

**See Beyond  
the Horizon**

Linx Consulting Inc.

## **CMP TECHNOLOGIES and MARKETS to the 5 nm NODE**

**Eighth Edition**

Published  
3Q 2018

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

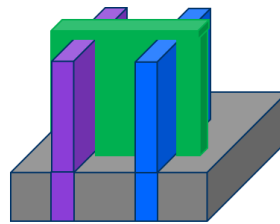
- ◆ Copper/Barrier
  - ◆ Cobalt
  - ◆ Dielectric
  - ◆ Tungsten
  - ◆ Ceria
- ◆ Emerging
- ◆ 3D NAND

Linx Consulting Industry  
Analysis Report

Call for Information  
+1 617 273 8837  
+1 973 437 4517  
+886 952 111222  
[www.linx-consulting.com](http://www.linx-consulting.com)

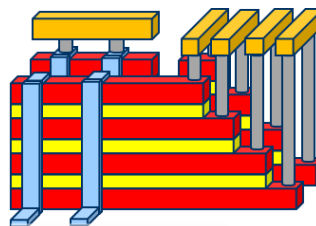
Linx Consulting is pleased to announce that we have completed our latest edition of **CMP Technologies and Markets to the 5nm Node**. The industry is now going through an unprecedented period of change, including:

Novel transistors:



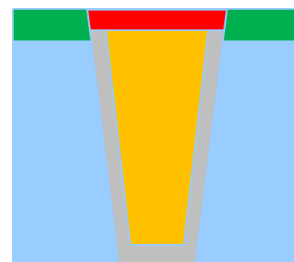
Gate Architecture

New memories:

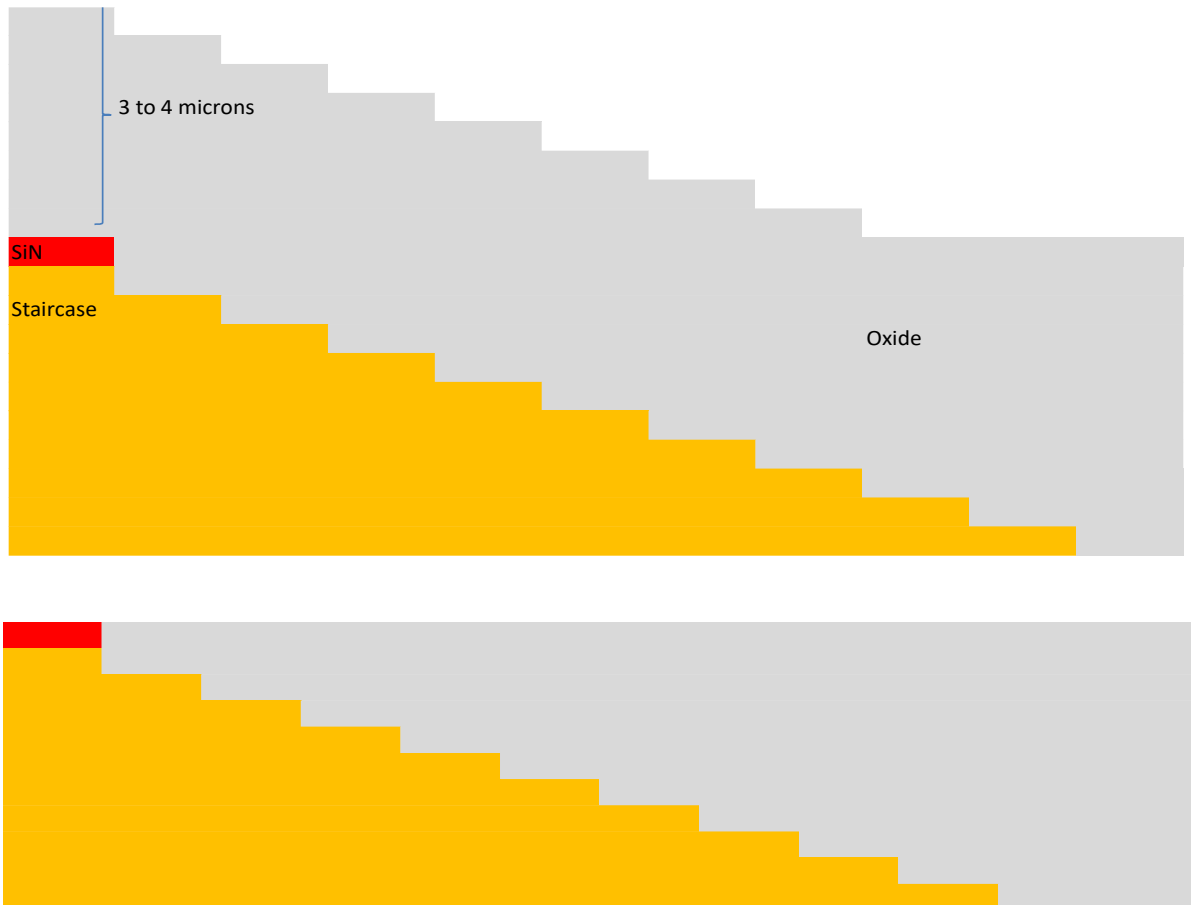


New Memory

Novel Interconnects:



