspension of plant operation	Increased frequency of wind storms and floods	○	○	○	Approx. ¥100 million/day Implement measures to control the risks so that plant suspension risks can be largely avoided. Monitor trends in the frequency and intensity of extreme weather events and consider the need for additional countermeasures.	Approx. ¥100 million/day
	Physical risk	Chronic risk	Increase in employee health hazards	Increase in the number of heat wave days	○	○	○	Not significant Monitor heat conditions and the number of health hazards, and consider countermeasures according to the situation.	Not significant
Opportunity	Products/ services		Increased need for CO_2-free titanium	Increased demand for low-carbon products from customers		○	○	–	Not determined Carry out pilot-scale development of CO_2-free titanium production technology through to 2023. In 2025, begin commercial production in small quantities, scaling up in stages.
	Products/ services		Increased need for titanium as a hydrogen-related material	Accelerate the promotion of national hydrogen-related policies			○	–	Approx. ¥1 billion/year increase in revenue (fiscal 2030) *Compared to fiscal 2021 In preparation for a rapid increase in inquiries for WEBTi® porous titanium sheet, which is expected to be applied to parts for water electrolysis hydrogen production equipment, we will establish an initial mass production system in fiscal 2023. Investment decisions and technology evaluation will be made in accordance with the progress of the build-up toward a hydrogen society, and the scale of the project will be expanded by fiscal 2040.
	Products/ services		Increased need for catalysts for manufacturing resins that contribute to EV car body weight reduction	Increase in EV production volume		○	○	–	Approx. ¥1 billion/year increase in revenue (fiscal 2030) *Compared to fiscal 2021 Further enhance the functionality of high-performance catalysts. A new plant will be completed in November 2022, expanding production capacity to meet growing demand.

IEA STEPS/IPCC RCP4.5 scenario [2.6°C scenario]

Reasons for Choosing this Scenario

The WEO STEPS scenario (our policy to date) and IPCC RCP4.5 developed by the International Energy Agency (IEA) were selected for the scenario under which Japan's NDC* would not be achieved. This represents a scenario under which the policies set forth by the Japanese government (the 6th Basic Energy Plan and Green Growth Strategy) would not be executed as planned.

Our Resilience, Taking the Scenario into Consideration

The risk of magnesium supply shortages as a result of the current decarbonization policy in China is a concern, but that risk can be reduced by taking steps to stabilize magnesium procurement.

IEA NZE 2050 scenario [1.5°C scenario]

Reasons for Choosing this Scenario

The WEO NZE 2050 scenario developed by the International Energy Agency (IEA) was selected as being in line with the Paris Agreement, i.e., the scenario under which Japan's NDC* would be achieved.

Our Resilience, Taking the Scenario into Consideration

We believe that by taking appropriate measures, it is possible to reduce the degree of risk impact on the titanium business, and that this is a good chance to increase opportunities such as the development of new smelting technologies that can produce CO_2-free titanium.

*Nationally Determined Contribution, submitted by Japan on October 22, 2021. Consistent with carbon neutrality by 2050, the ambitious goal is to reduce greenhouse gas emissions in FY2030 by 46% from the FY 2013 level.

Contribution to global environmental conservation

03 Risk Management

The Climate Change Risk Identification Process

The Risk Management Committee leads the identification of climate change risks. The results of ESG Promotion Committee deliberations are reported to the Executive Committee for final approval of the company's identified climate change risks. In assessing and determining the severity of climate change risk, we primarily consider the following factors:

Method of Determining Level of Severity

- Short-, medium-, and long-term time horizons
- Transition risks: Decarbonization trends, generation power mix, product demand trends, existing and new regulatory requirements (carbon pricing, plastics regulations, etc.)
- Physical risks: Frequency of occurrence, loss of life, impact on external parties, degree of loss
- Potential for risks to materialize

How We Respond to Risks

Identified climate change risks are assessed in accordance with the Risk Management Manual, and responses such as avoidance, mitigation, transfer and retention are each considered. After deliberation by the Risk Management Committee, response policies are reported to and approved by the Executive Committee through the ESG Promotion Committee.

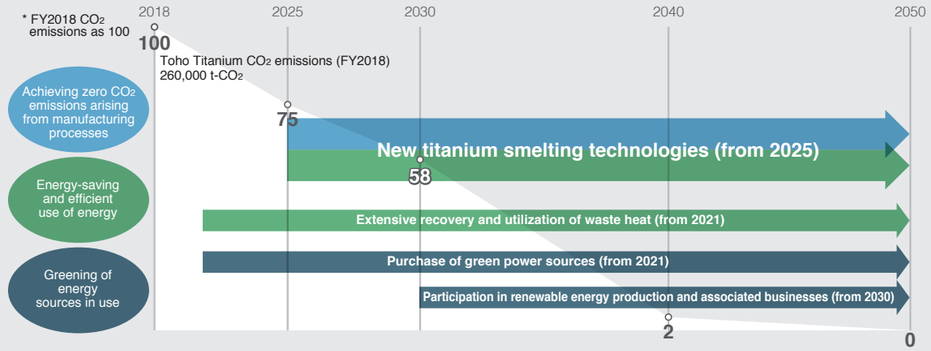
Integration into Company-Wide Risk Management

The Risk Management Committee is chaired by the Toho Titanium president, and consists of its executive officers, the presidents of affiliated companies, and other members appointed by the President. Climate change risk is also managed by the Risk Management Committee in the same manner as other risks, based on the system set forth in the Risk Management Manual.

