



TOSOH

ANNUAL REPORT

Tosoh Corporation and consolidated subsidiaries
Fiscal year ended March 31, 2015

TOSOH CORPORATION

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Forward-looking Statements: *Annual reports contain estimates, projections, and other forward-looking statements, which are subject to unforeseeable risks and uncertainties. Readers should understand that Tosoh's business and financial results could differ significantly from management's estimates and projections.*

For reference purposes only, US dollar amounts have been translated, unless otherwise indicated, from yen at the rate of ¥120.17 = US\$1, the prevailing exchange rate at the end of the fiscal year under review.

Tosoh Corporation's 2015 fiscal year covers the period from April 1, 2014 to March 31, 2015.

AT A GLANCE

Values

Values based on *monozukuri*—“a craftsman-like approach” to product detail and quality—have shaped Tosoh Corporation’s destiny and growth for more than 80 years. We take pride in having established a resilient global enterprise whose products and services are woven into the fabric of modern life.

Basics

Tosoh Corporation was established in 1935 and is listed on the First Section of the Tokyo Stock Exchange. We are the parent company of the Tosoh Group, which comprises more than 100 companies worldwide and a multiethnic workforce of over 11,500 people and generated net sales of ¥809.7 billion (US\$6.7 billion) in fiscal 2015.

Products

Tosoh furnishes the raw materials for an astonishing array of products that have revolutionized modern civilization. Look around you. It is almost impossible to find a manufactured item that does not include something from Tosoh.

Message from the President

Focusing on Growth

Tosoh started fiscal 2015 coming off an excellent fiscal 2014 performance. The company was ready to move ahead with core strategies to further its profitability and to position the Tosoh Group for growth in a rapidly changing business environment.

During the year under review, there were some unexpected developments, and many of them were positive. In the first half, several factors, such as rising raw materials costs and resulting product price increases, supported the company's greater profitability, leading Tosoh to revise its fiscal performance forecasts upward in October 2014. Favorable trends persisted in the second half of the fiscal year, as the prices of oil and naphtha declined substantially. Meanwhile, the yen progressively weakened against other currencies during the fiscal year. These favorable trends notwithstanding, Tosoh will continue to observe and provide timely responses to shifts in the business environment.

Major developments during fiscal year 2015 included Tosoh's reorganization of its R&D structure and absorption of Nippon Polyurethane Industry Co., Ltd. (NPU).

With another good year behind it, Tosoh is pressing ahead with strategies to bolster its commodities operations and to refocus its resources on expanding its specialties operations.

Core Operations Underpin Solid Performance

Commodities and specialties operations both contributed to our performance growth in fiscal 2015. Among our commodities operations, the Chlor-alkali Group continued to improve its performance following its fiscal 2014 recovery and posted increases in net sales and operating income. The group was, in fact, the major contributor to consolidated net sales among Tosoh's operating groups, and its robust performance boosted the company's overall growth. The Petrochemical Group, meanwhile, experienced a drop in profits but did achieve a slight increase in net sales.

Our specialties operations center on the Specialty Group, which in fiscal 2015 again upped its contributions to our consolidated net sales and operating income. It expanded its net sales contribution to 21.6% and generated 60.7% of Tosoh's consolidated operating income.

Reflecting this balanced growth, year on year Tosoh's consolidated net sales rose 4.8%, to ¥809.7 billion (US\$6.7 billion), and its consolidated operating income increased 23.6%, to ¥51.4 billion (US\$427.7 million). Our net income, meanwhile, soared 110.7%, to ¥62.3 billion (US\$518.4 million). That jump, however, is partially attributable to the booking of substantial deferred tax assets associated with the carryforward losses of NPU, which were assumed by Tosoh Corporation as a result of its October 1, 2014, merger with NPU.

In recognition of the upswing in our business performance, Tosoh increased its year-end dividend to ¥5.0 per share. In combination with the ¥2.0 yen per share additional commemorative dividend that we included in our interim dividend for fiscal 2015, Tosoh's annual dividends per share rose ¥4.0 per share, to ¥10.0 per share.

The Year in Review

Heading into the first half of fiscal 2015, we expected difficult business conditions. We anticipated in particular some backlash in the domestic market in response to the spike in demand in the last half of fiscal 2014 ahead of the hike in Japan's consumption tax in April 2015. In addition, one of our ethylene plants underwent scheduled maintenance during the fiscal year's first quarter.

The Chlor-alkali Group's shipments of vinyl chloride monomer (VCM), polyvinyl chloride (PVC) resin, and urethane raw materials declined in the fiscal year's first half as a result in part of that scheduled maintenance. But these declines were somewhat mitigated by increased shipments of caustic soda. The Petrochemical Group also saw shipments of many of its products contract, mostly because of declines in unit production due to the scheduled maintenance.

Our Specialty Group, however, recorded strong first-half shipments of such products as ethyleneamines and high-silica zeolites (HSZ®). The group's positive performance overall combined with rising export prices and a weakening yen to increase Tosoh's consolidated net sales and profits. The increase in profitability so exceeded our early forecasts that we revised upward our full-year forecasts for consolidated operating and net income.

We entered the second half of fiscal 2015 buoyed by the favorable oil prices and yen rate. We were cautiously optimistic about business conditions despite the slow Japanese economy and the prolonged effect on domestic business of the hike in Japan's consumption tax. Adding to our sense of caution, moreover, were the slowdowns in emerging countries' economic growth and the heightened political tensions in the world's oil-rich regions.

However, Japan's gross domestic product (GDP) rose for the remaining two quarters of our fiscal year. Oil prices and the yen rate remained at favorable levels. And the Japanese government decided to postpone the second hike in the consumption tax that it had scheduled for 2016. Hard on the heels of this good news was the ruling coalition party's landslide victory in an election that solidified support for Prime Minister Abe's Abenomics economic and monetary initiatives and calmed anxiety about Japan's economic direction.

Tosoh's fiscal performance mirrored improving conditions. All of our product groups posted net sales growth and positive operating income. The Specialty Group recorded a strong performance, but the Chlor-alkali and Engineering Groups more than doubled their profits over fiscal 2014 results. Overall, the company's robust performance can be attributed to a weak yen and declining oil prices, to increased shipments of some principal products, and to a recovery in demand for some key product lines.

The Merger with NPU

Progress toward the merger with NPU has been slow but steady. Tosoh's association with NPU began in 2001. That was when Tosoh acquired a major stake in the isocyanate producer to position itself in Asia's potentially high-growth polyurethane market and to enjoy other benefits of the association. NPU, for example, also offered synergies with our chlor-alkali business in particular because of relationships between Tosoh's and NPU's raw materials and products.

So close were those relationships that after making NPU a consolidated subsidiary in fiscal 2007, Tosoh raised its ownership in fiscal 2009. NPU, however, fell on hard times shortly thereafter amid the appreciation of the yen and the global economic tumult at the end of the decade. To enhance our oversight of NPU's necessary restructuring, we purchased yet more of the company, in fiscal 2013 and made it a wholly owned consolidated subsidiary.

NPU's restructuring succeeded, but the outlook for its still potentially high-growth business remains clouded by increasingly severe competition. Its global competitors plan capacity expansion, and the supply-demand balance for MDI is likely to worsen. Tosoh, therefore, chose to merge NPU's operations into its own to provide the strong management platform required to face the challenges ahead. The merger enables faster decision making, unified manufacturing, and optimized R&D.

The merger occurred on October 1, 2014. The management resources of both companies have been consolidated at Tosoh's head office in the newly formed Urethane Division of the Chlor-alkali Group. Some time, clearly, is required for full integration as a business unit. But we are pleased with progress to date and confident that the Urethane Division will rapidly capture the myriad synergies of the merger.

That confidence draws on our experience of earlier mergers. Tosoh absorbed Tekkosha Co., Ltd., in 1975 and Shin-Daikyo Petrochemical Co., Ltd., in 1990. And we're convinced of as much success with the NPU merger.

R&D Reorganization

Reorganizing our R&D facilities was another structural change that we undertook in fiscal 2015. This was prompted mainly by the merger with NPU but was, in fact, long overdue. The heads of our three main R&D centers were burdened with excessive responsibilities. We needed to free them up and better allocate our R&D resources among our three-pillared priorities of life sciences, energy and environmental conservation, and electronic materials.

We've done that and organized our new R&D structure by technical field and function and by whether our research laboratories engage in product and technology development research or long-term research. Where once we had three main R&D centers we now have seven research

laboratories, including the Urethane Research Laboratory formed from NPU's former R&D facility.

An advantage of the new R&D organization is our enhanced ability to concentrate our resources on specific themes relevant to growth areas in our target markets. We expect our new focus to yield exciting products and materials and to speed our development timelines.

Key Issues and Strategies Moving Forward

We addressed a number of important issues in fiscal 2015 that will continue to be the focus of our attention in the year ahead. Principal among these are improving the profitability of our commodity operations and expanding the role of our Specialty Group.

Improving the Profitability of Commodity Operations

The profitability of our commodity operations is a long-standing issue. These operations are highly sensitive to fluctuations in the global economy, in oil prices, and in exchange rates and must deal with the inevitable cycle of global production capacity leapfrogging demand.

In fiscal 2015, we concluded various initiatives to improve the profitability of our vinyl isocyanate chain operations. Our merger with NPU at the beginning of October will aid the recovery in the profitability of our urethane operations. And our completion of the 200,000-metric-ton production capacity expansion at our No. 3 VCM Plant, also in October, adds not just VCM capacity but PVC and caustic soda production capacity as well.

An ongoing focus of attention is achieving the best mix of products and raw materials, such as ethylene, based on market conditions. We are also devising ways to heighten our cost-competitiveness, including sharing the cost benefits of our electric generation capabilities among our domestic manufacturing companies.

The core issue in our petrochemical operations is their dependency on a mature and competitive domestic market. We continue to reduce production and logistics costs, strengthen business relationships with raw material suppliers and customers, and differentiate by developing specialty grades.

Our petrochemical competitors are in the same position and are downsizing. A plant closed in fiscal 2015, and two more are scheduled for closure in the next two years. The steady decline in supply will enable us to increase our operating rates and improve our profitability.

Some of our petrochemical products, of course, are not as dependent on Japan's market as others. Chlorosulphonated polyethylene (CSM) rubber and polyphenylene sulfide (PPS) engineering plastic are prime examples. Tosoh is the world's leading

producer of CSM. And our principal PPS customer is the global automobile industry, which is estimated to grow 6% in the medium term. We are, therefore, expanding our CSM and PPS operations and maintaining their market positions through product differentiation.

Expanding the Role of the Specialty Group

The Specialty Group has long been a big contributor to our profitability because of its sales in high-margin niche markets. The group, moreover, has always served to offset the cyclical fluctuations in the profitability of our commodity operations. So, while our core commodities operations are our major source of cash flow, our smaller specialties operations ensure our stable profitability.

The global business landscape, however, is changing. The Specialty Group must play a more central role in Tosoh's evolution to adapt to changes in its operating environment.

We are therefore increasing the Specialty Group's production capacity and sales volume and launching new Specialty Group products. We are in particular determining which high-growth niche markets offer the best opportunities for Tosoh's products, technologies, and other strengths.

HSZ is one of our top-earning products, and we have been quick to keep ahead of demand for HSZ. We added to our HSZ production capacity in fiscal 2015, bringing to 200% our increase in domestic HSZ capacity since 2008.

