

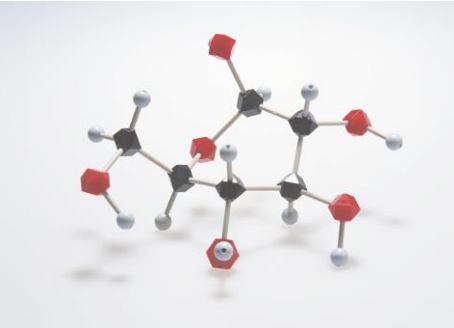
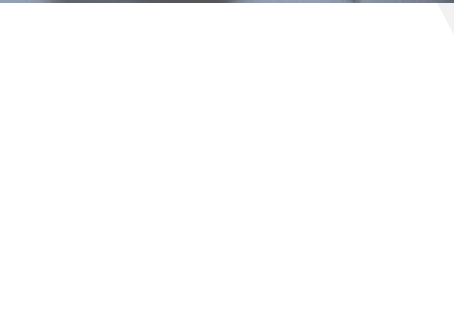
DKS Co. Ltd.

Technologies by Industry



SUPERFLEX, HITENOL, NOIGEN, ELEXCEL, CELLOGEN, EIMFLEX, NEW FRONTIER, PYROGUARD, ELASTRON, LAVELIN, PLYSURF, DK BE-CLEAR, AIRKEM, NIOCAN, CATIOGEN, LAMIPROOF, RESISTAT, DK ESTER, MONOPET, METACLEA, PITZCOL, TRIBIO, DD-1760, DIKSSOL, RHEOCRYSTA, DK FOAMER, MONO ACE, AIPHTACT, COSMELIKE, NEO-HITENOL, AMOGEN, CREEJUS, DK POLYOL, SHALLOL, SUPER SRF, KOD-M, SELFLOW, Kainou-Tochukasou and Sudachin are trademarks or registered trademarks of DKS Co. Ltd.





Chemistry provides a solution

【Company credo】

Contributing to the nation and society through industry

【Mottoes】

Quality First, Cost Reduction, and R&D Efforts

We aim to be a “Uni-Top” company that is appreciated for its uniqueness, not quantity.

We have a variety of technologies and knowledge gained from our experiences in a wide range of industrial fields. Our thousands of products and services will surely serve the needs of our customers!

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Company Profile

- Corporate name: DKS Co. Ltd.
- Start of business: April 1909
- Establishment: August 1918
- Headquarters: 48-2 Higashikujo-Kamitonodacho, Minami-ku, Kyoto 601-8002, Japan
- Capital: JPY 8,895,000,000
- No. of employees: 585 (Consolidated 1,111) as of end March 2024



Surfactants



We have been providing highly functional surfactants since the Company's founding in 1909.



Amenity Materials



We provide materials and peripheral application technologies necessary for a comfortable living environment.



Polyurethane Materials



We provide industrial materials and polyurethane raw materials, for example, paints, adhesives, civil engineering and construction materials, and electric insulating materials.



Functional Materials



We provide products such as flame retardants, radcure resins, and waterborne polyurethanes for applications in home appliances and daily necessities.



Electronic Device Materials



We provide ceramic materials and conductive pastes for applications in home appliances and electronics components.



Life Sciences

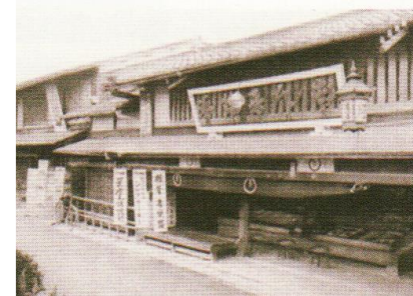


We provide naturally derived health foods and technologies for extraction, concentration, and powdering of natural products.

