



Tosoh Corporation

General Presentation



Delivering on our promise of quality products through The Chemistry of Innovation.

Tosoh Corporation *is a global chemical company that supplies manufacturers with the materials they need to create the products that make modern life all that it is. And everything it can be.*

We invite you to take a closer look at the wide world of Tosoh.

Fiscal 2017 Consolidated Net Sales

US\$6.6 billion



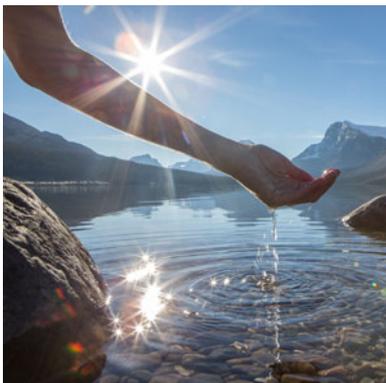
CHLOR-ALKALI GROUP
 Net sales: US\$2.6 billion
 Share of net sales: 37.6%



PETROCHEMICAL GROUP
 US\$1.5 billion
 Share of net sales: 21.8%



SPECIALTY GROUP
 US\$1.6 billion
 Share of net sales: 23.7%



ENGINEERING GROUP
 US\$799.0 million
 Share of net sales: 11.7%



OTHER GROUP
 US\$361.3 million
 Share of net sales: 5.3%

Note: For references purposes only, US dollar amounts have been translated, unless otherwise indicated, from yen at the rate of ¥112.19 = US\$1, the prevailing exchange rate at the end of the fiscal year ended March 31, 2016.



