June 16, 2022

Corporate Name: AGC Inc.
President & CEO: Yoshinori Hirai
(Code Number: 5201; TSE Prime section)
Contact: Chikako Ogawa, General Manager,
Corporate Communications & Investor Relations
(Tel: +81-3-3218-5603)

AGC's "IR DAY 2022" Presentation Materials

AGC held "IR DAY 2022" today, following the one held on June 13.

Today's presentation materials are attached.

IR DAY 2022

Electronics

AGC Inc.

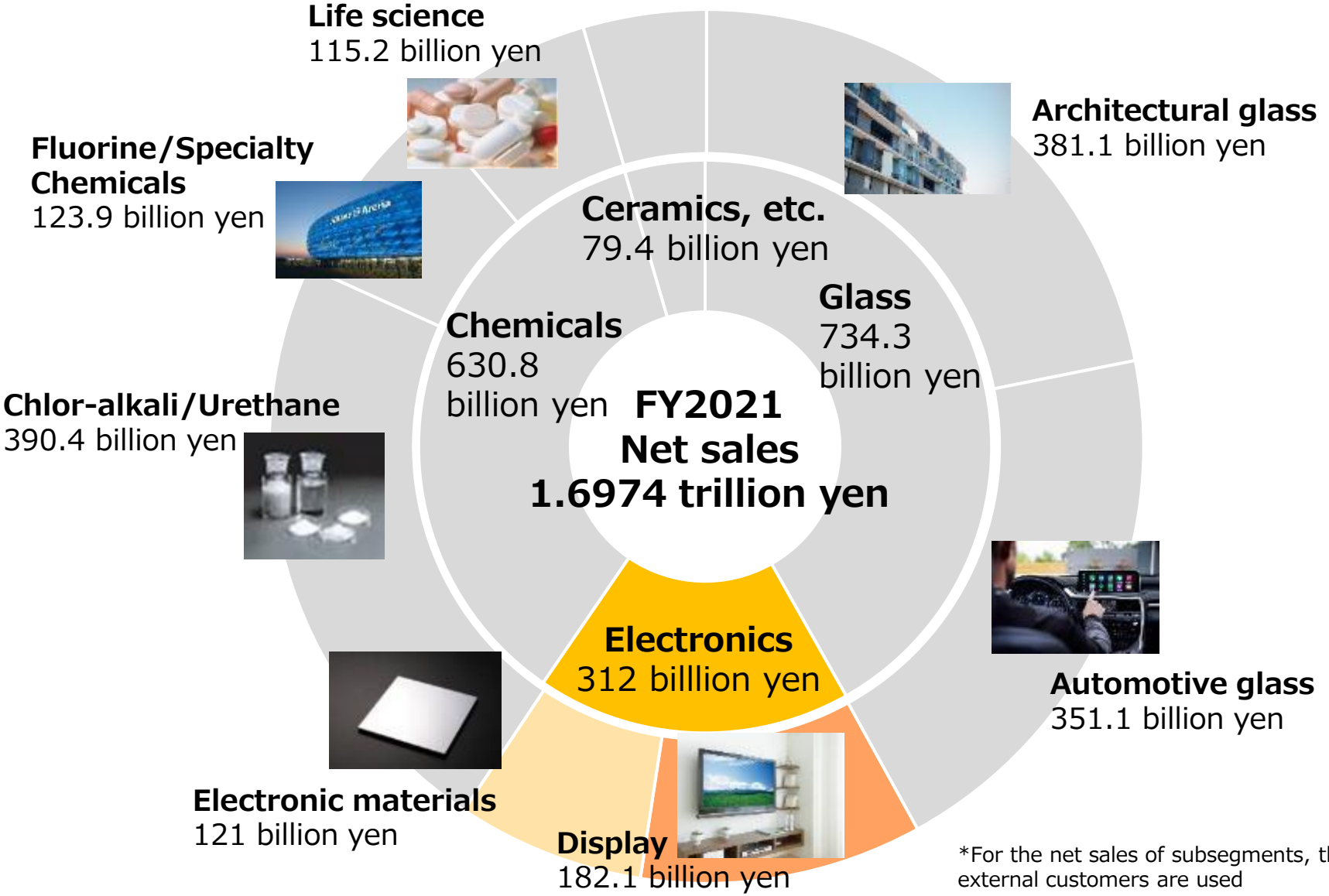
June 16, 2022

Your Dreams, Our Challenge

Table of Contents

The Electronics Business within the AGC Group

AGC
Your Dreams, Our Challenge

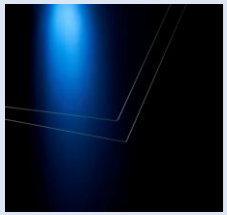


*For the net sales of subsegments, those for external customers are used

Main products

AGC
Your Dreams, Our Challenge

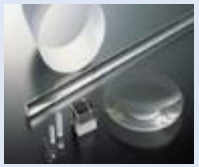
Glass substrates for TFT liquid crystal/organic EL



AN Wizus™

AN100, AN Wizus™, AN Rezosta™

Semiconductor-related products



Synthetic quartz lens materials

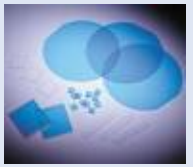
SiC thermal treatment jigs

CMP slurry

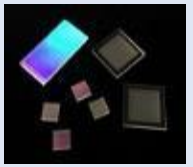
EUV blanks

Glass frit and paste

Optoelectronic materials



Infrared cut filter



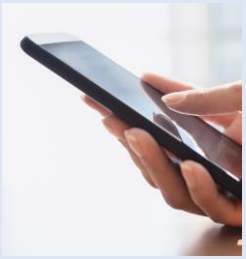
DOE (diffractive element) diffuser (diffuser plate)