Technology History

History

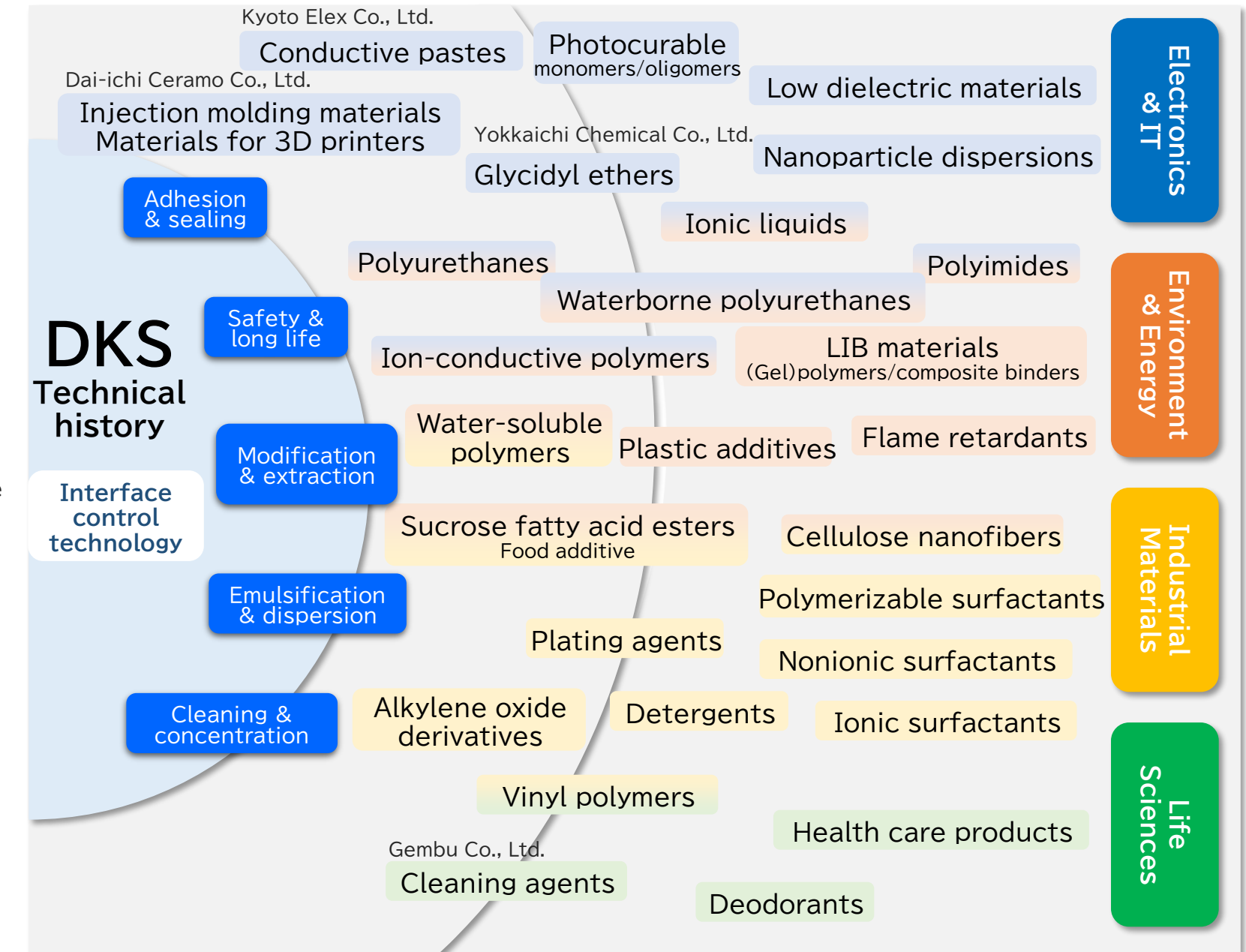
1909
Business started at Ohno Kungyokudo
Launched cocoon unwinding agent

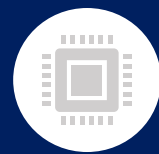


1915
Launched Gembu Marseille Soap



1934
Launched a higher alcohol-based detergent (later MONOGEN)





Mobility

Higher safety, more comfortability

A variety of functional materials that contribute to lightweighting, higher performance, and enhanced safety of automobiles