1,500 products*

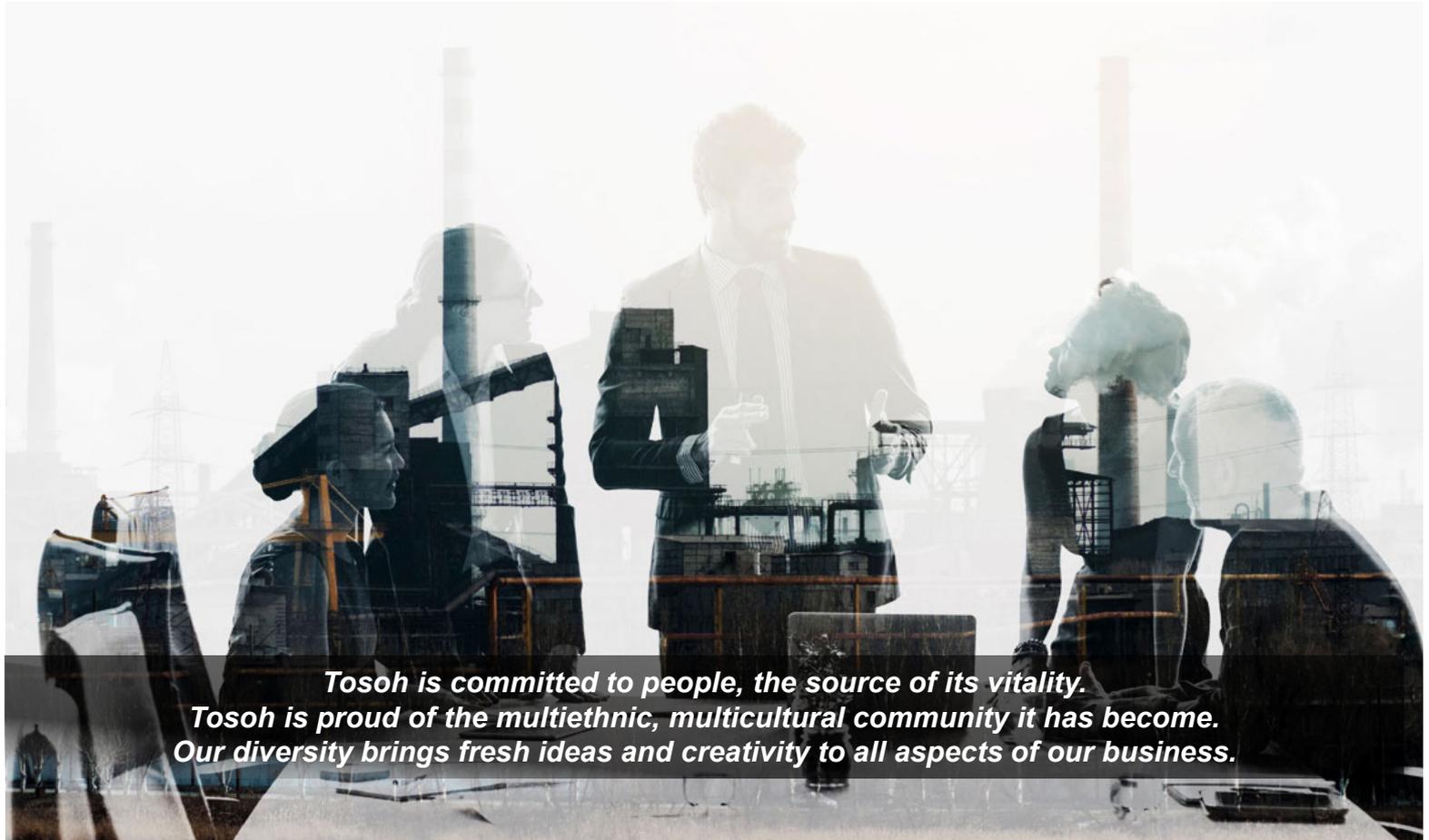


Look around you, it is almost impossible to find a manufactured item that does not include something from Tosoh.

*Does not include the 10,000-plus parts that go into Tosoh's clinical diagnostic systems.