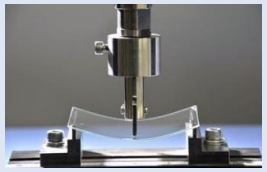
Highly refractive glass

Glass ceramics substrates

Glass mold lenses

Specialty glass for display application





Dragontrail™ series, AS2

Multi-material

Copper clad laminate materials

Industrial PTFE composite materials

Others

Lighting materials

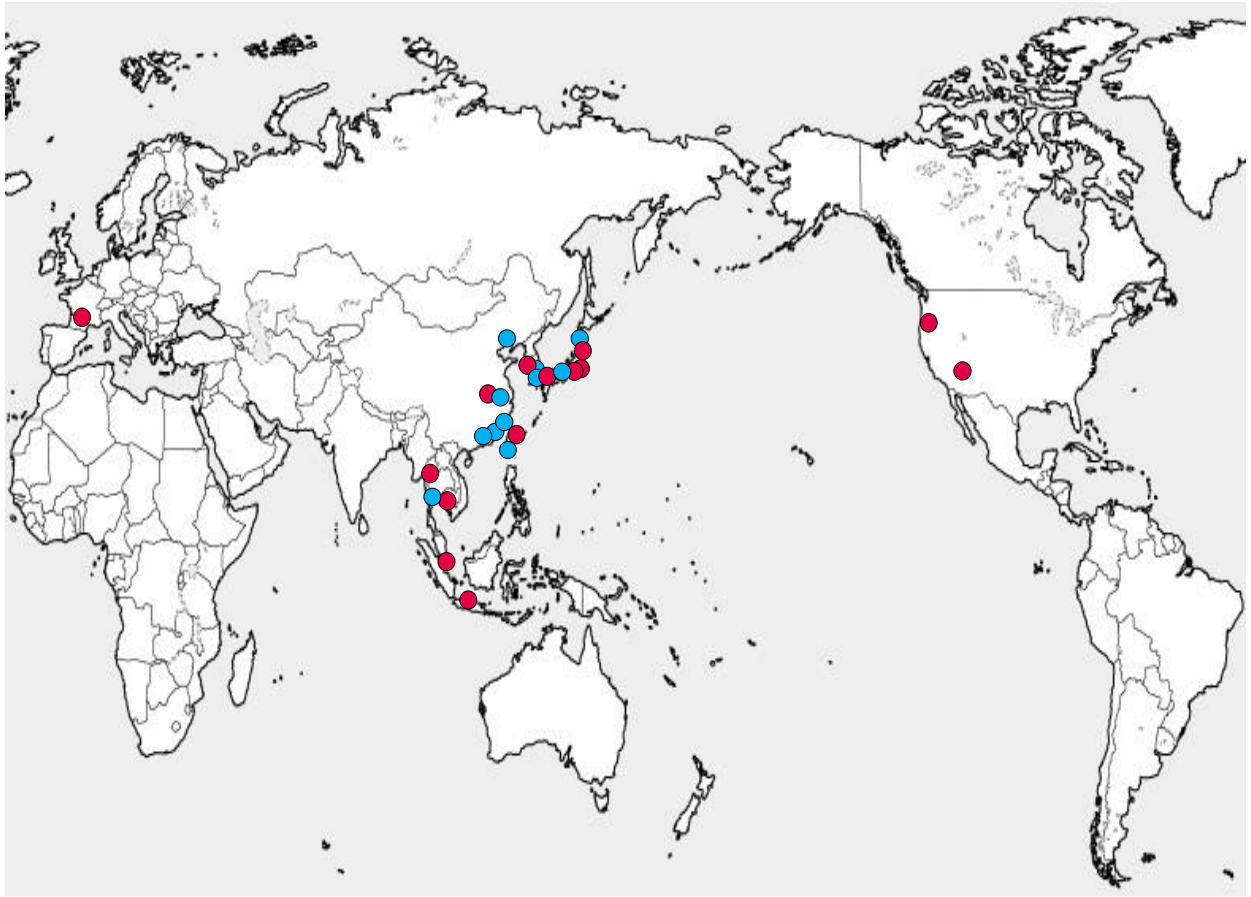
Laboratory glass products

Heat resistant glass dishes

Cell cultural containers

Polycarbonate film

Geographical coverage



●: Electronic materials ●: Display

Manufacturing sites	
Europe and the United States	AGC Electronics America AGC Multi-Material (United States and Europe)
Thailand	AGC Micro Glass Thailand AGC Flat Glass Thailand AGC Techno Glass Thailand
Indonesia	Iwaki Glass Indonesia
Singapore	AGC Multi-Material (Singapore)
China	AGC Display Glass (Kunshan, Shenzhen, Huizhou) AGC Flat Glass AGC Advanced Electronics Display Glass AGC Flat Glass Protech AGC Multi-Material
Korea	AGC Fine Techno Korea AGC Display Glass Ochang Korea Taconic
Taiwan	AGC Electronics Taiwan AGC Display Glass Taiwan
Japan	Kansai Plant AGC Electronics AGC Seimi Chemical AGC Techno Glass AGC Micro Glass AGC Polycarbonate Optical Coatings Japan AGC Display Glass Yonezawa

Division policy

Under the division policy “Stay in front with SDGs,” we will continue to contribute to a sustainable society as a leading supplier of differentiated material solutions.

Example of contribution to the realization of a sustainable society

AGC
Your Dreams, Our Challenge

Key opportunities	Examples of materials and solutions of the Electronics Segment	
Arrangement of social infrastructures	Display	Glass for display
	Electronic materials	Semiconductor materials and copper clad laminate materials
Realization of safe and comfortable mobility	Display	Glass for display
	Electronic materials	In-vehicle sensing and radar materials, semiconductor materials, and copper clad laminate materials
Informatization and construction of the IoT society	Display	Glass for display
	Electronic materials	Semiconductor materials, copper clad laminate materials, optoelectronics materials, and glass substrates for AR/MR glass

Social values

Contribution to the realization of safe and comfortable city infrastructures

Net sales by segment

- Electronic materials have been expanding smoothly and have been on a growing trend since 2018

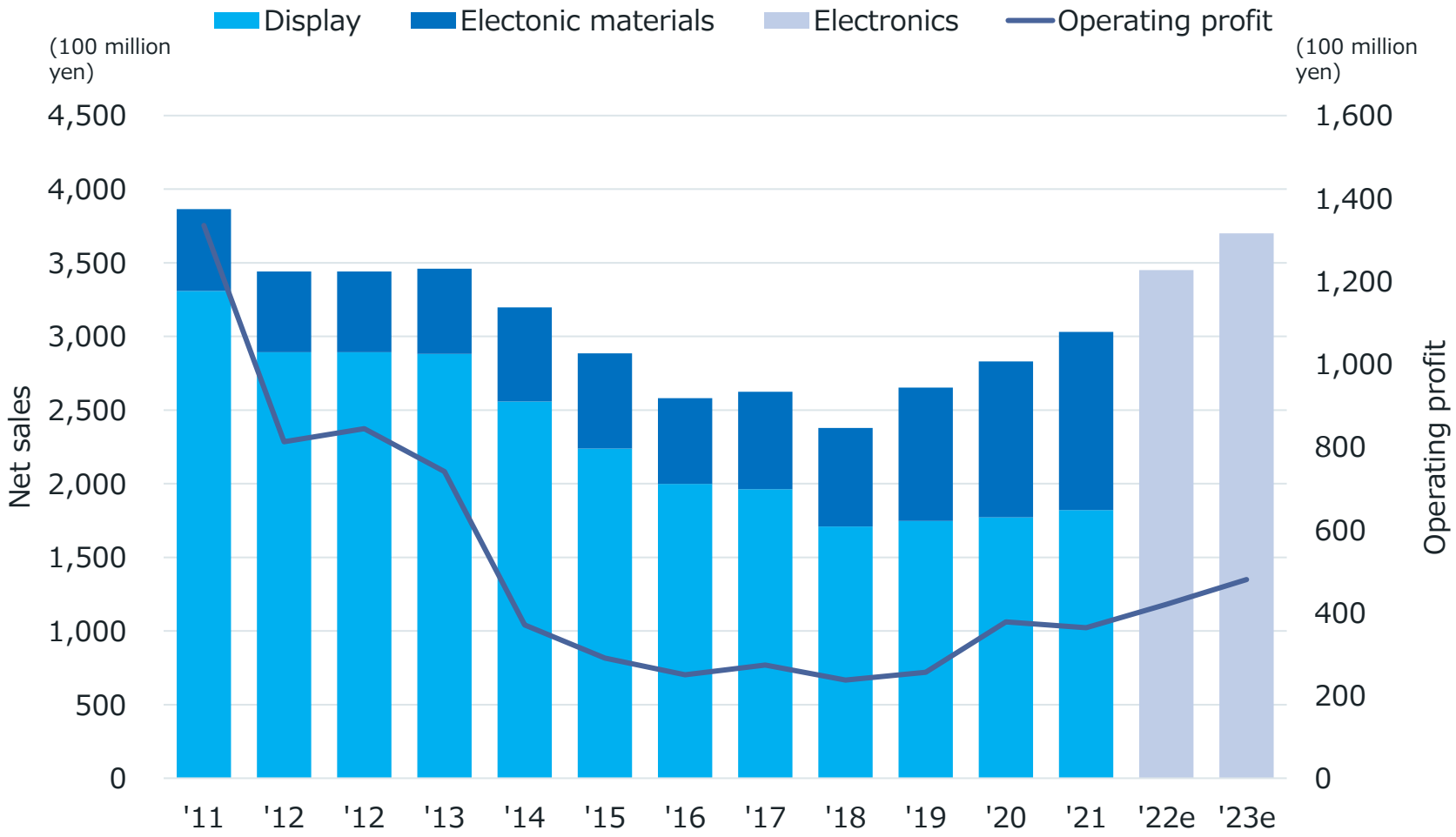
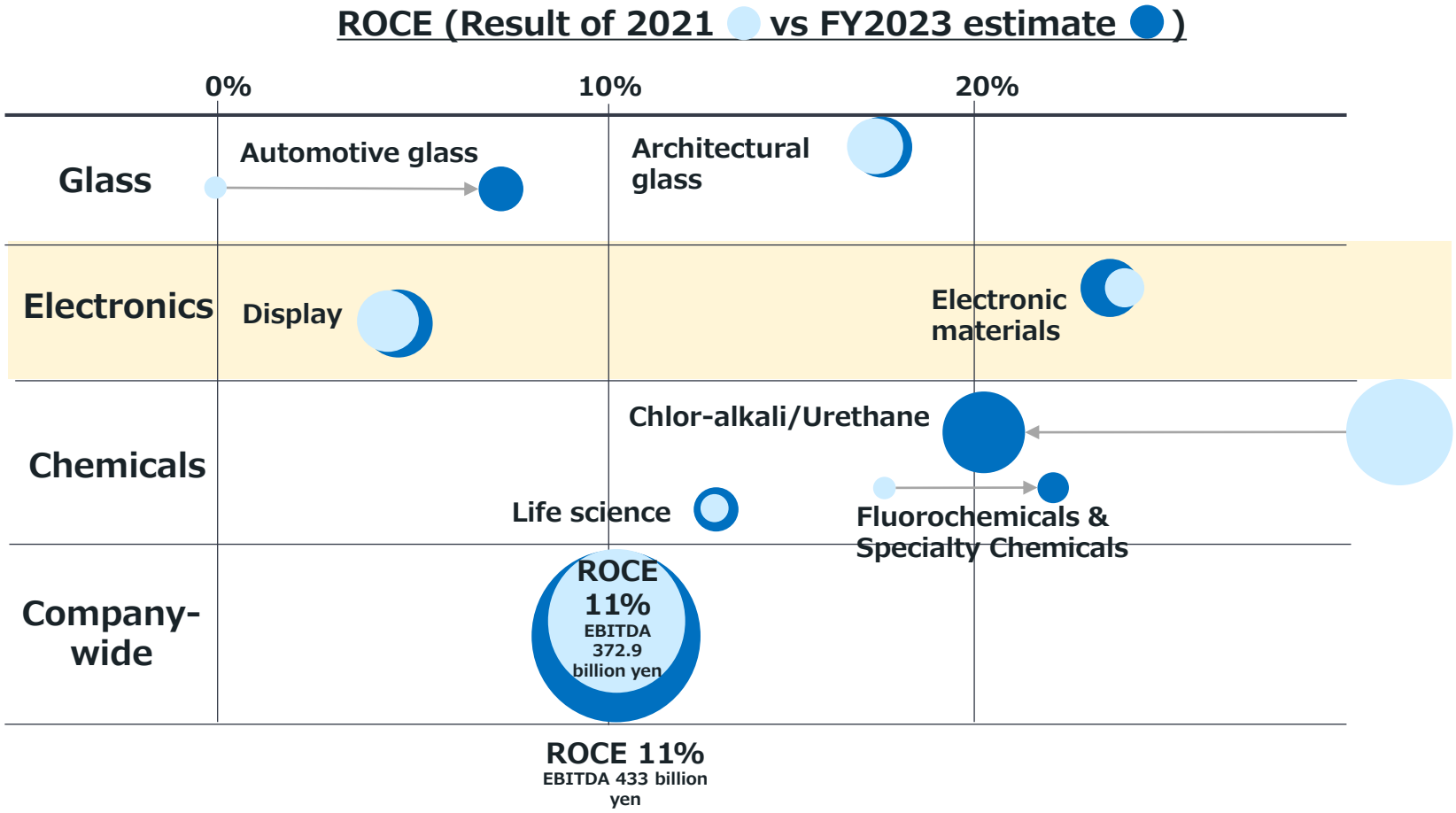