We also in fiscal 2015 added production facilities for RZETA®, our proprietary, new, and unique emission-free reactive amine catalyst for polyurethane (PU) foam. In addition, our subsidiary Tosoh Hyuga Corporation began its commercial production of chemical manganese oxide (CMO®), which is used for the lithium-ion battery market.

The Specialty Group also launched multiple products in fiscal 2015. Its Bioscience Division, for instance, introduced three new models of each of its major clinical diagnostic systems. And its Advanced Materials Division introduced Zpex® Smile, a high grade of translucent zirconia dental material especially for front teeth that has been an immediate success.

Numerous other high-performance products and technologies of the Specialty Group's Organic Chemical, Advanced Materials, and Bioscience Divisions are outlined elsewhere in this report. We are confident that the Specialty Group will drive our growth.

Consequently, we are committed to investing aggressively in the Specialty Group. We are, for the immediate term, looking at investments to further our bioscience, CMO, electronic material, and optical polymer businesses.

Our reorganized R&D structure should fast track a stream of products and technologies for the Specialty Group. Tosoh's R&D should also foster the Specialty Group's growth in another important way. Specialty products have shorter product lives compared with commodity products. The Specialty Group, therefore, must rely on R&D to come up with new and improved products.

Being a Good Corporate Citizen

Tosoh is committed to good corporate citizenship. Around the world, it complies with regulations and guidelines, works toward safe operations, ensures employee health and welfare, and contributes to local communities through corporate social activities.

We participate in the global Responsible Care (RC) initiative, which seeks to improve chemical companies' performance environmentally and in safety and health. The RC program sets policies and objectives that involve qualitative and quantitative targets and compliance with diverse standards.

Tosoh's corporate governance system, meanwhile, ensures transparency, compliance, and operational efficiency. We firmly believe in the system's ability to enhance corporate value and growth.

I am personally involved in setting up programs to improve the safety of our domestic production operations. I have visited our major production facilities in Japan and talked with their managers and employees about the progress and effectiveness of those programs. And I have increased the annual budget to address issues raised and especially the recent problems arising from faulty plant maintenance.

We value our people and have programs in place to oversee their health and welfare, job satisfaction and productivity, and personal growth. Our employee programs instill an awareness of such important issues as environmental concerns and social contributions. Recently, our efforts were validated by Japanese company rankings that recognize Tosoh as a good company for high school and university graduates to work for.

Perspectives

The price of oil and the value of the yen are among the most important factors for Tosoh's business in fiscal 2016. Should oil prices and the yen remain at the levels as of this writing, Japan's economic recovery will probably continue. Recent data suggests this to be the case. Corporate earnings remain solid and personal income and employment have improved.

Overseas, the economic outlook is mixed. Emerging economies, however, will continue to grow. Also expected to expand are the specific markets that we are targeting through our three-pillar R&D program and in each of our product groups, especially the Specialty Group.

Tosoh is well positioned to achieve growth in fiscal 2016 and beyond. Our vinyl isocyanate chain is back in balance. New and expanded production capacity for such of our products as VCM, caustic soda, HSZ, RZETA, and CMO will contribute to sales for the full year. And we are actively developing growth markets overseas, particularly for our specialties products.

Reflecting our strategic goals, we made public several new initiatives in April 2015, after the end of the fiscal year under review. We announced the start of construction on an HSZ production base in Malaysia that will substantially enlarge Tosoh's HSZ production capacity and ensure stable supply. We also announced the acquisition of an in-vitro diagnostics company in India to position our bioscience business in that market.

In February 2015, Tosoh celebrated its 80th anniversary. A look at the company's history makes it clear that Tosoh's success owes itself largely to an ability to remain flexible—to evolve with the times and continuously find pathways to growth. We in management are dedicated to continuing this tradition.

In all of our endeavors, we look forward to your continued and much appreciated support in fiscal 2016.

Kenichi Udagawa

President

SPECIAL FEATURE

Two Pillars of Growth

80 years have passed since Tosoh's founding as a soda manufacturer. Over the decades, it has evolved into becoming a supplier of diverse industrial chemicals, functional and advanced materials. Today, Tosoh balances large-volume commodities operations with high-value-added specialties operations for a two-pillared corporate structure that bolsters the company's sales and profits in good times and bad.

A structure comprising chlor-alkali, petrochemical, engineering, and other businesses on the commodities side and advanced materials, bioscience technologies, and organic chemicals on the specialties side helps Tosoh weather the inevitable downturns and rapidly changing business environment of its commodity operations. More significant even than the ability to tolerate and overcome business challenges, Tosoh's two-pillared structure enables the company to benefit from the high profit margins afforded it through participation in the world's most technology-intensive industries.

Increasing the Emphasis on Specialties

Tosoh has increasingly come to rely on its specialties operations to shore up its profitability when shortfalls in the cash-generating capabilities of its commodities operations occur. Specialties regularly contribute a substantial portion of Tosoh's consolidated net sales, and this is especially vital amid tough years for their primarily chlor-alkali- and petrochemical-based commodities counterpart. Over the past five fiscal years, specialties have accounted on average for a 20% share of Tosoh's consolidated net sales. That share increased to 21.6% in fiscal 2015.

The story is more mixed when it comes to operating income. There have been three occasions in the past five fiscal years when specialties' contributed significantly to Tosoh's consolidated operating income: in fiscal years 2011 and 2012, when they accounted for around 61% and 55%, respectively, and in fiscal 2015, the year under review, when they again accounted for a nearly 60% share following the recovery of fiscal 2014 after the market slowdown of fiscal 2013.

Going forward, the company plans to expand the role of its specialties operations. The plan is to give specialties a more central role in generating overall corporate growth.

The growth to greater prominence for Tosoh's specialties operations involved the launch of products and the expansion of production capacities in fiscal 2015. All specialties-related activities during the year, moreover, further demonstrated a pursuit of high-value-added niche markets.

That specialties have gained a burgeoning role in Tosoh's operations is indicated in part by their growing physical presence around the globe. This is particularly true for the bioscience business.

At the time of this writing, Tosoh's Bioscience Division has added four companies since the start of fiscal 2015 to strengthen its clinical diagnostics operations. The first of these is Tosoh Latin America SpA, established in Chile, which will work to support the growth of the Tosoh Bioscience business in the region. The division also reinforced its Belgium operations with the establishment of Tosoh Europe International N.V. followed by the opening of that company's branch office in Dubai, United Arab Emirates in order to better serve customers in the Middle East. And it also recently acquired well-known Indian in vitro diagnostics company, Lilac Medicare Private Limited, so as to grow and strengthen Tosoh's presence in the high-potential Indian in vitro diagnostics market.

Advanced materials, too, are on the move. Tosoh has confirmed plans to construct a high-silica zeolite (HSZ) plant in Malaysia. The plant will expand Tosoh's HSZ production capacity and stabilize the company's supply of HSZ.

Reinforcing the Profitability of Commodities

Tosoh's commodities operations represent many of Tosoh's core businesses and are being optimized alongside the company's specialties operations. Commodities continue to earn the lion's share of Tosoh's consolidated net sales but are sensitive to changes in the business environment. This is especially true for chlor-alkali, a longtime core Tosoh product family. Tosoh will strengthen and improve the profitability of the Chlor-Alkali Group by enhancing its ability to deal with market pressures and the need to control costs, to institute product mix adjustments, and to further integrate and thereby heighten the efficiency and effectiveness of the company's vinyl isocyanate chain.

Tosoh will also expand the Chlor-Alkali Group's manufacturing capacity for another core Tosoh product: vinyl chloride monomer (VCM). That expansion will ensure an abundant and stable supply of VCM for increased production capacity at Tosoh's domestic and overseas polyvinyl chloride (PVC) production facilities. Tosoh's PVC business will capitalize on the stability and abundance of VCM supplies by boosting sales of PVC to customers worldwide.

No product, meanwhile, is more core to Tosoh's operations than caustic soda. Tosoh Corporation was, after all, founded in 1935 as Toyo Soda Manufacturing Co., Ltd. And Tosoh's production of its namesake product stands to benefit from the company's plan to raise electrolysis operating rates to full at its Nanyo and Yokkaichi Complexes. The increase in production that this will occasion will strengthen Tosoh's profitability from sales of soda and chlorine derivatives.

Tosoh's October 2014 merger of Nippon Polyurethane Industry, Co., Ltd. (NPU), further complements the Chlor-alkali Group with enhanced polyurethane (PU) capabilities. The group will be better able to control the development, manufacture, and sale of commodity grades of isocyanates, or polyurethane raw materials. It will, moreover, also be able to leverage NPU's expertise in functional urethanes and PU foaming system products and NPU's manufacturing and sales facilities in China.

Other primary commodities operations that Tosoh will strengthen include the Petrochemical Group's olefins operations. The company intends on raising the operating rate of the naphtha cracker at its Yokkaichi Complex, which also contributes to the manufacture of VCM and PVC. In addition, Tosoh will work to heighten the responsiveness and flexibility of its olefin manufacturing and sales system.

Tosoh's emphasis, meanwhile, for the Petrochemical Group's polymer operations is their further development of high-value-added functional and specialized polyethylene products. This includes improved engineering grades of polyphenylene sulfide (PPS) resins and better, non-contaminating grades of chloroprene rubber (CR). As well, the polymer operations will increase sales of their advanced and specialty grades of functional polymers, especially chlorosulphonated polyethylene (CSM), of which Tosoh is the world's leading producer.

Innovating for Commodities and Specialties

Tosoh supports its commodities and specialties operations through innovation and leading-edge technology. Tosoh's R&D develops increasingly versatile and functional grades of products for niche applications while also developing next-generation products for the advancement of civilization.

Tosoh's reorganization of its R&D in fiscal 2015 positions those operations favorably to cope with increasingly numerous R&D projects. It allows Tosoh to bring its R&D resources to bear more fully than ever on various short-term development initiatives, for products and for technologies related to inorganic materials, polymer materials, organic materials, and polyurethane. It also enhances R&D for Tosoh's three long-term priorities of life sciences, energy and environmental conservation, and electronic materials, which command a heightened focus on specialties. Those priorities, therefore, are largely responsible for Tosoh's shift of its specialties operations from a supporting role for its core commodities operations to a role central to its business.

As Tosoh's markets have shifted, the company has faced the challenge of managing increasingly frequent crises while keeping its long-term business plans on course. Each of Tosoh's groups and divisions faces different issues but overall are united by Tosoh's strategy to expand its specialty businesses, to reinforce its commodities operations, and to continue on pathways to growth to ensure the company's ability to fulfill its commitments to its stakeholders and to society.

REVIEW OF OPERATIONS

SPECIALTY GROUP

Snapshot

The Specialty Group meets the needs of its varied customers for high-value-added bioscience, organic chemicals, and advanced material products and technologies. Its extensive offerings are solidly positioned in stable and expanding niche markets and individually and collectively are critical contributors to Tosoh's profitability.

The Specialty Group's clients span the globe and include the pharmaceutical, health care, semiconductor, consumer electronics, and automobile industries. They include, moreover, emerging businesses whose success hinges on the Specialty Group's development of solutions to fuel their progress. Innovative products and technologies from the Specialty Group align Tosoh with market opportunities and offer potential for sustainable expansion strategies.

