



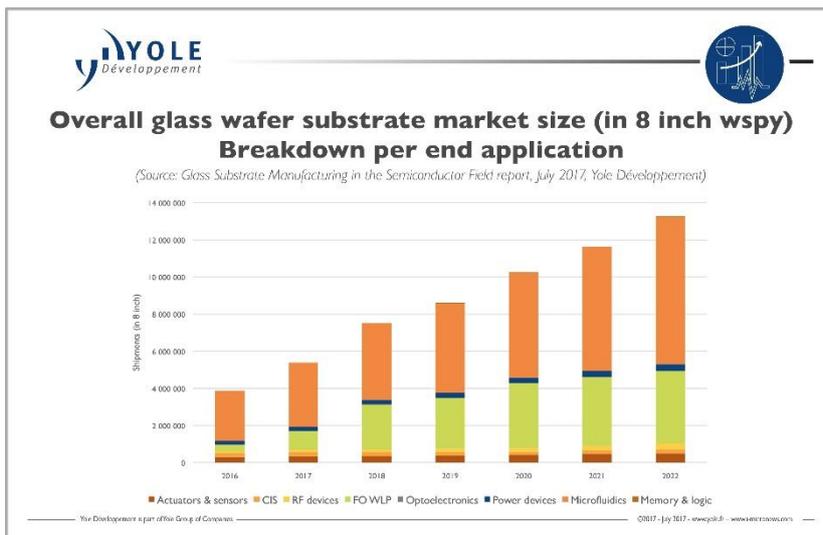
**FOR IMMEDIATE RELEASE:**

**Semiconductor manufacturing: what is driving the growth of the glass material market?**

Glass Substrate Manufacturing in the Semiconductor Field report – Yole Développement – July 2017

**LYON, France – July 11, 2017:** Used either as a permanent or as a temporary material within the semiconductor manufacturing processes, glass plays a key role in the semiconductor industry. It is today already implemented as a mature solution, in several market segments such as IR<sup>1</sup> cut filter for CIS<sup>2</sup> technology, microfluidics devices and some actuators and sensors.

[Yole Développement \(Yole\)](#) confirms the growth of the glass materials market for the next five years. Therefore, the 8-inch eq glass wafer market is expected to increase at a 23% CAGR<sup>3</sup> through 2022, reaching around 14M 8-inch eq wafer. Related revenue will exceed almost US\$594 million by 2022, explain Yole’s analysts. Why will the glass wafer market’s revenue more than double over the next five years?...



Yole’s analysts propose today a new technology & market analysis dedicated to glass materials for semiconductor manufacturing, titled [Glass Substrate Manufacturing in the Semiconductor Field](#). This report provides detailed information regarding the current and potential applicability of glass material in the semiconductor field, as well as its processing functionalities. Analysts also review in this report major

applications currently using glass material as well as potential applications that could require glass.

“Glass is making serious inroads in the semiconductor market, adopting various functionalities within IC<sup>4</sup> semiconductor devices,” asserts

<sup>1</sup> IR: Infrared  
<sup>2</sup> CIS: CMOS Image Sensor  
<sup>3</sup> CAGR : Compound Annual Growth Rate  
<sup>4</sup> IC: Integrated Circuit

**Amandine Pizzagalli, Technology & Market Analyst, Advanced Packaging & Semiconductor Manufacturing at Yole.** Specific to semiconductors, glass material is typically developed in two formats wafer and panel, and is available in two densities, thin and thick. Moreover, glass material can be used in two different ways to fabricate a semiconductor device's product:

- Glass-based product where the glass material is applied as a permanent material and remains in the final product.
- A non-glass-based product where the glass substrate is only applied for temporary use in the process flow and then removed after the IC device is processed.

Some IC device applications using glass material are mature, such as CIS, microfluidics, and actuators & sensors, with relatively low growth opportunity except for FO WLP<sup>5</sup> packaging applications driven by glass carrier usage.

Regarding functionalities, WLCapping<sup>6</sup> and permanent substrate, both fueled by the automotive and medical fields, drive the development of the glass wafer market.

The glass material market's ascent will be due to the fast growth of glass carriers for FO WLP and actuators & sensors. On the other side, TGV<sup>7</sup> interposer is still perceived as immature, but Yole is expecting an adoption rate for production by 2019 - 2020.

