Notes : In this presentation, "FY2017" refers to the year ending March 31, 2018. In addition, "FY2017 3M" refers to the period from April to June 2017.

### FY2017 1Q and Three-Month Financial Results

Securities code: 4109





### 1. FY2017 1Q and Three-Month Financial Results

- Basic Financial Data (Consolidated)
- Consolidated Statement of Income
- Non-operating Profit and Loss/Extraordinary Profit and Loss
- Sales Revenue and Operating Profit by Business
- Quarterly Operating Profit
- Consolidated Balance Sheet
- Capital Expenditures, Depreciation & Amortization, Research
   & Development Expenses



#### <Basic Financial Data (Consolidated)>

	FY2017 3M (Apr-Jun)	FY2016 3M (Apr-Jun)	Y	οΥ
(In millions of yen)	Actual	Actual	Increase/ Decrease	Percentage Increase/ Decrease
Sales Revenue	8,159	7,187	972	13.5
Operating Profit	888	960	-71	-7.4
Ordinary Profit	781	312	469	150.4
Profit Attributable to Owners of Parent	475	238	237	99.4

(In millions of yen)	Jun.30, 2017	FYE 3/2017	Increase/ Decrease
Total Assets	50,250	52,081	-1,830
Equity Capital	28,216	28,078	138
Interest-bearing Liabilities	13,442	13,967	-524



#### <Consolidated Statement of Income>

				YoY		
(In millions of yen)	FY2017 3M (Apr—Jun)	FY2016 3M (Apr-Jun)	Increase/ Decrease	Percentage Increase/ Decrease		
Sales Revenue	8,159	7,187	972	13.5		
Gross Profit	1,869	1,882	-12	-0.7		
Gross Profit Margin(%)	22.9	26.2	_			
SG&A	980	922	58	6.4		
Operating Profit	888	960	-71	-7.4		
<b>Operating Profit Margin(%)</b>	10.9	13.4	_			
Ordinary Profit	781	312	469	150.4		
Profit before Income Taxes	721	307	414	134.7		
Profit Attributable to Owners of Parent	475	238	237	99.4		



#### <Non-operating Profit and Loss/Extraordinary Profit and Loss>

#### ■ Non-operating Profit and Loss

	(In millions of yen)	FY2017 3M (Apr-Jun)	FY2016 3M (Apr-Jun)
Non-operating Profit		123	32
	Interest income	0	1
	Gain on valuation of derivatives	94	—
	Other	28	31
Nc	on-operating Expenses	230	680
	Interest expenses	10	13
	Share of loss of entities accounted for using equity method	67	9
	Loss on valuation of derivatives	—	404
	Foreign exchange losses	107	217
	Other	45	35

#### Extraordinary Profit and Loss

	(In millions of yen)	FY2017 3M (Apr-Jun)	FY2016 3M (Apr-Jun)
E	xtraordinary Profit	5	5
	Gain on sales of non-current assets	5	5
E	xtraordinary Losses	65	9
	Loss on abandonment of non- current assets	65	9
	Loss on sales of non-current assets	0	0
	Loss on sales of investment securities	_	0



#### <Sales Revenue and Operating Profit by Business>

	FY2017 3M (Apr-Jun)		FY2016 3M (Apr—Jun)		Percentage Increase/Decrease		
	(In millions of yen)	Sales Revenue	Operating Profit	Sales Revenue	Operating Profit	Sales Revenue	Operating Profit
High-p Busin	ourity Chemical ess	7,071	891	6,105	979	15.8	-9.0
	Surface Treatment	470		490		-4.1	
[uwo	Alternatives for CFCs	658		574		14.5	
Breakd	Batteries	1,403		1,295		8.3	
iness: [	Semiconductors/LCDs	3,537		2,887		22.5	
cal Bus	Semiconductor Devices	179		103		74.3	
Chemic	Catalysts	217		209		3.9	
-purity	Gypsum	22		24		-10.8	
[High	General products	372		320		16.3	
	Other	209		199		4.9	
Trans	portation Business	1,046	197	1,032	180	1.4	9.4
Medic	al Business	_	-210	_	-209	_	—
Other	Business	41	5	49	5	-16.5	-1.7