Table of Contents

ROCE by Segment (To-be image)

- Maintain the group-wide ROCE at 10% or higher
- Increase EBITDA* by approx. 60 billion yen (372.9 billion yen to 433 billion yen)



ROCE: (OP forecast of the year) ÷ (Operating asset forecast at the year end), OP by business is before allocation of common expenses
Diameter of each circle (excluding those of the group-wide section): the size of EBITDA * EBITDA=Operating profit +Depreciation

AGC plus-2023 Key Issues by Segment

AGC
Your Dreams, Our Challenge

	Business	Key issues	Direction
Strategic Business	Electronics	・Expand value-added products including EUV mask blanks ・Constantly generate new businesses	Further accelerate growth
	Life science	・Expand business through timely investments ・Achieve high growth based on the Group's global operations and technical-support capabilities	
	Mobility	・Steadily capture business opportunities amid market changes in the CASE era ・Start the mass production of car-mounted display glass in China to contribute to profit increase.	
Core Business	Display	・Respond to the continuing demand increase in the Chinese market to build a long-term stable business foundation	Unchanged from the previous basic strategies
	Chlor-alkali/Urethane	・Further strengthen the business foundation in S.E. Asia through capacity enhancement in Thailand and Indonesia	
	Fluorochemicals & Specialty Chemicals	・Capture the demand in global niche markets by adding value to products and domain expansion ・Change environmental challenges to business opportunities	
	Architectural glass Automotive glass	・Structural reforms toward the industrial realignment ・Minimize investments and integrate production to increase asset efficiency ・Steadily pursuing productivity improvement and cost reduction to improve profitability and capability for cash generation	Accelerate structural reform

Table of Contents

Strategy of the Display operations

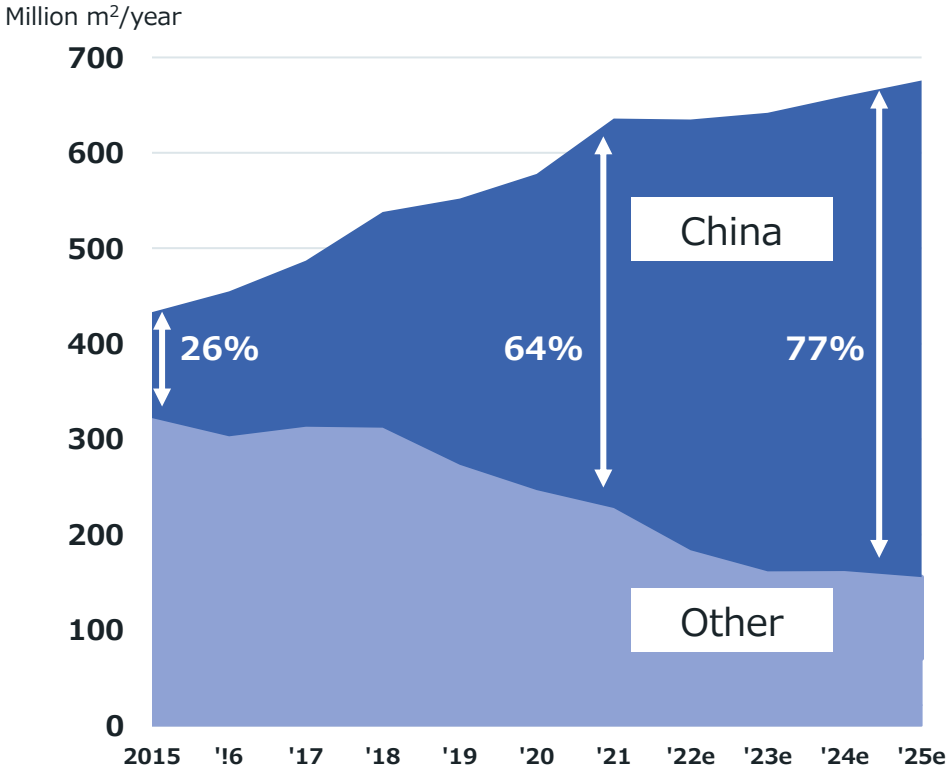
1. Response to increasing demand in the Chinese market

2. Build a long-term and stable revenue foundation

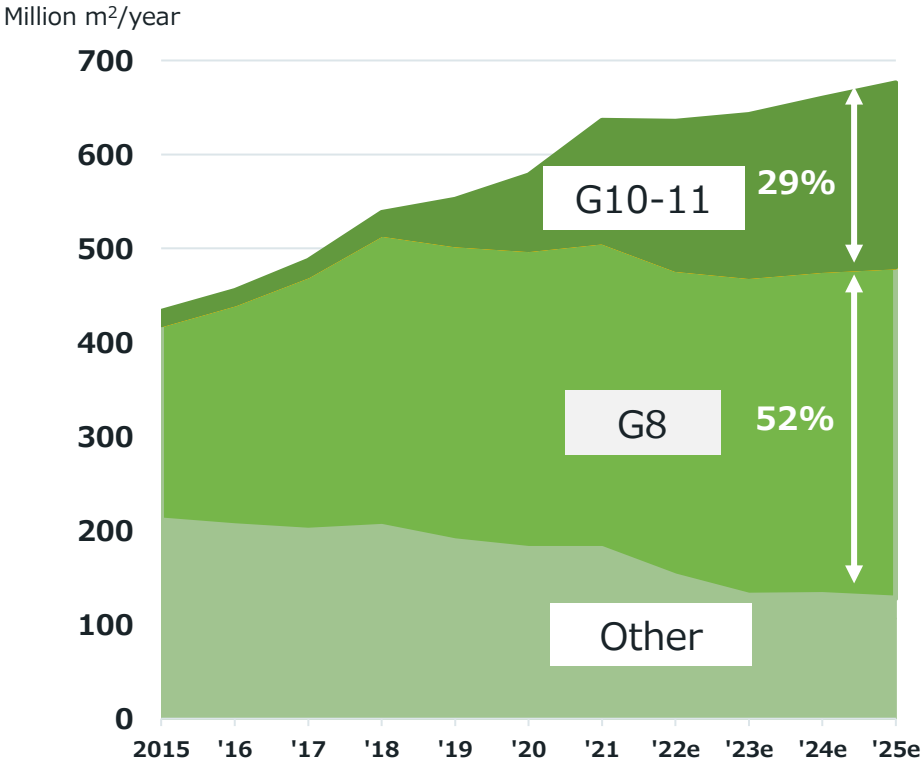
Display: Business environment

- Demand in China will expand further up to 2025
- Demand for large substrates of G11 size will increase

Demand for liquid crystal glass (region-specific)



Demand for liquid crystal glass (generation-specific)



Source: AGC estimate

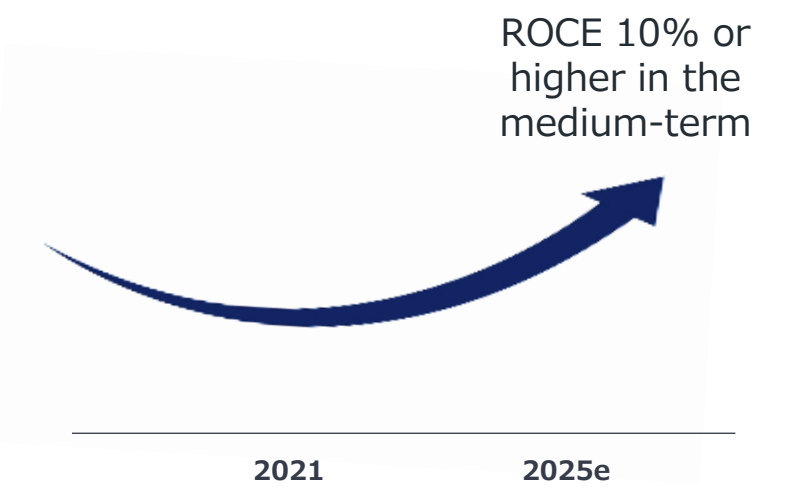
Construction of a long-term and stable revenue foundation

