Review of Operations

Petrochemicals

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	281,400	286,732	–5,332	–1.9%
Operating income	–4,930	4,398	–9,328	—

The Petrochemicals segment's sales for 2014 decreased 1.9%, to ¥281,400 million. Sales of olefins decreased owing to the fall in shipment volumes resulting from the shutdown maintenance that takes place once in every four years. Sales of organic chemicals increased owing to the rise in shipment volumes of vinyl acetate and ethyl acetate. The segment recorded an operating loss of ¥4,930 million, due to the influence of the shutdown maintenance and the sharp decline in naphtha prices toward the end of the term.

Olefins

Ethylene production in Japan totaled 6,648,000 tons in 2014, a slight decrease from 6,693,000 tons in the preceding year. SDK's ethylene production in 2014 was 590,000 tons, a decrease of 62,000 tons from the preceding year, reflecting the shutdown maintenance. Operating rate of SDK's ethylene plant in 2014, excluding the period of the shutdown maintenance, exceeded 95% on the average. After the completion of the shutdown maintenance, or in and after May, SDK's ethylene plant virtually operated at full capacity. However, sales of olefins were down due to the fall in shipment volumes resulting from the shutdown maintenance. Operating income fell sharply due to the influence of the shutdown maintenance and the changes in the feedstock situation. Specifically, naphtha prices plummeted toward the end of the term following the sharp decline in crude oil prices, causing the olefin prices to plummet as well. Meanwhile, the cost of olefin production remained at high levels due to the time lag between the purchase of naphtha and the sale of olefins, resulting in a sharp deterioration of the spread. Furthermore, we had to record loss on valuation of inventories at the end of the term.

Organic Chemicals

Sales of organic chemicals increased due to higher shipment volumes of vinyl acetate and ethyl acetate. Operating income fell due to higher costs, reflecting the rise in raw material prices.

PETROCHEMICALS TOPICS

Start-up of new ethyl acetate plant based on new technology

In June 2014, we started producing ethyl acetate at our new plant in Oita Complex, using a new technology. Ethyl acetate is an organic solvent used in wide-ranging applications, including printing ink, paint, and adhesive for LCDs. At the new plant, we have introduced our proprietary technology (direct addition of acetic acid to ethylene), enabling efficient production of low-cost and high-quality ethyl acetate.

Ethyl acetate plant

Dissolution of PT. Showa Esterindo Indonesia

We terminated ethyl acetate production at our subsidiary PT. Showa Esterindo Indonesia (SEI) at the end of 2014. We will dissolve the company after dismantling and removing the production facilities. SEI started its operation in 1999, supplying its product to meet steady demand in Southeast Asia. In recent years, however, its business environment became increasingly severe due to the rise in feedstock costs and the increase in supplying capacities in neighboring countries. We therefore concluded that it was difficult for SEI to continue its operation. We recorded an extraordinary loss relating to the termination of SEI's operation and its dissolution.

Review of Operations *(cont.)*

Chemicals

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	139,064	130,656	8,408	6.4%
Operating income	5,460	2,559	2,901	113.4%

The Chemicals segment's sales increased 6.4%, to ¥139,064 million. Sales of basic chemicals increased due to the rise in the volume of chloroprene rubber exports and the rise in acrylonitrile market prices, notwithstanding lower sales of liquefied ammonia. Sales of industrial gases were maintained at the previous year's level. Meanwhile, sales of electronic chemicals increased due to higher shipment volumes, reflecting the increase in the production of semiconductors and LCDs in East Asia. Sales of functional chemicals increased slightly. Operating income jumped 113.4%, to ¥5,460 million. Operating income from electronic chemicals rose due to higher shipment volumes. Operating income from basic chemicals was up due to higher market prices of acrylonitrile and greater export volume of chloroprene rubber. Operating income from industrial gases increased, but operating income from functional chemicals decreased due to the rise in costs.

CHEMICALS TOPICS

Expansion of high-purity ammonia production capacity in China

We increased the production capacity for high-purity ammonia (a specialty gas for semiconductor production) at Zhejiang Quzhou Juhua Showa Electronic Chemical Materials Co., Ltd., our manufacturing subsidiary in Zhejiang Province, China, from 1,000t/y to 2,000t/y. The expanded facility started operation in January 2014. Following the expansion, the Showa Denko Group acquired a total high-purity ammonia production capacity of 6,000t/y, consisting of 1,500t/y in Japan, 2,500t/y in Taiwan, and 2,000t/y in China. We will continue to strengthen our supply system to meet the growing demand for high-purity gases in East Asia, where production sites for LCDs and compound semiconductors are integrated.