#### <Quarterly Operating Profit>





#### <Consolidated Balance Sheet>

(In millions of yen)	Jun.30,2017	FYE 3/2017	Increase/Decrease
Current Assets	26,947	28,069	-1,122
Cash and Deposits	12,264	14,361	-2,097
Notes and Accounts Receivable – trade	8,493	7,867	625
Non-current Assets	23,303	24,011	-708
Property, Plant and Equipment	21,535	22,072	-537
Intangible Assets	124	129	-4
Investments and Other Assets	1,642	1,808	-166
Current liabilities	11,001	12,566	-1,565
Short-term Loans Payable	2,300	2,320	-20
Long-term Loans Payable within 1 year	3,560	3,684	-123
Non-current liabilities	9,633	9,998	-364
Bonds Payable	2,000	2,000	
Long-term Loans Payable	5,582	5,962	-379
Net Assets	29,615	29,516	99
Shareholders' Equity	27,946	27,771	175
Liabilities and Net Assets	50,250	52,081	-1,830



#### <Capital Expenditures, Depreciation & Amortization, Research & Development Expenses>

(In millions of yen)	FY2017 3M (Apr-Jun)	FY2016 3M (Apr-Jun)
Capital Expenditures	245	145
Depreciation & Amortization	811	780
Research & Development Expenses	333	321



# 2. Financial Forecast for FYE 3/2018

- Financial Forecast
- Forecast by Segment



#### <Financial Forecast>

\* Revised on Aug.8,2017

(In millions of yen)	FYE 3/2018 Revised Full-year forecast*	FYE 3/2018 Previous Full-year forecast	FYE 3/2017 Full-year results	FYE 3/2016 Full-year results
Sales Revenue	33,300	30,472	29,850	27,509
Operating Profit	4,700	3,350	4,372	1,388
Ordinary Profit	4,700	3,323	4,154	1,044
Profit Attributable to Owners of Parent	3,300	2,497	2,824	1,323
Current Net Profit Per Share	268.20	203.01	234.56	110.33
Capital Expenditures	3,010	3,010	2,328	1,302
Depreciation & Amortization	3,309	3,309	3,117	3,525
Research & Development Expenses	1,613	1,557	1,274	1,163



#### <Financial Forecast by Segment>

\* Revised on Aug.8,2017

		FYE 3 Revised fored	8/2018 Full-year cast*	FYE 3 Previous fore	8/2018 Full-year cast	FYE 3 Full-yea	8/2017 r results	FYE 3 Full-year	/2016 results
	(In millions of yen)	Sales Revenue	Operating Profit	Sales Revenue	Operating Profit	Sales Revenue	Operating Profit	Sales Revenue	Operating Profit
High-purity Chemical Business		29,100	5,030	26,016	3,687	25,501	4,422	23,087	1,390
Ĺ Ĺ	Surface Treatment	1,720		1,808		2,033		2,097	
akdow	Alternatives for CFCs	3,410		2,089		2,463		2,023	
: Brea	Batteries	5,670		6,438		5,072		2,989	
siness	Semiconductors/LCDs	14,350		12,304		12,310		12,224	
al Bu	Semiconductor Devices	760		464		527		545	
hemic	Catalysts	770		814		854		846	
Irity C	Gypsum	110		80		94		107	
igh-pu	General products	1,450		1,374		1,342		1,461	
Ξ	Other	860		640		803		791	
Tra	ansportation Business	4,020	720	4,269	635	4,143	698	4,195	664
Ме	dical Business	_	-1,080	_	-1,019	_	-792	-	-691
Ot	her Business	180	30	187	31	204	30	226	6



### 3. STELLA CHEMIFA CORPORATION

- Corporate Profile/Sales Office Locations/Plant Locations (as of June 30, 2017)
- List of Affiliated Companies
- High-purity Chemical Business



#### <Corporate Profile/Sales Office Locations/Plant Locations (as of June 30, 2017)>

#### • Corporate profile

Corporate name:	STELLA CHEMIFA CORPORATION	
Head Office:	Midosuji MTR Building 3F, 3-6-3 Awaji-machi, Chuo-ku,	Osaka
Founded:	February 1916	k (1111)
Established:	February 1944	*
Capital:	3,688,260,564 yen	INNER
Representatives:	Chairperson, Representative Director: Junko Fukada	<i>HERE</i>
	President, Representative Director: Aki Hashimoto	<b>MARKE</b>
URL:	http://www.stella-chemifa.co.jp/	and the first



