

Research & Development

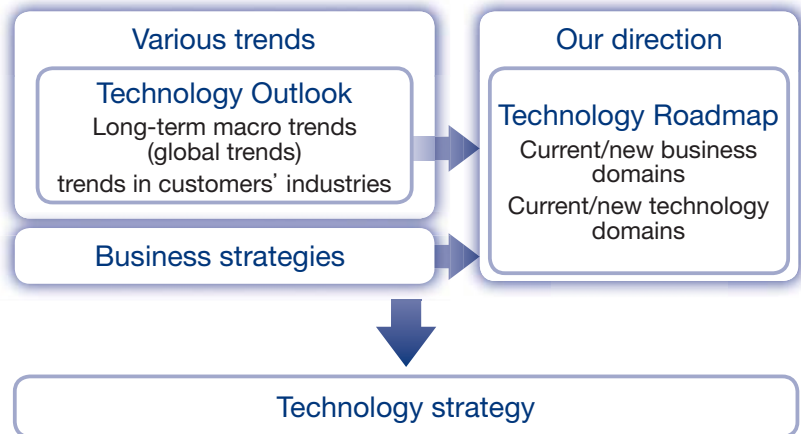
Research & Development Creating the Future of the AGC Group

Since its foundation, the AGC Group has developed its core technologies centered on glass, fluorine chemistry and ceramics technologies.

The AGC Group looks at various trends with a long-term vision, sets the direction of our technology strategy, and is striving to build the foundations for growth set forth in **Grow Beyond** through sophistication, combination and application of our core technologies.

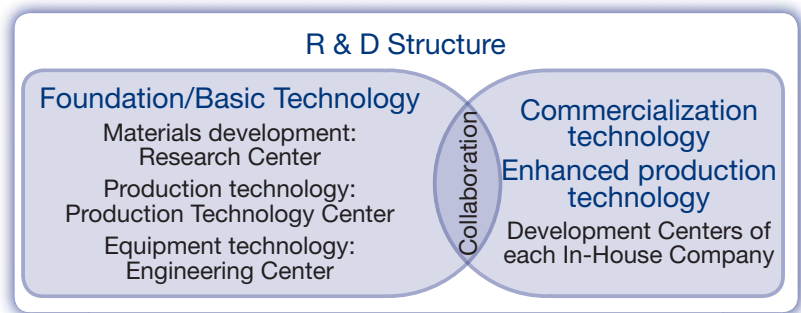
Technology Outlook and Technology Roadmap, which define the direction of technology strategies

In addition to mid- to long-term business strategies, the AGC Group formulates a Technology Roadmap based on our Technology Outlook that looks at various trends with a long-term vision in areas such as energy, resources and population, and thereby sets the direction of our global technology strategy.



Carrying out seamless operations ranging from basic research to product development

In R&D, the Research Center handles basic, long-term, innovative, and inter-business themes, while the Production Technology Center and Engineering Center undertake the development of innovative production technologies and equipment technologies. The Development Centers of each In-House Company enhance production technologies and undertake product development in close contact with customers. In fiscal 2010, the Production Technology Center was separated from both the Research Center and the Engineering Center in a bid to promote and accelerate "Glass-technology-driven company" as one of the foundations for growth.



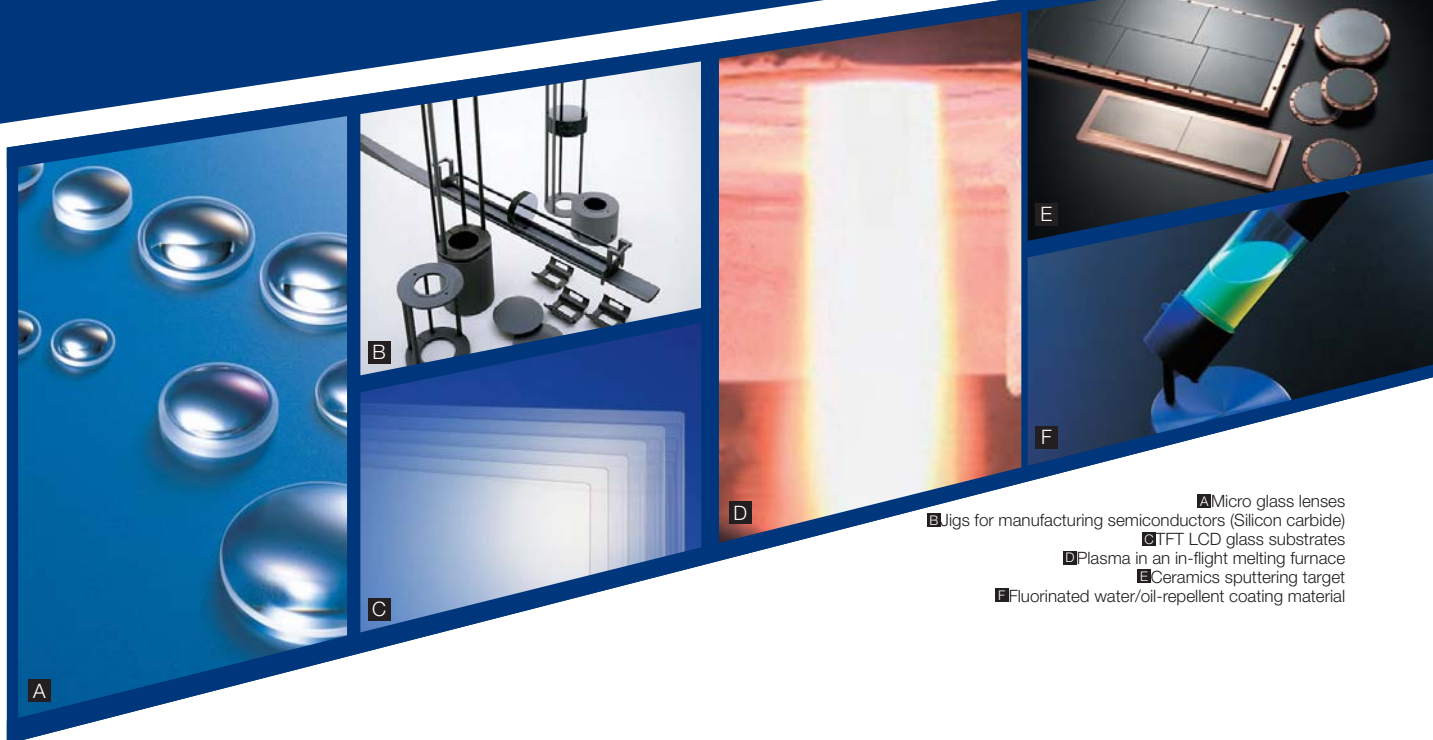
Building foundations for growth through sophistication, combination and application of our core technologies