Completion of a new high-purity N_2O base in South Korea

We concluded a work commissioning agreement with Dooam Industrial, of South Korea, concerning the production of high-purity nitrous oxide (N_2O) for semiconductor production, and agreed to jointly construct a purification facility within the premises of Dooam's plant near Seoul. The new facility was completed in January 2015. As a result, the Showa Denko Group's total high-purity N_2O supply capacity has increased to 1,800t/y, consisting of 1,200t/y in Japan and 600t/y in South Korea. High-purity N_2O is used for deposition of an insulating oxide film in the process of chemical vapor deposition (CVD) for producing semiconductors. For this application, demand for high-purity N_2O is growing at the rate of 10–15% a year in Asia. We will continue strengthening our supply system to meet growing demand in the East Asian market.

Strengthening high silica zeolite production system

Union Showa K.K. (USKK), a joint venture between SDK and UOP LLC, of the United States, completed a new high silica zeolite production facility within the premises of SDK's Higashinagahara Plant. The new facility started operation in December 2014. High silica zeolite is a kind of synthetic zeolite with increased hydrophobicity, and is used in removing odor and volatile organic compounds as well as adsorbing gases. The material is in tight supply and its demand in Japan and the rest of Asia is expected to grow further, reflecting increased environmental awareness and improvement in living standards. USKK is currently producing hydrophilic synthetic zeolite at its Yokkaichi Plant for such applications as dehydration, drying, refining, and separation. USKK will fully utilize the two plants, aiming to develop and supply new products for such purposes as treatment of contaminated water at Fukushima Daiichi nuclear power plant, decontamination in wide areas, treatment of radioactive nuclides to promote decommissioning of nuclear reactors, and treatment of ordinary industrial waste water.

Electronics

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	138,537	136,548	1,988	1.5%
Operating income	25,770	21,940	3,830	17.5%

The Electronics segment's sales increased 1.5%, to ¥138,537 million. Sales of HD media increased due to steady shipments for PC and other applications. Sales of rare earth magnetic alloys decreased due to lower shipment volumes. Meanwhile, sales of compound semiconductors increased due to higher shipment volumes. Operating income increased 17.5%, to ¥25,770 million, due mainly to the diminishing influence of reductions in the book value of rare earth inventories in the previous year.

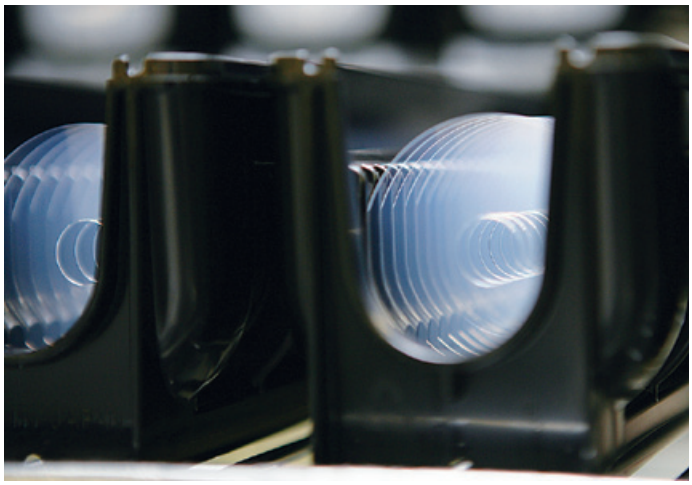
Hard Disks
Sales of HD media increased, reflecting relatively steady HDD shipments for external storage applications and the influence of the termination of support for Windows XP operating system. Operating income increased due to steady shipments and the effect of lower yen.

Compound Semiconductors
Sales of compound semiconductors increased due to the rise in shipment volumes. Operating income also increased.

Rare Earths
Sales of rare earth magnetic alloys decreased due to lower shipment volumes. Operating income increased due to the diminishing influence of reductions in the book value of inventories in the previous year.