Paints/Coatings

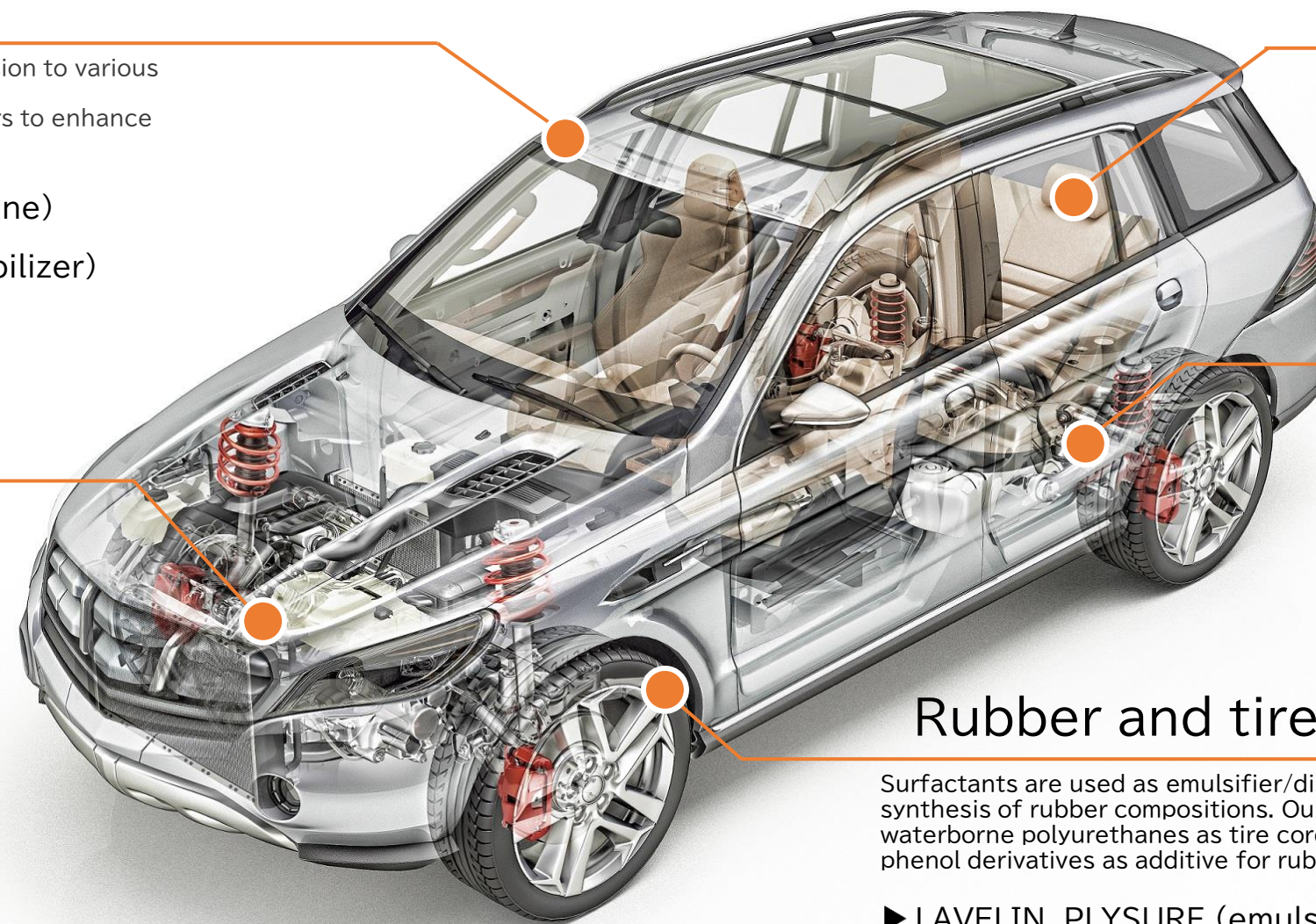
Waterborne polyurethanes, which have good adhesion to various materials, are used in exterior and interior paints. Surfactants are used as dispersants/compatibilizers to enhance stability of paints.

- ▶ SUPERFLEX (waterborne polyurethane)
- ▶ HITENOL, NOIGEN (dispersant/solubilizer)

Electric/Lithium-ion battery (LIB) components

To contribute to sustainability improvement, we develop LIB and peripheral materials e.g. water-based adhesives for negative electrodes and dispersion stabilizers. Potting agents are widely used to enhance performance and reliability of PCBs. We have many other materials that can achieve higher functionality.

- ▶ ELEXCEL (materials for LIBs)
- ▶ CELLOGEN (dispersion stabilizer for LIBs)
- ▶ EIMFLEX (potting agent for PCBs)
- ▶ NEW FRONTIER (photocurable coating agent)
- ▶ PYROGUARD (flame retardant)
- ▶ Various functional resins for heat dissipation, chain explosion prevention and insulation



Interior and exterior

Waterborne polyurethanes provide durability, elasticity and abrasion resistance and are used in synthetic leathers for automobile seats, seatbelt resins and decorative films.