The AGC Group positions "glass materials and glass production technologies," "coating technologies," "optics and electronics technologies," "ceramics material technologies" and "fluorine chemistry technologies," as well as "fundamental common technologies" that support the above, as its current core technologies.

Through sophistication, combination and application of our core technologies, we will work to develop technology for implementing "group-wide promotion of solar business," "measures against climate change" and "glass-technology-driven company" as the foundations for growth set forth in our **Grow Beyond** management policy.

Core technologies of the AGC Group and foundations for growth set forth in **Grow Beyond**

	Core technologies					
	Glass materials and glass production technologies	Coating technologies	Optics and electronics technologies	Ceramics materials technologies	Fluorine and other chemistry technologies	Fundamental common technologies
	Glass materials design Glass manufacturing Glass forming and processing	Dry coating Wet coating Patterning	Liquid crystal materials Photolithography Assembly Optical design	Refractory lining Fine ceramics	Fluorine chemistry Electro-chemistry Inorganic materials Nanomaterials	Equipment Sensing Evaluation and analysis Simulation
Group-wide promotion of solar business	○	○	○	○	○	○
Glass-technology-driven company	○	○	○	○	○	○
Measures against climate change	○	○	○	○	○	○



A Micro glass lenses
B Jigs for manufacturing semiconductors (Silicon carbide)
C TFT LCD glass substrates
D Plasma in an in-flight melting furnace
E Ceramics sputtering target
F Fluorinated water/oil-repellent coating material

Foundations for growth **Grow Beyond** : Future business domains

Group-wide promotion of solar business

Improving the efficiency of solar power generation

Glass substrates with TCO film for thin-film silicon photovoltaic module

This film scatters light by means of their surface concavoconvex texture, to conduct more light into the photovoltaic layer for higher power generation efficiency.

Glass mirrors for solar thermal generation

We provide high transmittance glass and highly reflective mirrors that maximize the energy reflectance of solar concentrators for solar thermal power generation system.



Photovoltaic cover glass



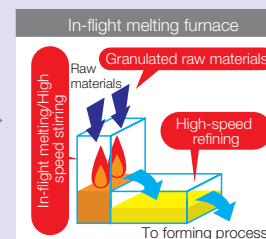
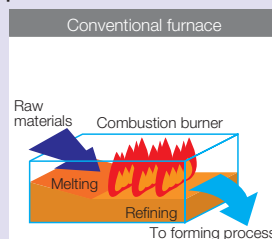
Concentrating solar thermal power generation system (highly reflective mirror)

Glass-technology-driven company

Improving the energy efficiency of the glass production process

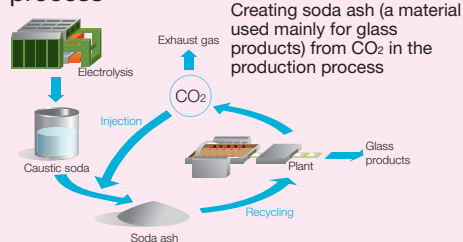
Total Oxygen Combustion Method
 By sending only oxygen to a glass melting furnace, it will reduce nitrogen oxide emissions and improve energy efficiency.

In-flight melting technology
 Granulated raw material mixtures are injected into a furnace and instantaneously melted by a combustion flame or plasma. This technology will enable halving CO₂ emissions and energy consumption during the production process.



Measures against climate change

CO₂ recycling in the glass production process



The CO₂ recycling system in the glass production process

Environmentally friendly products

Architectural glass (improves air conditioning efficiency)
 Automotive glass (improves fuel efficiency, responds to Eco-Cars)
 Chemicals recycling (collection and decomposition of greenhouse gasses)



Low-E double-glazed glass featuring high insulation and heat-shielding properties



Automotive glass

Reducing the environmental impact of fluorinated products

Coolants with zero ODP (Ozone Depletion Potential)
 Coolants with one-digit Global Warming Potential (GWP)



Coolants with zero Ozone Depletion Potential (ODP)
 ASAHIKLIN AE-3000