- With the maturing TV market, the glass demand is shifting to a stable growth due to a trend for larger-sized TV panels
- Promote the shift to the manufacturing structure to fit large-sized panel production and aim ROCE of 10% or higher by improved manufacturing efficiency
- Promote the introduction of technologies to improve carbon efficiency

Main investment cases

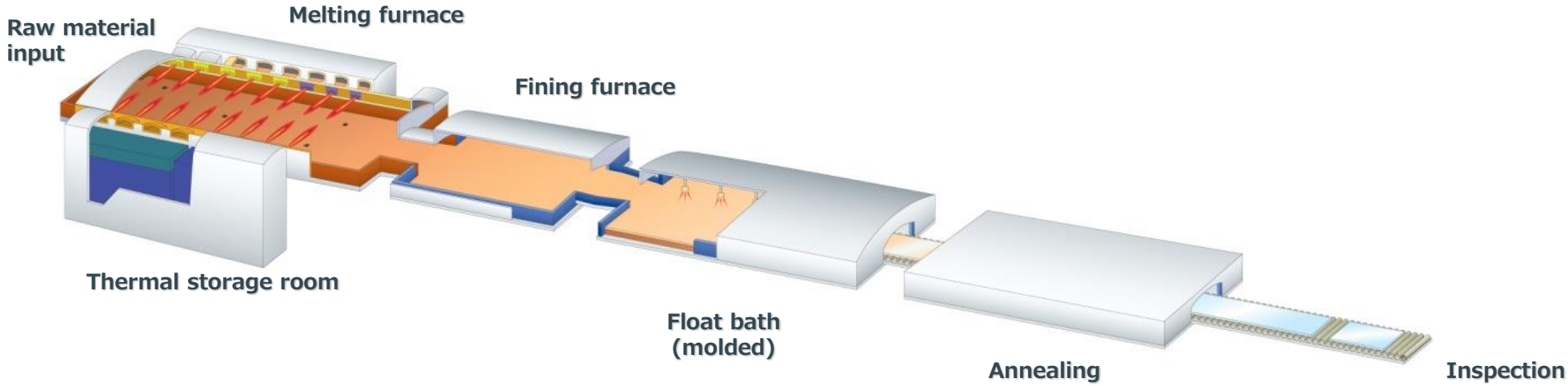
2020	2021	2022	2023	2024～
Relocate the furnaces for glass substrates for 11th generation TFT liquid crystal to China				
	Enhance the production capacity of glass for 11th generation TFT liquid crystal in China			
		Conversion to the optimal production equipment for large panel production		

Display Business ROCE



(Reference) Conversion to the optimal production equipment for large panel production

- Proceed with conversion to production equipment in order to cut out glass plates more efficiently



Conceptual image of cutting glass plates

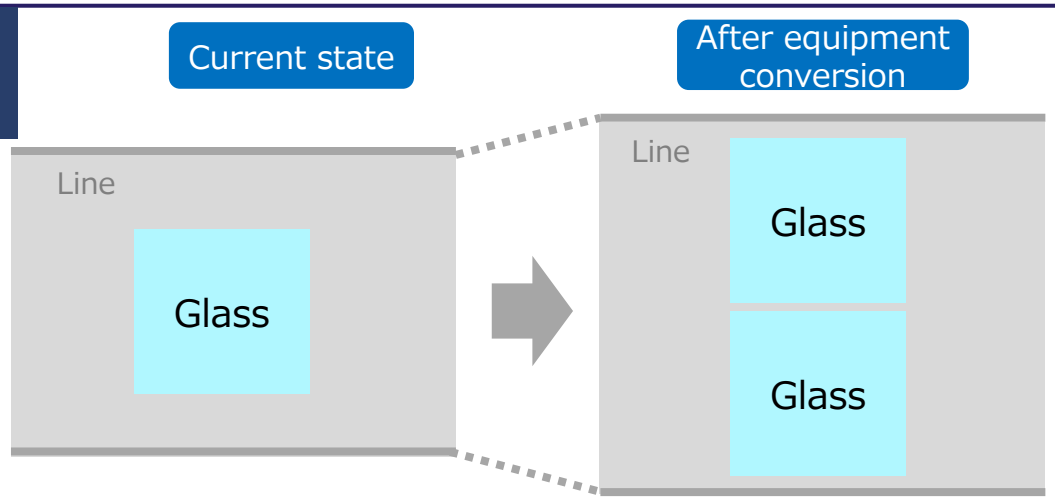
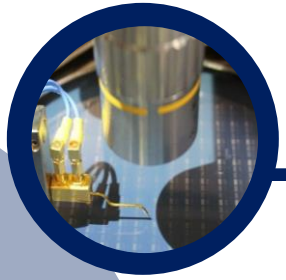


Table of Contents

Direction of the electronic materials operations

AGC
Your Dreams, Our Challenge

Aim at sustainable growth based on two operations



Semiconductor-related products

- Semiconductor market is expected to grow stably in long term mainly thanks to demand for high-tech semiconductors
- Aim at steady expansion of operations focusing on EUV blanks and high-performance slurry based on the semiconductor development roadmap

Optoelectronic materials

- The current main product, namely infrared cut filters for cameras, continues to grow as cameras installed in smartphones increase
- Deploy a variety of optical parts for new devices expected to grow in the future such as AR/VR, in-vehicle products, and 3D sensing
- Release new innovative products for new applications

Strengths of the electronic materials operations

AGC
Your Dreams, Our Challenge

"Material technology × Fabrication technology × Design/Evaluation/Analsis technology" for "organic materials + inorganic materials" developed through glass, chemicals, and ceramics

Material technology	Fabrication technology	Design/Evaluation /Analysis technology
Examples: • Glass(composition/melting/molding) • Polymer • Color material (dye/coloring) • Adhesive • Dry coating material ・ ・ ・ Expand the range of technologies	Examples: • Processing fabrication • Microfabrication • Glass molding • Wafer process • Film process • Imprint process ・ ・ ・ Expand the range of technologies	Examples: • Optical design • Mechanical and thermal design • Chemical molecule structure design • Simulation technology ・ ・ ・ Expand the range of technologies

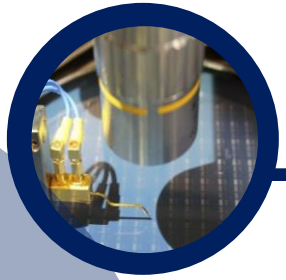
Provide AGC-specific solutions combining material technologies, fabrication technologies, and design technologies

Contribute to the development of the semiconductor and optoelectronics industries

Direction of the electronic materials operations

AGC
Your Dreams, Our Challenge

Aim at sustainable growth based on two operations



Semiconductor-related products

- Semiconductor market is expected to grow stably in long term mainly thanks to demand for high-tech semiconductors
- Aim at steady expansion of operations focusing on EUV blanks and high-performance slurry based on the semiconductor development roadmap

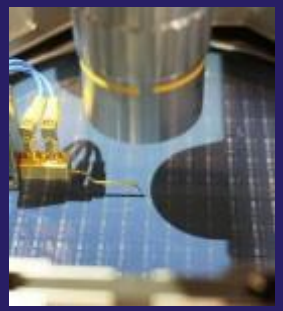
Optoelectronic materials

- The current main product, namely infrared cut filters for cameras, continues to grow as cameras installed in smartphones increase
- Deploy a variety of optical parts for new devices expected to grow from now on such as AR/VR, in-vehicle products, and 3D sensing
- Release new innovative products for new purposes