- ▶ SUPERFLEX (synthetic leathers)
- ▶ SUPERFLEX, ELASTRON (decorative films)

Structure

With our unique urethanization technology, we develop light-weight and high-strength resins to contribute to lightweighting of automobiles.

- ▶ PU-based CF RTP matrix resins

Other materials

We have space deodorizers and fiber binders to improve the environment inside automobiles.

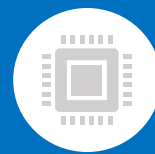
- ▶ DK BE-CLEAR, NOIGEN (cleaning agents)
- ▶ AIRKEM, NIOCAN (space deodorizers)
- ▶ SUPERFLEX, ELASTRON (fiber binders), CATIOGEN (antistatic agent)

Rubber and tire parts

Surfactants are used as emulsifier/dispersant for synthesis of rubber compositions. Our lineup includes waterborne polyurethanes as tire cord adhesive and phenol derivatives as additive for rubber.

- ▶ LVELIN, PLYSURF (emulsifier/dispersant)
- ▶ ELASTRON (adhesive)
- ▶ Phenol derivatives (DSP)





Electronics & IT

◎ Materials to connect the world

Adding high-functions to IT and electronic parts for PCs, smartphones, etc.



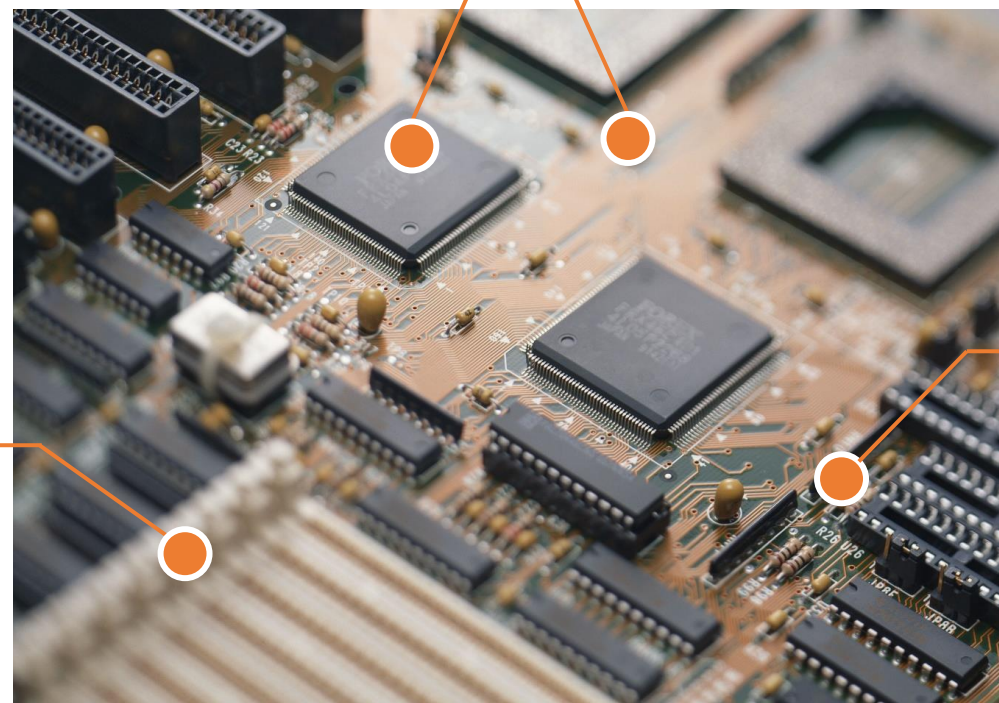
Mounting boards

Our products are used to remove flux used in processing and as surface modifier, antioxidant and protective layers.

- ▶ EIMFLEX, NEW FRONTIER (coating agents)
- ▶ DK BE-CLEAR (solder/flux remover)
- ▶ LAMIPROOF (antioxidant)
- ▶ Conductive pastes

Printed circuit board (PCB) materials

- ▶ Thermal crosslinking low-dielectric resins



Packaging materials

We have various high-function materials e.g. halogen-free phosphorus flame retardants for low dielectric resins and heat dissipating gap fillers.