12,292 people

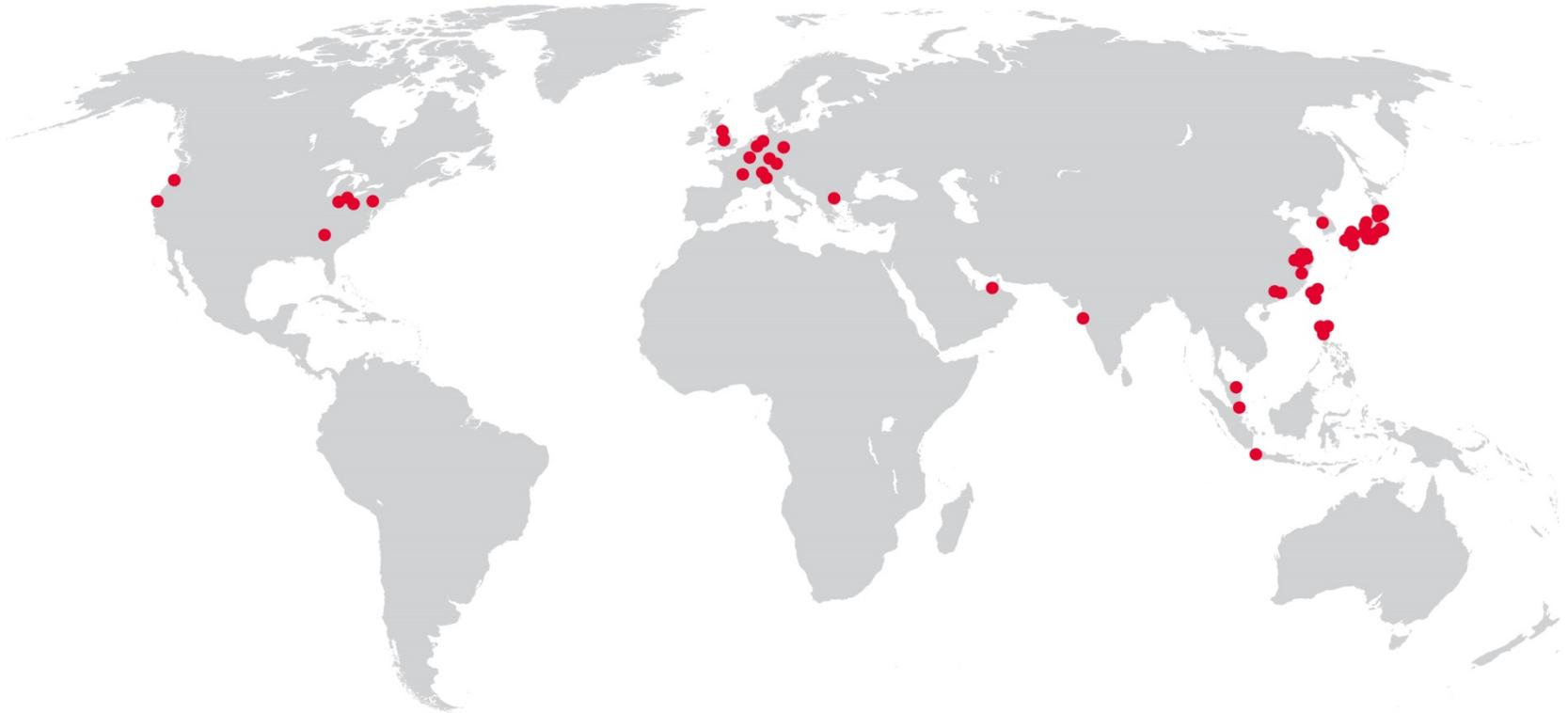


*Tosoh is committed to people, the source of its vitality.
Tosoh is proud of the multiethnic, multicultural community it has become.
Our diversity brings fresh ideas and creativity to all aspects of our business.*



Global Group

106 companies 20 countries



As we continue to expand globally, our focus remains on creating a corporate culture where people can realize their potential and be a part of the local community.

Environment

US\$24.1 million investment in fiscal 2017



Tosoh is dedicated to improving the quality of life through environmental preservation, to ensuring the safety and health of its employees and society, and to achieving economic progress.



Research & Development

900 researchers \$128.1 million investment



Through R&D, the Tosoh Group strengthens its businesses and enhances its ability to generate tomorrow's products today. The company combines its own R&D programs with joint research at external research facilities, including at universities and other educational institutions and at public research laboratories. Tosoh is also investing in venture funds.



Hybrid Business: Commodities & Specialties





Products and Markets

Tosoh serves the chemical and petrochemical, construction, automotive, consumer electronics, information technology, bioscience, and environmental markets.



Petrochemicals Group

Olefins
Polymers

Chlor-alkali Group

Chlor-alkali
Cement
Urethane

Specialty Group

Organic Chemicals
Bioscience Products
Advanced Materials

Engineering Group

Water Treatment
Construction

Petrochemicals

Olefins

Ethylene
Propylene
C4 Fraction
Tertiary-butyl alcohol
Cumene
Aromatic compounds, BTX (benzene,
toluene, xylene)



On the Road: A Part of Your Daily Life

Tosoh furnishes an array of materials that underpin the electronics, automobile, and plastics industries. Our synthetic rubber helps wet suits insulate wearers from the cold; our engineering plastic polyphenylene sulfide (PPS) strengthens car engine parts; our Melthene[®] polyolefin resin fastens the easy-to-peel lids on yogurt and other food containers; and our Ryuron[®] polyvinyl chloride (PVC) paste puts that soft stretch in rubber gloves.

Polymers

- Polyvinyl chloride (PVC)
- High-density polyethylene (HDPE)
- Low-density polyethylene (LDPE)
- Linear low-density polyethylene (LLDPE)
- Ethylene vinyl acetate (EVA) copolymer
- Adhesive polymer
- PVC paste (Ryuron[®])
- Polychloroprene rubber
- Chlorosulfonated polyethylene (CSM)
- Alkylated CSM
- Polyphenylene sulfide (PPS) resins
- C₉ hydrocarbon resins



In the Living Room: A Part of Your Daily Life

Tosoh is there while you're relaxing in your living room. Our polyvinyl chloride covers the inside of your house with easy to clean wallpaper and the outside with durable siding. It also covers the electrical cords that bring your appliances to life and the solar panels that provide your house with energy.



Chlor-alkali

Chlor-alkali Division

Caustic soda

Vinyl chloride monomer (VCM)

Calcium hypochlorite (Niclon[®])

Sodium bicarbonate

Urethane Division

Isocyanate raw materials and functional urethane

Methylene diphenyl diisocyanate (MDI)

Toluene diisocyanate (TDI)

Hexamethylene diisocyanate (HDI)

Polyurethane adhesives

Coating resins

Elastomers

Polyisocyanates for polyurethane paints

Polyols



In the Kitchen: A Part of Your Daily Life

Tosoh supplies essential products that go into plastics, glass, pulp and paper, aluminum, and soaps and detergents. Our resins are used in everything from refrigerators to mixing bowls and utensils; our caustic soda keeps clothes clean; and our Niclon[®] calcium hypochlorite makes drinking water safe.