Group Performance and Markets

Continued Surge in Profitability

Specialty Group fiscal 2015 net sales rose 14.0% over fiscal 2014 group net sales, to ¥174.9 billion (US\$1.5 billion). That constituted 21.6% of Tosoh's consolidated net sales, compared with 19.8% in fiscal 2014. Group operating income climbed 55.9%, to ¥30.0 billion (US\$249.5 million), for 58.3% of Tosoh's consolidated operating income, compared with 46.2% a year earlier and 36.7% in fiscal 2013. The operating income to net sales ratio was 17.1%, compared with 12.5% in fiscal 2014.

A recovery in demand for ethyleneamines boosted shipments of that product by the Specialty Group. In addition, ethyleneamine export prices improved as demand for ethyleneamines in overseas markets rose because of an improving demand-supply balance and a weakening yen. Followed by the price improvement overseas, the group successfully increased its ethyleneamine prices for the domestic market as well.

To compensate for rising raw material prices, the group increased the price of one of its popular bromine fire retardants.

The Specialty Group's separation-related products business saw shipments of liquid chromatography packing materials decline. The group's in vitro diagnostics (IVD) product operations, however, experienced increased shipments of reagents.

Shipments of the Specialty Group's high-silica zeolites (HSZ®) also increased, especially for automobile exhaust system catalytic converters. Likewise, the group witnessed increased shipments of its zirconia for dental and decorative applications and of its electrolytic manganese dioxide (EMD) for dry cells.

Developments

Capital Investments

In fiscal 2015, Tosoh completed the construction of a plant to produce RZETA®, the Specialty Group's proprietary, new, and unique emission-free reactive amine catalyst for polyurethane (PU) foam. The plant was built on the site of Tosoh's oldest ethyleneamine production line, which the company shut down in fiscal 2013 because of oversupply in the market. Because PU foam features low volatile organic compounds (VOC), it is attracting great interest from European and Japanese automakers.

Tosoh also completed a further 50% expansion of HSZ production capacity at its Nanyo Complex in November 2014. The expansion is meant to help the Specialty Group meet the constantly increasing demand for auto emission catalysts, a category where Tosoh aims for a top share globally. It is now preparing to establish an overseas HSZ production base to reduce its business risk, diversify its supply routes, and shorten its delivery times.

Tosoh Group company Tosoh SMD, Inc., is investing heavily in its US facilities for developing and producing physical vapor deposition sputtering targets in preparation for the evolving competitive landscape of the semiconductor industry.

In the second half of fiscal 2015, Tosoh initiated the construction of a reaction tower for the Specialty Group's bromine operations. Scheduled for completion in fiscal 2018, the state-of-the-art tower will lower production costs and raise competitiveness.

New Products

In fall 2014, Tosoh launched new models in each of its major clinical diagnostic system lines. Sales of a new molecular testing system, the TRCReady®-80, started in September, followed by sales of the next-generation automated immunoassay analyzer, the AIA®-CL2400, in October, and sales of a new automated glycohemoglobin analyzer, the HLC-723G11®, in November.

Tosoh AIA, Inc., meanwhile, announced plans to increase its enzyme immunoassay reagent production capacity to support market growth for its AIA business. Construction got under way in November 2014 and is scheduled for completion in October 2016.

Network Expansion

The Specialty Group's Bioscience Division set up Tosoh Europe International N.V. in Belgium and then opened a branch office of this new company in Dubai, United Arab Emirates, to better serve customers in the Middle East and Africa. It also established Tosoh Bioscience Latin America SpA in Santiago, Chile, to further grow its business in Latin America. And at the time of this writing, Tosoh has established a presence in India through its acquisition of IVD company Lilac Medicare Private Limited.

Strategies and Outlook

Organic Chemicals

Tosoh's annual ethyleneamine production capacity of 71,000 metric tons places it among the world's largest producers of ethyleneamines. The company, moreover, exports approximately 80% of the ethyleneamines it produces.

Traditionally one of Tosoh's top earners, ethyleneamines underwent a brief downturn but were restored to profitability in fiscal 2014 by a rebounding market and the Specialty Group's strategic actions. The Specialty Group continues its shift to high molecular weight amines and its expansion of its global ethyleneamine derivative network, particularly for its TEDA®, Toyocat®, and RZETA polyurethane catalyst operations.

The group is also seeking to solidify the recovery of its ethyleneamines business through higher pricing and larger market shares for its core ethyleneamine grades. It has been successful in implementing several price increases over the past few years. The latest price increase was in January 2015 and was for ethylenediamine (EDA) and diethylenetriamine (DETA) and followed global price increases for the group's principal ethyleneamines in April 2014.

The Specialty Group's medium-term strategy for its bromine and brominated derivative products, for which Asia is the largest market, is to stay ahead of the competition by expanding product sales and reducing costs. Tosoh's decision to build a reaction tower, scheduled for completion fiscal 2018, is sure to help the group achieve its strategic aims.

To ensure long-term growth for its eco-business products and services, the group has a twofold business strategy. It will reinforce its competitiveness in top-of-the-line brands for the environmental and recycling market by continuing to make the piperazine-based agents that are its core environmental product line. It will also look beyond its domestic market to the emerging markets of China and other Asian countries, where rapid economic development poses pressing environmental issues.

Advanced Materials

Zeolites

The Specialty Group's zeolite operations are focused on keeping ahead of the steady growth in demand for HSZ products from the automotive, oil and energy, and environmental industries. The two major areas of demand are for catalytic converters in automobiles and for catalysts for petrochemical production. And the Specialty Group is steadily increasing production capacity and developing products to stay apace of rapidly evolving trends in industry and environmental regulations. During the fiscal year under review, Tosoh announced plans for constructing a new HSZ manufacturing plant in Malaysia, with completion planned for the latter half of calendar 2016 and sales planned to begin in the middle of calendar 2017.

Ceramics

The goal of the Specialty Group's zirconia powder operations is to maintain top share of the global fine ceramics market. The group established Tosoh as a major player in the dental materials market when it introduced translucent and colored zirconia. In December 2014, the Specialty Group furthered Tosoh's presence in dental materials with its launch of Zpex® Smile.

Zpex Smile is a grade of translucent zirconia especially for front teeth. The product outperforms traditional materials and is widely acclaimed for its quality and high translucency. As such, it is expected to substantially expand its share of the market.

Zirconia's application as a decorative material in standard wristwatches and car accessories is another growth opportunity for sales and profits for Tosoh's fine ceramics.

Battery Materials

Tosoh is the world's largest producer of EMD and a major supplier of EMD to the conventional battery market. And the Specialty Group intends to help the company maintain and expand its position in that market. The EMD market is mature and competitive, but there are opportunities for growth. Recent exits from the global market have opened the door to increased sales to global manufacturers of primary batteries and of cathode materials for lithium-ion batteries (LIBs).

The Specialty Group is also establishing itself as a principal producer of manganese-based cathode materials for the lithium-ion secondary battery market.

The group has a chemical manganese oxide (CMO®) plant to meet growing demand. Demand for lithium-ion secondary batteries is anticipated to grow substantially, and the expanding market for electric vehicles is undeniably a market where Tosoh can contribute. In addition, rising standards of living, improving infrastructure, and rising personal incomes in emerging countries are expanding purchases of handheld or portable electronic devices, for which battery materials are essential.

Electronic Materials

Thin film materials and quartz are other of the Specialty Group's operations expanding to meet growing demand. The semiconductor market is expected to grow stably alongside explosive growth in handheld devices, electronics in automobiles and other consumer products, and digital information technologies. So the Specialty Group is implementing measures to serve the next-generation memory and printable electronics markets and developing and expanding sales of products for atomic layer deposition (ALD) and coating applications.

Bioscience

Separation and Purification

Tosoh is committed to a major presence in the global bioscience market. Thanks largely to the efforts of the Specialty Group, the company boasts well-established bioscience brands in such leading markets as Japan, the United States, and nations in Europe. The group is now targeting such high-growth markets as China, India, and the countries of Southeast Asia and the Middle East. Medium term, the Specialty Group is focusing on sales of separation columns and Toyopearl. It is also shifting to the manufacture of columns for the ultrahigh-performance liquid chromatography (UHPLC) systems that are quickly becoming mainstream and replacing high-performance liquid chromatography (HPLC) systems.

In addition, the Specialty Group is concentrating on earning a bigger share of the global market for separation media. A key product in this respect is its recently introduced Toyopearl® AF-r Protein A HC-650F separation media. This Toyopearl grade was developed specifically to address biopharmaceutical industry demand for antibody purification media. The group has recently doubled its production capacity for Toyopearl.

Clinical Diagnostics

In fiscal 2015, the Specialty Group continued to help Tosoh build a worldwide presence in clinical diagnostic systems. It launched three new models in its main

AIA system, glycohemoglobin analyzer, and TRC system product lines.

Tosoh has established a positive reputation in the global diabetes market with a line of GHb analyzers from the Specialty Group. And the group has plans to increase the company's share of this approximately ¥50 billion and rapidly growing market. Those plans include producing compact, reasonably priced GHb analyzers suitable for developed and developing countries and expanding the support network for all of its GHb analyzer models.

The global molecular testing market, too, is growing steadily and is estimated to be worth over ¥500 billion. Market growth is particularly strong in emerging countries, where molecular testing is most valued for its usefulness in testing for infectious diseases, for which Tosoh's nucleic-acid amplification testing (NAT) products are particularly useful. The group has steadily established itself in the market and launched its next-generation system, the TRCReady-80, in fiscal 2015.

Key Opportunity Checklist

- Leverage advanced medical diagnostics technologies to help medical caregivers improve the lives of growing numbers of people
- Anticipate and invest in technology to serve the changing global semiconductor industry
- Look beyond present markets to target opportunities in developed and developing economies, focusing particularly on the growing markets of Asia

CHLOR-ALKALI GROUP

Snapshot

The Chlor-alkali Group operates the largest fully integrated manufacturing capacities of their kind for chemical commodities in Asia and supplies the worldwide chlor-alkali industry with raw materials for a vast range of products. It is well positioned to take advantage of opportunities in especially Asia's expanding markets.

The group's main products are chlorine, caustic soda, vinyl chloride monomer (VCM), polyvinyl chloride (PVC) resins, calcium hypochlorite, sodium bicarbonate, methylene diphenyl diisocyanate (MDI), toluene diisocyanate (TDI), hexamethylene diisocyanate (HDI), and functional urethanes. It both sells these raw materials and furnishes them as feedstock to Tosoh's fully integrated vinyl isocyanate chain, which yields Tosoh's commodity and specialty products.

Tosoh's MDI, TDI, and HDI production, previously handled by wholly owned subsidiary Nippon Polyurethane Industry Co., Ltd. (NPU), is overseen by the company's new Urethane Division. In October 2014, Tosoh merged with NPU to strengthen the management and efficiency of the integrated supply structure so central to the company's vinyl isocyanate chain, including the manufacture of MDI, TDI, and HDI urethane products. That merger led the company to fold all Tosoh Group urethane operations into the Urethane Division within the Chlor-alkali Group.

MDI is integral to the Chlor-alkali Group's strategies because MDI is a raw material for polyurethane and a fine chemical with multiple uses in organic synthesis. It offers attractive marketing synergies with Tosoh's diverse product lines, including organic synthesis compounds, polyurethane catalysts, and specialty polymers. TDI, which was the start of NPU's business, also serves myriad applications similar to those served by MDI. HDI, meanwhile, is a higher-value-added product with applications in high-performance paints and other specialty polymers.