- ▶ PQ-60 (phosphorus flame retardant)
- ▶ Heat-dissipating gap filler
- ▶ Two-component polyurethane resins (sealant, adhesive)

Glass cloth

- ▶ CATIOGEN (antistatic agent)

Display materials

We provide materials suitable for various parts e.g. anti-reflection films, polarizing plates, and backlight units.

- ▶ Adhesion improving primer
 - Waterborne polyurethanes
- ▶ High refractive index photocurable coating resins
 - High-reactive low-viscous polyfunctional monomers
 - Inorganic nanoparticle dispersions
- ▶ ELEXCEL, RESISTAT, CATIOGEN (antistatic agents)



Other materials

- ▶ Materials for 3D printing
- ▶ Zirconia feedstock (optical fiber connector component)

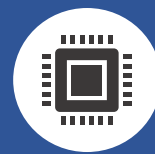
Flames

- ▶ PYROGUARD (flame retardants)

TOPIC

With our sucrose derivative technology which uses natural raw materials, we are always looking for applications in new areas. By an application to optical materials, we are contributing to carbon neutralization.

- ▶ DK ESTER (sucrose esters of fatty acids)
- ▶ MONOPET SOA (sucrose octa-acetate)
- ▶ MONOPET SB (sucrose benzoate)



Semiconductor © From front- to back-end processes

Semiconductor technology is evolving day by day as our life becomes more and more digitalized. We offer process agents, sealants, etc., based on our core surfactant technology.



Cleaning agents

We provide cleaning agents essential to semiconductor manufacturing processes based on our surfactant technology.

- ▶ DK BE-CLEAR, METACLEA (cleaning agents)
- ▶ Penetrants, dispersants

Photoresist materials

We develop photoresist materials that protect certain areas of wafers. We also develop photomask-related materials, and our cleaning agents are widely used.

- ▶ Photocurable resins
- ▶ Cleaning agents

Wafer-making

● Cutting silicon ingot
● **Wafer polishing**
● Silicon wafer

Front-end process

● Cleaning
● Thin film deposition
● **Photolithography**
● Etching
● Ion implantation
● **Planarization (CMP)**

Agents for CMP

We have a lineup of materials for chemical mechanical polishing (CMP) processes.

- ▶ PITZCOL (polymer dispersant)
- ▶ High-functional cleaning agents
 - Organic base

Agents for tapes

We develop agents for back grinding and dicing tapes.

- ▶ ELEXCEL (antistatic agent)
- ▶ NEW FRONTIER (photocurable resin)

Back-end process

● Dicing
● Wire bonding
● Molding
● Final inspection

Sealants

We develop *polyimide materials*, which can be used as an encapsulant for power semiconductors that require high heat resistance.

- ▶ Epoxy resin raw materials
- ▶ Low thermal expansion resins
 - Polyimide materials

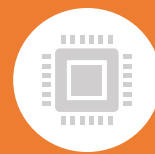
Packaging

● **Packaging**

Packaging materials

We develop various high functional materials such as flame retardants for low dielectric resins and heat dissipating gap fillers.

- ▶ PQ-60 (phosphorus flame retardant)
- ▶ Heat-dissipating gap fillers
- ▶ Two-component polyurethane resin (sealant)
- ▶ High-reactive and low-viscous polyfunctional monomers
- ▶ Thermal-crosslinking low dielectric resin
- ▶ Metal antioxidant



Environment & Energy ◎ Caring for our environment

We undertake initiatives to promote SDGs-related activities and carbon neutralization, focusing particularly on decarbonization and reduction of environmental impacts. We provide products that are environmentally friendly, and/or products suitable for the energy industry.



Environmentally friendly products

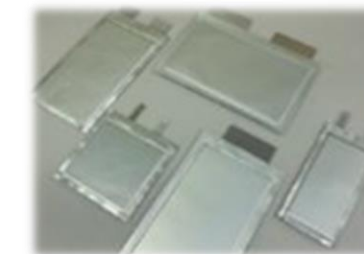
We have a lineup of products made from natural materials e.g. sugar and cellulose, which are used in various applications such as food, energy, and agrochemicals. We also have other products, e.g. photocurable materials that save energy consumption, PLA modifier, water-based materials, and petrochemical-free materials.