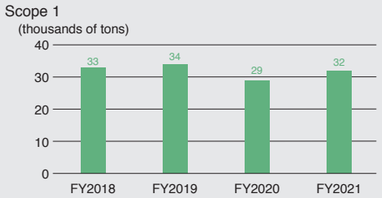
04 Indicators and Targets

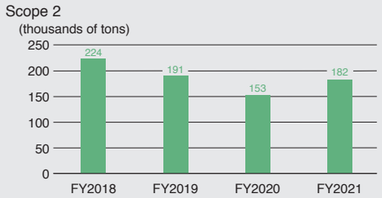
Our Group is committed to reducing GHG emissions by achieving zero-CO_2 emissions from manufacturing processes, conservation and effective use of energy, and moving to carbon-free sources for the energy we use. We have set targets of a 25% reduction by fiscal 2025 and a 40% reduction by fiscal 2030 (both compared to fiscal 2018), with a final goal of reaching net zero by fiscal 2050.

Roadmap to Achieving Carbon Neutrality by 2050



GHG Emissions





*CO_2 emissions from carbon-neutral city gas are deemed to qualify as "zero."

Adoption of CO_2-free electricity

From fiscal 2021, CO_2-free electricity is being used for the electric power needs of our Hitachi Plant and also part of the Chigasaki and Wakamatsu Plants. In the future, we will continue to reduce CO_2 emissions by introducing CO_2-free electricity to other plants.

Compensation Rules for Directors and Management

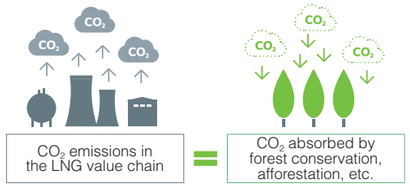
The Company's compensation system for Directors and management consists of fixed and performance-linked remuneration. In the future, we will consider reflecting the achievement of climate change-related goals in our compensation structure.

TOPIC

Carbon Neutral LNG Buyers Alliance

Toho Titanium joined 14 companies including Tokyo Gas Co., Ltd. in launching the Carbon Neutral LNG Buyers Alliance in March 2021. The alliance brings together Tokyo Gas and other companies that purchase carbon-neutral LNG (CNL) in an effort to realize a sustainable society, expand the use of CNL, and increase the value of its utilization.

CNL is liquefied natural gas (LNG) that is regarded as producing no CO_2 emissions on a net global basis when burned, because the greenhouse gases produced in the process from the mining of CNL to its combustion are offset with CO_2 credits (carbon offsets). In the future, we aim to make CNL widely known worldwide, improve its reputation among investment institutions, and establish its position in various environment-related systems.



Net zero emissions

Providing Products Beneficial to the Environment and Safety

Technologies that Contribute to Sustainability → p.15

In addition to responding to the evident needs of our customers, our Group is promoting the development of new processes and products that contribute to the reduction of global environmental impact. We are also keenly aware of how we can help achieve the SDGs through the raw materials we use, our manufacturing processes, and our product applications, thereby contributing to the development of a sustainable society.

Development Plan Progress Rate

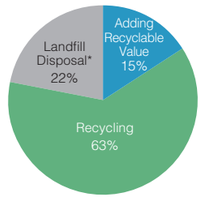
80% or more

Sustainable resource utilization

Effective Use of Water Resources

While improving operations and promoting water recycling, we are working to identify regions of high water risk and reduce the volume of water extracted. In addition to meeting the permit standards for water quality and quantity in each region and complying with laws and regulations, six of the Toho Titanium Group's seven major production sites (five of our sites, Toho Technical Service, and Toho Material), or 86% of the Group's production sites (five of our sites and Toho-Technical), have water management plans in place.

Breakdown of Industrial Waste



*20% of the 22% landfill disposal ratio is effectively utilized for the development of offshore landfill sites.

Promotion of Waste Reduction and Reuse

While controlling amounts of waste generated at each business site as much as possible, we are also enhancing our sorting of waste to render it valuable and recyclable. When waste disposal is the only option left, we do so properly and in compliance with the Waste Disposal and Public Cleansing Act.

Investigating Where to Dispose of Sludge Generated at the Wakamatsu Plant

We are considering use of a different disposal contractor to handle sludges generated at the Wakamatsu plant, which are currently disposed of in landfills, so that they can be recycled.

Promotion of Waste Plastic Reuse

The Chigasaki Plant previously disposed of waste plastics such as packaging materials generated at the plant by incineration or landfill, but we now use a new waste disposal contractor and adopt a recycling process to promote efforts to reuse these materials. In the future, we plan to expand the reuse of these materials to all of our plants.

Reusing Waste Plastic as a Resource (reusable as artificial wood)

Contribution to society

Respect for human rights in the supply chain

Toho Titanium Group promotes respect for human rights in keeping with the United Nations (UN) Guiding Principles on Business and Human Rights. We also understand the human rights described in the International Bill of Human Rights and the Declaration on Fundamental Principles and Rights at Work of the International Labour Organization (ILO) are an absolute minimum to be observed. We will fulfill our social responsibility as the operator of an integrated supply chain by clearly stating respect for human rights and diversity in our Code of Conduct, and by requesting our business partners to give the same consideration to human rights and diversity.