Osaka Sales Department:	Midosuji MTR Building 4F, 3-6-3 Awaji-machi,
	Chuo-ku, Osaka
Tokyo Sales Department:	Tokyo Tatemono Yaesu Building 2F, 1-4-16 Yaesu,
	Chuo-ku, Tokyo

#### Factory addresses

Sanpo Factory:7-227 Kaisan-cho, Sakai-ku, SakaiIzumi Factory:1-41 Rinkai-cho, IzumiotsuKitakyushu Factory:1-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu



#### <List of Affiliated Companies>

Base	Logo Corporate Name		Business Segment	Location
At home	OSTELA	Stella Chemifa Corporation	High-purity Chemical Business	Chuo-ku, Osaka
	Ø alue express	Blue Express, Inc.	Transportation Business	Sakai-ku, Sakai
	ØBLUE AUTØ TRUST	Blue Auto Trust Co., Ltd.	Other Business	Sakai-ku, Sakai
	🥥 ステラ ファーマ株式会社	Stella Pharma Corporation	Medical Business	Chuo-ku, Osaka
	Ostern:singapore	Stella Chemifa Singapore Pte Ltd.	High-purity Chemical Business	Singapore
	Ø alue express	Stella Express(Singapore) Pte Ltd.	Transportation Business	Singapore
	Ø BLUE EXPRESS	Blue Express (Shanghai) International Trade Inc.	High-purity Chemical Business	China
Abroad	Ø BLUE EXPRESS	Blue Express (Shanghai) International Freight Forwarding Co., Ltd.	Transportation Business	China
	От на ва снема спе	Zhejiang Blue Star Chemical Co., Ltd.	High-purity Chemical Business	China
	FECT	FECT Co., Ltd.	High-purity Chemical Business	South Korea
	C E E C C C C C C C C C C C C C C C C C	Quzhou BDX New Chemical Materials Co., Ltd.	High-purity Chemical Business	China



< Manufacture and Sale of High-purity Chemical Products>

Our products, fluorine compounds, have continued to be used in the manufacturing process of various products.

Segment name	Main product	Applications	
Surface treatment	Hydrofluoric acid for industrial use	Used for acid cleaning of stainless steel and for thinning glass substrates for LCDs	
Alternatives for CFCs	Anhydrous hydrofluoric acid	Material for chlorofluorocarbon and fluorine resin	
Batteries	Lithium hexafluorophosphate	Electrolyte for electrolytic solution of lithium-ion secondary batteries	
Semiconductors	High-purity hydrofluoric acid	Cleaning solution for silicon wafers and LCDs	
and LCDs	High-purity buffered hydrofluoric acid	Solar batteries	
Semiconductor	High-purity fluoride (CaF <sub>2</sub> , PbF <sub>2</sub> , MgF <sub>2</sub> , AlF <sub>3</sub> and others)	Lens material for i-line steppers and cameras	
devices	Potassium fluoride	Auxiliary agent for manufacturing tantalum for tantalum capacitors	
General products	Tin fluoride	Quasi-drug	



### **Semiconductors and LCDs**

- Features of our products
- Result and Forecast of world semiconductor market scale by regions
- New business development in growing market
- Maintenance and strengthening of quality edge
- Change of shipping volume of high-purity hydrofluoric acid (semiconductors and LCDs)



#### <Features of our products>

- (1) With our ultra purification technology and ultra sensitive technology, we are able to supply the ultra-high-purity hydrofluoric acid and the ultra-high-purity buffered hydrofluoric acid with the best quality in the world.
- (2) Products Lineups are readied to respond the customer requirements, including like suppression of adhering particles, and suppression of increased roughness of wafer surfaces, and others, for the semiconductor and FPD manufacturing process.

