

**See Beyond
the Horizon**

**Published
1Q 2018**

***Uncertainty around
true materials
requirements is a
huge risk for leading
edge materials
developers.***

**Understanding and
forecasting the
markets for**

- ◆ ALD
- ◆ CVD
- ◆ ECD
- ◆ PVD
- ◆ SOD

**Linx Consulting Industry
Analysis Report**

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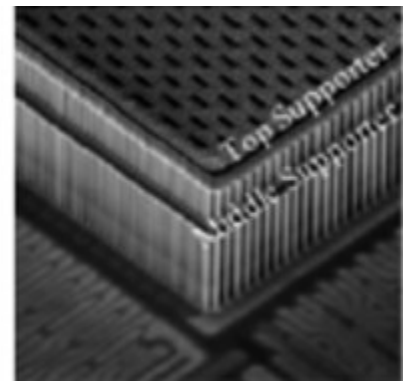
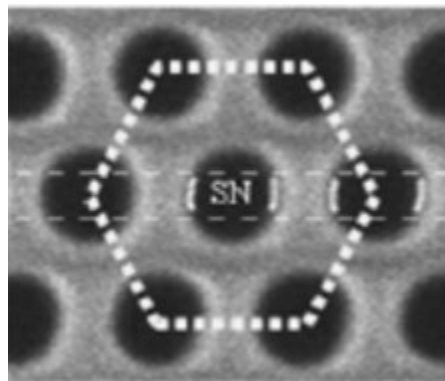
Linx Consulting Inc.

ADVANCED THIN FILM PROCESSES and MATERIALS for FEOL and INTERCONNECT APPLICATIONS

2017 –2022

Seventh Edition

The semiconductor industry has relied on CVD and PVD technologies to meet much of the requirements in thin film depositions. Along with these process technologies, many standard materials, such as SiO₂, Al and Ti, have been relied on to meet a majority of the industry's needs. However, now the industry is facing significant change starting with the conversion to FinFETS as well as novel DRAM structures enabling spacers, novel gates, high-κ gate dielectrics, etc. to all grow rapidly.



Source: Samsung

ADVANCED THIN FILMS is an industry analysis report of approximately 500 pages electronically delivered in Power-Point format. Subscriptions include a global company-wide license, and one day of consulting.

1. EXECUTIVE SUMMARY

- 2017—2022 Consumption of materials
- Growth rates by deposition technology
- Distribution of precursors—FEOL, MOL, BEOL

2. METHODOLOGY AND BACKGROUND

3. FORECAST DRIVERS

- Segmentation by device type
- Introduction of EUV
- Review ITRS
- Map unit operations by device type

4. REVIEW OF FEOL DEPOSITION

- **Vapor Deposition**
 - Metal Gates
 - High-k Gate Dielectrics
 - High Mobility Channels
 - Strain & Spacers
 - STI/PMD
 - FinFETs
 - High- κ Capacitors
- **Physical Deposition**
 - Metal Gates
 - STI/PMD

5. REVIEW OF BEOL DEPOSITION TECHNOLOGY

- **Vapor Deposition**
 - Low- κ Dielectric
 - Barrier (ALD, CVD)
 - Seed Layers
 - Caps (ALD, CVD)

- **Physical Deposition**

- Barrier (PVD)
- Cu & Co ECD
- Caps (CVD)

6. REVIEW OF MEMORY DEVICES

- **Vapor Deposition**

- 2D & 3D NAND Structures
- GST—CrossPoint
- STTMRAM
- DRAM FEOL Structures

7. MATERIALS MARKET ANALYSIS and FORECASTS, 2017—2022

By application and year in terms of value and volume:

- **Vapor Deposition**

- ALD
- CVD

- **Physical Deposition**

- ECD
- PVD
- SOD

8. LEADING SUPPLIERS & BUSINESS ASSESSMENT

- Leading suppliers by material
- Share review by segment
- Competitive review

Materials Covered

HCDS	GeH4	HfCl4 and TEMA Hf	Al—300 & 300mm
TSA	CCTBA	CpZr and TEMA Zr	Ti—200 & 300mm
Aminosilane spacer	CpCOCo	Niobium and dopants	Ta—200 & 300mm
BTBAS, 3DMAS, MCS, BDEAS	Fluorine Free W	TMAI	Cu—200 & 300mm
DiSilane	PDMAT	Cobalt	W
Low-k Dielectrics	TDMAT	Ti	Ni & Co
		ECD - Co and Copper	Metal gate & Other
		SOD—PHPS	

Benefits

- A report of approximately 500 pages, with the latest perspectives on technology and market opportunities, with perspectives on future technology needs.
- An electronic copy of the content of the final report in Microsoft PowerPoint and Excel formats.
- Output from Linx Consulting's models and the ability to modify forecast assumptions to develop alternative scenarios.
- One day of consulting time to advise and assist in decision making and accurately interpreting the analysis*.

Schedule

- The report was completed in 1Q 2018

Fee structure

The report is available in sections or its entirety, as detailed below:

Sections	Subscriber Pricing
Full Report	\$14,200
ALD & CVD Sections	\$10,500
ECD, PVD & SOD Sections	\$8,900

Note: all travel expenses incurred will be billed separately

SUBSCRIPTION AGREEMENT

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