Introduction of Our Business for 1st Half of FYE 3/2021

November 6th, 2020

STELLA CHEMIFA CORPORATION

Securities code: 4109

Corporate Profile

(as of September 30, 2020)

Corporate Name	STELLA CHEMIFA CORPORATION
Head Office	Meiji Yasuda Seimei Osaka Midosuji Bldg. 10F, 4-1-1 Fushimi-machi, Chuo-ku, Osaka City, Osaka
Founded/Established	February 1916 / February 1944
Capital Fund	4,829,782,512 yen
Representatives	Representative Director, President and Chief Executive Officer: Aki Hashimoto Representative Director, Senior Managing Executive Officer (Products Management Group): Kiyonori Saka
URL	https://www.stella-chemifa.co.jp/english/
Number of Employees	300
Sales Department	Osaka Sales Department (Chuo-ku, Osaka city, Osaka) Tokyo Sales Department (Chiyoda-ku, Tokyo)
Factory	Sanpo Factory (Sakai-ku, Sakai City, Osaka) Izumi Factory (Izumiotsu City, Osaka) Kitakyushu Factory (Yahatanishi-ku, Kitakyushu City, Fukuoka)

Subsidiaries & Associates

At home (3 companies)

Transportation Business	BLUE EXPRESS, Inc.	Sakai-ku, Sakai City, Osaka
Other Business	BLUE AUTO TRUST Co., Ltd.	Sakai-ku, Sakai City, Osaka
Medical Business	STELLA PHARMA CORPORATION	Chuo-ku, Osaka city, Osaka

Abroad (7 companies)

High-Purity Chemical Business	STELLA CHEMIFA SINGAPORE PTE LTD	Singapore
Transportation Business	STELLA EXPRESS (Singapore) PTE LTD	Singapore
High-Purity Chemical Business	Blue Express (Shanghai) International Trade Inc.	China
Transportation Business	Blue Express (Shanghai) International Freight Forwarding Co., Ltd.	China
High-Purity Chemical Business	Zhejiang Blue Star Chemical Co., Ltd.	China
High-Purity Chemical Business	FECT CO.,LTD	South Korea
High-Purity Chemical Business	Quzhou BDX New Chemical Materials Co., Ltd.	China

Introduction of Our Business

Manufacture and applications of hydrogen fluoride

CaF_2 (Calcium fluoride (Fluorite)) + H_2SO_4 (Concentrated sulfuric acid) = **2HF Hydrogen fluoride** + $CaSO_4$ (Calcium sulfate)

* There are five main grades of fluorite purity, and for semiconductor applications, high quality fluorite with a purity of 97% or higher is required.

- Calcium sulfate → **Concrete materials, etc.**
- **Reaction and refinement using our proprietary technology**
  - **Treatment of surface such as stainless steel**
  - **Raw materials such as alternatives for CFCs**
  - **Etching agent for semiconductor liquid crystals**
  - **Materials for lithium-ion secondary batteries**
  - **Camera lens materials for semiconductor manufacturing equipment**
  - **Reaction catalyst Other products**

Introduction of Our Business

High-Purity Chemical Business

Surface Treatment	Manufacture and sale of chemicals used for acid cleaning of stainless steel and slimming of LCD panels
Alternatives for CFCs	Manufacture and sale of hydrofluoric anhydride, raw materials for CFCs and fluoropolymers
Batteries	Manufacture and sale of additives to improve the performance of lithium-ion secondary batteries
Semiconductors/LCDs	Manufacture and sale of chemicals for etching in the semiconductor and LCD panel manufacturing processes
Semiconductor Devices	Manufacture and sale of raw materials for camera and stepper lenses, tantalum production aids for tantalum capacitors, etc.
Catalysts	Manufacture and sale of raw materials for fluoropolymers and catalysts for the manufacture of pharmaceutical intermediates, etc.
Gypsum	Sale as raw material for concrete, etc. (Byproduct of hydrofluoric acid production)
General Products	Manufacture and sale of fluorine compounds for toothpaste, concentrated boron compounds, etc.
Other	Sales of purchased goods, etc.