Chlor-alkali

Cement

Ordinary portland cement

Portland fly ash cement

Portland blast furnace slag cement



For Strong Structures: A Part of Your Daily Life

Tosoh cement goes into buildings, bridges, and highways. And the recycling capacity of our cement plant helps significantly reduce the waste produced by Tosoh and communities surrounding the plant.



Specialty

Organic Chemicals

Ethyleneamines

Polyurethane catalysts
(TEDA, TOYOCAT[®] RZETA[®])

Bromine

Hydrobromic acid

Flame retardants (FLAMECUT[®])

Chelating agents (TS-300, TX-10)

Nonaqueous solvents (HC series)

Sodium P-styrene sulfonate (Spinomar[®] NaSS)

High-purity ethylene dichloride



For When You Are Out and About: A Part of Your Daily Life

Tosoh provides cutting-edge technologies to the semiconductor, consumer electronics, automotive, pharmaceuticals, and medical industries.



Specialty

Bioscience

Automated immunoassay analyzers (AIA[®], AIA-CL series)

Reagent systems (AIA-PACK[®], AIA-CLPACK[®])

Automated glycohemoglobin (GHb) analyzers (HLC[®] series)

Real-time fluorescence monitoring systems (TRC[®] series)

High-performance liquid chromatography (HPLC) columns (TSKgel[®] series)

Separation media for bio-pharmaceutical purification (Toyopearl[®])

High-performance gel permeation chromatography (GPC) Systems (EcoSEC[®] series)



In Health Care Solutions: A Part of Your Daily Life

Tosoh produces a range of scientific and clinical diagnostics products that address the health concerns of developed and developing countries.

Advanced Materials

Yttria-stabilized zirconia powders & compounds
(TZ and Zpex[®] series)

Grinding media (YTZ[®])

Zirconia fine beads

Electrolytic manganese dioxide (EMD)

Zeolites for molecular sieves (Zeolum[®])

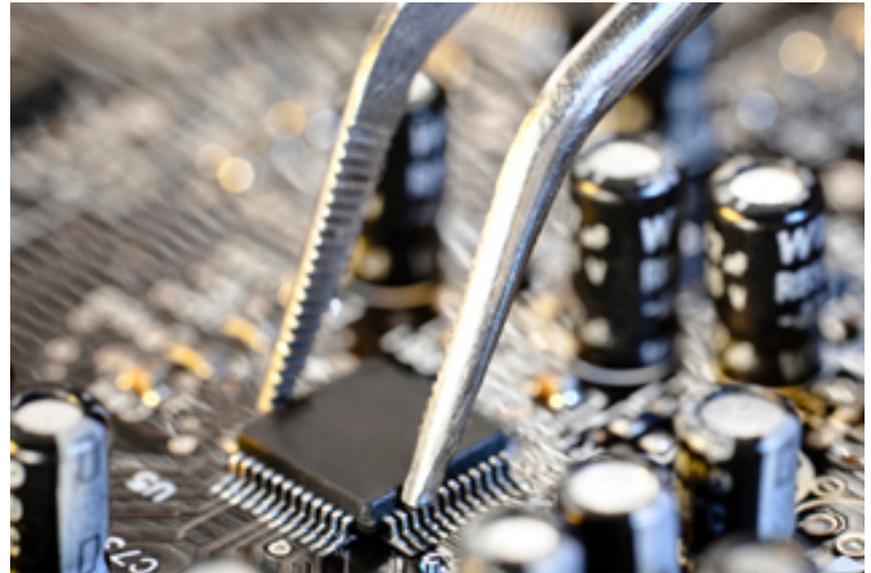
Zeolites for catalysts (HSZ[®] series)

Silica glass materials

Fabricated quartzware

Machined quartzware

Sputtering targets



For Conserving Natural Resources

Tosoh is taking steps to ensure its share of the surging market for rechargeable lithium-ion batteries, which conserve energy and are becoming increasingly important value-added components of automobiles and electronic products.