The Chlor-alkali Group's chemical commodities business is thriving in tandem with the growth of economies worldwide despite constantly changing shipment volumes and prices as supply and demand fluctuate. The group has the know-how and the systems to optimize its production mix to match circumstances and to enable Tosoh to compete in chlor-alkali globally.

The group also oversees Tosoh's cement operations. Those operations utilize waste and coal ash, slag, and other by-products from Tosoh's operations and elsewhere. That valuable contribution to recycling also occasions a considerable reduction in the cost of manufacturing cement. The entire cement output is then consigned for sale by Taiheiyo Cement Corporation, Japan's largest cement manufacturer.

Group Performance and Markets

Improved Profitability

Chlor-alkali Group net sales rose to ¥294.3 billion (US\$2.4 billion) in fiscal 2015, an increase of 2.8% over fiscal 2014 group net sales. The group accounted for 36.4% of Tosoh's consolidated net sales, down from 37.1% a year earlier. Operating income improved 114.8%, to ¥8.3 billion (US\$69.2 million), contributing 16.2% of consolidated operating income. The group's operating income to net sales ratio was 2.8%, up from 1.4% in fiscal 2014.

The group's sales of caustic soda increased for several reasons. Among them were growth in demand in some markets and an increase in production enabled by the expansion in Tosoh's VCM production capacity.

Several factors were likewise behind the decline in the group's domestic shipments of PVC. Domestic demand fell following a rush in demand at the end of fiscal 2014 that occurred in anticipation of a hike in Japan's consumption tax. In addition, domestic customers held off on PVC purchases amid dropping prices for naphtha. PVC exports, conversely, rose in line with expanding VCM production.

Shipments of urethane raw materials expanded in Japan in response to firm demand from the automobile-related, construction, medical, and other markets. Exports, however, declined because of China's slowing economy and a softening of market prices.

The Chlor-alkali Group's cement shipments dropped because of falling demand.

Developments

Merger

After a long process of restructuring NPU, Tosoh decided to take the next step and assimilate NPU's operations through a merger.

The two companies' operations were already well integrated. Tosoh's Nanyo Complex supplied NPU with the utilities and the aniline, carbon monoxide, and chlorine that NPU uses as raw materials for its isocyanate product line. NPU's isocyanate manufacturing processes also generated hydrogen chloride that NPU furnished to Tosoh as a raw material for VCM. This collaboration turned Tosoh's vinyl chain into the fully integrated vinyl isocyanate chain that it is today.

Tosoh, however, foresaw increasingly severe competition in isocyanates. To prepare, it opted to merge NPU into itself for faster decision making, unified manufacturing, optimized R&D, and heightened management efficiency. The single management

structure consolidates the once separate operations' synergies, enabling a comprehensive response to fluctuating exchange rates, expanding global production capacity, and rising competition from overseas manufacturers.

Capital Investments

In fall 2014, Tosoh expanded the production capacity of the Nanyo Complex's No. 3 VCM Plant by 200,000 metric tons. The overall gain in capacity redressed the imbalance in supply that had existed between the company's VCM and PVC operations since an accident destroyed the No. 2 VCM Plant at the Nanyo Complex in 2011. It also permitted an increase in the electrolysis operating rate, which, in turn, raised caustic soda production.

In October 2014, Tosoh Group subsidiary Taiyo Vinyl Corporation increased the annual PVC production capacity at its plant in Chiba Prefecture, adjacent to metropolitan Tokyo, by 10,000 metric tons. The expanded facilities will meet increased domestic demand for PVC. They will contribute specifically to meeting the substantial need for PVC in recovering from the Great East Japan Earthquake and in constructing the infrastructure for the 2020 Summer Olympics and Paralympics in Tokyo.

Strategies and Outlook

Vinyl Isocyanate Chain

The profitability of the vinyl isocyanate chain has been a major issue for the Tosoh Group over the past decade. The operations have faced stiff challenges from steadily rising naphtha and other raw material prices, from substantial expansion in worldwide production capacity, and from global financial crises and the yen's appreciation.

Most affected have been the Chlor-alkali Group's core VCM and PVC products. In addition to measures it is taking to reduce costs and raise the competitiveness of its products, the Chlor-alkali Group is striving to increase its production and sales of its more profitable primary chloride line of caustic soda and related products. The expansion of VCM production capacity at the Nanyo Complex and resultant increase in the electrolysis operating rate that enabled greater production of caustic soda was a major step toward that goal.

Medium term, there are significant opportunities for caustic soda sales in Oceania, centered on Australia, and in Southeast Asia and North America. Markets are particularly strong in India, Vietnam, and other Asian countries because of growing alumina plant operating rates. Prospects are also favorable for sales of calcium hypochlorite, sodium bicarbonate, sodium sulfate, and other products. Even in Japan, where demand for caustic soda has contracted, Tosoh has maintained an approximately 20% market share.

Exploiting the cost-effectiveness of Tosoh's independent electricity generation capabilities is another important way the Chlor-alkali Group is boosting the cost-competitiveness of its primary chloride and other product lines. The Chlor-alkali Group is devising methods to share Tosoh's electricity generation capabilities among its operations at the company's domestic factories, beginning with the Yokkaichi Complex, and at the Sakata Plant of Tohoku Tosoh Chemical Co., Ltd. Environmental taxes on fossil fuels will be implemented incrementally in Japan over the next few years, and the group's efforts to distribute Tosoh's electricity generation will contribute to keeping its electric power costs and its product pricing competitive.

The global VCM market is highly competitive but growing. So the Chlor-alkali Group employs a wide range of measures to reduce its VCM production costs and to strengthen its VCM marketing. The group is also considering prioritizing domestic and overseas markets where profitability is greatest amid changing exchange rates, market conditions, and technologies.

The group is focusing on products, including PVC, produced by Tosoh subsidiaries. Its plan is to encourage subsidiaries to collaborate in expanding markets in ways that ensure their profitability. The goals specifically for VCM and PVC operations are to provide stable VCM supplies to Tosoh's PVC manufacturing subsidiaries and to maximize profits for all. This means strengthening domestic sales and tapping sales opportunities overseas in such markets as Indonesia and India. China, meanwhile, is a difficult market because of its rising use of the carbide method to produce PVC.

Tosoh produces more than 35% of Japan's VCM output and is the domestic leader in PVC resins, accounting for one-fourth of national output. Long term, VCM and PVC demand should increase in Asia, and Tosoh expects to benefit despite heightened competition at home and abroad.

Urethanes

Fiscal 2015 saw the launch of the Chlor-alkali Group's Urethane Division, which combines Tosoh's and NPU's MDI, TDI, HDI, and functional urethane operations. The transition has gone smoothly, and all of the new division's administrative staff are now located at Tosoh's head office. From this single location, the division is examining how best to tap Tosoh's ample resources to further its urethane business strategies. Meanwhile, the division's newly combined R&D capabilities are gearing up to develop profitable products.

Tosoh's conversion to low-cost MDI production was mostly complete before the merger. The division is now contemplating additional MDI production capacity to enhance its presence domestically and overseas.

Another of the division's operational targets is to strengthen Tosoh's competitiveness in China's monomeric MDI market. The division is also improving the quality characteristics, including color, of its polymeric MDI to support that product's higher pricing.

To reinforce its MDI marketing drive in Asia, the division has set up an MDI stockpiling base in Singapore. This facilitates its reach particularly in ASEAN markets.

The Urethane Division is also targeting a growing share of the overseas HDI market, primarily through expanded sales to US and European customers and to customers elsewhere. In addition, it will expand its sales of liquid polycarbonate diol (PCD), a highly pliable and tough raw material for polyurethane resin products, and of other of its products.

Cement

The Chlor-alkali Group's one-kiln cement production system lessens its fixed costs through reduced maintenance and lower labor and outsourcing expenses. The system's improved waste plastic processing capacity and capability also contribute to its operational profitability.

Medium term, the group is considering increasing the waste plastic processing of its cement operations. This will involve an upgrade to its cement manufacturing facilities alongside ongoing programs to conserve energy and reduce energy costs.

In fiscal 2016, the Chlor-alkali Group expects that demand for cement will remain steady. Demand from Great East Japan Earthquake rebuilding projects is tapering off, but demand related to construction in response to the upswing in the economy and to the 2020 Summer Olympics and Paralympics in Tokyo should pick up. In addition, private-sector demand is expected to be firm.

Key Opportunity Checklist

- Enhance position as the clear leader in chlor-alkali in Asia and as a major chlor-alkali player globally
- Take advantage of healthy demand for MDI in Asia, which is increasing at 5% per year
- Leverage merger with NPU to maintain or increase market share

PETROCHEMICAL GROUP

Snapshot

The Petrochemical Group supplies diverse customers with conventional and high-performance and specialty products. Polymers, including polyethylenes and functional polymers, and olefins are the group's main product lines, and the group maintains its competitive edge by moving its products upstream, managing its product mix, cutting its costs, and diversifying its product lines. The Petrochemical Group bridges the gap between the Specialty and Chlor-alkali Groups in Tosoh's dual commodities and specialties strategy.

Tosoh has utilized olefin feedstock from the Petrochemical Group to become an integrated manufacturer of hydrocarbon-based products and their derivatives, including ethylene, propylene, cumene, and aromatic compounds. Customers use olefins to manufacture a broad range of products, from automotive additives to food flavors and fragrances.

The Petrochemical Group's polymer operations manufacture ethylene vinyl acetate (EVA); low-density polyethylene (LDPE); linear low-density polyethylene (LLDPE); high-density polyethylene (HDPE); and such functional polymers as chloroprene rubber (CR), adhesive polymers, and engineering plastic resins. The polymer operations adapt product specifications to meet customer needs for polymers in consumer and industrial products. Various grades of EVA are found in everything from solar cells to shoe soles. LDPE is used in medical applications and food packaging. And HDPE is applied in injection moldings and high-purity pharmaceutical containers.

Chlorosulphonated polyethylene (CSM) rubber and polyphenylene sulfide (PPS) feature in the Petrochemical Group's functional polymer lineup. CSM is a highly durable rubber in short supply worldwide, and Tosoh is the leading global CSM producer. PPS is an engineering plastic also in great demand globally. It is valued by automotive manufacturers because it helps them make lighter, more fuel efficient vehicles.

Group Performance and Markets

Challenging Business Environment

The Petrochemical Group's fiscal 2015 net sales edged up 0.1% from a year earlier, to ¥223.7 billion (US\$1.9 billion). The group's contribution to Tosoh's consolidated net sales, however, declined from 28.9% in fiscal 2014 to 27.6% in the fiscal year under review. Operating income also declined ¥7.9 billion, or 53.2%, to ¥6.9 billion (US\$57.6 million), mainly because of the unfavorable impact of falling product prices and higher cost of sales of inventory valued via the average cost method, both due to the decline in the price of naphtha during the fiscal year. The operating income to net sales ratio was 3.1%. The Petrochemical Group's operating income accounted for 13.5% of

Tosoh's consolidated operating income.

Shipments of ethylene, propylene, cumene, and other olefins were generally brisk. Olefins shipments increased, especially for cumene as well as for ethylene with the latter benefitting from a favorable balance of purchases and in-house consumption. Sales prices, however, dropped during the fiscal year in line with declining naphtha prices.

Polyethylene resins saw a decrease in shipments of general-use, high-density polyethylene. Domestic polyethylene prices, however, began declining incrementally when naphtha and other raw materials costs started dropping in the third quarter. Shipments of CR and CSM benefited from improved export prices because of the weak yen.