Introduction of Our Business - Semiconductors/LCDs -

Ultra-High Purification Technology

- Impurity levels of less than 1 ppt (1×10^{-12}) are controlled by ultra-purification and ultra-cleaning technologies.
- Mass production of ultra-pure chemicals for ultra-high integrated circuit

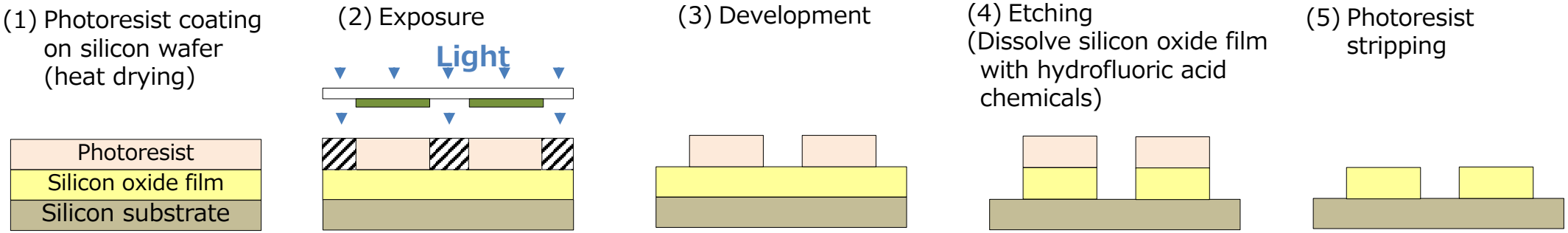
Ultra High Purity Hydrofluoric Acid

- Hydrofluoric acid (HF) is the only chemical capable of etching out silicon oxide film
- Chemical solutions are indispensable to the semiconductor manufacturing process and require ultra-high purity
- In particular, dilute hydrofluoric acid is used in a number of semiconductor processes

Ultra High Purity Buffered Hydrofluoric Acid

- Mixed aqueous solution of hydrofluoric acid (HF) and ammonium fluoride (NH_4F)
- Mainly used in processes such as etching and cleaning of insulation films
- Chemicals with etch rates ranging from tens of Å/min to thousands of Å/min can be produced

Example of Application (Photolithography Process)



Introduction of Our Business - Semiconductors/LCDs -

Production capacity of High Purity Hydrofluoric Acid for Semiconductors

Kitakyushu Factory

Kitakyushu City, Fukuoka

30,000 t /year

Sanpo Factory

Sakai City, Osaka

65,000 t /year

STELLA CHEMIFA SINGAPORE

Singapore

10,000 t /year

105,000 t /year

*** As a comprehensive manufacturer of fluorine compounds, we use our own technology to do everything from manufacturing to filling.**

Introduction of Our Business - Batteries -

Additives

- Additive for electrolytic solution to improve the performance of lithium-ion secondary batteries
- High-temperature endurance・High conductivity・Increased capacity・Low resistance・Flame retardance

Izumi Factory's manufacturing building (Izumiotsu City, Osaka)

Lithium Hexafluorophosphate

- High-purity electrolytes for lithium-ion secondary batteries

* Manufacturing at our affiliate company in China (Maximum production capacity: 1,300 t/year)

Example of materials used in lithium-ion secondary batteries

Additives	Positive and negative electrode	Separator	Current collector
Electrolyte	Binder	Protective IC	PTC element

Quzhou BDX New Chemical Materials Co., Ltd. (China)

Action on the Development of Materials for the Next-Generation Battery

[Metal-ion secondary batteries]	High-purity electrolytes for sodium-ion secondary batteries (sodium hexafluorophosphate)
[All-solid secondary batteries]	Fluoride materials for all solid-state batteries
[Fluoride-ion secondary batteries]	Fluoride-ion conductor material

Introduction of Our Business - Enriched Boron -

Enrichment plant
(Izumiotsu City, Osaka)

Enriched Boron (Boron-10)

- Natural boron is made up of two isotopes, boron-10(20%) and boron-11(80%)
- Developed technology to enrich boron-10 to over 95%
- Established mass production technology of enriched boron for the first time in Japan(2000)
- Boron-10 has an extremely high capacity to absorb neutrons