Engineering

Water Treatment

(Organo Corporation)

Water Treatment Systems and Products

Construction

(Tohoku Denki Tekko Co., Ltd., etc.)

Construction of machinery, plant, steel structure,
environmental and sanitation facilities, containers

Electrical machinery

Instrumentation

Civil engineering

Maintenance and quality assurance

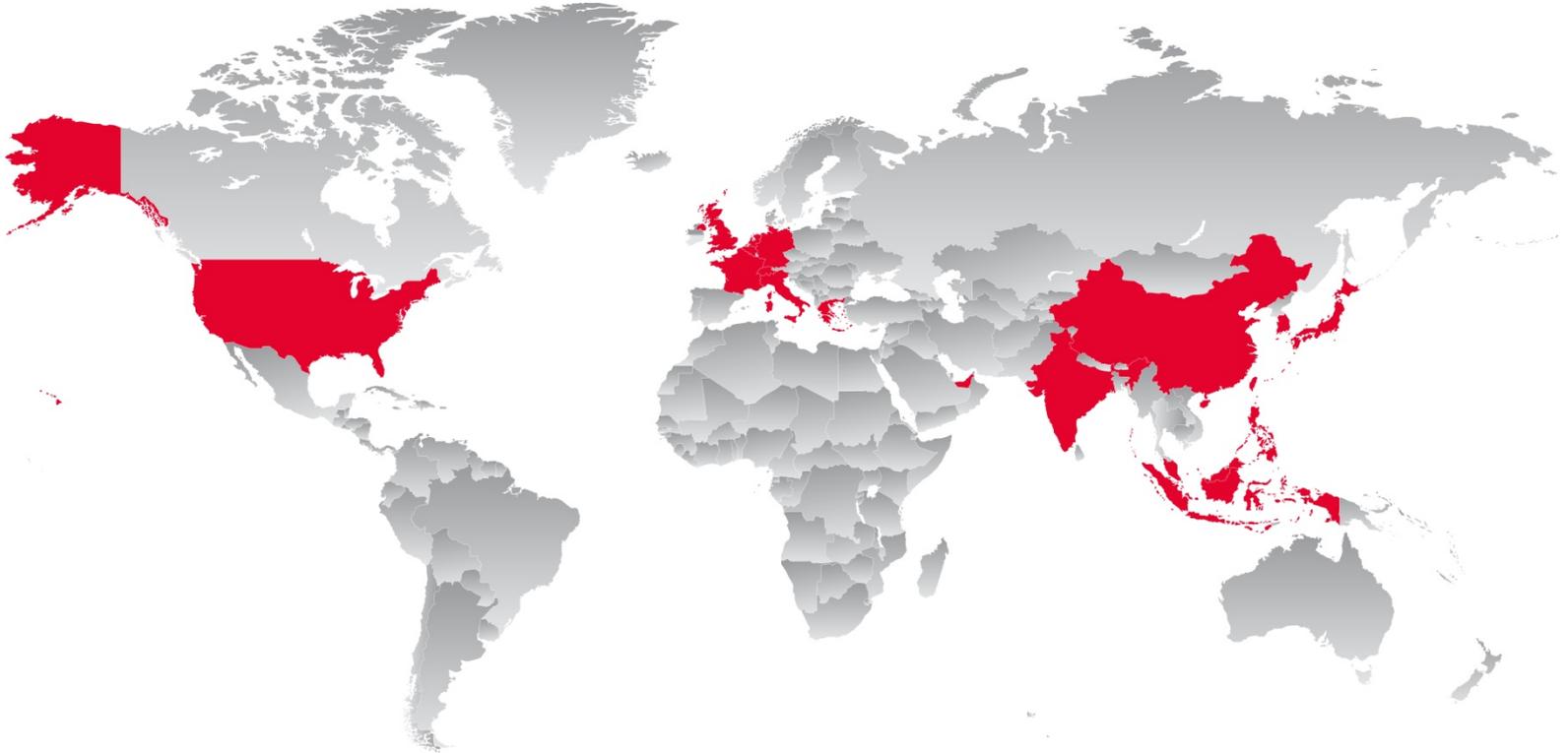


To Keeping Water Pure: A Part of Your Daily Life

Tosoh subsidiary Organo Corporation has been an important contributor to progress in industry and daily lives since 1946. Its water treatment systems and products goes into waterworks, sewage treatment plants, power stations, pharmaceuticals manufacturing, food processing operations, information technology and electronics industries.