Responsible Mineral Procurement

Our Group's basic policy entails never procuring or using minerals with OECD Annex II risk (i.e., [1] human rights abuses associated with the mining, transportation, and trade of minerals; [2] direct or indirect support for non-government armed groups; [3] illegal acts by public or private security forces; [4] bribery and misrepresentation of mineral origin; [5] money laundering; [6] non-payment of taxes, fees, and mining rights fees to the government) in conflict areas and high-risk areas (CAHRAs), including tin, tantalum, tungsten, gold, cobalt, and mica. If any risks are found in the supply chain, corrective actions will be taken.

In order to comply with this policy, we request that our business partners understand the Group's thinking and commit to responsible mineral sourcing. We will also disclose appropriate information about these efforts to all stakeholders.

Coexisting with local communities

Our Group believes that, as a member of the local communities where our business sites are located, building relationships of trust while maintaining harmony and cooperation with local communities is essential for sustainable development. Based on this thinking, we are making various social contributions and supporting local revitalization in each region so that we can continue to develop together with local communities as a corporate citizen.

Fostering a Toho Titanium Mindset

Toho Titanium Soccer Club

Established in 1955, the Toho Titanium Soccer Club has a long history and has players who have played in the professional J League and various other categories. Players work at either the Chigasaki Plant or the Yokohama Headquarters, and all are employees who balance work and soccer. Since 2002, we have planned and managed the boys' and girls' soccer tournament "Toho Southern Cup," and since 2016, we have continued to support the healthy growth and development of children through soccer by holding soccer clinics in the Chigasaki and Samukawa areas, and we are loved as a community-based team.

Contributing to the Local Community through Proactive Communication

In addition to actively participating in environment-related events sponsored by local governments and other organizations, as well as science and technology events for elementary and junior high school students, we provide on-site classes at nearby high schools and offer plant tours for local residents. While contributing to children's education, the program provides an opportunity for children to deepen their understanding of our business and safety initiatives.

The Toho Titanium Soccer Club also promotes harmony with the local community by organizing monthly community cleanups by staff and players.

Appealing workplace

Message from a Human Resources and Labor Affairs Officer

To maximize the value of human resources for sustainable growth

Director, Senior Managing Executive Officer
General Manager, Business Management Division
Hiroshi Matsubara

The Toho Titanium Group identifies four materialities (important issues) including the creation of an appealing workplace, toward which we are making efforts under the themes of improving occupational health and safety in the workplace, diversity and inclusiveness, creating a comfortable work environment, and human resources development.

In order for our company to continue to grow, it is essential that we view human resources as an important form of capital, and that we maximize the skills and motivation of each individual. For this reason, in addition to on-the-job training through work, we provide rank-specific training and correspondence courses for all employees to support their career development. In particular, starting in fiscal 2022, each business unit formulates a "succession plan" with a focus on the training of promising future candidates for management positions.

Furthermore, in anticipation of an increasingly serious decline of the working population, we promote manpower-saving measures through automation and remote control of manufacturing sites, as well as the development of new manufacturing methods. This will improve the working environment and create more time for employees to take on more creative work and accelerate innovation. At the same time, we actively recruit highly knowledgeable personnel with doctoral degrees, as well as DX personnel and non-Japanese nationals, in an effort to secure and develop human resources who can play a key role in our growth strategy.

In order to achieve sustainable growth, it is also important to align the vectors of all employees. With the aim of improving employee engagement over the medium- to long-term, we have begun employee satisfaction surveys in fiscal 2022, and plan to continue identifying issues and implementing countermeasures through periodic monitoring. In order to raise employee awareness of work-life balance from a long-term perspective, we conduct New Career Plan Training, in which employees consider environmental changes and ways of working, such as post-retirement work styles and lifelong life work. In this way, we hope we can help make our employees' work worthwhile by recognizing diverse values and looking at the meaning of working together. We continue to foster a culture of never-ending exploration so as not to be bound by fixed ideas, and cultivate human resource capabilities to steadily implement the new Medium-Term Management Plan that will start in the next fiscal year.

Non-Japanese national employee

Fourth-year graduate training

Training to promote active participation by women

Appealing workplace

Improving Occupational Health and Safety in the Workplace

Under our basic policy of prioritizing safety, the Group is engaged in a variety of activities to ensure a safe and pleasant work environment and achieve zero occupational accidents.

At the Chigasaki Plant, the plant manager is the general safety and health manager as stipulated in the Law on Industrial Safety and Hygiene, and at other plants, safety and health management is promoted in each line under the direction of the plant manager.

In addition, the Health and Safety Committee, consisting of labor and management, holds regular discussions to improve workplace health and safety. With regard to health and hygiene, we monitor the status of dust, noise, and specific chemical substances in the work environment on a company-wide level and to make improvements as necessary.

Diversity and inclusion

We are committed to building a workplace that takes diversity and inclusion into consideration.

Training to Promote Active Participation by Women

Based on the Law Concerning the Promotion of Active Participation by Women in the Workplace, our Group has formulated a General Business Owner Action Plan to support the development of the next generation.

Senior Employees in Action

We have introduced a Retirement Reemployment System available to all employees. To encourage employees to take advantage of their wealth of work experience and expertise, contracts are renewed until age 65, based on the employee's wishes. (as of fiscal 2021)

Employment of People with Disabilities

In order to secure the 2.3% employment rate legally mandated by the government, we are working on recruiting and improving the workplace environment.

Creating a supportive work environment

We have introduced a system that allows each employee to flexibly choose a wide range of work styles according to his or her life events and life stages. A Parental / Nursing Care Leave System is also in place to help employees balance work and family life, as well as a Flex-Time System and an Accumulated Annual Leave system in case of illness, etc.