Developments

At the end of the fiscal year, Tosoh announced the development of a world-class ultrahigh molecular weight polyethylene (UHMWPE) that uses Tosoh's new, proprietary metallocene catalyst. Tosoh's new UHMWPE features a narrow molecular weight distribution that affords it properties superior even to the strong abrasion, tear resistance, and other properties of HMWPE. So Tosoh is eyeing applications for its UHMWPE in sliding components, high-strength fibers, and the separators of rechargeable lithium-ion batteries.

Planning is under way for the commercialization of this new UHMWPE. Fundamental in that planning is the full-scale distribution of samples of the product and its applications.

Among other recently developed products, the Petrochemical Group also introduced two new grades of high melt strength polyethylene (HMS-PE). Both are suited for use in medical bottles that are transparent and meet Japan's safety standards. The group also plans to develop and sell variations of the two new HMS-PE grades for application in infusion bags, ampoules, and unit-dosage dispensers for eyedrops and other medicines. Sampling is under way.

Strategies and Outlook

Olefins

The Petrochemical Group expects increased shipments of olefins in fiscal 2016, partially in response to the production downtime in fiscal 2015 as a result of scheduled maintenance. A weak yen and strong stock market support favorable capital investment sentiment and an improved business environment, particularly for corporate Japan's export-oriented companies.

One of Tosoh's domestic competitors shut down an ethylene plant in fiscal 2015 and is expected to close two more over the next two years. The closure to date has improved the supply and demand for olefins in Japan, and the others will do the same. In fiscal 2015, the decline in supply following the first plant closure allowed Tosoh's Nanyo Complex to increase the operating rates of its ethylene production facilities, further lowering costs at those facilities. The closures collectively will leave Tosoh as the only provider of olefins in the Chukyo region, around Nagoya, and doubtless fuel more operating rate increases.

Beginning in 2017, a significant amount of ethane cracker capacity will be coming onstream in the United States despite the recent sharp drop in oil prices. Although this presents another challenge to Petrochemical Group operations, a positive impact of the US shale gas revolution is the strong possibility that supplies of butane and benzene and other aromatics will tighten in that market because of a shift to ethane from oil crackers.

In Asia, the Petrochemical Group sees olefins as a growth market in the long term despite rising competition from Middle Eastern and Asian suppliers. Developing economies invariably consume increasingly large amounts of olefins, as is happening throughout the Asia-Pacific region, and the group maintains some advantages over competitors in many markets.

The Petrochemical Group relies on its refining and petrochemical modeling system (RPMS) to deal with a changing business environment. It adjusts the mix of its cracker output, for instance, to maximize profitability. As a result, it is prepared to expand by taking advantage of opportunities that arise from managing the balance among production rates, product mix, and market prices.

Recently, the significant decline in oil and naphtha prices has added a new twist to managing the overall balance, particular regarding pricing strategies.

Polyethylenes

Global demand for polyethylenes is expected to grow in the fiscal year ahead, driven by developing countries especially in Asia and Africa. The Petrochemical Group aims to maintain its polyethylene market shares in difficult markets and to expand its polyethylene sales in growing markets. Polyethylene exports are benefiting from the weak yen. In Japan, the group's main strategy for core polyethylene products is differentiation through high-value added grades, new products, or customization for market segments or major customers.

Functional Polymers

The profitability of the Petrochemical Group's functional polymers benefits from a weak yen. PVC has had problems with underpricing, but the group is working to achieve stable profitability in its PVC business. It is doing so by expanding its share of high-margin specialty PVC paste grades for the automotive industry and for high-performance wallpaper and flooring.

The group, meanwhile, is repositioning itself in the technically advanced segment of the CR market by expanding its line of superior-grade products. This includes introducing CR grades that do not contaminate metal molds and sulfur-modified CR grades. The group is emphasizing the development of crystallization-resistant grades.

Even without the advantage of a weak yen, Tosoh has been the world's top supplier of CSM to the high-end market for many years. To maintain and further that position, the Petrochemical Group has an ongoing product development program and plans for production capacity expansion in line with market growth.

Demand for PPS resins from the principal customer for these products, the global automobile industry, is estimated to expand 6% over the medium term. Continued global oversupply, however, makes differentiating Tosoh's products essential to ensuring the profitability of the company's PPS resins business.

The Petrochemical Group as a result offers special grades of PPS resins. These include Susteel®-brand PPS, which features superior metal bonding for automotive applications. They also include SGX-grade PPS resin, which a leading smartphone maker began using in its mobile phone casings in 2013. Several Chinese smartphone makers have subsequently also begun applying SGX-grade PPS resin in their manufacturing processes.

Key Opportunity Checklist

- Boost sales of olefins abroad in line with emerging markets increasing utilization of plastic products
- Target sales of high-performance petrochemical products to balance sales of conventional petrochemical products
- Remain the global leader in CSM amid firm demand and short supply worldwide

ENGINEERING GROUP

Snapshot

The Engineering Group comprises water treatment and pure water generation leader Organo Corporation and construction company Tohoku Denki Tekko Co., Ltd.

The group's domestic sales of water treatment facilities, services, and related chemicals improved in fiscal 2015 because of heightened business from Japanese customers, particularly in the electronics industry where ultrapure water used as a cleaning agent for semiconductors manufacturing is a must. Overseas sales, however, suffered from a downturn in the global electronics industry.

The Engineering Group's construction-related sales rose compared with the previous year.

Group Performance and Markets

Performance Recovery

In fiscal 2015, the Engineering Group's net sales were ¥75.7 billion (US\$630.3 million), an increase of 10.5% from net sales in fiscal 2014. The group also achieved a substantial recovery in operating income, which surged 164.7%, to ¥3.3 billion (US\$27.7 million). The operating income to net sales ratio was 4.4%, compared with 1.8% a year earlier.

The Engineering Group accounted for 9.4% of Tosoh's fiscal 2015 consolidated net sales, compared with 8.9% in fiscal 2014. Its contribution to Tosoh's consolidated net operating income also rose, from 3.0% to 6.5%.

Domestic sales of water treatment facilities, services, and related chemicals increased because of large orders from the domestic electronics industry and because of capital investment, maintenance, renovation, and other business by domestic clients in industry in general.

Organo's overseas orders, meanwhile, increased in all of the subsidiary's markets. But the subsidiary's overseas sales declined because of decreased capital investment by the electronics industry worldwide, a trend particularly evident in Taiwan.

Construction operations, on the other hand, posted increased sales in fiscal 2015 compared with fiscal 2014 because of improved demand.

Developments

Strategic Collaboration and Reorganization

Organo has taken several steps over the past few years to consolidate its businesses and expand its service capabilities.

In July 2013, Organo concluded a business alliance with Katayama Nalco Inc. in the water treatment chemicals business. The two companies are working together to expand their water treatment businesses. Organo's chief products are in water and wastewater treatment chemicals, while Katayama Nalco's core lines are process-related chemicals for steel, petrochemicals, and pulp and paper. The alliance is expected to contribute significantly to the Engineering Group's annual net sales in fiscal 2016.

On April 1, 2014, Organo launched a comprehensive reorganization that included merging six of its regional sales companies and Organo Yamashita Chemical Corporation. The reorganization has bettered Organo's performance and yielded cost and marketing benefits.

Organo had three goals for the reorganization. It was to strengthen sales capabilities with a single, flat sales organization capable of selling to small and medium-sized enterprises (SMEs). It was to integrate management resources. And it was to strengthen cost competitiveness by eliminating redundant operations and boosting procurement power.

In October 2014, Organo announced that it was taking sole control of the groundwater and soil contamination survey and purification and remediation services that it had developed in collaboration with Eco-Techno Corporation, a joint venture with Tosoh. Organo has designs on becoming a one-stop solutions company for water-related services, which encompass a broad range of businesses, from the production of ultrapure water to the treatment of wastewater and the use of hydrothermal systems.

Strategies and Outlook

Water Treatment

Tosoh subsidiary Organo Corporation is a specialist in water treatment and pure water generation technologies and systems. It focuses on water treatment systems for industry and for municipal waterworks and sewage treatment plants. Organo also offers soil remediation technologies that rank highly worldwide.

Organo's operations encompass two business segments: water treatment engineering and functional products. Its water treatment engineering consists of plant and solutions businesses. The plant business markets water treatment systems. The solutions

business maintains and manages delivered systems. Organo's functional products business sells consumables, including standard products, chemicals, and food processing materials.

In fiscal 2016, Organo anticipates strong sales for many of its product lines amid improving domestic and global economic conditions. Domestically, capital investment is growing in most industrial sectors. Despite the negative impact of various factors, including the hike in Japan's consumption tax, Organo received, in fact, more domestic orders in fiscal 2015, which will contribute to robust sales in fiscal 2016.

Large projects by the electronics industry should again contribute to Organo's sales. Organo will take advantage of an improving business climate to expand its orders and sales within that industry. In addition, Organo will aim for strong gains in sales to the water treatment chemicals industry. And it will expand its solutions business and continue to reduce costs to improve profitability.

Organo looks ahead as well to continued growth in sales to industrial customers based on its strengthened sales operations. It seeks orders especially for wastewater treatment systems from the untapped SME segment.

Organo's recent integration of groundwater and soil contamination survey and purification and remediation services strengthens its technological and its marketing capabilities. This is timely given Organo's view to capturing opportunities emerging from planned construction in the Tokyo area, including for the 2020 Tokyo Summer Olympics and Paralympics and the linear motor car project of Japan's major railway company.

The mature domestic market, meanwhile, compels Organo to increasingly look abroad for business especially in water treatment engineering for power stations. This sees Organo leverage its network of subsidiaries and affiliates in China, Thailand, Malaysia, Taiwan, Vietnam, and Indonesia and convert its overseas activities to local operation and staffing as appropriate, a process that will be ongoing in fiscal 2016.

Its reorganization completed, Organo introduced a medium-term business plan early in fiscal 2016 that sets new performance targets. To meet those targets, the subsidiary will focus its resources on its wastewater, water treatment, and overseas businesses. By shifting emphases in its business portfolio, the subsidiary will build a structure that generates stable profitability.

Organo will, of course, continue to make functional products a priority in fiscal 2016 because of their strong contribution to stable earnings. Other emphases include the business alliance with Katayama Nalco, an upgraded sales organization, and an expanded granulation business.

Construction

Improving economic conditions and continued capital investments in the Tohoku region for post-earthquake reconstruction leads Tohoku Denki Tekko to expect a firm business performance in fiscal 2016. The subsidiary plans as well, of course, to continue enhancing its cost structure and public works labor and material costs.

Tohoku Denki Tekko's strategic objectives include adopting a solutions-oriented sales approach in its industrial electrical machinery businesses that goes beyond hardware to planning, construction, and installation. New business is always a priority. And the subsidiary will develop its bag filter system business to lift its reputation as a systems provider. In addition, Tohoku Denki Tekko will review the merits of selling its facility maintenance and repair services for Tosoh Group companies in the Kanto region.

Key Opportunity Checklist

- Focus on international opportunities to counter mature conditions domestically
- Target the rapidly modernizing areas of Asia with water treatment facilities and thermal plant projects, particularly in Indonesia and Vietnam

OTHER GROUP

Snapshot

Tosoh is committed to close connections among its business operations and customers. It relies on its other businesses to ensure those connections. Timely support of its diverse operations is mission critical for Tosoh. Tosoh's other businesses, therefore, are always on call.