- ▶ Sugar-derived products
 - Sucrose esters of fatty acids • Sucrose octa-acetates • Sucrose benzoates
- ▶ Cellulose-derived products
 - Sodium carboxymethyl celluloses • Cellulose nanofibers
 - Thermoplastic celluloses • Flame retardant celluloses
- ▶ NEW FRONTIER (photocurable resin)
- ▶ TRIBIO (polylactic acid modifier)
- ▶ Waterborne polyurethanes
- ▶ Petrochemical-free surfactants

Chain explosion prevention

- ▶ Anti-chain explosion agent (polyurethanes)

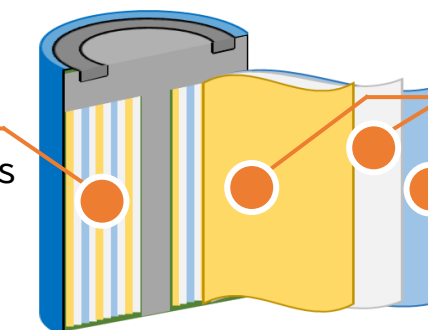


Battery materials

We contribute to realization of more sustainable societies by promoting battery materials.

Electrolyte materials

- ▶ Flame-retardant electrolytes
 - Ionic liquids
- ▶ Gelling agent
 - (Gel)polymers



Additives for positive/negative electrodes and separators

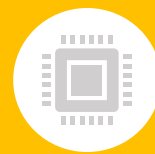
- ▶ Dispersants, thickeners
 - Sodium carboxymethyl celluloses
 - Cellulose nanofibers
- ▶ Adhesives
 - Water-based composite binders
 - Solvent-based polyimide resins

Energy industry

We manufacture high-performance conductive pastes for solar cells, which have high conductivity and excellent printability to realize high output of solar panels. We also have potting agents for power conditioners and CFRTP matrix resins which contribute to lightweighting and strengthening of windmill turbines.

- ▶ DD-1760 (conductive pastes)
- ▶ EIMFLEX (potting agents for PCBs)
- ▶ PU-based CFRTP matrix resins





DKS products are widely used in a variety of parts and materials in our daily life.



Food & pharmaceutical additives

DKS emulsifiers are used for various food products for oil-water emulsion stabilization, aeration, and inhibition of starch aging. They are also used as thickeners and/or lubricants.

- ▶ DK ESTER, DK FOAMER (sucrose esters of fatty acids)
- ▶ MONO ACE (emulsifier blends)
- ▶ AIPHTACT (polyvinyl pyrrolidones)

Agriculture

DKS products are used as a binder to prevent powdering of agrochemicals, and as a stabilizer for agrochemical water dispersions.

- ▶ NOIGEN (surfactants)
- ▶ DIKSSOL (surfactants blends)
- ▶ RHEOCRISTA (cellulose nanofibers)

Personal care products & detergents

Since DKS products give good texture and emulsion/dispersion stability, they are used as thickeners and stabilizers for personal care products. Surfactants with antibacterial and cleaning effects are also widely used.

- ▶ RHEOCRISTA (cellulose nanofibers)
- ▶ COSMELIKE (sucrose esters of fatty acids)
- ▶ NOIGEN, CATIOGEN, NEO-HITENOL, AMOGEN (surfactants)
- ▶ CREEJUS (polyvinyl pyrrolidones)
- ▶ MONOGEN, Gembu Soaps (soaps, detergents)
- ▶ Phenoxyethanol (preservatives)

Paints & insulating materials

Surfactants are used to make water-based paints highly water-resistant and give good adhesiveness. PU foams are used for insulation in buildings.

- ▶ HITENOL (polymerizable surfactant)
- ▶ NOIGEN, HITENOL (surfactants)
- ▶ DK POLYOL (rigid urethane foams)

Printing & inks

Waterborne polyurethanes are used as an ink binder and/or coating agent for the receptor layer, and surfactants with good pigment and dye dispersing effect are used to make inks with good tones.

- ▶ SUPERFLEX (waterborne polyurethanes)
- ▶ PLYSURF (ionic surfactants)
- ▶ RHEOCRISTA (cellulose nanofibers)
- ▶ PITZCOL, SHALLOL (water-soluble polymers)
- ▶ LAVELIN (dye dispersants)

Civil engineering & construction

DKS products are used in mountain tunnels as an anti-collapse agent for fragile rock formations and as a water-reducing admixture for concrete.