Development and Operation of Various Systems

System	Key Features
Limited-Area Employee	Work location can be restricted within a specified area.
Reemployment System	Reemployment is made available within a specified period of time in the event of unavoidable discontinuation due to childcare, nursing care, spouse's transfer, etc.
Accumulated Annual Leave (holidays)	Annual paid leave days which ordinarily lapse and are ineligible for carryover can be accumulated separately
Dormitories and Company Housing (including rentals)	Enables moving in with low out-of-pocket expenses (subject to occupancy conditions)
Recreation Subsidies	Provides semi-annual recreation subsidies to employees and others to promote fellowship in the workplace
Refreshment Bonus	Refreshment Bonus for employees completing 10 years and 20 years of service

TOPIC

Take Parental Leave

Technical Division
Technical Development Center

Daisuke Taki

Upon the birth of my child, we found out that my wife has a disease, so I took parental leave to focus on childcare and nursing. Since I was in charge of multiple development themes, I had prepared myself for a serious challenge in whether it would even be possible for others to take over my work duties. But thanks to the full support of my supervisor and coworkers, I was able to take parental leave without any major problems. I am very relieved to be able to protect my family without stopping my career, and I am truly grateful for the understanding and cooperation of those around me.

In Japan, it is still common to look at parental leave for men as just another kind of vacation. I think it is necessary for the company as a whole to continue this kind of support and to deepen understanding, including the expansion of benefits and other systems, so that individual circumstances and work-life balance can be respected.

Mental Healthcare

Training is provided to employees and managers for early detection and prevention of mental health problems. In addition, we have established a mental and physical health consultation service, provide guidance on improving lifestyle habits, and focus effort on information dissemination and awareness-raising activities through various in-house media.

Consultation with Labor Unions

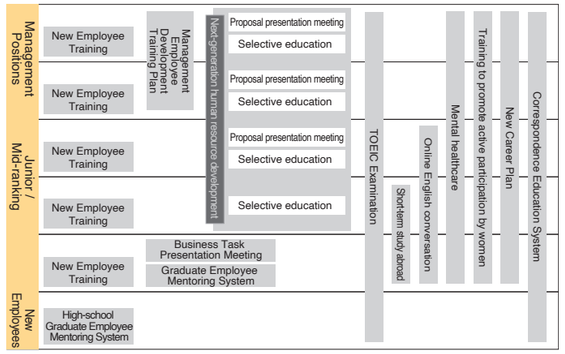
The Group has a stable labor-management relationship with the JAM Toho Titanium Labor Union, and through dialogue about once a month, we negotiate and discuss various management topics and employee working conditions based on mutual trust. We will continue to maintain good labor-management relations through dialogue between labor and management based on the labor agreement.

Human Resource Development and Utilization

Our Group believes that human resources are the source of our competitiveness. We have formulated a human resource development plan to strengthen and establish a human resource base to support our medium- to long-term business strategies.

In addition to on-site skills training to pass on and acquire advanced technical skills, and individual theme training to acquire knowledge and foster awareness, we are engaged in systematic human resources development by assigning instructors to new employees and creating custom-made guidance and training plans. At the same time, we have introduced group education to inculcate the abilities and knowledge required for each position, as well as a short-term study-abroad program and selective education to foster global and innovative human resources from the earliest stages. In addition, various self-development programs are available to improve the skills of each and every employee.

Medium- to Long-term Human Resource Development Plan (excerpt)



TOPIC

We encourage diverse career experiences and attitudinal changes to enable everyone to fully apply their individual abilities and competitive strengths, regardless of gender.

Chemicals Business Department
Counselor, Chemicals Planning & Sales Dept. and New Business Promotion Office

Yukiko Miyamoto

I joined the company mid-career and was initially assigned to the General Affairs Department to take on secretarial, general affairs and public relations duties, and then was transferred to the Catalyst Planning and Sales Department. I currently work in the Chemicals Planning and Sales Department. I am involved in human resource development, working with seven members of the department while conducting business activities for the products I am in charge of. I also supervise four members of the New Business Promotion Office.

We have a small number of female employees, and unfortunately the types of positions in which women are engaged tends to be limited. On the other hand, cross-departmental personnel transfers have recently become more active, and there is a growing momentum toward the fair evaluation and promotion of individual abilities regardless of gender. From my own experience, I believe that it is important for individuals to gain sufficient knowledge and experience by their 30s for their future careers, so I want to work on staffing to give young employees the opportunity to experience a variety of work and job types.

In addition to the conventional education system, I would also like to propose the introduction of training programs that enable employees to look at themselves objectively through interaction with people outside the company. I believe it is necessary to provide employees with opportunities to change their mindset in order to achieve sustainable growth, increase earnings, and create new business operations for our company, as well as to fully apply their individual abilities toward career advancement.

Approach to Recruitment

We work to secure talented people who can be active on a global scale, regardless of gender, nationality, or whether they are new graduates or already a career professional. As we strengthen our recruitment activities, we are focusing particularly on expanding our internship program. This program, which focuses on work experience and actual equipment tours at plants and laboratories, has continued online during the COVID-19 pandemic. By providing work experience based on the job seeker's field of expertise and future career vision, we are able to prevent early post-recruitment job turnover that can result from ill-matched assignments. The retention rate of new college graduates after three years is 100%.