Semiconductor-related products: Market overview

AGC
Your Dreams, Our Challenge

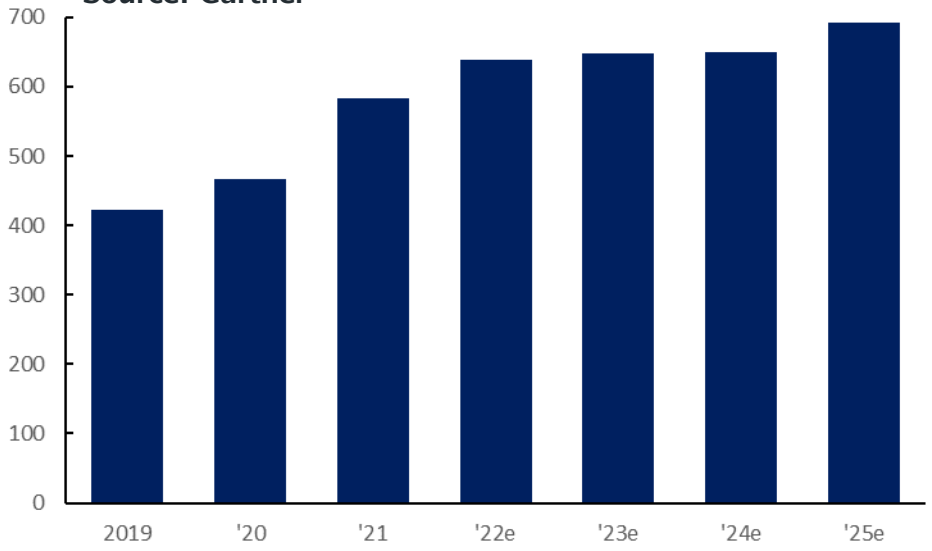
Semiconductor materials



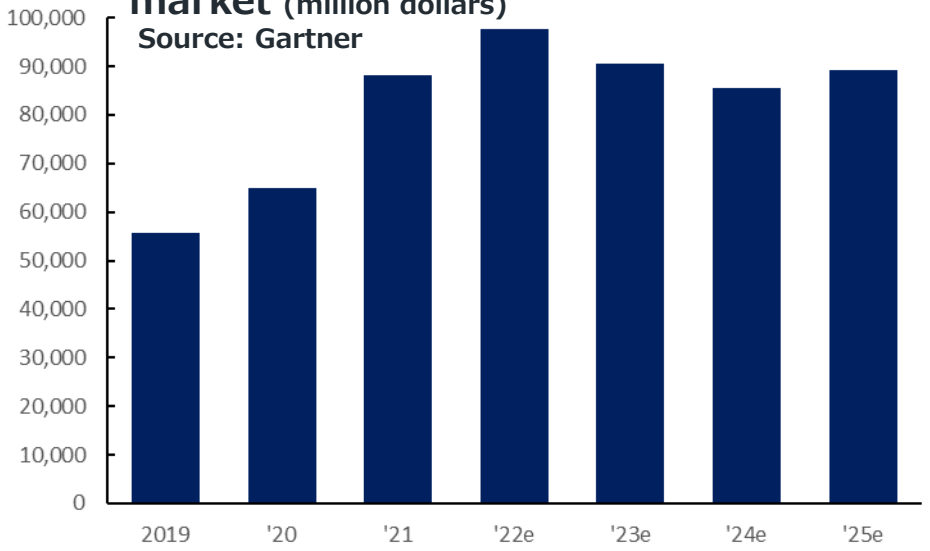
Market overview

- Though COVID-19 related demand in the semiconductor market has passed its peak, the demand increasing thanks to investments in data centers and communication infrastructures for the metaverse expected to appear from 2022 to 2024, so the market is expected to keep growing even after 2022
- As the semiconductor market grows and diversifies, the semiconductor manufacturing equipment market is expected to keep growing even after 2022

Semiconductors (billion dollars)
Source: Gartner



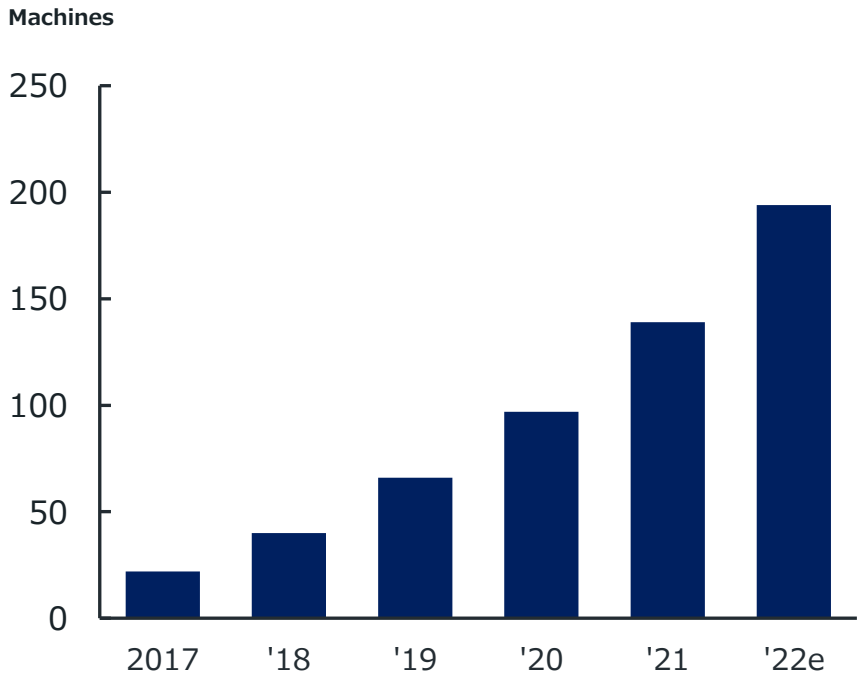
Semiconductor manufacturing equipment market (million dollars)
Source: Gartner



EUV mask blanks: Business environment

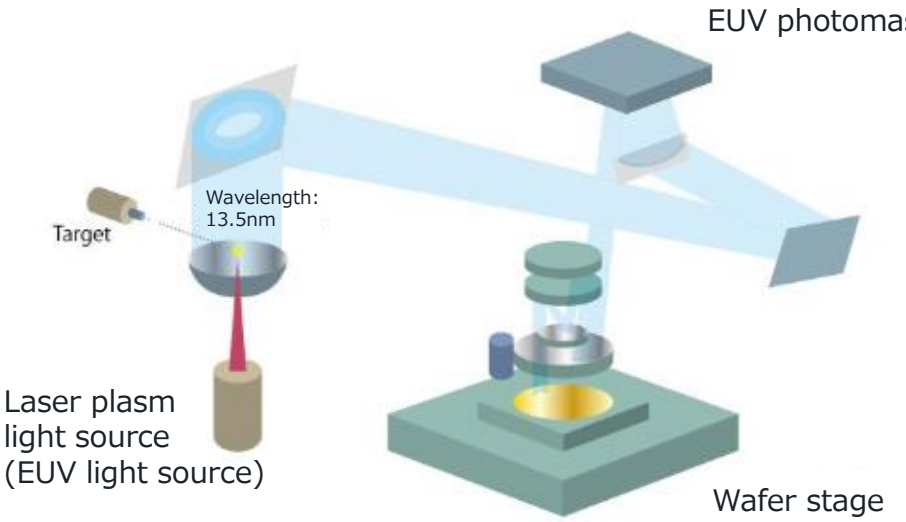
- EUV lithography equipment rapidly diffused because of miniaturization of semiconductor chip circuit patterns
- The demand for EUV blanks greatly increased as the shipped number of EUV lithography equipment increases

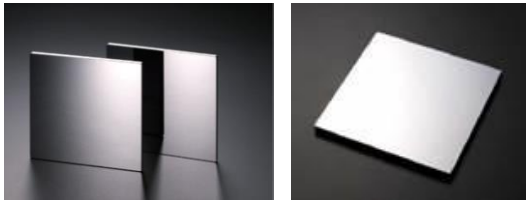
Cumulative number of EUV lithography equipment



Source: The number of EUV exposure machines is based on material published by ASML

Outline of EUV lithography equipment





AGC
EUV blanks

EUV mask blanks: Strengths

The only blanks manufacturer in the world that covers the whole production process from glass materials to polishing and deposition

Started development in 2003 and realized technologies that can meet the strict quality standard

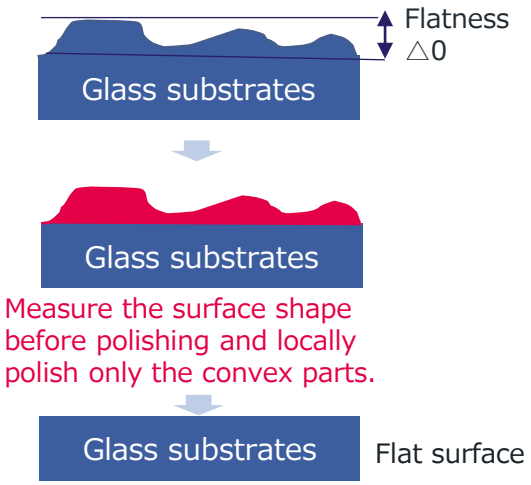
Inorganic materials

Low-expansion glass substrates

Started the development of synthetic quartz production technologies in 1982 and produces highly pure substrates using technologies and knowledge developed for many years

Polishing

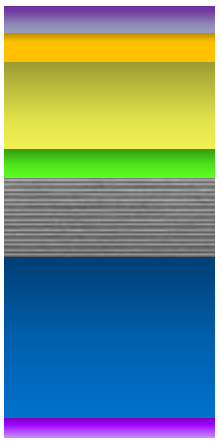
Developed a special polishing method to meet the required quality level (substrate flatness) unique to EUV blanks
Realize ultra-high flatness with comprehensive production of substrates + polishing