In addition to trading companies, Tosoh's Other businesses also include professional services that assist the Tosoh Group. These include logistics; administrative services; personnel training; information technology (IT) support; and more. They also contribute essential research and analytical support for Tosoh's introduction of innovative technologies, products, and services.

Tosoh works to ensure that each of its other businesses evolves from a cost center to a profit center. And it ensures that they compete with external suppliers for Tosoh Group business, which benefits them and the Tosoh Group by promoting cost- and administrative effectiveness and technological advances.

Group Performance and Markets

Superior Services and Strong Earnings

In fiscal 2015, other business net sales climbed 1.1% over net sales the year before, to ¥41.0 billion (US\$341.2 million). Operating income rose 17.3%, to ¥2.8 billion (US\$23.7 million), for an operating income to net sales ratio of 6.9%. Other businesses contributed 5.1% of Tosoh's consolidated net sales in fiscal 2015, compared with 5.3% in fiscal 2014. They also accounted for 5.5% of Tosoh's consolidated operating income, versus 5.8% a year earlier.

Strategies and Outlook

Logistics

Logistical support for Tosoh Group companies falls into four categories: (1) reducing manpower requirements and improving efficiency; (2) providing risk management processes and other procedures to upgrade safety and quality; (3) ensuring that shipping terminals and warehouses can meet changing needs and optimize shipping route traffic; and (4) backing up overseas expansion.

The Urethane Division that Tosoh formed as a result of its merger with NPU will benefit from logistical support in fiscal 2016. Tosoh's other businesses will furnish the new division with the logistics it needs to smoothly integrate its operations and capture the synergies therefrom. They will also provide the logistics required to help the Urethane

Division and Tosoh Silica Corporation improve their earnings.

In fiscal 2015, Tosoh's logistics-related other businesses helped reorganize the transport of VCM following the 200,000-metric-ton VCM production capacity expansion at the Nanyo Complex. They will continue to review the revised VCM transportation system for further improvements in the fiscal year ahead.

General Services

People are Tosoh's priority. As such, it has established other businesses to handle personnel management, employee benefit administration, and training.

These general services businesses oversee personnel management and employee benefit administration and training. They also encourage subsidiary and affiliate participation in the Tosoh Group salary administration system to further ongoing efforts to raise group-wide efficiency.

The overarching goals of Tosoh's general services businesses are to expand the number and quality of their offerings and to ensure the optimum health of employees throughout the Tosoh Group.

Analysis and Research

Tosoh's analysis and research businesses provide an array of sophisticated services to Tosoh Group companies worldwide. They specialize in the organic, inorganic, and polymer chemistry and the electronic materials that underpin Tosoh's product and application development programs.

They focus, moreover, on bolstering Tosoh's technical capabilities, brand reputation, and profitability. In so doing, they undertake a constant flow of analysis and research for Tosoh Group companies in structural analysis, organic chemistry, surface analysis, high-molecular weight polymers, and inorganic chemistry. They conduct approximately half of their analysis and research at the Nanyo Complex and the remainder at the Yokkaichi Complex and at various Tokyo-based Tosoh operations.

To maintain first-rate analysis and research capabilities, Tosoh annually allots the related other businesses a substantial equipment budget. This permits their yearly installation of state-of-the-art equipment to upgrade and expand the level and scope of their analysis and research on behalf of the Tosoh Group.

That, in turn, makes them increasingly marketable outside the Tosoh Group in their bid to become strong, independent profit centers for Tosoh. External sales in analysis and research have edged up in recent years. And the plan is to cultivate ever more work from customers beyond the Tosoh Group. That plan involves these other businesses in

promoting their analysis and research services through scientific papers, presentations, and conferences and other events.

Information Systems

Those of Tosoh's other businesses offering information systems services maintain more than 300 servers, over 9,000 personal computers, and some 170 networks across 42 companies. Their work spans administrative and factory operation systems. And their development of an enterprise resource planning (ERP) system allows Tosoh management to assess the performance of Tosoh Group members in deploying and employing information systems.

Information systems-related other businesses are tasked with evaluating and introducing technologies, systems, and services. They also maintain and upgrade systems and services across the Tosoh Group and thereby reduce group-wide IT costs. In fiscal 2015, for example, they installed a work process management system for Tosoh Techno-System, Inc., and integrated the NPU and Tosoh Corporation systems in time for the merger in October 2014.

The other businesses involved with information systems services, meanwhile, continue to reinforce the skills of their employees through education. Specific areas of training include learning how to write applications for the group's core IT systems, acquiring proficiency in diverse programming languages, and cultivating skills in innovation and process improvement.

Key Opportunity Checklist

- Target business development outside the Tosoh Group
- Support the global expansion initiatives of the Tosoh Group

RESPONSIBLE CARE

MANAGEMENT

Commitment

MESSAGE FROM THE PRESIDENT

Each Tosoh employee must be aware of and take responsibility for safety to further Tosoh's growth as a safe chemical manufacturer.

In fiscal 2016, our overriding task is to get every member of the Tosoh Group to correctly and fully implement Responsible Care (RC) activities. We are targeting zero accidents and lost time, continued improvement in profitability, and the expansion of our businesses.

Tosoh's 80th Anniversary

Tosoh began operations in 1935 as a commodities manufacturer of soda, which it produced based on the ammonia method, and of cement. Since then, we have had our ups and downs. Among the more recent of them are our failure to achieve the goals of our 1985 medium-term business plan, our success in developing and in expanding our vinyl chloride chain, and our struggles in dealing with the adverse economic impact of the so-called Lehman Shock. Our predecessors courageously overcame obstacles in the process of transforming Tosoh into the dual commodities and specialties company it is today.

In fiscal 2015, we took another step forward in our evolution by merging with Nippon Polyurethane Industry Co., Ltd. (NPU). I am determined to ensure that Tosoh celebrates its 90th and 100th anniversaries as a profitable company trusted by stakeholders far and wide. Courageously but cautiously, I intend to accelerate the company's growth.

Eliminating Accidents and Lost Time

An event in our 80-year history that we must never forget is the explosion and fire that occurred in November 2011, resulting in the loss of a precious life. Tosoh is implementing a wide range of safety measures to ensure that such an accident never reoccurs. We are, for example, increasing our plant maintenance budgets for the three fiscal years starting in fiscal 2015. The additional funds are mainly for preventative maintenance.

Fortunately, the number of incidents is declining. But even with only two in fiscal 2015, we have not eliminated them entirely. Reflecting on the frequency of lost time, moreover, I am concerned that our safety measures have not been fully implemented in all our operations. My visits to our Nanyo and Yokkaichi Complexes, however, also leave me concerned that one of the causes of recent problems is the additional time burden that our safety measures place on our employees.

In the year ahead, I will look at ways to ensure safety at Tosoh's operations and to establish workplaces where employees can calmly and carefully do their jobs.

Coexisting with Local Communities

In fiscal 2015, we resumed our opinion exchange meetings with associations from the communities neighboring our Nanyo Complex. We likewise resumed our dialogue about RC measures at our Yokkaichi Complex with neighboring Yokkaichi city. Through these and our many other points of contact with our neighbors, we endeavor to provide continuous and proactive disclosure. We aim to establish relationships whereby the communities surrounding our facilities know that they can reliably trust in the safety of our operations.

A Trustworthy Tosoh

Tosoh is establishing a business structure increasingly immune to external factors. That involves strengthening our commodities and expanding our specialties operations. Above all, it involves commitment from Tosoh to reliably produce safe products that contribute to a better society through innovations in chemistry. We will, in other words, strive for growth while ever mindful of the imperative to remain a company trusted by all its stakeholders.

Kenichi Udagawa
President

Message from the Chairman of the RC Committee

Tosoh continues to respond to its stakeholders' trust by improving its RC activities.

RC activities at Tosoh are conducted based on policies determined by the company's RC Committee. Through a process of verifying results and discussing the company's RC activities to date, the committee brings to light issues that are reflected in the following fiscal year's RC activities. This process sees the committee endeavor to develop and refine Tosoh's RC activities through a plan-do-check-act (PDCA) cycle.

It is my impression, meanwhile, that Tosoh is achieving results with the disaster prevention and safety reform measures it is implementing. The number of incidents is declining. Regrettably, incidents have yet to be eliminated entirely.

Reflecting on the nature of the incidents in the previous fiscal year, however, leads me to believe that the causes of incidents at Tosoh have changed since the company's implementation of safety reform measures. Previously, incidents occurred for lack of proper safety manuals or understanding of the purpose behind safety measures. Today's incidents appear to be more the result of inadequate equipment and facilities maintenance and defects in Tosoh's safety plans. The company therefore must reexamine the content of its safety reform measures.

Tosoh again in fiscal 2015 endured frequent lost-time events. I think the causes included excessive employee job pressure and the absence of a calm frame of mind on the part of employees. The paucity of activities to ensure sound working processes and to predict safety risks also contributed to lost time. Having room to calmly and correctly do the job is vital to all aspects of safety. Time and consideration are essential to knowing the properties of the chemical substances in Tosoh's manufacturing processes; to minimizing emissions or effluents of those substances into the atmosphere, water, and soil; and to safely handling those substances and the products made from them.

Tosoh's mission is to safely and surely deliver its products to its customers. For that purpose, I intend to increase the RC Committee's emphasis on logistics and transport management, including stepping up the committee's communication and collaboration with logistics services vendors.

Tosoh collaborates with the chemical industry associations of numerous countries to enhance RC activities globally. For this purpose, in February 2006 the company signed the Responsible Care Global Charter formulated by the International Council of Chemical Associations (ICCA). That charter was recently revised by the ICCA to make it easier to understand for nonindustry stakeholders. And Tosoh re-signed the newly revised Responsible Care Global Charter in September 2014.

Revisiting the Responsible Care Global Charter has refreshed my awareness of the RC

Committee's responsibilities. It has renewed my recognition of the importance of working hand in hand with all who are involved with or affected by Tosoh's operations. This includes all the people involved with our supply chain, the customers who appreciate what we furnish, and the people who reside in the vicinity of our production facilities. As such, I intend to continue to raise the level of the company's RC activities.

Dr. Yasuyuki Koie

Tosoh Managing Director and Chairman of Tosoh's RC Committee

Environmental Accounting

Environmental cost-benefit accounting quantifies Tosoh's environmental programs. In fiscal 2015, investments in environmental preservation amounted to ¥9.06 billion (US\$75.4 million) or ¥8.2 billion more than in the previous year.

Health, Safety, Environmental Management

Basic Principles Regarding the Environment, Safety, and Health

Tosoh Corporation contributes to the advancement of society through continuous innovation in chemistry, leading ultimately to the supply of products and services to the satisfaction of customers. At the same time, Tosoh continues to regard environmental protection, safety, and health as top management priorities.