In accordance with the Law Concerning the Promotion of Active Participation by Women in the Workplace, we have set a target of hiring 20% or more female employees in order to steadily increase the number of female employees and quickly develop female managers. For the past five years, the female employee hiring rate was 26%, which exceeds our target.

Number of Employees Hired in the Past 5 Years (new graduates and career)

	2018	2019	2020	2021	2022	Total
Male	8	7	10	6	9	40
Female	3	3	3	2	3	14
(Female ratio)	(27%)	(30%)	(23%)	(25%)	(25%)	(26%)
Total	11	10	13	8	12	54

Solidifying our management foundation

Strengthening Corporate Governance

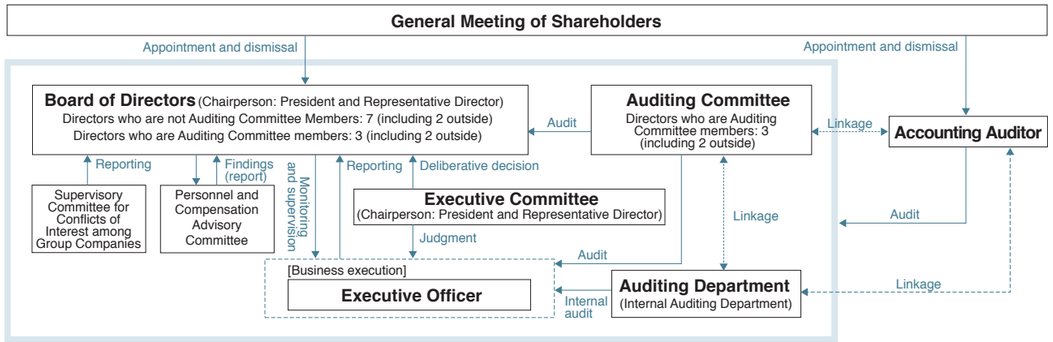
Basic Thinking

Based on our Corporate Philosophy, the Company strives to enhance corporate governance in accordance with the following basic policies in order to achieve sustainable corporate growth and increase medium- to long-term corporate value, and to ensure transparent, fair, timely, and accurate decision-making and appropriate business execution in light of our business characteristics and the surrounding environment.

1. We will respect the rights of shareholders, ensure the substantial equality of shareholders, and strive to create an environment for the appropriate exercise of rights.
2. We strive to cooperate appropriately with all stakeholders.
3. In addition to disclosure in accordance with laws and regulations, we work proactively to provide information beyond that required by law in efforts to ensure transparency.
4. The Board of Directors and the Auditing Committee members will:
   - i Clearly articulate the major direction of corporate strategy, etc.
   - ii Create an environment that supports appropriate risk-taking by senior management
   - iii Effectively supervise management (including Executive Officers) and Directors, etc.

   In doing so, the Board will strive to appropriately fulfill its respective roles and responsibilities.
5. We strive to engage in constructive dialogue with shareholders to contribute to sustainable growth and medium- to long-term enhancement of corporate value.

Corporate Governance Structure (as of June 30, 2022)



Board of Directors

The Board of Directors deliberates and decides on growth strategies, management plans and other corporate strategies to ensure the Company's sustainable growth and increase its corporate value over the medium to long term. To monitor and control risk-taking, we have four Outside Directors (all four of whom are Independent Directors) in the ten-member Board of Directors. Each of them monitors the operation of Directors from a professional, independent, and objective standpoint. We maintain a system to ensure that internal controls and risk management are fully functional.

Auditing Committee member

Two of the three Auditing Committee members are Independent Outside Directors, who fulfill their responsibilities through monitoring and verification from an independent and objective standpoint. Auditing Committee members include qualified accountants, who use their high level of expertise to conduct operational and accounting audits and provide active and appropriate opinions at Board of Directors meetings. Full-time Auditing Committee members attend important meetings and have access to all information regarding internal proposals and reports. Auditing Committee members also conduct audits in full cooperation with the Accounting Auditor and the Internal Audit Department.

Executive Committee

In order to clarify the structure of responsibility in the management organization and to speed the execution of business operations, we have introduced an Executive Committee system under which certain business execution authority is delegated to Executive Committee members. The Executive Committee consists of the President and Representative Director (President), Executive Officers and Full-time Auditing Committee members, and other persons appointed by the President.

Regular Executive Committee meetings are held several times a month, or as needed, at which the President instructs Executive Committee members and communicates policies and resolutions of the Board of Directors. Executive Committee members report to the President on the status of business execution.

Personnel and Compensation Advisory Committee

The Committee consists of all Independent Outside Directors, as well as the Representative Director and other Directors appointed by the Representative Director, and is chaired by the President. The Personnel and Compensation Advisory Committee meets at least once a year to discuss and report to the Board of Directors on matters related to personnel and remuneration of Directors and senior management, as well as to evaluate the effectiveness of the Board of Directors.

Messages from the Outside Directors

Moving forward to strengthen a foundation for aggressive management

I believe that the role of an Outside Director is to supervise the execution of business operations from an independent standpoint external to the company, and to provide useful advice and recommendations based on expertise. Because I am an attorney, my main concern as a Director has to do with legal and regulatory compliance. Modern corporate administration often requires management that focuses on offense, but proactive business execution is only possible when there is a strong defense. I understand that my role as a Director is to fortify the company's defense so that it can take on a boldly offensive management approach.