The CMP slurry and pad market has finally returned to higher growth rates driven by the strong year in 2017 and across both 200mm and 300mm platforms. Also new applications for CMP are emerging and helping to drive growth. One key application is in 3D NAND and is shown below:



In addition, the positive impact of new CMP applications in both planar and multi-gate structures as well as cobalt metallization are positively impacting the demand for CMP slurries and pads.

The eighth edition of **CMP Technologies and Markets** identifies and focuses on growth drivers for CMP applications and forecasts consumables demand to 2022. Linx Consulting follows its proven methodology utilizing direct field research with leading CMP users, equipment suppliers, consumable suppliers and technology sources, as well as relying on its proven modeling capabilities to deliver this report to our valued clients.

## Report Structure

### 1. Executive Summary

- Manufacturing Challenges
- Device Roadmaps
- Slurry and Pad Forecast
- Defectivity
- Impact of 450mm

### 2. Methodology

- Methodology
- Econometric Semiconductor Forecast
- Model Schematic

### 3. Forecast Drivers

- Market Forecast
- Roadmap And Device Assumptions

### 4. CMP Applications in Wafer Fab BEOL

- ***Complete P1, P2, P3 (as applicable) Assessment***
- Review of POR, Challenges, consumables, activities of leading fabs for the following applications to 14nm:
  - Bulk copper
  - Barrier
  - Tungsten
  - Cobalt

### 5. CMP Applications in Wafer Fab

- Oxide
- Ceria
- Polymers

### 6. CMP Applications—Emerging

- ***Complete P1, P2, P3 (as applicable) Assessment***
- Si FinFET
  - STI
  - Poly
  - Gate Open
  - Metal Gate
  - Self Aligned Contact
  - Contact Metal 0
- Planar Transistors
- 3D NAND
- Other advanced memories
- Ge and III-V FinFET, MG and M0

### 7. Market Assessment And Forecasts

- Overall market for slurries and pads
- 300mm CMP unit operation forecasts by:
  - Application
  - Node
  - Device type
- Pricing Info

### 8. Supplier Assessment

- Supplier Landscape
- Slurry Suppliers
- Pad Suppliers

### 9. Business Analysis & Opportunities

**CMP Technologies and Markets to the 5nm Node** is an industry analysis report of approximately 500 pages, and offers the latest perspectives on technology and market opportunities, as well as future technology needs.

**Subscribers will receive the following Benefits:**

1. An electronic copy of the content of the final report in Microsoft PowerPoint and Excel formats.
2. Output from Linx Consulting's models in Excel format with the ability to modify forecast assumptions to develop alternative scenarios.
3. Company wide license to the reports.
4. One day of consulting time for the industry analysis report to advise and assist in decision making and accurately interpreting the analysis.\*

**Fees:**

Regular Subscriber - US\$12,600.

\* Note: all travel expenses incurred will be billed separately

## Linx Consulting Industry Analysis Report

Please enter our subscription to **CMP TECHNOLOGIES and MARKETS to the 5nmNODE**. The subscription includes data files of the report sections and one day of consulting time to be used within 3 months of report publication. (Please note: travel fees associated with the consulting time will be billed separately). We understand that this report is available only by subscription. Subscription prices do not include sales tax if applicable. You will invoice us for the total amount, and we will pay this invoice within 30 days of receipt.

To protect our investment in this report and that of other subscribers, we agree that, for a period of three years after its date of issue, we will: (1) restrict its circulation to our own employees; and (2) use all reasonable precautions to prevent the disclosure of its contents to any other persons or organizations without written permission from Linx Consulting Inc. We may, however, make this report available to any subsidiary company in which we hold more than half interest or to any parent company that holds more than a half interest in our firm. We may also use or disclose any information in this report that is public knowledge, that was already in our possession before receipt of the report, or that comes to us from third parties independently of this report.

Company	Address
Designated Contact	Designated Contact Email Address
Phone	Purchase Order Number
Signature	

**Fax to +1 973 210 3017 or email to a contact below.**

**Mike Corbett**

mcorbett@linx-consulting.com

Office: +1 973 437 4517

Cell: +1 973 698 2331

**Andy Tuan**

atuan@linx-consulting.com

Linx - Asia — Taipei

Cell: +886 958 111222

**Mark Thirsk**

mthirsk@linx-consulting.com

Office: +1 617 273 8837

Cell: +1 774 245 0959

**Audrey Parton**

aparton@linx-consulting.com

+1 570 595 6493

**CMP Technologies and Markets to the 5nm Node**