Global Presence



Global Solutions

Tosoh first ventured overseas over 50 years ago, establishing a presence in the United States in the early 1960s. Today, the Tosoh Group boasts a global network that generates a major portion of Tosoh's sales outside Japan.



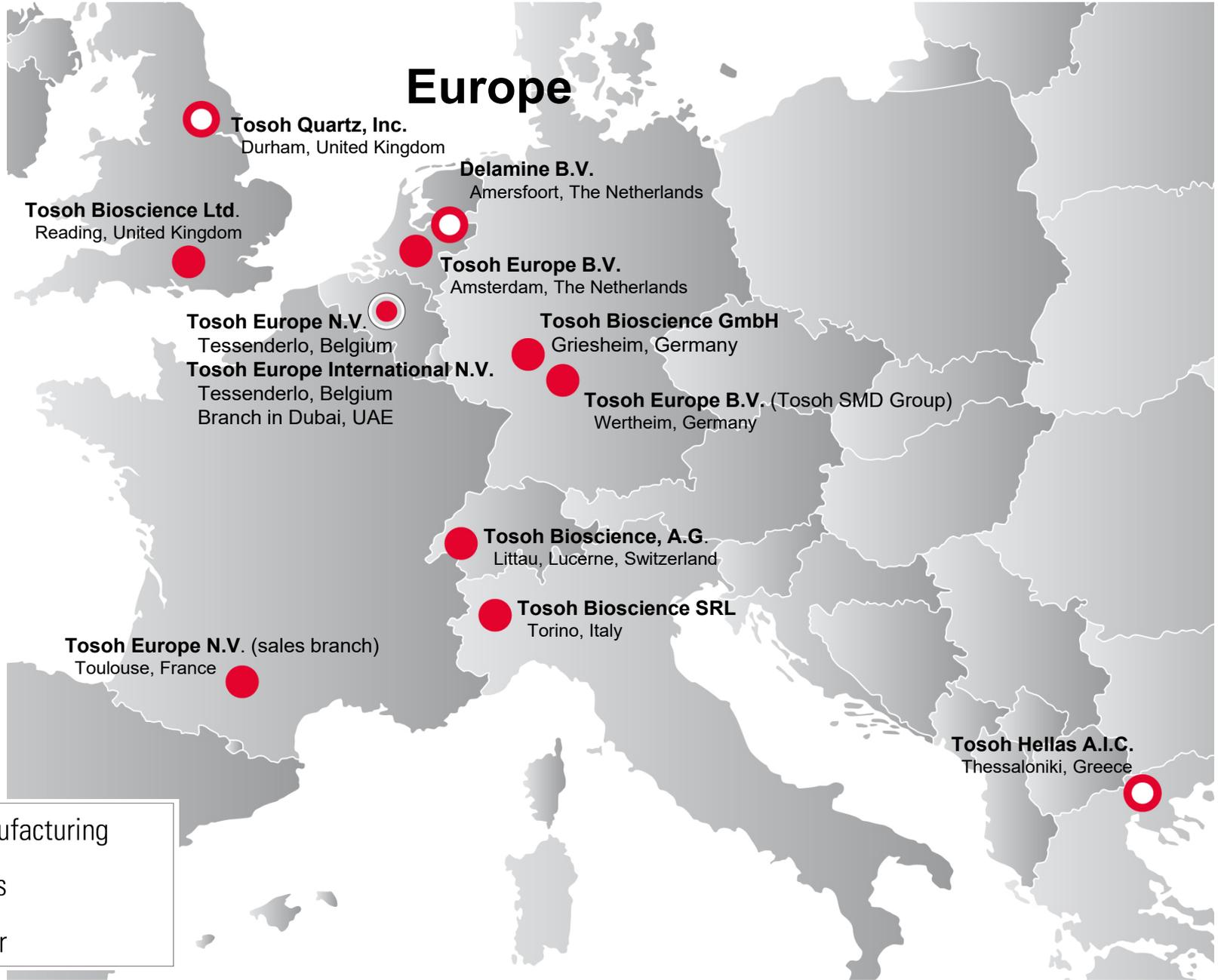
Americas



- Manufacturing
- Sales
- Other



Europe



○ Manufacturing
● Sales
○ Other



Southeast Asia



Tosoh India Pvt. Ltd.
Mumbai, India

Tosoh SMD Korea, Ltd.
Kyungki-Do, Korea

Tosoh Quartz Co., Ltd.
Tainan, Taiwan

Tosoh SMD Taiwan, Ltd.
Hsinchu, Taiwan

Tosoh Quartz Co., Ltd.
Hsinchu, Taiwan

Philippine Resins Industries, Inc.
Makati City, The Philippines

Tosoh Polyvin Corporation
Batangas, The Philippines

Mabuhay Vinyl Corporation
Makati City, The Philippines

Tosoh Advanced Materials Sdn. Bhd.
Terengganu, Malaysia

Tosoh Asia Pte. Ltd.
Singapore

P.T. Standard Toyo Polymer
Jakarta Pusat, Indonesia

Other Tosoh Group Companies

Organo (Thailand) Co., Ltd.
Organo (Asia) Sdn. Bhd.

○ Manufacturing

● Sales



China





Japan

Nanyo Complex

Yamaguchi Prefecture

- Technology Center
- Inorganic Materials Research Laboratory
- Organic Materials Research Laboratory
- Yamaguchi Sales Office
- In-House Power Generation up to 829 MW

Fukuoka Branch

Fukuoka Prefecture

Tosoh Hyuga Corporation

Miyazaki Prefecture

Osaka Branch

Osaka Prefecture

Yokkaichi Complex

Mie Prefecture

- Functional Polymers Research Laboratory
- Polymer Materials Research Laboratory
- In-House Power Generation up to 206 MW

Tosoh Zeolum, Inc.

Toyama Prefecture

Tosoh AIA, Inc.

Toyama Prefecture

Tosoh Quartz Corporation

Yamagata Prefecture

Tosoh SMC Corporation

Yamagata Prefecture

Tohoku Tosoh Chemical Co., Ltd

Yamagata Prefecture

Sendai Branch