Product name (Semiconductor and LCDs)		Description	
Ultra-high-purity hydrofluoric acid		The ultra-high-purity chemical used for wet etching and wet cleaning of silicon wafers in manufacturing semiconductors, FPDs, solar batteries and MEMS.	
Ultra-high-purity buffered hydrofluoric acid		The ultra-high-purity chemical mixed hydrofluoric acid and ammonium fluoride.	
	BHF (buffered hydrofluoric acid)	The chemical mixed 50% hydrofluoric acid and 40% ammonium fluoride solutions.	
	LL BHF	BHF with various functionalities by adding a surfactant.	
	LAL BHF	BHF containing a surfactant which has achieved extended service life and other advantages by optimizing the concentration of ammonium fluoride.	
	LA BHF	BHF which etches silicon oxide at high speed.	
HSN Series		Silicon oxide etchant with High Selectivity for silicon nitride.	
LPL BHF (tentatively called)		Silicon oxide etchant without damaging to silicon and poly-silicon absolutely.	



<Results and forecast of world semiconductor market scale by regions>





#### <New business development in growing market>

#### Main new semiconductor factories planned in China

Manufacturer	Place of construction	Produced item	Wafer size	Production capacity	Start of production
тѕмс	Nanjing	Logic IC	12 inches	200,000 wafers/month	Second half of FY 2018
UMC	Amoy	Logic IC	12 inches	First stage: 50,000 wafers/month (completed) Second stage: 50,000 wafers/month	Second stage: Mid-FY 2017
Fujian Electronics & Information (Technology licensed by UMC)	Quanzhou	DRAM	12 inches	First stage: 60,000 wafers/month Second stage: 60,000 wafers/month	Second half of FY 2018
	Chongqing	IC	12 inches	15,000 wafers/month	FY 2017
Giobaltoundries	Chengdu	–	12 inches	several tens of thousands of wafers/month	FY 2019
Yangtze River Storage Technology (YRST) *Tsinghua Unigroup acquired capital in XMC.	Wuhan	3D-NAND DRAM	12 inches	20,000 wafers/month → 300,000 wafers/month	FY2018 FY2020
Nexchip (PSC)	Hefei	Logic IC	12 inches	_	FY 2018 to FY 2019

additionally, large-scale investments are planned on new semiconductor factories in China.

[SMIC (Beijing, Shanghai, Tianjin, and Shenzhen), HLMC (Shanghai), Intel (Dalian), etc.]

Furthermore, expansion factory by Samsung (Xian), CMOS image sensor factory (Huaiyin) by Tacoma and Tower Jazz, and others, are also under conception stage, suggesting active launch of overseas manufacturers into China.

### We have proceeded to the China semiconductor development with the effective strategies.



#### <Maintenance and strengthening of quality edge>

#### SA Grade HF quality

Product technology generation	≥ 45 nm	28 nm	≤ 16 nm	
Our product grade	SA/SA-X	SA-XX	SA-XXX	
Metal impurities level	< 100 ppt	< 10 ppt	< 1 ppt	Succeeded in ultra-high-purity
Management size of particle	0.2/0.1 um	0.05 um	0.03 un	7
	Further strengthening particle management			

We respond the needs of semiconductor manufacturers with introducing the World's most advanced analytical instruments.





#### <Change of shipping volume of high-purity hydrofluoric acid (semiconductors and LCDs)>





### **Batteries**

- Features of our products
- Changes in lithium-ion battery market size and trends in electric-powered vehicles
- Launch of electrolyte business for lithium-ion secondary batteries in China
- Additive for lithium-ion batteries



#### <Features of our products>

- (1) Used as main material comprising the lithium-ion secondary batteries and commercialized ahead of other companies
- (2) Because of the product's high purity, it is recently being used for high-performance lithium-ion secondary batteries.

Product name (related to batteries)	Description
Lithium hexafluorophosphate	Electrolyte for lithium-ion secondary batteries Electrolyte for other batteries
Lithium tetrafluoroborate	Electrolyte and additives for lithium-ion primary and secondary batteries
Additive for batteries	Additive for lithium-ion batteries





<Lithium hexafluorophosphate particle form>



<Lithium tetrafluoroborate>

<Large-size container: 1 m3>



### <Changes in lithium-ion battery market size and trends in electric-powered vehicles>



Market rollout of electricpowered vehicles will be accelerated in the years to come.





Source: Materials of Fuji Chimera Research Institute, Inc.