ELECTRONICS TOPICS
Commercial production of 3.5-inch HD media with the world's highest capacity

Our 3.5-inch HD media (1.1–1.3 terabyte per platter) have been adopted in eight-terabyte HDDs, which represent the highest storage capacity in the world. The HD media are based on the seventh-generation perpendicular magnetic recording (PMR) technology. In 2005, we became the first in the world to produce PMR-technology-based HD media. With the progress in cloud computing and resultant growth in the amount of generated data, HDD demand is expected to increase for use at data centers, in particular. As a crucial HDD component influencing storage capacity, demand for HD media is expected to increase at around 3% a year.



HD media

Inorganics

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	67,557	65,919	1,638	2.5%
Operating income	–300	–838	538	—

The Inorganics segment's sales increased 2.5%, to ¥67,557 million. While oversupply of steel continued in Asia, steel demand recovered gradually in the United States and Japan. Thus, sales of graphite electrodes increased slightly due to higher shipment volumes. Sales of ceramics increased due to higher shipment volumes of abrasives and other ceramic products. The segment recorded an operating loss of ¥300 million, an improvement of ¥538 million.

Ceramics
Sales of ceramics increased due to higher shipment volumes of abrasives and other ceramic products. SDK has been shifting its chemical alumina production site from Yokohama to PT. Indonesia Chemical Alumina, a joint venture with ANTAM. Commercial operation at the new plant started in February, 2015.

Carbons
Despite continued oversupply of steel in Asia, electric steel production in advanced countries, such as the United States and Japan, recovered. Sales of graphite electrodes increased slightly. Operating income also increased.

INORGANICS TOPICS
Reorganization of ceramics-related subsidiaries

To strengthen the competitiveness of our ceramics business, we reorganized relevant subsidiaries in Japan as a means to increase efficiency. We started up Showa Denko Ceramics Co., Ltd. in January 2014 as the core company for our ceramics business. In October 2014, Showa Denko Ceramics absorbed Tohoku Metal Chemical Co., Ltd., a producer of glass polishing materials. In January 2015, we started up Showa Fine Ceramics Co., Ltd. by consolidating Nagoya Kenmazai Kogyo Co., Ltd. (a manufacturer and seller of abrasives) and Shiojiri Showa K.K. (a contract manufacturer under SDK's Shiojiri Plant). Under "PEGASUS Phase II," the ceramics business is classified in the category of "Base (Stable)." The reorganization

forms the core of our strategy to strengthen the ceramics business. We will make sure to produce the planned effects and expand the business.

Increased adoption of high-performance photocatalyst *LUMI-RESH*™

High-performance photocatalyst *LUMI-RESH*™, developed by our subsidiary Showa Denko Ceramics Co., Ltd., has been adopted by Taiyo Kogyo Corporation in its indoor membrane material "Hikari-Protextile," and by Lilycolor Co., Ltd. in its high-performance curtains. Furthermore, Nippon Soda Co., Ltd. successfully developed a paint containing *LUMI-RESH*™. SDK developed and started marketing heat insulation panels coated with the new paint for use in plant growth facilities based on a completely closed system. Application of *LUMI-RESH*™ to the surface of heat insulation panels reduces bacteria and viruses in the air, preserving the freshness of vegetables. When a photocatalyst absorbs light, it catalyzes a light-energy-induced reaction that generates active oxygen from moisture and oxygen in the air. Active oxygen inactivates bacteria and viruses adhering to the surface. While conventional photocatalysts react to ultraviolet rays contained in sunlight in large quantity, *LUMI-RESH*™ is effective when subjected to low-energy light from indoor fluorescent lights and LEDs. By further improving photocatalyst performance and developing new applications jointly with customers, the Showa Denko Group will aim to contribute to people's health and safety.

PT. Indonesia Chemical Alumina's new plant

Aluminum

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	97,956	90,383	7,573	8.4%
Operating income	2,999	5,845	–2,846	–48.7%

The Aluminum segment's sales rose 8.4%, to ¥97,956 million. Sales of rolled products were up due to the rise in shipment volumes of high-purity foils for capacitors, reflecting increased production by capacitor manufacturers for such applications as electric appliances and vehicles. Sales of aluminum specialty components increased due to higher shipment volumes for automotive parts applications. Sales of aluminum cans increased following the acquisition and consolidation of Hanacans, a manufacturer of aluminum beverage cans in Vietnam. Operating income fell 48.7%, to ¥2,999 million, due to the sharp rise in aluminum ingot prices.