Applications of Enriched Boron Compounds

- Neutron-absorbing material of spent nuclear fuel transportation and storage containers
- Material of control rods of nuclear reactors and rack material of spent nuclear fuel pools
- Excess reaction control of pressurized-water reactors by dissolving into primary cooling water
- Raw materials for cancer drug for boron neutron capture therapy (BNCT:Boron Neutron Capture Therapy)

Introduction of Our Business - GMP-related -

Tin Fluoride

- 2017
  The GMP inspection by USFDA for tin fluoride, an active ingredient of OTC anticaries drugs, was completed, and obtained official approval.
- 2018
  Started marketing of “tin fluoride” as a GMP-compliant product.

Izumi Factory's manufacturing building
(Izumiotsu City, Osaka)

<Actions of fluorine on teeth>

- To suppress Streptococcus mutans from producing acid (Cavity prevention)
- To promote tooth remineralization
- To form acid-resistant teeth (to form fluorapatite)

* We expect to see big demand mainly in Europe and the US, where there is strong interest in dental health and beauty.

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* **What is FDA?**
FDA stands for Food and Drug Administration in the U.S.
(A public agency, similar in function to the Ministry of Health, Labour and Welfare in Japan)

* **What is GMP?**
It stands for “Good Manufacturing Practice”, which refers to a common standard for manufacturing and quality control of drugs and quasi-drugs.

Introduction of Our Business - Other product examples -

(Product information)

Optical Material-Related

◆Calcium Fluoride ◆Aluminum Fluoride ◆Lithium Fluoride ◆Strontium Fluoride ◆Barium Fluoride
◆Magnesium Fluoride ◆Zinc Fluoride ◆Lead Fluoride

Reactive Catalyst-Related

◆High Purity Boron Trifluoride ◆Boron Trifluoride Diethyl Ether ◆Boron Trifluoride Dimethyl Ether
◆Boron Trifluoride n-Butyl Ether ◆Boron Trifluoride Phenol ◆Boron Trifluoride Monoethyl Amine
◆Boron Trifluoride Piperidine ◆Triethylamine 3HF

Surface Treatment, Alternatives for CFCs-Related

◆Anhydrous Hydrofluoric Acid ◆55% Hydrofluoric Acid

Nuclear Energy-Related

◆^{10}B Enriched Potassium Fluoroborate
◆ ^{10}B Enriched Boric Acid

Other Products

◆Fluorosilicic Acid ◆Potassium Fluorosilicate ◆Fluoroboric Acid ◆Tin Fluoroborate
◆Copper Fluoroborate ◆Lead Fluoroborate ◆Sodium Fluoroborate ◆Potassium Fluoroborate
◆Ammonium Hydrogenfluoride ◆Sodium Fluoride ◆Potassium Fluoride ◆Ammonium Fluoride
◆Potassium Hexafluorozirconate ◆Potassium Hexafluorotitanate ◆Refined Calcium Fluoride
◆Potassium Hexafluorophosphate

Newly-Developed Products

◆Detergents Suppressing Etching of Silicon Nitride Film ◆Detergents Inhibiting Silicon and Polysilicon Damage
◆Various Fluoride Nanoparticles Dispersant (Magnesium, Lithium, Ytterbium, Calcium) ◆Various Ionic Liquids
◆Special-Purpose Inorganic Fluorine Compounds ◆Fluorinated Carbon Nano-Tubes
◆Phosphor and its related materials