The Personnel and Compensation Advisory Committee, an advisory body to the Board of Directors, engages in extensive discussions on matters related to the nomination and remuneration of Directors and others, while the Supervisory Committee for Conflicts of Interest among Group Companies carefully examines such matters from the perspective of protecting minority shareholders. Since these committees are composed primarily of Outside Directors, they also serve as a forum for information sharing and discussion among Outside Directors.

I will continue to use my knowledge and experience as an attorney to contribute to the company's sustainable growth and increase its corporate value.

Director

Yasuhiko Ikubo

I will focus on the attainment of further competitiveness based on a thorough understanding of the current situation.

I have long been involved in business operations in the metals industry, and provide support to current business operations in the form of management policies, recommendations for new business, and support for efforts to strengthen risk management.

Since my arrival in 2019, the Board of Directors has made a strong impression on me for its open and free exchange of ideas, and in recent years, discussions have been held from a higher-level, more cross-functional perspective that transcends the divisions of responsibility between individuals. I feel that the decision-making process has thus become increasingly enhanced.

For our further growth, it is necessary to reassess the strengths and challenges of each business, including subsidiaries, in light of the company-wide business portfolio. I will therefore focus on strengthening the system for monitoring existing businesses with an eye to unlock future business potential. I would also like to deepen discussions with the management team on measures to make the company more competitive. These measures might include adding value and differentiating Toho Titanium from competitors so that it will not become just another material processing business, and accelerating the creation of new businesses while also utilizing partnerships and alliances.

Director

Kimiharu Okura

Deepening our commitment to sustainability promotion and contributing to further enhancement of corporate value

I understand proactive sustainability promotion and disclosure as essential to meeting investor expectations. Outside Directors have become increasingly involved in efforts to promote sustainability at the Company since the revision of the Corporate Governance Code in June 2021. In particular, the Board of Directors has been discussing the disclosure of responses to climate change in accordance with the TCFD recommendations.

In the future, it will be necessary to disclose non-financial information in a more systematic and multifaceted manner, taking advantage of the media characteristics of materials such as Annual Securities Reports, Integrated Reports, and websites. In addition, I will examine the progress of our efforts for human capital and securing diversity from an objective perspective to encourage acceleration in taking action. As an Audit and Supervisory Committee member, I am responsible for auditing the execution of duties by Directors. I will contribute to the further deepening of the discussion and to the improvement of sustainability management by using the knowledge I have gained during my career as a certified public accountant, and through my experiences such as writing, research, and consulting work.

Director and Auditing Committee member

Shigeko Senzaki

Heightening our ability to create value over the medium and long term through more effective, transparent governance

A little more than a year has passed since I assumed my current position. During this period, I have sensed a growing momentum throughout the company, including the Board of Directors, toward promoting ESG management with an awareness of our social responsibility to our stakeholders, including our shareholders. In addition, while our company's inclusion in the Prime Market requires us to meet high standards with our Corporate Governance Code, I have seen the company take appropriate actions to put the code into practice, including discussions on the protection of minority shareholders.

In order to achieve our stated goal of sustainability management, it is important for us to deepen our discussion of a business portfolio that contributes to sustainable growth and reflect this in our medium- to long-term vision. In making recommendations on matters including business strategies, I adopt the primary perspectives of risk management, financial strategy, and business operational efficiency. My recommendations are based on the experience and knowledge I have gained in business operations and strategy formulation from a management perspective at financial institutions and business enterprises. In addition, as an Auditing Committee member, I will strive to understand the current situation and identify issues through dialogue with each department and through internal inspections. I will provide highly effective auditing and supervisory functions, including the lawfulness of the company's business and the efficiency of its operations, thereby contributing to further transparency in management.