The glass material market for semiconductor is concentrated amongst glass material suppliers from different categories:

- Raw material manufacturers like Schott, Corning, and AGC providing raw glass material and blank wafers or sheets. These companies have limited wafer-processing capabilities.
- Glass processors and structured substrate manufacturers like PlanOptik and Tecnisco, which can pattern and structure glass wafers from the raw material provided by raw material suppliers. These companies typically purchase wafers from raw-glass material suppliers and then design/create products from the raw material.
- Structured/patterned glass wafer manufacturer mainly from MEMS<sup>8</sup> & microfluidics areas, focused mainly on microfluidic and MEMS devices. This category mostly includes foundries that start from blank or pre-patterned wafers. However, contrary to a typical foundry such as Silex Microsystems, these companies create their own products.

Established glass applications such as CIS and microfluidics have led Schott to dominate the glass material market in the semiconductor

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<sup>5</sup> FO WLP : Fan-Out Wafer Level Packaging

<sup>6</sup> WLCapping : Wafer Level Capping

<sup>7</sup> TGV : Through Glass Vias

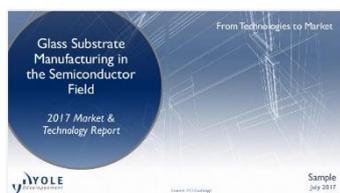
<sup>8</sup> MEMS : Micro Electro Mechanical Systems

field. However, emerging applications including RF devices, FO WLP technology and more... could require the use of glass material. These emerging fields represent a real business opportunities for some glass companies.

*“In the quest to acquire market share, we’re seeing the entrance of aggressive players like NEG in the FO WLP field”, explains Amandine Pizzagalli from Yole. “We also see increased competition, even in mature markets like actuators & sensors and power devices where Chinese glass processor companies are likely to challenge established players like PlanOptik and Tecnisco.”*

Increased competition has created a challenging environment for glass substrate makers. This competitive landscape is analyzed in Yole’s Glass Manufacturing report. A detailed description of this report is available on [i-micronews.com, manufacturing reports section](http://i-micronews.com/manufacturing-reports-section).

Yole’s analysts are part of [SEMICON West](#) agenda with presentations (Click [Program](#)) and booth (#7753 ). The team will also attend [SEMICON Taiwan](#) (Booth # 828). Feel free to ask for a meeting or visit our team this week. Stay tuned!



### About [Glass Substrate Manufacturing in the Semiconductor Field](#) report

*Why will the glass wafer market's revenue double over the next five years? ... This report has been performed by Yole Développement (Yole) part of Yole Group of Companies.*

#### Companies cited in the database:

Amkor, Austriamicrosystems (AMS)/Heptagon, 3D Glass Solutions, 3D Micromac, 3M, AGC, Bosch, Corning, DelphiLaser, Dolomite, ESI, EO Technics, GFH Laser Micro Machining, Han's Laser, Honeywell, Georgia Tech, Hitachi, Ibiden, Kulite, Schott, IMT AG, Infineon, Intel/Lemeptix, Invenios, LPKF, Luxtera, On Semiconductor, Omron, Menlo Micro, Micron, Murata, Nippon Electric Glass (NEG), PlanOptik, Samtec, Samsung, Sensata Technologies, Sensirion, Shinko, SK Hynix, ST Microelectronics, SUSS MicroTec, Texas Instruments, Trumpf, TDK Epcos/Qualcomm, Unimicron, TSMC, and more ...

#### Author:

**Amandine Pizzagalli** oversees the equipment and materials fields for the Advanced Packaging and Manufacturing team at Yole Développement. She graduated with a degree in Electronics Engineering, specializing in semiconductors and nanoelectronic technologies. Before joining Yole, Amandine worked for Air Liquide with an emphasis on CVD and ALD processes for semiconductor applications.



#### About Yole Développement – [www.yole.fr](http://www.yole.fr)

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, RF Electronics, Solid-state lighting, Displays, Image Sensors, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

The “More than Moore” company Yole, along with its partners System Plus Consulting, PISEO, Blumorpho and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to grow their business.

- Consulting & Financial Services: Jean-Christophe Eloy ([eloy@yole.fr](mailto:eloy@yole.fr))
- Reports: David Jourdan ([jourdan@yole.fr](mailto:jourdan@yole.fr))

**Yole Group of Companies - Press Relations & Corporate Communication: Sandrine Leroy ([leroy@yole.fr](mailto:leroy@yole.fr))**

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