Rolled Products

Sales of rolled products were up due to the increase in shipment volumes of high-purity aluminum foils for capacitors used in electric appliances and vehicles.

Specialty Components

Sales of aluminum specialty components increased due mainly to higher shipment volumes for automotive applications. Operating income was maintained at the previous year's level due to the influence of higher prices of aluminum ingot.

Aluminum Cans

Sales of aluminum cans increased due to the consolidation of Hanacans, of Vietnam, notwithstanding lower volumes of shipments to Japanese beer manufacturers. Shipment volumes declined in Japan, reflecting the reaction to the consumption tax hike and unusually cool summer. Operating income fell sharply due to the influence of soaring aluminum ingot prices and lower shipment volumes during the unusually cool summer.

ALUMINUM TOPICS

Expanded high-purity aluminum foil production capacity in China

As for the business in high-purity aluminum foil (a key material for aluminum electrolytic capacitors), we decided in July 2014 to expand the production capacity at our subsidiary Showa Denko Aluminum (Nantong) Co., Ltd., from 400 tons, to 600 tons per month. The expanded facility began operations in March 2015. Aluminum electrolytic capacitors are used in wide areas, including electric appliances, IT devices, electric vehicles, hybrid cars, and equipment for wind/solar power generation. Demand for aluminum electrolytic capacitors is expected to grow rapidly in China. The Showa Denko Group will aim to ensure stable supply of high-quality, high-purity aluminum foil to serve the growing aluminum electrolytic capacitor market in a timely manner.

Starting commercial operation of a new aluminum casting plant in Malaysia

Our subsidiary SHOTIC Malaysia Sdn. Bhd. completed the construction of a new aluminum casting plant in Malaysia in November 2014, and started commercial operation of the new plant. This is the first overseas aluminum casting plant for the Showa Denko Group. Together with the existing aluminum forging plant of SHOTIC Singapore Pte., Ltd., the Group has established an integrated aluminum forging/casting system in the ASEAN region. The Group will quickly meet brisk demand from auto makers and automotive parts suppliers operating in the region.

Consolidation of a Vietnamese aluminum can maker

In May 2014, SDK and its wholly owned subsidiary Showa Aluminum Can Corporation (SAC) completed the procedures for jointly acquiring 91.75% of shares in Hanacans Joint Stock Company (Hanacans), a manufacturer of aluminum beverage cans in Vietnam. Hanacans, with a solid customer base, is the largest aluminum can producer in the northern region of Vietnam. Furthermore, Hanacans will introduce SAC's advanced production technology and quality control system, thereby strengthening its competitive power in the growing Vietnamese market.

Others

Consolidated Business Results *(Millions of yen)*

	2014	2013	Difference	Rate of change
Sales	195,024	176,516	18,508	10.5%
Operating income	–678	–626	–52	—

The Others segment's sales rose 10.5%, to ¥195,024 million. Sales of lithium ion battery (LIB) materials were maintained at the previous year's level. Shoko Co., Ltd.'s sales increased. BE International Corporation has been consolidated. The segment recorded an operating loss of ¥678 million, down ¥52 million.

OTHERS TOPICS

Completion of the expansion of LIB packaging film production capacity

Our subsidiary Showa Denko Packaging Co., Ltd. completed the expansion of its capacity at its Hikone Plant for producing LIB-packaging aluminum laminated film. Commercial production started in July 2014. The production capacity has tripled versus the 2010 level. The market for LIB-packaging aluminum laminated film continues to grow. Demand for the film is expected to grow for use in large LIBs for automotive applications, in addition to demand for use in small LIBs for smartphones and tablet computers. The Group will aim to ensure stable supply of high-quality materials for the rapidly growing LIB market.

Increased adoption of proprietary LED chips for plant growth facilities

SHIGYO™ method, developed jointly by SDK and Professor Shigyo, Department of Agriculture, Yamaguchi University, accelerates the growth of plants at LED-based facilities by irradiating light with optimum wavelengths and intensity in consideration of the kind of plant and growing stages. SDK's proprietary LED chips are used for this technology. *SHIGYO*™ method was adopted in 2014 by Gushiken Co., Ltd., a major bread maker in Okinawa Prefecture, and by Endo Corporation at its facility in Yamagata Prefecture. Aiming to promote plant growth facilities that realize a stable supply of safe food, SDK will continue to provide various types of support to companies considering participation in this business.