- ▶ SUPER SRF (rock caking agent)
- ▶ KOD-M (PU-based water reducing admixture, water-stopping agent)
- ▶ SELFLOW (water reducing admixture)



Life Sciences ◎ For healthy and pleasant 100 years

Aiming to contribute to a healthy society, we provide health foods such as Kainou-Tochukasou and Sudachin. We also have NIOCAN, a deodorant and sanitizer supervised by an olfactory measurement operator.



Biococoon Laboratories, Inc.
Morioka City, Iwate Prefecture

A DKS Group company and an Iwate University venture with over 40 years of experience in silkworm cordyceps researches



Kainou-Tochukasou

We discovered *Naturido* from Isaria Japonica, a novel ingredient that helps to maintain cognitive functions. It is a new functional food containing Naturido derived from Isaria Japonica.



A novel ingredient *Naturido* that works in the brain derived from Isaria Japonica:

Reported to have an effect to maintain certain cognitive functions such as

Visual memory

A skill to memorize events and/or what is visually observed



Cognition speed

A skill to quickly and appropriately decide on what is visually observed



of middle-aged and older adults



Sudachin

Sudachin is a supplement product made from *sudachitin*, a polyphenol extracted from the peel of sudachi citrus, a special crop of Tokushima, Japan. We are studying various functions of sudachitin.

Essential oils

These aromatic essential oils are extracted from the peels of sudachi, yuzu, and yuko citrus grown in Tokushima, Japan. Use whenever you feel like relaxing or brighten up your mind.



NIOCAN

Instantly canceling any odor

NIOCAN is a deodorizer and sanitizer developed by a professional olfactory measurement operator. Unlike conventional deodorizing mechanisms, it employs a neutralizing-deodorizing method using plant essential oils.



Ikeda Yakusou Co., Ltd.

Miyoshi City, Tokushima Prefecture

Manufacturing sudachi products with its extraction and pulverization technologies

Contract manufacturing

Ikeda Yakusou offers contract-based manufacturing services such as pulverization for health foods and chemical products at a GMP-certified plant. It has established a strict quality control system.

- ✓ High precision extraction technology
- ✓ High quality spray dryer (SD)
- ✓ Strict quality control systems: GMP, GQP, ISO9001 and HACCP



(from left)
Extraction tank,
spray dryer

Network

Japan

Laboratory



Headquarters



Headquarters
Laboratory
Gembu Co., Ltd.
Kyoto Elex Co., Ltd.



Ohgata Branch



Biococoon Laboratories, Inc.

Tanakura Branch

Tokyo Headquarters
Dai-ichi Kenkou Co., Ltd.

K&D Fine Chemical Corporation

Ikeda Yakusou Co., Ltd.

Kyushu Office

Nagoya Office

Shiga Branch

Dai-ichi Ceramo Co., Ltd.

Yokkaichi Branch

Chitose Plant
Kasumi Plant
Yokkaichi Chemical Co., Ltd.