Inorganic materials

Deposition

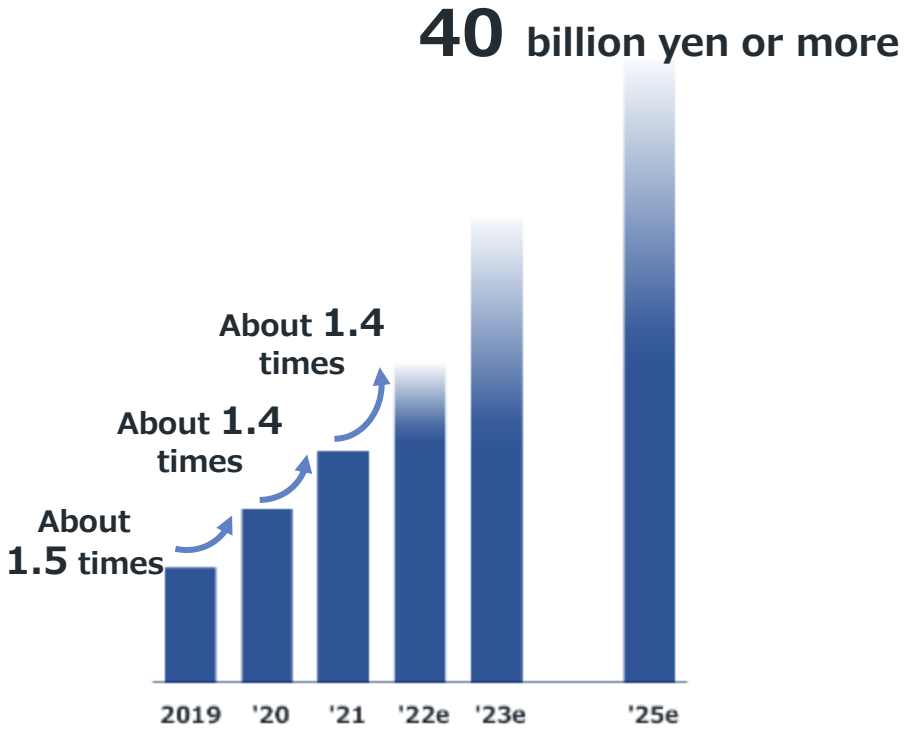
Meet the needs of customers with optimal membrane design capabilities in response to shift to high definition and deposition technologies that reduce defects



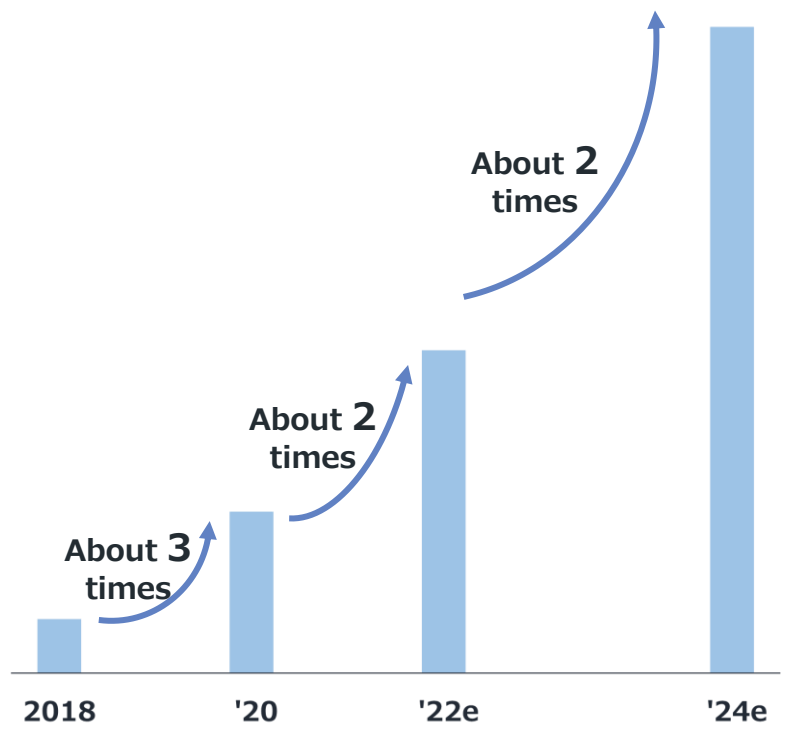
EUV mask blanks: Strategy

- EUV mask blanks are increasingly adopted for memory chips in addition to logic ICs
- Double the production capacity of EUV mask blanks in 2022. Double it again in 2024
- Continue active investments along with market growth

Net sales of EUV mask blanks of AGC



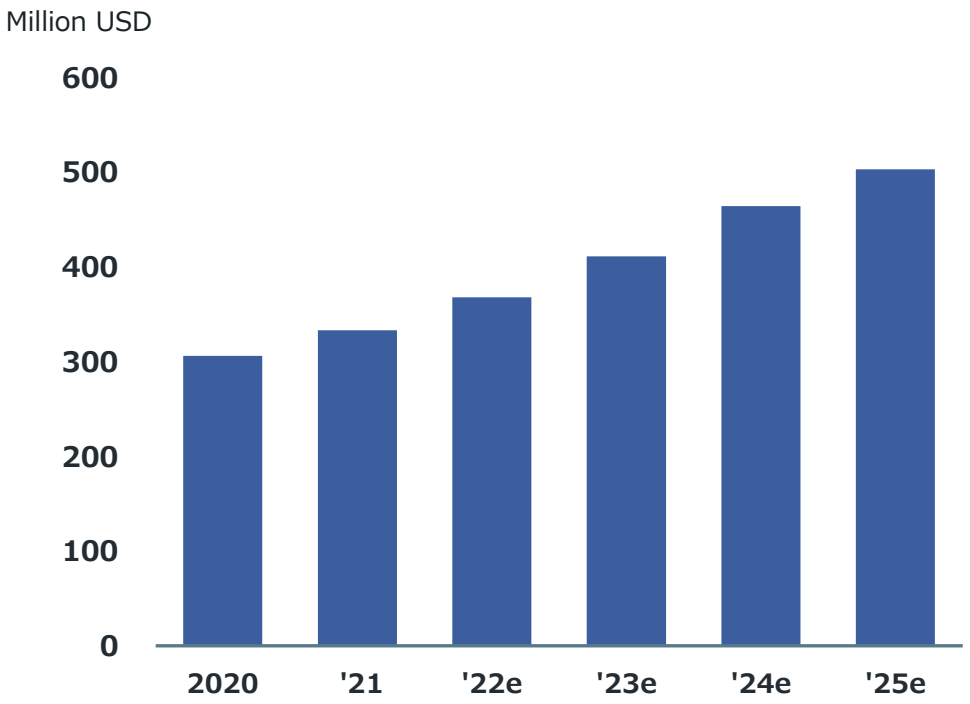
Capacity enhancement of EUV mask blanks

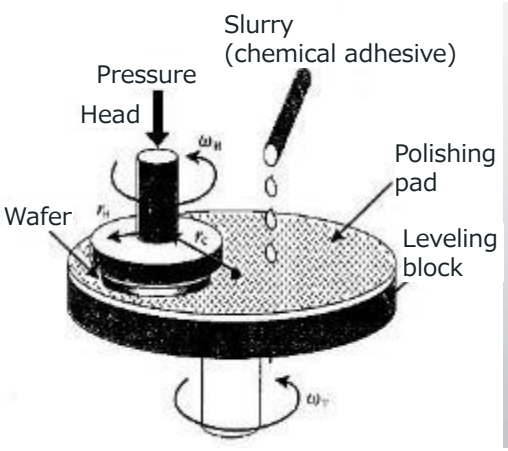


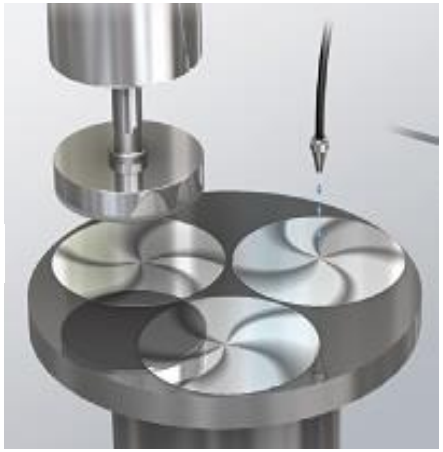
CMP slurry: Business environment

- The scale of ceria slurry grew from about 30 billion yen in 2021 to about 50 billion yen in 2025
- One of the reasons is that applied layers of ceria are increasing especially in the front-end process of advanced semiconductors
- If ceria is adopted more for the next-generation 3D package process, the market scale may expand greatly

Ceria slurry market







Source: AGC estimate

CMP slurry: Strengths and strategy

Slurry solution manufacturer that has entire prodiction capability from abrasive grain to slurry

Provide “high-quality slurry” + “solutions” customized for customers’ design rules and processes

Slurry design (grain and composition)	Grain manufacturing	CMP slurry	Customer support
	Inorganic materials	Inorganic/ Organic materials	

Original abrasive grain whose physical properties are controlled

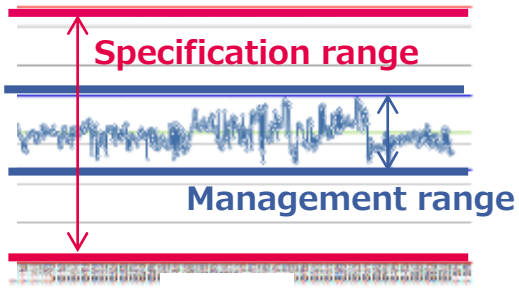
×

Composition design using mainly an additive that controls the polishing properties

=

CMP slurry

Realize stable quality by managing and controlling manufacturing processes



- ✓ Track records of applications to cutting-edge processes
- ✓ Proposal of solutions including the polishing process
- ✓ Quick technical support
- ✓ Proposal of continuous improvement