Action Policies

Basic Stance

- Promote initiatives with an awareness of the obligation to comply with laws and regulations and self responsibility
- Set targets, draw up action plans, and implement actions with the participation of all concerned
- Incorporate audit results in future action plans

Environmental Protection Initiatives

- Conserve energy and resources through the use of the smallest-possible quantities of resources to obtain the greatest-possible benefits
- Reduce emissions and waste through improved manufacturing processes and operational management

Safety Assurance Initiatives

- Prevent accidents and respond to disasters through facility safety management
- Maintain and manage emergency response capabilities through safety drills
- Eliminate accidents and disaster effects through the analysis of case studies

Product-Related Environmental and Safety Assurance Initiatives

- Allow consideration for the environment, safety, and health to guide product design and the development of manufacturing processes
- Undertake prior assessment during the development of new products and processes
- Ensure product safety through total quality management

Communication Initiatives

- Provide safety management-related information for products and chemical substances
- Enhance public confidence through dialogue about business activities

Responsible Care Committee

Tosoh's RC Committee guides and promotes the company's RC activities. The committee is chaired by the director responsible for the company's Environment, Safety and Quality Control Division, and its members include general managers from Tosoh's Purchasing and Logistics Division, operating divisions, manufacturing complexes and offices, and research centers.

The RC Committee devises an annual RC activity plan and presents it to Tosoh's president. The president, in turn, presents the plan to the Board of Directors, which makes the final decision on the activities planned. Tosoh's manufacturing complexes and offices subsequently flesh out the plan's details and implement its planned activities.

Responsible Care Activities

Guided by core policies, Tosoh made progress with its various RC initiatives in fiscal 2015. The company improved its safety record, but, regrettably, incidents still occurred. In the year ahead, Tosoh will raise the level of its RC activities to achieve its main objectives of zero incidents and lost time.

Stewardship

Stewardship of Social Responsibility

We undertake to continuously innovate products that contribute to the sound development of society, to provide a reliable supply of our products, and to gain the trust of society.

We strive to be a prosperous business and a cooperative and contributing member of the local communities where we do business.

Preparedness for Major Earthquakes

The Great East Japan Earthquake of 2011 taught Japan's Central Disaster Prevention Council and other groups that major earthquakes might occur and cause serious damage even where tremors are rare. Meetings in March and August 2012 produced conclusions about earthquakes and tsunami based on analyses of the Nankai Trough using megaquake models. Those conclusions, published in December 2013 and March 2014, included maps and more indicating the impact of tsunami on Yamaguchi Prefecture, home to Tosoh's Nanyo Complex, and Mie Prefecture, home to Tosoh's Yokkaichi Complex.

The Nanyo and Yokkaichi Complexes comply with all legal requirements, including Japan's Construction Standards, High-Pressure Gas Safety, and Fire Service Laws. They are, with the exception of some electric power generation, designed to safely cease operation at a specified magnitude of earthquake.

Both complexes, moreover, have introduced measures and continue to plan more on an ongoing basis that prioritize saving lives. They hold comprehensive disaster prevention drills for earthquakes and have set up web cameras to enable the remote monitoring of conditions at each complex during a disaster. They have also assessed and reinforced as necessary the earthquake-resistance of facilities that have an important role under emergency conditions. In addition, they have in place countermeasures and evacuation procedures in the event of soil liquefaction caused by an earthquake and flooding caused by a tsunami. The complexes have as well stockpiled emergency supplies to sustain employees unable to return to their homes in the aftermath of a disaster.

ENVIRONMENT AND SOCIETY

Environment and Safety

Input and Output

Tosoh products are manufactured by reaction, cracking, and distillation. We utilize our power generation plants and coal-fired boilers to supply the electricity and steam, respectively, for reactions and cracking. We use industrial water and seawater to cool reactions.

To balance our product output, we manage our generation of electricity and steam. We also manage our emissions to reduce the burden our production activities place on the environment.

Effective Use of Resources

Tosoh makes a significant contribution to recycling in its operations and in the surrounding communities. We collect waste produced on location and from households and other companies near our operations and recycle it into new products.

Tosoh processes much of its waste, such as coal ash, as raw materials at its cement plant. Our Nanyo Complex is able to process not only industrial waste from its facilities' operations and those of nearby companies but also household garbage from local communities.

Industrial Waste Emissions

Tosoh almost completely disposes of and recycles its industrial waste. What we don't process we make available for use outside the Tosoh Group or dispose of in landfills.

Tosoh double checks the specifics of each type of waste for disposal before issuing a manifest on handling industrial waste. Through our manifests, we supervise waste leaving our facilities on-site and confirm final waste disposal or reuse. We also annually inspect our disposal sites.

Product Safety

Tosoh's raw materials and products contain specified-use and restricted substances under Japan's Fire Prevention Law, Law Concerning Poisons and Other Harmful Substances, and other laws. It is essential to ensure safety at each processing stage in our operations, including R&D, manufacturing, logistics, and quality assurance. Tosoh complies with safety requirements under its RC goals of chemical product safety, quality assurance, logistical safety, and other internal directives.

R&D

R&D encompasses improving and developing products, from basic materials to cutting-edge technologies. Our R&D programs develop products that meet customers' needs safely and reliably.

Manufacturing

The main mission of a chemical company is to provide stable product supply. To that end, Tosoh sets up committees to ensure safe operations when adding new equipment, expanding capacity, and maintaining and upgrading facilities.

Logistics

Tosoh conducts training programs for the companies that transport its products. Our aims are to raise safety awareness and to establish safe supply lines between our operations and our customers.

Quality Assurance

Tosoh's quality management system is all encompassing. Its emphases include responding promptly to customer inquiries.

Safe Sourcing of Chemical Products

Tosoh carries out initiatives to ensure compliance with domestic and foreign legal regulations for the safe handling of chemicals. These include assessing product safety and providing product information.

Tosoh Initiatives

- *Tosoh provides safety data sheets (SDS) to ensure the safe handling of its products. The SDS accord with unified international classification and labeling requirements known as the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).*
- *Tosoh submits notifications, registrations, and applications in compliance with such domestic laws as the Chemical Inspection, Health and Sanitation, and Pharmaceuticals Laws.*
- *Tosoh complies with such foreign legal regulations as Europe's Registration Evaluation Authorization and Restriction of Chemicals (REACH).*
- *Tosoh participates in the autonomous Japan Initiative of Product Stewardship (JIPS) movement promoted by the Japan Chemical Industry Association. JIPS aims to minimize the effects of chemical products on health and the environment.*

Human Rights, Human Resources, Diversity

Human Resources

Tosoh's human resources system inspires and rewards employees. Employees are inspired to take ownership of their responsibilities and are rewarded for proactively exhibiting a strong sense of such ownership.

Principles

Creative Organization

Enabling employees to realize their potential

Challenging Environment

Applying a grading system for thorough employee evaluation

Impartial Treatment

Rewarding employees who make an effort

Employee Education Programs

Tosoh has long provided education and training programs to enhance knowledge and skills, foster employee interaction, generate a stimulating workplace, and cultivate leaders and innovators. The company's offerings include on-site, manager and other rank-based, and vocational training. Classes that promote internationalization are also provided.

Recruitment Policies Promote Diversity

Tosoh follows a non-discriminatory policy when it comes to hiring new recruits. Tosoh also implements a program of reemploying retired employees so that they can pass on their technical skills to new employees.

Contribution to Society

Tosoh's many initiatives include promoting two-way communication with all its stakeholders, foremost among them the residents of communities neighboring the company's facilities. The company seeks to raise the quantity and quality of such communication exchanges by providing convenient venues for such activities.

Tosoh uses meetings at these venues as opportunities to encourage an understanding of its operations and responsible care activities and to listen to the opinions of all interested parties. In this way, Tosoh in part fulfills its commitment to being a company that can be trusted and relied on.

GOVERNANCE

Corporate Governance and Management System

Tosoh has established a system that enables prompt responses to changing business environments and thereby raises corporate value. We strive for sound management and a high degree of fairness and transparency.

Tosoh's corporate governance and management system comprises five committees consisting of directors and general managers from throughout the Tosoh Group. All five committees—the Internal Control Committee, Compliance Committee, Antimonopoly Compliance Committee, Export Supervision Committee, and the previously introduced Responsible Care Committee—function to gain the trust of society.

Internal Control and Risk Management

Internal Control Committee

The Internal Control Committee, which convenes four times a year, oversees Tosoh's compliance with the financial reporting requirements of Japan's Financial Instruments and Exchange Act. Specifically, it supports the design and improvement of our internal controls.

It evaluates the effectiveness and, based on evaluations by our Audit Office, the status of our internal controls and generates plans therefor. It also prepares and publicly issues internal control reports. Its membership comprises general managers from related departments.

In fiscal 2015, the committee reviewed Tosoh's internal control system, resulting in much clearer management, such as for dealing with legal compliance and various types of risk relevant to group companies.

Compliance

Compliance Committee

Our Compliance Committee, which convenes twice a year, structures Tosoh's compliance systems; formulates its corporate behavior guidelines; and undertakes and implements compliance-related training, research, and fact finding. In 2014, the committee produced a code of conduct applicable to the entire Tosoh Group that establishes high standards for groupwide compliance.

The committee has also established a compliance hotline that allows employees and others to anonymously report compliance-related indiscretions. The Compliance Committee, meanwhile, highlights the latest compliance-related developments on

Tosoh's intranet. Those highlights include quizzes on compliance, real-life examples of compliance, and more to heighten employee awareness of the importance of compliance.

Antimonopoly Compliance Committee

The Antimonopoly Compliance Committee prepares in-house rules, manuals, and other instruction methods to ensure compliance with Japan's Antimonopoly Act. The committee also holds meetings on a timely basis to deliberate and make decisions on necessary actions on an ongoing basis. Tosoh's Legal and Patents Department conducts hearings on sales price revisions proposed by the sales departments of business divisions. It also holds hearings to confirm whether there have been any meetings with competitors regarding pricing and bidding on government contracts.

The committee annually holds in-house seminars to heighten an awareness of and to ensure compliance with such laws as the Antimonopoly Act and the Act against Delay in Payment of Subcontract Proceeds, etc., to subcontractors. Separate seminars on each law were held at Tosoh headquarters and were attended by 349 employees and 295 employees, respectively, in fiscal 2015.

Export Supervision Committee

The Export Supervision Committee prepares in-house rules, manuals, and other instruction methods to ensure compliance with Japan's Foreign Exchange and Foreign Trade Act. The committee also holds meetings appropriately to consider and make decisions on necessary actions. The committee decides on the export management procedures for cargo and other items that fall under Japan's list control and catchall control regulations. The Export Department manages the procedures. The committee also holds in-house seminars annually to ensure legal compliance with export controls. A total of 464 employees attended its seminars in fiscal 2015.

Board of Directors (as of June 26, 2015)

Representative Directors

Kenichi Udagawa	President
Toshinori Yamamoto	Managing Director

Managing Directors

Toshinori Yamamoto
Sukehiro Itoh
Masaki Uchikura
Keiichiro Nishizawa
Katsushi Tashiro

Directors

Kouji Kawamoto
Masayuki Yamada
Nobuaki Murashige
Hiroto Murata
Tsutomu Abe

RESEARCH AND DEVELOPMENT

Reorganization

In tandem with its merger with NPU, Tosoh reorganized its R&D structure in fiscal 2015 according to technical field and function, giving Tosoh the opportunity to realign its resources according to Tosoh Group priorities. The company's three main R&D laboratories are now seven facilities and include the Urethane Research Laboratory, formerly NPU's R&D facility. The new structure is expected to speed the development of a wide array of exciting new products and materials.

Overall, the reorganization places the seven new research facilities into two categories. Some are product and technology development research laboratories, and others are long-term research laboratories.