Director and Auditing Committee member

Naoki Harada

Key Consolidated Financial Summary (11 years)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Operating results, etc. (Unit: ¥1 million)											
Net sales	36,006	40,081	30,430	33,702	43,424	31,212	37,256	43,648	45,509	36,159	55,515
Cost of goods sold	30,869	33,232	29,916	31,666	34,762	22,548	27,807	32,628	35,338	27,364	41,755
Selling, general and administrative expenses	5,470	6,047	5,220	4,674	4,771	4,937	5,518	5,746	6,102	5,660	13,760
Operating profit	△ 333	801	△ 4,706	△ 2,638	3,891	3,726	3,930	5,274	4,068	3,135	5,228
Ordinary profit	△ 1,016	485	△ 5,157	△ 2,595	3,541	3,874	3,493	5,269	3,716	△ 417	5,177
Current net profit (△loss)	△ 621	△ 2,151	△ 5,498	△ 2,633	4,233	3,367	3,394	6,499	2,366	△ 3,156	3,695
EBITDA (operating profit + depreciation costs)	6,557	7,849	2,153	4,004	10,009	9,275	9,000	10,251	9,333	8,639	11,283
R&D Costs	1,634	1,509	1,222	1,254	1,266	1,402	1,567	1,527	1,683	1,729	1,976
Capital expenditure	4,771	2,466	5,267	981	851	1,069	4,062	4,190	4,644	8,441	10,584
Depreciation expense	6,890	7,048	6,859	6,642	6,118	5,549	5,070	4,977	5,265	5,504	6,055
Financial position (Unit: ¥1 million)											
Net assets (at end of period)	28,125	39,732	34,620	32,207	36,192	39,156	42,037	47,730	48,262	44,459	47,166
Net assets (end of year)	98,143	101,900	95,752	88,497	83,033	83,439	83,945	87,645	87,118	91,149	98,095
Interest-bearing debt (end of year)	63,860	54,431	57,117	51,113	41,499	38,139	35,872	32,798	31,676	39,367	40,428
Cash flow (Unit: ¥1 million)											
Cash flow from business activity	△ 1,904	1,093	4,392	7,307	12,945	5,889	6,394	8,316	7,953	1,402	9,790
Cash flow from investment activity	△ 5,035	△ 4,158	△ 5,421	△1,100	△ 3,954	△ 1,443	△ 4,048	△ 4,114	△ 4,482	△ 8,390	△ 10,433
Cash flow from financial activity	7,775	3,002	1,758	△ 6,406	△ 10,088	△ 4,018	△ 2,785	△ 3,787	△ 2,405	6,835	206
Cash and cash equivalent year-end balance	1,416	1,531	2,528	2,368	1,226	1,620	1,184	1,600	2,641	2,534	2,128
Per-share information (¥)											
Net assets per share	462.0	556.8	484.7	450.9	506.8	548.4	588.9	668.8	676.2	622.8	660.8
Current net profit (△loss) per share	△ 10.3	△ 30.9	△ 77.3	△ 37.0	59.5	47.3	47.7	91.3	33.2	△ 44.4	51.9
Dividend per share	5.0	3.0	-	-	5.0	7.0	10.0	12.0	12.0	12.0	15.0
Financial indicators											
Cost to sales ratio	85.7%	82.9%	98.3%	94.0%	80.1%	72.2%	74.6%	74.8%	77.7%	75.7%	75.2%
Selling, general and administrative expense ratio	15.2%	15.1%	17.2%	13.9%	11.0%	15.8%	14.8%	13.2%	13.4%	15.7%	24.8%
Net income-to-equity ratio (share capital)	28.6%	38.9%	36.0%	36.3%	43.4%	46.8%	49.9%	54.3%	55.2%	48.6%	47.9%
Operating return on assets (ROA)	△ 0.4%	0.8%	△ 4.8%	△ 2.9%	4.5%	4.5%	4.7%	6.1%	4.7%	3.5%	5.5%
Ordinary return on assets (ROA)	△ 1.1%	0.5%	△ 5.2%	△ 2.8%	4.1%	4.7%	4.2%	6.1%	4.3%	△ 0.5%	5.5%
Net return on equity (ROE)	△ 2.2%	△ 6.4%	△ 14.8%	△ 7.9%	12.4%	9.0%	8.4%	14.5%	4.9%	△ 6.8%	8.1%
D/E Ratio	2.3	1.4	1.7	1.6	1.2	1.0	0.9	0.7	0.7	0.9	0.9
Dividend payout ratio	-	-	-	-	8.3	14.6	18.2	14.6	26.9	-	28.1
Operating profit to net sales ratio	△ 0.9%	2.0%	△ 15.5%	△ 7.8%	9.0%	11.9%	10.5%	12.1%	8.9%	8.7%	9.4%
Ordinary profit to net sales ratio	△ 2.8%	1.2%	△ 16.9%	△ 7.7%	8.2%	12.4%	9.4%	12.1%	8.2%	△ 1.2%	9.3%

Key Consolidated Non-Financial Summary (4 years)

Environment

		2018	2019	2020	2021
Water emissions (1,000m^3)		1,379	1,348	1,304	1,429
Atmospheric emissions	SOx emissions (t)	0.1231	0.07578	0.07213	0.07279
	NOx emissions (t)	2.5722	2.18705	1.89692	2.41514
Waste emissions (t)		23,203	21,115	21,772	25,025
Total energy consumption (PJ)*1, *2		4.5	4.6	3.7	4.3
CO_2 emissions*1, *2	Scope 1 (Unit: 1,000t CO_2)	33	34	29	32
	Scope 2 (Unit: 1,000t CO_2)	224	191	153	182
	Total of Scope 1 and 2 (Unit: 1,000t CO_2)	257	225	182	213

*Items without notes comprise TOHO TITANIUM CO., LTD. and one domestic consolidated subsidiary.
*1 Scope of data: Toho Titanium Co. and its four subsidiaries in Japan and overseas
*2 Reporting period: fiscal 2021 (Japan: April 1, 2021 to March 31, 2022; overseas: January 1 to December 31, 2021)

Society (human resources related)

	2018	2019	2020	2021
Number of employees at end of term	859	907	956	981
Ratio of employees with disabilities (%)	2.2	2.3	1.9	2.0
Ratio of females to all employees (%)	5.5	6.2	6.8	7.2
Permanent employee turnover rate (%)	3.4	2.1	2.5	3.0
Average annual training time per employee (hours)	-	-	11.0	11.4

Governance

Number of Directors	9	9	9	9
Number/ratio of Outside Directors(persons/%)	3/33	3/33	3/33	3/33
Number/ratio of female Directors(persons/%)	0/0	0/0	0/0	0/0
Number of Auditing Committee members	3	3	3	3
Number/ratio of Outside Auditing Committee members (persons/%)	2/67	2/67	2/67	2/67
Number/ratio of female Auditing Committee members (persons/%)	0/0	1/33	1/33	1/33

