# **Sumitomo Chemical's Semiconductor-Related Business**

## Semiconductor manufacturing process and our products

Sumitomo Chemical has established state-of-the-art product design and evaluation technologies, building on the organic synthesis expertise developed through its fine chemicals business. We offer photoresists that support the miniaturization of advanced semiconductors, along with ultrapure chemicals, and we are also focusing on expanding performance chemicals required for advanced and back-end processes. Through these efforts, we provide a diverse lineup of high-quality products for semiconductor manufacturing.

#### **Photoresist**

Deepening proprietary core technologies, Strengthen global supply and development structure

#### semiconductor chemical

Establish world-class business scale with supply capabilities built

Interlayer dielectric formation, photoresist

oating, patterning, cleaning, and metallizatio

#### Semiconductor back-end materials

Enter back-end process material market leveraging our know-how in front-end process materials and proprietary performance materials and processing technologies.

#### Semiconductor Business environment

The silicon semiconductor market will continue to grow in a stable fashion, driven by expanded Al applications, further advances in IoT, and the spread of autonomous driving and smart mobility Should become an even larger market. Increased demand for new technologies such as 3D to drive greater sophistication and diversification in materials technologies and needs.

# Semiconductor market size 1.7xvs FY2024 FY2024 FY2030

#### **Front-end process**

**Ingot production** 

Our product Aluminum target Our metallic material used for depositing a thin layers

through sputtering. Our alu-

minum target is the only one

in the world manufactured

through an integrated process

from raw material to final

product ensuring high quality.

Wafer fabrication

#### afer cleaning and thin film layer deposi

Impurities on the wafer surface are removed and an oxide layer is formed.





#### IPA, sulfuric acid, ammonium-hydroxide, and hydrogen peroxide solution (high purity chemicals)

High-purity chemical for removing impurities and cleaning and drying semiconductor substrates. We have a global supply system and cutting-edge technologies (purification process and high-sensitivity analysis).

Photoresist coating, patterning, cleaning, and contact formation



Our product Wafer protection agent

delivers high reliability.

It protects the surface of semiconductor chips during the dicing

and etching processes. Our product is equipped with superior

film properties to prevent mechanical and chemical damage, it



A photoresist is uniformly coated over the The circuit pattern is transferred by exposing light through a



**Photoresist coating** 

# The developer removes the unnecessary

#### **Etching**

The unnecessary material is removed along the photoresist pattern by etching.



### Our product Photoresist

Our photoresist is a photosensitive material that precisely forms highly dense and highly integrated patterns for semiconductor circuits. Furthermore, by utilizing proprietary polymers and photosensitive materials developed with advanced organic synthesis technology, our photoresist achieves both high resolution and high quality. We offer a broad lineup ranging from i-line to EUV.



## Selective etchant (performance chemical)

A functional chemical used for formation of gate interconnects that also selectively removes unnecessary material. It precisely controls the solubility of each material and achieves high selectivity with the surface protection technology.

IPA, sulfuric acid, hydrogen peroxide solution (high purity chemicals)

# **Insulating film formation**



An insulating film is formed to electrically isolate circuits from each other.



## Ion implantation

lons are implanted to induce desired semiconductor properties.



#### Photoresist stripping and cleaning

The recidual photoresist is removed and the wafer is cleaned



### Wafer bonding

Two wafers are bonded together to form a single unit.



### Wafer backgrinding The back side of a wafer is ground for thinning.

**Photoresist** 

#### Wafer dicing

A wafer is diced into chips.



# Pick and place

Diced chips are picked up and placed into a

A circuit is formed

through repeated



### **Encapsulation**

The chip is encapsulated with material such as resin to protect it from the external environment.



### **Redistribution layer**

It is used to route wiring within the package and connect the chip to external terminals



#### Our product In-process cleaner (performance chemical)

Our product is a functional chemical for removing adhesives (glue) used in wafer bonding process.It is designed to have high solubility for adhesives while preventing damage to semiconductor chips

#### Our product Photoresist for the back-end process

This photoresist used for advanced packaging such as chiplets. Characterized by a thick film, high resolution, and high sensitivity.

# **Back-end process**

Inspection

Integrated Report 2025

## Growth strategy for the key products

#### Photoresist

For cutting-edge photoresists, we will deepen core technologies and strengthen the global supply and development structure.