Direction of the electronic materials operations

Aim at sustainable growth based on two operations

Semiconductor-related products

- Semiconductor market is expected to grow stably in long term mainly thanks to demand for high-tech semiconductors
- Aim at steady expansion of operations focusing on EUV blanks and high-performance slurry based on the semiconductor development roadmap

Optoelectronic materials

- The current main product, namely infrared cut filters for cameras, continues to grow as cameras installed in smartphones increase
- Deploy a variety of optical parts for new devices expected to grow from now on such as AR/VR, in-vehicle products, and 3D sensing
- Release new innovative products for new purposes

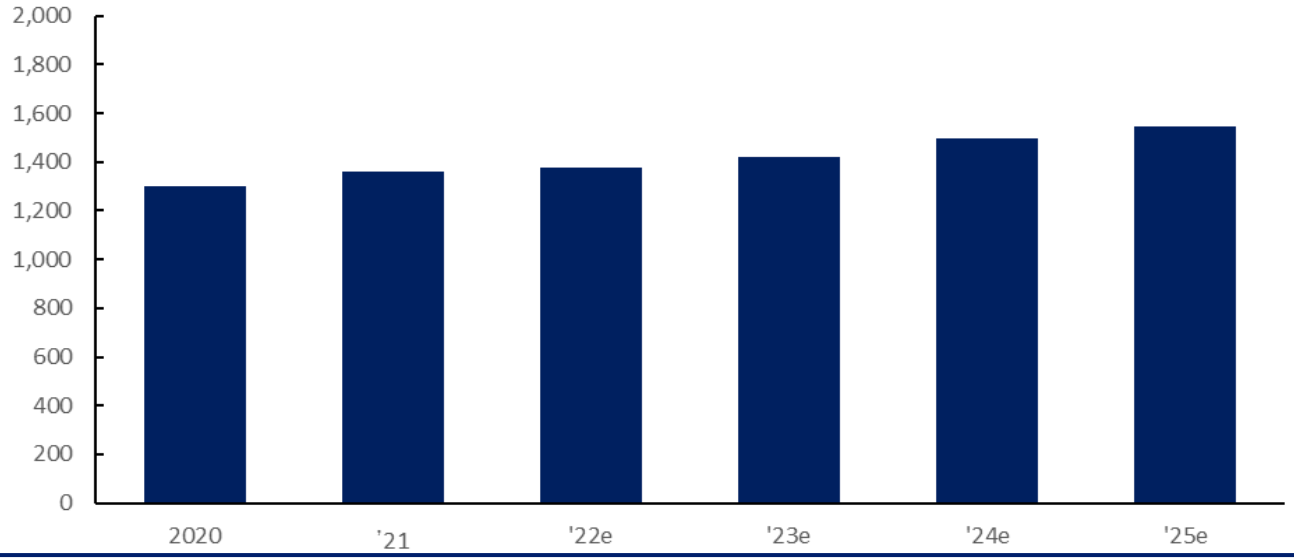
Optoelectronic materials: Market overview

Optoelectronics materials

Market overview

- The growth rate of smartphones dropped in 2020 due to COVID-19 but got back to a growing trend in 2021
- Demand for smartphones is expected to remain stable beyond 2022 due to the spread of 5G and replacement of smartphone as a daily necessity

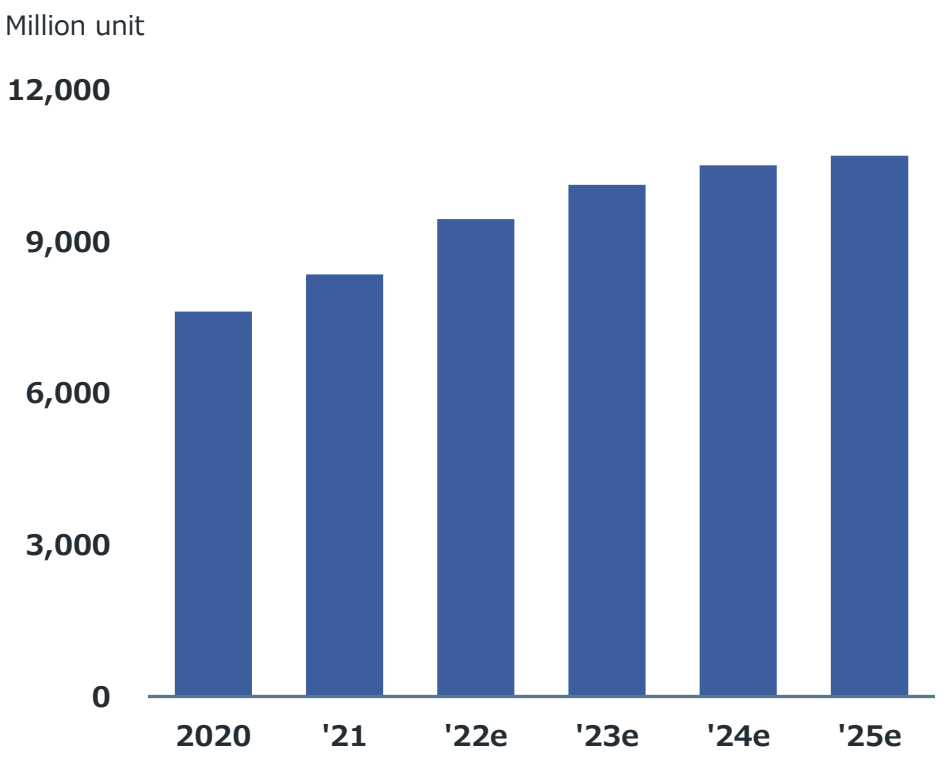
Number of smartphones (million unit)
Source: AGC estimate value based on the IDC information



Infrared cut filter: Business environment

- Though the growth rate of smartphones has peaked out, the number of built-in cameras continues to grow thanks to advancement of conversion to compound eye cameras
- The role of the infrared cut filter will continue to grow as the size of the image sensor grows and the needs for video shooting increase
- As the size of the filter grows, the total square-meter shipped will increase faster than unit-based shipment

Number of image sensors for cameras



Source: AGC estimate

Infrared cut filter: Strengths and strategy

AGC
Your Dreams, Our Challenge

Filter manufacturer that covers the whole production process from glass melting to molding and fabrication

Realized spectral characteristics that are difficult to realize by combining glass, disposition and optical design technologies, contributing to a better image quality for cameras

Inorganic materials

Melting

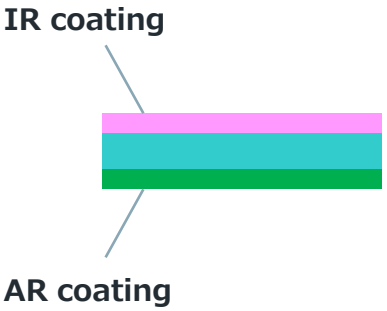
Realized sharp absorption characteristics of the infrared region by adopting fluorophosphate glass and introducing copper ions

Polishing

Inorganic/ Organic materials

Deposition

Realized various spectral characteristics by disposition of multiple optical thin films with different refractive index rates



Cutting

Realized high-quality cut surfaces with AGC's unique cutting methods

Direction of the electronic materials operations

Aim at sustainable growth based on two operations

Semiconductor-related products

- Semiconductor market is expected to grow stably in long term mainly thanks to demand for high-tech semiconductors
- Aim at steady expansion of operations focusing on EUV blanks and high-performance slurry based on the semiconductor development roadmap

Optoelectronic materials

- The current main product, namely infrared cut filters for cameras, continues to grow as cameras installed in smartphones increase
- Deploy a variety of optical parts for new devices expected to grow from now on such as AR/VR, in-vehicle products, and 3D sensing
- Release new innovative products for new purposes

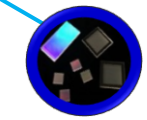
Activities for creation of new business: AR/MR glass

- Although the AR market has been slow to take off, the AR glass market is expected to grow at a high rate along with the expansion of 5G communication. We also expect to see new devices such as AR glass with smartphone funcions attached to them.
- AGC will contribute to the development of the market with advanced refractive and transmission glass manufacturing technologies, high-precision glass microfabrication technologies, etc.