Corporate Information as of March 31, 2022

Company Overview

Company Name	TOHO TITANIUM CO., LTD.
Headquarters Location	JR Yokohama Tower 22nd Floor, 1-1-1 Minamisaiwai, Nishi-ku, Yokohama, Kanagawa 220-0005, Japan +81 45-394-5522 (General Affairs and Personnel Department)
Established	August 20, 1953
Capital	¥11.963 billion
Business Activities	Production and sales of titanium metal Production and sales of catalysts for polyolefin production Manufacture and sale of electronic component materials
No. of Employees	981 (consolidated)
Business Sites in Japan	Headquarters (Yokohama City, Kanagawa Prefecture) Chigasaki Plant (Chigasaki City, Kanagawa Prefecture) Wakamatsu Plant (Kitakyushu City, Fukuoka Prefecture) Yahata Plant (Kitakyushu City, Fukuoka Prefecture) Kurobe Plant (Kurobe City, Toyama Prefecture) Hitachi Plant (Hitachi City, Ibaraki Prefecture)
Consolidated Subsidiaries	Two domestic companies: Toho Technical Service Co., Ltd. Toho Material Co., Ltd. Two overseas companies: Toho Titanium America Co., Ltd. (US) Toho Titanium Europe Co., Ltd. (UK)
Stock Exchange Listing	The First Section of Tokyo Stock Exchange (Securities Code: 5727)

Group Companies and Affiliates:

Toho Technical Service Co., Ltd.

Office Address 3-3-5 Chigasaki, Chigasaki, Kanagawa 253-0041
Principal Business Manufacture and sale of welded, machined or forged titanium products, insoluble electrodes, titanium-based powders (titanium powder, titanium hydride powder, 64 alloy powder), and sale of various titanium materials and zirconium sponge
URL https://www.tohotec.co.jp/english/

Toho Material Co., Ltd.

Office Address 692-1 Tokiguchi, Tokitsu-cho, Toki-shi, Gifu 509-5122
Principal Business Manufacture and sale of automotive disc brake pad materials such as potassium titanate and other titanic acid compounds
URL https://www.toho-titanium.co.jp/pdf/company/tohomaterial.pdf

TOHO WORLD Corporation

Office Address 11-2 Otemachi, Kokurakita-ku, Kitakyushu-shi, Fukuoka 803-0814
Principal Business Solutions in the field of technology and skills, dispatch of engineers and technicians, contract manufacturing, contract equipment maintenance, and handing down technology and skills
URL https://towor.co.jp/

Toho Titanium America Co., Ltd. (US)

Principal Business Sales and market research of titanium metal and catalysts for polyolefin production, etc.

Toho Titanium Europe Co., Ltd. (UK)

Principal Business Sales and market research of titanium metal and catalysts for polyolefin production, etc.

Advanced Metal Industries Cluster and Toho Titanium Metal Company Limited

Office Address Yanbu, Kingdom of Saudi Arabia
Principal Business Manufacture and sale of titanium sponge

Stock Information

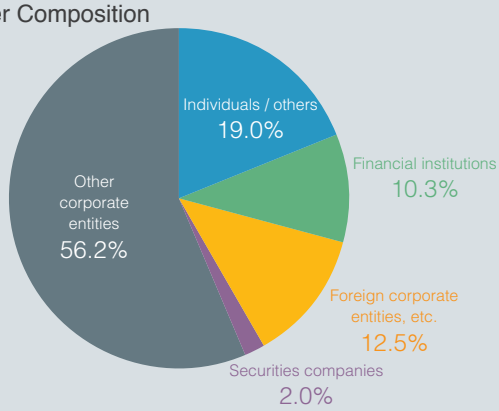
Basic Stock Information

Number of Shares Per Unit	100 shares
Total Shares Authorized for Issuance	160,000,000 shares
Shares Outstanding	71,270,910 shares
Number of Shareholders	19,149
Fiscal Year Closing Date	March 31
Ordinary General Meeting of Shareholders	June
Accounting Auditor	Ernst & Young ShinNihon LLC

Major Shareholders

Shareholder Name	Number of Shares (Unit: 1,000 shares)	Share-holding Ratio
JX Nippon Mining & Metals Corporation	35,859	50.31%
The Master Trust Bank of Japan (Trust Account)	4,795	6.74%
Nippon Steel Corporation	3,500	4.92%
Custody Bank of Japan (Trust Account)	1,606	2.26%
MSCO CUSTOMER SECURITIES	904	1.27%
STATE STREET BANK AND TRUST COMPANY FOR STATE STREET BANK INTERNATIONAL GMBH, LUXEMBOURG BRANCH ON BEHALF OF ITS CLIENTS: CLIENT OMNI OM25	772	1.08%
UBS AG LONDON ASIA EQUITIES	647	0.91%
UBS AG LONDON A/C IPB SEGREGATED CLIENT ACCOUNT	609	0.86%
J.P. Morgan Securities Japan	596	0.84%
State Street Bank West Client Treaty 505234	572	0.80%

Shareholder Composition



Information Disclosure and Promotion of Dialogue with Shareholders and Investors

The Toho Titanium Group discloses necessary information to shareholders, investors and other stakeholders in a timely, appropriate, and proactive manner, while giving due consideration to fair disclosure. We are moving forward with initiatives to enhance corporate value and sustainable growth based on the feedback and other information we receive in these efforts.

Target readership	content
Analysts and domestic/ foreign institutional investors	Briefings on financial results attended by the President twice a year (interim and year-end) Online conference calls and individual interviews by the IR Department
Individual shareholders and Investors	Delivery of business reports (interim and year-end), annual shareholders' meetings, responses to telephone inquiries, etc.
Posting of IR materials on website	Financial results briefing materials, quarterly financial results information and other news materials are posted in the "IR Library" section of the Company's website.