Miyagi Prefecture

Nagoya Branch

Aichi Prefecture

Tosoh Corporation (Headquarters)

Tokyo

Life Science Research Laboratory

Advanced Materials Research Laboratory

Kanagawa Prefecture

Polyurethane Research Laboratory

Kanagawa Prefecture

- Manufacturing
- Sales
- Other



Global Sales and Marketing Offices



Americas

Tosoh USA, Inc.
Grove City, OH, USA

Tosoh Specialty
Chemicals USA, Inc.
Alpharetta, GA, USA

Europe, North Africa SEA, India, Middle East

Tosoh Europe B.V.
Amsterdam, The Netherlands

Tosoh Asia Pte. Ltd.
Singapore

China

Tosoh (Shanghai) Co., Ltd.



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Additional Information

Vinyl Isocyanate Chain

The vinyl isocyanate chain is a fully integrated sequence of manufacturing operations that produce several key chemicals from the vinyl and isocyanate chains respectively.

Vinyl Chain

The vinyl chain starts with salt and naphtha. Salt is electrolyzed to yield chlorine, caustic soda and hydrogen. The naphtha steam cracking process yields ethylene, carbon monoxide and benzene. Chlorine is reacted with ethylene and hydrogen chloride (a by-product of MDI production) to produce ethylene dichloride (EDC), and the balance is used to manufacture other chlorine derivatives. Tosoh then converts EDC—which can also be combined with caustic soda to produce ethyleneamines, another major Tosoh product—to vinyl chloride monomer (VCM), which is converted into various polyvinyl chloride (PVC) resins.

Isocyanate Chain

The naphtha-derived benzene, together with hydrogen and ammonia yields aniline, which, combined with formalin, and the vinyl chain's chlorine and carbon monoxide leads to methylene diphenyl diisocyanate (MDI), an essential raw material for polyurethanes.