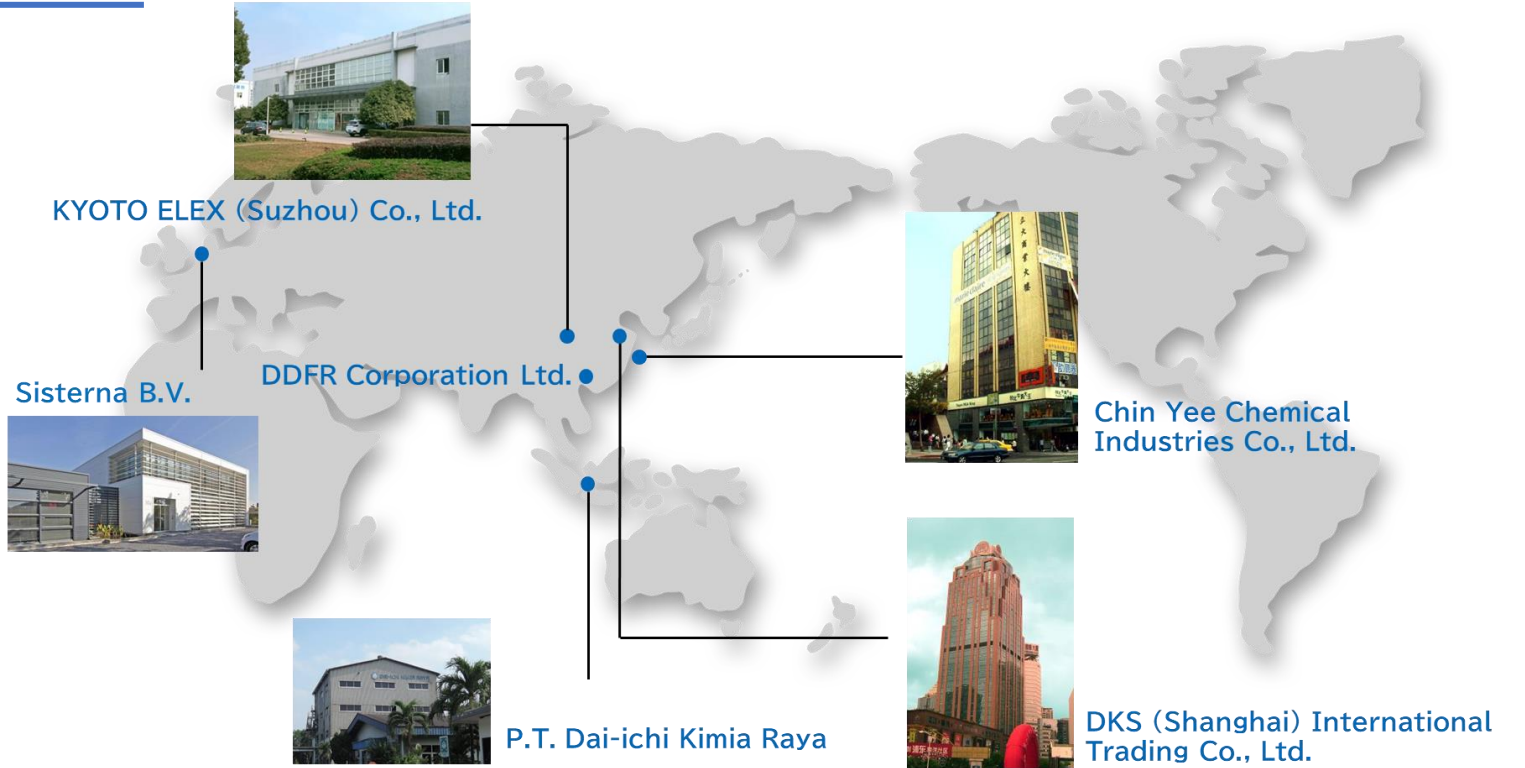


Production site	Main products
Yokkaichi Branch	Functional chemical products Urethane-related chemicals Plastic additives
Ohgata Branch	Sodium carboxymethyl celluloses Waterborne polyurethanes Professional detergents Polyvinyl pyrrolidones
Shiga Branch	Surfactants Sucrose fatty acid esters Food additive formulations Professional detergents
Tanakura Branch	Healthy food (Tochukasou)

Subsidiary	Business activities
Yokkaichi Chemical Co., Ltd.	Production and sales of surfactants
Gembu Co., Ltd.	Sales of detergents, finishing agents and equipment for professional laundry Sales of industrial/professional-use deodorants
Kyoto Elex Co., Ltd.	Production and sales of electronic materials
Dai-ichi Ceramo Co., Ltd.	Production and sales of feedstock for powder injection molding

Subsidiary	Business activities
Dai-ichi Kenkou Co., Ltd.	Production and sales of agents for civil engineering and construction
Biococoon Laboratories, Inc.	R&D regarding drugs and health care ingredients Production of foods and health care products
Ikeda Yakusou Co., Ltd.	Production of drug substances and ingredients for health food Production and sales of life sciences products, such as drugs and quasi-drugs
K&D Fine Chemical Corporation	Production and sales of surfactants

Overseas



Subsidiary	Business activities
Chin Yee Chemical Industries Co., Ltd	Production and sales of surfactants and plastic/electronic materials
Sisterna B.V.	Application development and sales of sucrose esters of fatty acids
PT Dai-ichi Kimia Raya	Production and sales of textile agents, paper processing agents, plastic additives and food additives
DKS (Shanghai) International Trading Co., Ltd.	Trading
KYOTO ELEX (Suzhou) Co., Ltd.	Production and sales of electronic materials
DDFR Corporation Ltd.	Sales of plastic additives, e.g. flame retardants