#### <Launch of electrolyte business for lithium-ion secondary batteries in China>

\*Converted at the rate of 1 Chinese yuan = 19 yen (as of October 27, 2015)

Name	Quzhou BDX New Chemical Materials Co., Ltd. (established in December 2015)
Location	17 Nianhua Road, Kecheng District, Quzhou City, Zhejiang Province, People's Republic of China
Business lineup	Lithium hexafluorophosphate (LiPF6) Research & development and production of byproduct hydrofluoric acid for industrial use, hydrochloric acid and other fluorine containing chemical system products Sales of in-house products and provision of related services
Capital fund	70 million Chinese yuan (1,330 million yen*) Stella: 25.0%; Quzhou NGF Chemicals Co., Ltd.: 75.0%
Objectives	In China, continuous growth of lithium-ion secondary battery industry is anticipated. A local production system is established to handle demand in China.
Details of cooperation	Part of the manufacturing facilities of electrolyte for lithium-ion batteries is relocated to a joint company. The joint company produces the electrolyte for lithium-ion batteries by the relocated facilities and markets the electrolyte in and outside China.



Outline



#### <Launch of business of electrolyte for lithium-ion secondary batteries in China>

Quzhou BDX New Chemical Materials Co., Ltd.







Manufacturing building

- <Plan and schedule>
- 2016

Completion of relocation of manufacturing facilities (Manufacturing capacity: 1,300 t/year at maximum)

June 2017

Start of operation of manufacturing facilities. As soon as product evaluation (including suppliers) is completed, sales is slated to be started.





#### <Additives for lithium-ion batteries>



Demand

Beyond the Chemical P.28



### **GMP-related**

GMP (Good Manufacturing Practice)



#### <GMP (Good Manufacturing Practice)>

#### Standards for Manufacturing Control and Quality Control for Drugs and Quasi-drugs

Three principles: "Reducing human errors to the lowest level" "Preventing contamination and product quality loss" "Designing systems to assure high product quality"



Inside Izumi Factory (Izumi Otsu City)



#### <GMP (Good Manufacturing Practice)>

For manufacturing semiconductors



Sales started.

Full-scale operation in 2016



## Boron isotope (<sup>10</sup>B)

- <sup>10</sup>B enrichment technology, what is <sup>10</sup>B, and production capacity
- Characteristics of <sup>10</sup>B and applications of <sup>10</sup>B compounds



#### **Establishment of enrichment technology**

We established a mass production technology of <sup>10</sup>B for the first time in Japan and in November 2000, the only enrichment plant in Japan was completed.



<The only <sup>10</sup>B enrichment plant in Japan> (completed in November 2000)

#### What is enriched boron (<sup>10</sup>B)?

Natural boron is comprised of an isotope of <sup>10</sup>B and <sup>11</sup>B. An existence ratio of <sup>10</sup>B is approximately 20%, and an existence ratio of <sup>11</sup>B is approximately 80%. We can enrich an existence ratio of <sup>10</sup>B more than 95%.

#### Production capacity

Enriched boron (<sup>10</sup>B): 6,000 kg/year (40 tons/year as boric acid)



#### Features of enriched boron

<sup>10</sup>B offers properties of remarkably high neutron absorption capacity, and by increasing <sup>10</sup>B concentration, the absorption capacity is improved significantly.

#### ■Applications of <sup>10</sup>B 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.
- Cancer drug for boron neutron capture therapy (BNCT)



Spent nuclear fuel storage container (Neutron shield material)

Courtesy of Kobe Steel Takasago Works



### 4. Medical Business

- Corporate Profile (as of June 30, 2017)
- Boron Neutron Capture Therapy (BNCT)
- World's First Accelerator-based BNCT Clinical Trial
- Boron-based Drug SPM-011 for BNCT Designated for MHLW Prioritized Review System for innovative medicines "SAKIGAKE"
- Participation in Development of Cancer Diagnosis Technology



#### <Corporate Profile (as of June 30, 2017)>

- **Company name:** STELLA PHARMA CORPORATION
- Address: 3-2-7 Koraibashi, Chuo-ku, Osaka-shi, Osaka
- **Representative:** Tomoyuki Asano, Representative Director and President
- Established: June 2007
- **Business lineup:** Research and development, manufacture and marketing, etc. of drugs and medical devices
- Capital fund: 1,900 million yen
- Shareholders:Stella Chemifa CorporationInnovation Network Corporation of JapanSumitomo Heavy Industries, Ltd.
- Laboratory: Sakai Drug Discovery Research Center (Naka-ku, Sakai-shi, Osaka)

URL: http://www.stella-pharma.co.jp/



**STELLA PHARMA** 



#### <Boron Neutron Capture Therapy (BNCT)>

### **Boron Neutron Capture Therapy**

Boron Neutron Capture Therapy (BNCT) is a particle beam radiation therapy which damages cancer cells specifically by making the best of nuclear fission reactions between boron 10, stable isotope of boron, and thermal neutrons with small energy.