TOSOH FULLY INTEGRATED VINYL ISOCYANATE CHAIN

As of October 2014

Units: 1,000 metric tons per year

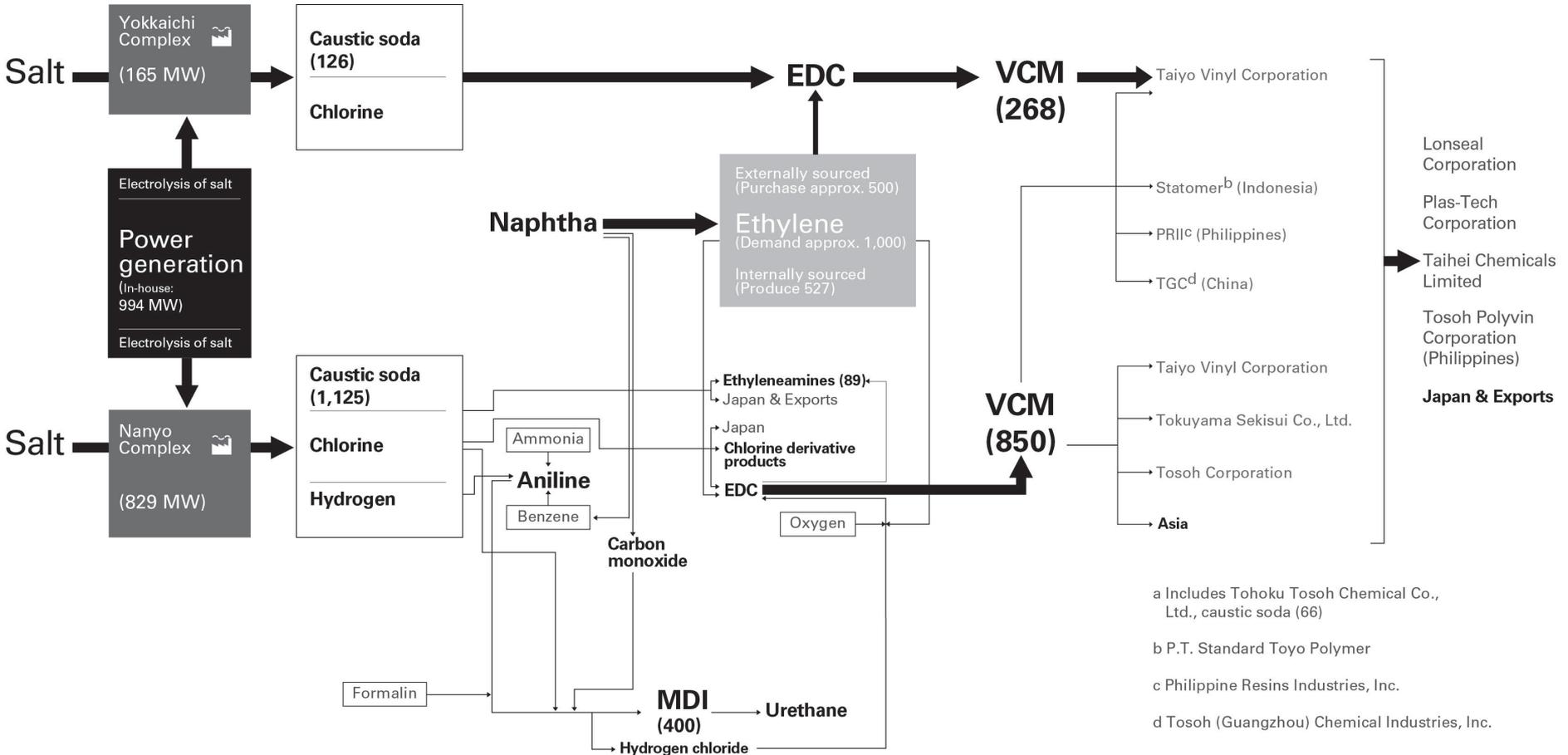


Caustic soda total
(1,317)^a

VCM total
(1,118)

PVC resins total
(1,126)

PVC processing



^a Includes Tohoku Tosoh Chemical Co., Ltd., caustic soda (66)

^b P.T. Standard Toyo Polymer

^c Philippine Resins Industries, Inc.

^d Tosoh (Guangzhou) Chemical Industries, Inc.



Organization