Introduction of Our Business

くらしのなかの ステラケミファ

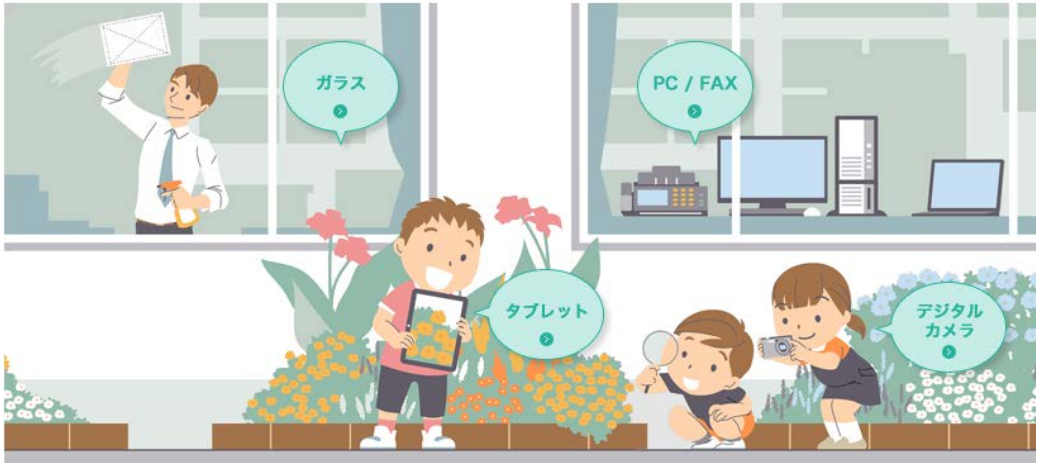
* For details, please visit the website.

街のなかでもステラケミファ

家のなかでもステラケミファ

病院のなかでもステラケミファ

学校のなかでもステラケミファ



Introduction of Our Business - Transportation Business -

(HP URL)

Transportation Business

BLUE EXPRESS, Inc.

Transport	Land transport ・Marine transport・Rail transport
Customs Clearance	Customs clearance ・Loading and Unloading
Warehousing	Providing multi-functional warehouses fully equipped with the latest systems
Container services	Supplying large and pressurized containers that meet ISO specifications, medium-size IBC pressurized containers, as well as IBC containers with UN specifications,and also offering services for cleaning, repairing and leasing the containers

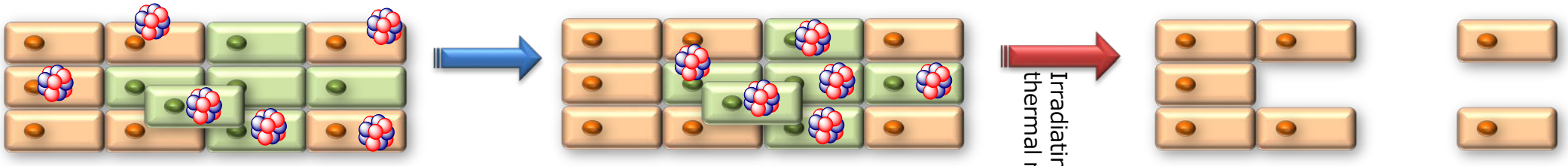
Customs clearance sites	Shipping terminals	Overseas Bases
Ohama Office	Sendai Office	Singapore
Osaka Office	Kanto Office	China(Shanghai)
Yokohama Office	Yokohama Office	
	Shimizu Office	
	Nagoya Office	
	Ohama Office	
	Kobe Office	
	Kitakyushu Office	

(HP URL)

Medical Business

STELLA PHARMA CORPORATION

Boron Neutron Capture Therapy	(Boron Neutron Capture Therapy : BNCT)
Mechanism of BNCT	A particle beam treatment that selectively destroys cancer cells by using the nuclear fission reaction between boron (Boron-10) and thermal neutrons produced by injecting a boron agent into cancer cells and irradiating the affected area with neutrons from outside the body.



Administration of Boron-10 compound (BPA)

Boron-10 compound (BPA) is selectively brought into cancer cells.

Cancer cells with Boron-10 compound (BPA) are selectively destroyed.

Efforts to Expand the Indications

Head and neck cancer (recurrent head and neck cancer)	We have obtained marketing and manufacturing approval for pharmaceutical products.(Boron preparation:Steboronine®)
Brain tumor (recurrent malignant glioma)	A phase II study is underway. (Under the consultation of the Prioritized Review System for innovative medicines [SAKIGAKE Designation System])
Melanoma/angiosarcoma	A phase I clinical study is underway.
Recurrent high-grade meningioma	A physician-led phase II study is underway. (An investigational new drug has been provided)