Product and Technology Development Research Laboratories

Inorganic Materials

Research focuses on developing functional inorganic materials and technologies. Themes include high-performance HSZ for automobile applications, zirconia for dental material applications, and manganese oxide compounds for the cathodes of rechargeable lithium-ion batteries

Polymer Materials

Research emphasizes polymers and petrochemical products and technologies. Themes center on polyethylenes for various applications, including medical and ultrahigh molecular weight polymers, superior grades of chloroprene rubber and PVC pastes, and applications for polyphenylene sulfide (PPS) and other petroleum resins.

Organic Materials

Research aims to develop functional organic materials and technologies. Themes include polyurethane foam catalysts and amine derivatives for environmentally friendly reagents and other applications and advanced electron and hole transport materials used in organic light-emitting diode (OLED) displays.

Urethane

Research centers on urethane-related materials and technologies. Themes include polyurethane foam for cushion and flame-resistant and other materials and functional urethane for such products as paints and adhesives.

Long-Term Research Laboratories

Life Science

Life science is one of the three priorities of Tosoh's R&D strategy. Research focuses on biomedical- and medical-related materials and technologies. Themes include high-performance packing materials for the separation and purification of antibody drugs and early-stage cancer testing technology.

Functional Polymers

Research explores electronic, optical, and biofunctional polymers. Themes involve high-performance film materials for LCDs and heat-resistant substrate materials for flexible displays.

Advanced Materials

Research covers developing materials and technologies for the two other priorities of Tosoh's R&D strategy: electronics and environment and energy. Themes include sputtering targets for LCD displays and organometallic materials for the next generation of integrated circuits.

Policies and Themes

Tosoh's R&D team consists of about 870 people constantly at work on product and technology improvements and on laying the groundwork for future business. In fiscal 2015, Tosoh invested ¥12.9 billion (US\$107.2 million) in its R&D programs, up slightly from the prior fiscal year.

Our R&D programs aim to strengthen our core businesses and to enhance our ability to generate tomorrow's products today. To stay on the leading edge in our priority fields, we encourage internal cooperation to maximize organizational resources and generate synergies. We also collaborate in joint research projects with external research facilities, at universities and other educational institutions and at public research laboratories.

Tosoh's priorities in allocating R&D resources are life sciences, energy and environmental conservation, and electronic materials. All of the company's research laboratories focus on these fields.

Life sciences R&D strives to give developed and developing economies access to high-end diagnostics and biopharmaceutical technologies. Separation technologies and immunoassay and genetic testing reagents are central bioscience R&D themes. Resources are being devoted in particular to an emerging Tosoh strength in protein modification technology.

Energy and environmental conservation R&D focuses on themes related to shifts in the chemical industry driven by public opinion and regulation. Specifically, this involves R&D

programs for high market growth potential rechargeable lithium-ion batteries (LIBs), for catalysts and chelates for removing harmful substances, and for solar power materials.

Electronic materials R&D is dictated by dynamic and sometimes dramatic advances in semiconductors and consumer electronics. R&D emphases revolve around technologies and materials for photomasks and substrates, thin layer deposition, solar power, and electronic displays to keep abreast of and to foster further evolution in the semiconductor and consumer electronics industries.

How to combine the strengths of diverse R&D operations for optimum results is an ongoing quest at Tosoh. We constantly explore methods of integrating R&D thematically and of improving collaboration in R&D generally. Our R&D reorganization, in fact, was planned with these goals in mind.

Quality R&D springs from quality people. So we nurture the scientific and leadership skills of our R&D personnel. About five years ago, we introduced a management of technology (MOT) program to develop our R&D managers. A similar program fosters today's researchers at Tosoh. We also hold events to encourage cohesion among our R&D people and to provide opportunities for them to network and exchange information.

Specialty Group

Functional materials R&D at Tosoh targets the development of products that address society's pressing needs in cutting-edge environmental stewardship, health care, and electronics technologies. It contributes, for example, to highly efficient, reasonably priced solar power generation.

Tosoh's solar power R&D encompasses physical vapor deposition (PVD) materials for thin film silicon and copper indium gallium selenide (CIGS) photovoltaic cells. Its various programs yield increasingly efficient materials and technologies, such as transparent conducting oxide (TCO) sputtering targets that achieve higher photovoltaic cell efficiency than standard targets.

R&D programs for sputtering targets support manufacturing technologies for semiconductors and flat-panel displays. They've helped the Specialty Group achieve advances in sputtering targets for the manufacture of the thin film transistor oxide semiconductors used in flat-panel displays and for the low-temperature, low-resistance thin film used in the increasingly popular touch-panel displays.

Thanks to quality R&D, the Specialty Group has an advantage in display-related materials. R&D has given the group electron transport materials and the high-efficiency electron hole transport materials used in OLED displays. R&D is now devising, among other materials, organometallic compound materials for the next generation of miniaturized circuits.

Tosoh R&D also contributes strongly to Specialty Group automotive-related products. Energy

and environmental conservation R&D has produced groundbreaking work on zeolites for automotive catalytic converters. And it continues to develop improved manganese oxide materials for use in the cathodes of the rechargeable LIBs popular in electric vehicles and other applications.

Eco-product R&D centers on improved heavy metal chelating agents. It recently produced an agent for removing anionic heavy metals, such as hexavalent chromium, that complements the Specialty Group's line of cationic heavy metal chelates.

Tosoh's vision of its role in global health care is as a supporter of better medicine in developing and developed countries for infectious diseases, cardiovascular diseases, cancer, and diabetes. The company strives to put advanced medical diagnostic systems into the hands of medical caregivers and researchers. And R&D has made particular progress in developing diagnostic tools for infectious diseases. The Specialty Group's molecular testing systems for tuberculosis, for example, are exponentially faster than conventional systems.

As well, R&D efforts have produced zirconia dental materials that are contributing to better treatments in dentistry. The group recently added a grade of zirconia to its zirconia dental materials product line with such a high degree of translucence that it is suited for use in front teeth.

Zirconia R&D, moreover, involves working with researchers outside Tosoh toward advances in properties and applications. In fiscal 2015, Tosoh participated in a research project that developed a nanocrystalline, ultradegradation-resistant zirconia capable of withstanding extreme conditions beyond the resistance of conventional yttria-stabilized zirconia.

Biomedical R&D at Tosoh, meanwhile, generates the high-performance separation media essential for analysis and purification. The Specialty Group's strengths in protein modification technology are growing, particularly in the purification technologies for the human-derived proteins used in leading-edge antibody drug development and early-stage cancer testing technology.

Chlor-alkai Group

R&D aimed at the Chlor-alkai Group focuses on innovations in electrolysis and other technologies to strengthen the vinyl isocyanate chain that lies at the core of Tosoh's business in basic chemicals.

Tosoh uses n-BiTAC bipolar ion-exchange membrane electrolyzer cells for electrolyzing salt. They represent the first link in the company's vinyl isocyanate chain and are the best of their kind in electrical efficiency. But R&D continues to investigate and test cathodes that likewise conserve power. R&D continues, in short, to devise technologies to improve Tosoh's vinyl isocyanate chain manufacturing, from catalyst development through process improvement and debottlenecking.

R&D devises and reengineers processes to heighten the integration of the vinyl and isocyanate components of the chain. These efforts boost the yields and heighten the efficiency by which the raw materials and intermediates shared by plants are used to produce vinyl products and methylene diphenyl diisocyanate (MDI), hexamethylene diisocyanate (HDI), and other urethane-based products.

In recent years, R&D has had a particularly important role in developing technologies that improve the cost-efficiency of and that expand the Chlor-alkali Group's urethane product lines. Product expansion ranges from polymeric and monomeric MDI to higher-value-added products, such as HDI, liquid polycarbonate diol (PCD), and thermoplastic polyurethane (TPU) elastomer.

Thoroughgoing R&D has facilitated the installation of a low-cost MDI production system within the Chlor-alkali Group's urethane operations. R&D has also improved the color and quality characteristics of monomeric MDI, enabling a higher price structure. Other R&D results include added applications for the heat-resistant polyurethane foam used in the construction industry and for other urethane-based products.

Petrochemical Group

Petrochemical R&D adds strategic value to commodities. Its primary purpose is to improve and develop polymers and related technologies. R&D, for example, grants the Petrochemical Group's commodity polyethylenes superior functionality. Development of laminates, food packaging, and other products contribute greatly to group sales.

R&D underpins new applications for the Petrochemical Group's high melt elasticity polyethylenes in automobiles, packaging, construction materials, and medical items. Recent innovations include high melt strength polyethylene (HMS-PE) suitable for use in unit-dosage dispensers for eyedrops and other medicines and in medicine bottles and ampoules. Also new is polyethylene capable of withstanding sterilization at 121° Celsius. Its combination with the Petrochemical Group's HMS-PE laminate technology has resulted in intravenous (IV) bags that meet the demanding international PIC/S good manufacturing practice standard and offer functional, efficiency, and cost benefits.

At the end of fiscal 2015, the Petrochemical Group announced its development of a world-class, ultrahigh molecular weight polyethylene (UHMWPE) using a new, proprietary metallocene catalyst. The new UHMWPE demonstrates superior abrasion and tear resistance. When compared with conventional UHMWPEs prepared with the Ziegler-type catalyst, they also exhibit high tensile strength.

R&D has positioned the Petrochemical Group's high-performance ethylene vinyl acetate (EVA) sealing film strongly in the photovoltaic cells market. Tosoh is one of only a few companies worldwide making grades of EVA suitable for the encapsulant film of photovoltaic cells. And Tosoh researchers are developing highly durable EVA-based adhesives.

Recently, the supply of raw materials for petrochemical resins provided by C5 and C9 fractions has become an issue in the petrochemical industry because of the decline in the operating rates of naphtha crackers. Consequently, Tosoh's researchers are concentrating on developing manufacturing technologies that substantially improve the production volume of naphtha crackers.

R&D has added PPS resins with superior metal bonding and high thermal conductivity characteristics to the Petrochemical Group's high-performance resins lineup. The group's metal adhesion PPS compounds are thus popular in the electronics industry. Commercial applications of PPS resins are available for smartphone bodies and for LED lighting parts. R&D is also developing materials that resist the surface degradation common in insulation materials.

Chloroprene rubber (CR) R&D focuses on reengineering manufacturing processes to expand production and on developing new grades in line with customer requirements. We are also working to improve our production processes for chlorosulphonated polyethylene (CSM) rubber and to develop new CSM grades to support Tosoh's position as the world's top CSM manufacturer.

Much of Tosoh's R&D in petrochemicals involves discovering new applications for products and developing new products for those applications. R&D is looking into uses for PVC paste besides wallpaper and flooring materials. And it is aggressively developing polymer materials for use in optical materials for LCDs and in substrate materials for flexible displays, such as its recently developed functional polymer that boasts superb optical properties and heat resistance.

Engineering Group

The R&D Center of our subsidiary Organo Corporation forms the core of Engineering Group R&D. That facility emphasizes developing basic technologies, improving products, and devising new products and services to complement and bolster Organo's offerings. It develops water treatment equipment, such as pure, superpure, and clean water producing equipment; water treatment plants, such as wastewater treatment or chromatography separation systems; water treatment chemicals; and food additives and materials for food processing.

R&D continues to broaden Organo's horizons. An Organo research team recently participated in a research project that succeeded in developing an industrial process to continuously produce vegetable-based ceramide of 95% purity. An immediate application is in high-purity ceramide moisturizers for the safety-conscious cosmetic industry.