# Deepening core technologies

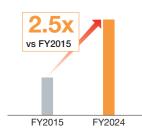
# Control technology for dissolution rate contrast Material design and synthesis capabilities

#### Contributing to higher functionality as a top runner

Since steady demand growth is expected for immersion ArF photoresists, in which we possess world-leading technological capabilities, as well as thick-film i-line photoresists for high aspect ratio applications, we will further advance our technologies.

At the same time, we will focus on developing products for next-generation EUV photoresists, such as our proprietary organic molecular resists, and work to further expand our cutting-edge photoresist-related business.

#### Photoresist sales



#### **Next-generation EUV photoresist**

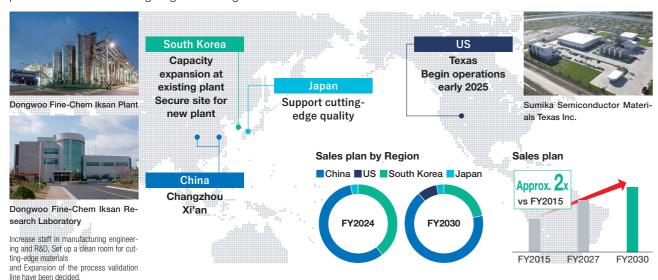
We will design and mass-produce resist materials at molecular size to support ultra die shrink of semiconduc-

We will also accelerate development of next-generation platform by concentrating R&D resources.

	Next-generation (high N	A) Existing type				
Platform	Made from organic molecul	les Main ingredient is polymer				
Size	Molecule size: < 1 nm	Polymer: < several nm				
Strengths Metal-free	Molecule size: < 1 nm	High development contrast design				
Affinity with existin processes	g Ac	chieve die shrink				
Target market share $20\%$ share by volume in cutting-edge resist						

### **High-purity chemicals**

We have established world-class business scale with supply capabilities built from upfront investments. Also, we are strengthening process technology and evaluation and analysis infrastructure to ensure the stable supply of high-quality products tailored to cutting-edge technologies.



# Strengthen global supply and development structure

proactively commit ourselves to upfront investments in cutting-edge fields in line with the advancement of semiconductors.

FY2030

FY2023

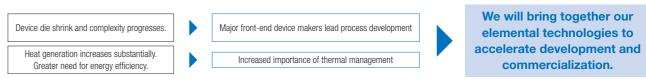
#### Established a two-site supply system in Japan and S.Korea

#### Positioning of each plant 2030 2024 Further enhancement of Building of a new research/ Kasugade: mother plant; accumulation and global deployment of the evaluation system mass production evaluation building in the Osaka area manufacturing technology know-how South Korea (Iksan): supply site for Korean customers; stable supply through dual-site operations 2015 2025-26 Building of a new plant Expansion of production capacity Expansion of the cutting-edge photoresist ArF photoresist: fivefold at the South Korean evaluation facility in the Osaka area between 2010 and subsidiary, Dongwoo 2020 Photoresist market demand 2024 forecast Commencement of operations of the new **EUV** photoresists 2023 cutting-edge photoresist ArF photoresists Addition of a cutplant in the Iksan area KrF photoresists ting-edge photoresis Launch of the q-line South Korea g/i-line photoresists the Osaka area 10.2 2009 Building of a new plant of immersion Launch of the i-line photoresist (world's first mass the Osaka area produced i-line photore-

#### Semiconductor back-end materials

As the formation of cutting-edge back-end markets begin against the backdrop of major technological innovations in semiconductor processes, we will make a market entry leveraging our know-how in front-end process materials, proprietary performance materials, and processing technologies.

#### Market trends



#### **Sumitomo Chemical's strengths**

Photoresist	Performance chemicals	High-purity chemicals			Cutting-edge inorganic materials Highly thermal conductive filler	Performance materials		
High precision	High-purity precision an	d trace amount analysis	umount analysis		(alumina) F	Functional resin design		
Functional molecular design		Quality management	X		Ultrafine particle processing  Display films			
Photosensitive material design	Process suitability	*Impurities at the ppt level management technologies		Core technologies	Roll to Roll precision lamination and coating Cutting-edge optical inspection technologies			

We aim to generate 10% of total semiconductor material sales after FY2030.

Integrated Report 2025