#### <World's First Accelerator-based BNCT Clinical Trial>

### Phase II study is going on.

The world's first BNCT clinical trials using the boron-based drug for BNCT (SPM-011), which Stella Pharma developed, as well as the accelerator-based irradiation system for BNCT, developed by Sumitomo Heavy Industries, "Phase II study for recurrent malignant glioma (high-grade brain tumor)" started in December 2015 and "Phase II study for head and neck cancer" in June 2016. These trials were started after submitting the clinical trial plan notification, and are still ongoing.



Verification of effect by the dose decided.

#### Beyond the Chemical P.38

Neutron dose is increased stepwise to check safety.



#### <Boron-based Drug SPM-011 for BNCT Designated for MHLW Prioritized Review System for innovative medicines "SAKIGAKE">

Boron-based drug "SPM-011" for BNCT for which Stella Pharma Corporation performs clinical development was designated by Ministry of Health, Labour, and Welfare (MHLW) for "Prioritized Review System for innovative medicines 'SAKIGAKE'" on April 21, 2017.

Drug name	Intended indications and effects	Name or trade name of applicant
SPM-011	<ul> <li>Recurrent malignant gliomas</li> <li>Unresectable locally recurrent head and neck cancer and locally-advanced head and neck cancer (non-squamous cell carcinoma)</li> </ul>	Stella Pharma Corporation

The BNCT system (accelerator-based irradiation system) of Sumitomo Heavy Industries, Ltd. who jointly carries out the clinical study was assigned for the target item of the said system as a medical device on February 28, 2017, too.

#### "Prioritized Review System for innovative medicines 'SAKIGAKE"

When an innovative new drug or medical device satisfies severity and other specified requirement of applicable diseases, the drug or the medical device which MHLW evaluates and assigns is given priorities in consultation and review process for its approval by using this system, and the target NDA review period can be shortened to six months, one half of that required in ordinal review.



#### <Participation in Development of Cancer Diagnostic Technology>

We have undertaken the development of PET diagnostic technology using [<sup>18</sup>F]FBPA, which attracts researchers and industry attention as a new PET drug used for "PET diagnosis," which is a technology useful for early detection of cancers.

#### Features of PET diagnosis using [<sup>18</sup>F]FBPA

- ★ To be able to detect "brain tumor" which is difficult to detect at present.
- ★ Able to simply carry out PET diagnosis by [<sup>18</sup>F]FBPA for institutes where PET diagnosis is conducted at present.
- $\star$  To be able to judge whether BNCT can be applied.



(Left) MRI image of brain tumors (Right) [<sup>18</sup>F]FBPA PET image of brain tumors

In this project, the development theme applied, jointly with Osaka Prefecture University and Osaka University entitled "Development of efficient synthesis method of revolutionary PET probe particle [<sup>18</sup>F]FBPA and verification assessment of tumor specific integration capabilities" was adopted for 2016 "Project for Cancer Research and Therapeutic Evolution" of Japan Agency for Medical Research and Development (AMED) and is to be continuously implemented in FY 2017, too.

In order to provide total medical care from early cancer diagnosis to therapy, we will continue to carry out research and development starting this year.