See-through・wave guide

High refractive glass substrates

3D sensing



DOE/Diffuser

Sensing camera

Optical filter

Photo and video camera

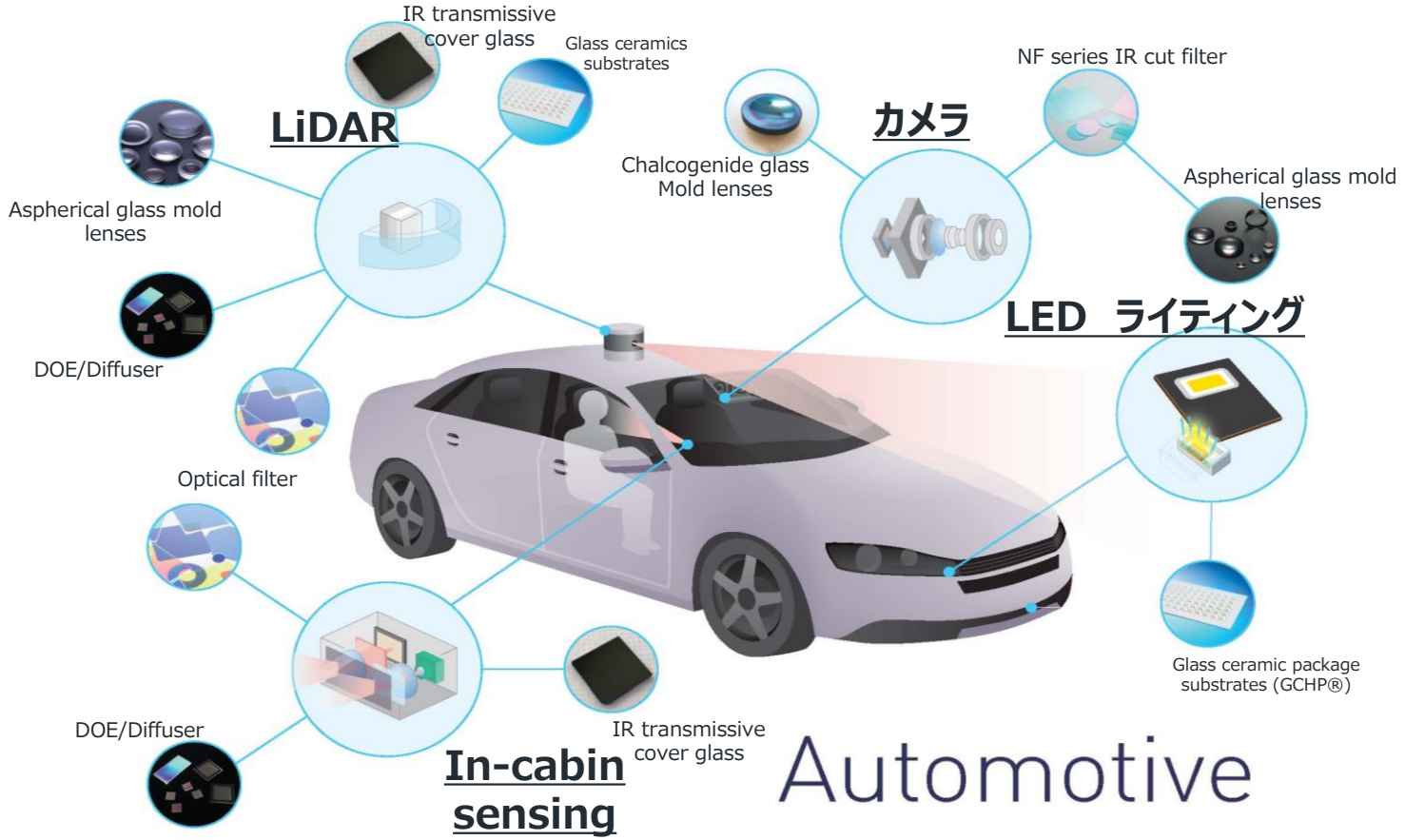
Aspherical glass mold lenses

NF series IR Cut filter

Source: AGC estimate

Activities for creation of new business: ADAS* and self-driving

- Diverse optical sensors will be installed in self-driving cars such as cameras that digitize vision and LiDAR that allows the driver to grasp three-dimensional positioning of people and objects around the car.
- AGC will contribute to the widespread use of ADAS and self-driving cars by providing optical materials that constitute these sensors.



Source: AGC estimate *: Advanced Driver-Assistance Systems

Table of Contents

Conclusion

Under the division policy “Stay in front with SDGs,” we will continue to contribute to a sustainable society as a leading supplier of differentiated material solutions.

Appendix

Semiconductor-related products: Product lineup

Synthetic quartz: High-purity/high-quality/high-function glass for semiconductor processes

- Manufactured based on the technologies and research and development of fine glass, fine chemicals, and fine ceramics developed by AGC for a long period of time
- Suitable for optical parts of semiconductor processes of exposure devices, etc. and adopted for various optical materials, etc.

SiC thermal treatment jigs: High-purity/high-strength/low-thermal-expansion ceramics

- Track record of 30 or more than years mainly as part of semiconductor manufacturing equipment used at a high temperature
- Also adopted for bodies of EUV exposure machines and SiC power devices thanks to excellent thermal resistance

CMP slurry: "High-quality slurry" customized for customers' design rules and processes

- Optimize and supply slurry that realizes a very flat, multi-layer structure and for various purposes such as oxidized films and wiring materials
- Adoption for memory processes mainly for cutting-edge logic

EUV blanks: High-quality photo mask blanks compatible with cutting-edge exposure

- Supply products by comprehensive production from glass materials to disposition for cutting-edge EUV exposure processes
- Realized ultra-low defects, ultra flatness, and high-function membranes

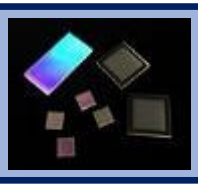
Frit paste: Glass materials for insulation and airtight sealing

- Products can be provided in various forms such as powder, paste, and compact. Adopted in many fields of electronics
- Expand the application fields as high-function electronic materials making use of our composition design capabilities and analysis capabilities

Optoelectronic materials: Product lineup

Infrared cut filter: Glass filter that realizes spectral characteristics that are difficult to realize

- Lead the industry of high-performance glass filters to adjust the sensitivities of image sensors called CCD and CMOS used for digital cameras such as cameras of cell phones, monitoring cameras, and in-vehicle cameras in the visible range of light



DOE/diffuser: Glass micro-optical elements that realize high performance, high reliability, and high light stability

- Diffractive optical elements used for 3D sensing, Lidar, face authentication, etc. (DOE) + glass diffuser
- Propose proprietary optical design, microfabrication technologies, and mass production technologies developed through elements for light pickup and communication

Highly refractive glass: Glass substrates used for next-generation displays

- Propose a wide range of new high-refractive and high-transmission glass substrates with used for AR (Augmented Reality) glass and MR (Mixed Reality) glass, smart glass, etc.

Glass ceramics substrates: Contribute to the brightness of LED and semiconductor laser and power improvement

- Realize high reliability regarding heat dissipation and discoloration and contribute to power improvement and durability improvement of LED products of a wide range of wavelengths
- Contribute to brightness improvement because the reflectance is about 20% that of an aluminum substrate in the visible light area

Glass mold lens: Aspherical glass lens that improves the performance of optical equipment

- Aspherical glass manufactured by precise glass molding technologies greatly improves the performance of optical equipment
- Propose aspherical glass lenses made of chalcogenide glass, which has high infrared transmittance, for night-vision cameras

Optical membranes: Optical membranes compatible with a wide range of wavelengths from UV to IR

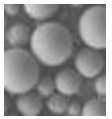
- Supply a wide range of optical membranes that can demonstrate their functions and performance in various fields such as medicine, measurement, videos, exposure, industrial equipment, space/astronomy, bio products, home appliances, and lighting

Direction of the electronic materials operations: Copper clad laminates

AGC Your Dreams, Our Challenge

- The super-high-end rigid CCL market will grow to about 450 billion yen (CAGR of about 10%) in 2025
- In this market, the market of CCL adopted for 5G antennas and millimeter-wave antennas for automobiles (24 GHz or more) will grow significantly to 150 billion yen in 2025 (CAGR of 38%)
- AGC provides solutions to customers with technologies and human resources suitable for (1) Raw materials (inorganic matters and organic matter), (2) Manufacturing/characteritics evaluation, and (3) Applications suitable for super-high-end CCL (Copper Clad Laminate), which is necessary for next-generation, high-speed communication

	Market scale of 2025 (estimate)
Super high-end (Purposes: millimeter wave, base station for 5G, satellites, etc.)	AGC 400 to 450 billion yen (including the market of 5G antennas and millimeter-wave antenna for automobiles (24 GHz or more) of 150 billion yen)
High-end (purposes: servers, routers, etc.)	
Middle- and low-end	1 trillion 100 billion yen to 1 trillion 200 billion yen

CCL technology of AGC	(1) Raw material	Composition	(2) CCL CCL manufacturing characteristics evaluation
CCL material/process	Inorganic filler  Absorbing fluoropolymer (Fluon+ ™ EA-2000) 	Mixed liquid 	CCL  **Acquisition of Park and Taconic**
	Adhesive fluoropolymer **Inorganic filler** e.g. Ceramics, glass, etc.	**Conversion to composite** - Melting/kneading sheet - Solvent dispersing liquid - Control structure	**Interface control technology** - Adhesion mechanism analysis **CCL characteristics evaluation** - CTE - Dielectric characteristics - Peal strength - Coefficient of thermal conductivity - Transmission loss

(3) Application example of AGC

- Architectural glass base station antennas
- Automotive 5G + In-vehicle antennas, etc.

Source: Our estimated based on Fuji Chimera & Prismark market surveys, data provided by Rogers, etc.

AGC
Your Dreams, Our Challenge

END

Precaution on predictions:

The purpose of this material is to provide information, and it is not intended to encourage any action. This material (including the performance plan) was prepared by us based on currently available and reliable information but includes risks and uncertainties and we shall not be responsible for its correctness or integrity.

Please use it at your own responsibility. We shall not be liable for any loss caused by investment decisions made solely on forecasts, target figures, etc. shown in this material.