Photo: Courtesy of Professor Ono at Kyoto University Research Reactor Institute



### **5. Transportation Business**

- Corporate Profile (as of June 30, 2017)
- Transportation System by Cooperation with Domestic Bases
- > Overseas Bases
- International Intermodal Logistics System
- Future Activities



#### <Corporate Profile (as of June 30, 2017)>

- **Company name:** BLUE EXPRESS CORPORATION
- Address: 10 Ohamanishi-machi, Sakai-ku, Sakai-shi
- **Representative:** Kiyonori Saka, Representative Director and President
- Established: June 1991
- Capital fund: 350 million yen
- Business lineup: Common motor trucking / International intermodal transport / Warehousing / Customs clearing agent / sales, rental and lease of containers, tanks, etc. / Automobile maintenance services / Business related to life insurance and non-life insurance agent, etc.

http://www.blue-express.co.jp/



URL:



#### <Transportation System by Cooperation with Domestic Bases>



 Shipping terminals
 Sendai Office
 Kanto Office
 Yokohama Office
 Shimizu Office
 Shagoya Office
 Ohama Office
 Kobe Office
 Kitakyushu Office





#### <Overseas Bases>

#### China (Shanghai)

Blue Express (Shanghai) International Trade Inc.

Blue Express (Shanghai) International Freight Forwarding Co., Ltd.

#### Singapore

Stella Express (Singapore) Pte Ltd



#### <International Intermodal Logistics system>





#### <Future Activities>

- To steadily expand business with first priority given to the improvement of customer satisfaction. Further quality improvement, etc. of international intermodal logistics service
  - To maintain continuous investment for further growth Effective utilization of head office premises, such as the extension of hazardous substance warehouses, etc.

To further strengthen business operation base and revenue base Streamlining of compliance system, etc.









### **6. Future Activities**

- Approaches to Advanced Energy Devices
- Development of Additives for Electrolytes of Lithium-ion Batteries (LIBs)
- Development of Catalysts for Polymer Electrolyte Fuel Cells (PEFCs)
- Development of Electrolyte for Post Lithium-ion Batteries
- Fluoride Nanoparticles
- Fluorinated Carbon Nanotubes (F-CNT) [1]
- Fluorinated Carbon Nanotubes (F-CNT) [2]



#### <Approaches to Advanced Energy Devices>



The attainment of original products that would serve as our next-generation prime source of earnings based on our fluorine chemistry and energy-related technologies



#### <Development of Additives for Electrolytes of Lithium-ion Batteries (LIBs)>





### <Development of Catalysts for Polymer Electrolyte Fuel Cells (PEFCs)>



Performance required for fuel cell catalyst



Remarkable output improvement confirmed under the conditions(low humidity) which is a problem for the operation of PEFC



A system that enables in-house assessment of fuel cells is established. The further improvement of the performance is under consideration toward sample work.



#### <Development of Electrolyte for Post Lithium-ion Batteries>



World's highest quality level electrolyte for sodium-ion batteries

Succeeded in development of highquality and low-cost process

Under sample work primarily to LIBs' electrolytes users

#### Imminent practical use A prototype bicycle with a sodium-ion battery mounted is created.



Electric Bicycle

\*Image illustration



#### <Fluoride Nanoparticles>

Development of low refractive index fluoride material for antireflection film



Evolution and market expansion of smart cars, IoT, and

\*Image illustration

Increased demand of coating material that increases display panel visibility



Hollow introduced in particles by particle morphology control

Achievement of low refractive index



Beyond the Chemical P.52

wearable devices



#### <Fluorinated Carbon Nanotubes (F-CNT) [1]>

With improvements in mass-production technology of carbon nanotubes (CNT), practical application has occurred.

CNT is the development field where the market size smoothly progresses and further development of applications is awaited.



Our Company core technology Surface treatment technology by fluorine gas

Fluorinated carbon nanotube (F-CNT)

Schematic diagram of fluorinated CNT

#### Fluorinated carbon nanotube (F-CNT) dispersed liquid



Appearance of fluorinated CNT dispersed liquid



#### <Fluorinated Carbon Nanotubes (F-CNT) [2]>

#### **Example of developed applications**

Coating-type transparent conducting film and antistatic film



Example of prototype conductive film by F-CNT

- Able to be fabricated using general coating methods (bar coat, spray coating, etc.)
- Able to achieve required specifications for touchscreen applications
   Total light transmittance: 85% or more Sheet resistance: 500 Ω/□ or less



#### Composite material (compounding of CNT and resin)

 As a filler of CNT-containing resin composite material, strength has been increased by 25% as compared to simple resin.

Roll-out to the engineering plastic field



#### **Corporate slogan**

### **Beyond the Chemical**

We are drawing upon the strengths in the chemical field whose growth we have nurtured so far and moving toward even greater development in the future.







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