

**See Beyond
the Horizon**

**Published
4Q 2018**

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

Understanding and
forecasting the
markets for

Formulated Cleans

Residue Removal

Solvent Cleans

POST CMP Cleans

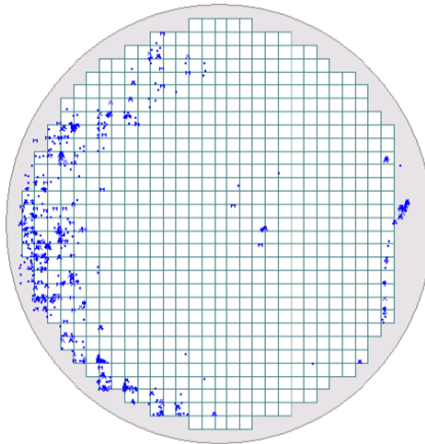
Linx Consulting Industry
Analysis Report

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Linx Consulting Inc.

**ADVANCED CLEANING
and
SURFACE PREPARATION
TECHNOLOGIES and MARKETS
2018—2023
Eighth Edition**

Effective cleaning has been pivotal to the evolution of the semiconductor industry. Improvements in materials for removing contaminants and residues from earlier process steps have led to higher yields and enabled new integration schemes.



Cleaning and stripping are the most common operations in IC manufacturing. The challenges in preparing the wafer surface for the subsequent process steps have increased significantly, driven by materials changes, critical defect size and the increasing use of high aspect ratio features.

1. EXECUTIVE SUMMARY

- 2018 -2023 Consumption of materials
- Growth rates by cleaning technology

2. METHODOLOGY AND BACKGROUND

3. FORECAST DRIVERS

- Segmentation by device type
- Map unit operations by device type

4. TECHNOLOGY EVOLUTION

- Wafer fab processes
- Technology trends by device type
 - ASIC, DRAM, NAND, etc.
- Cleaning chemical review

5. FORECASTS

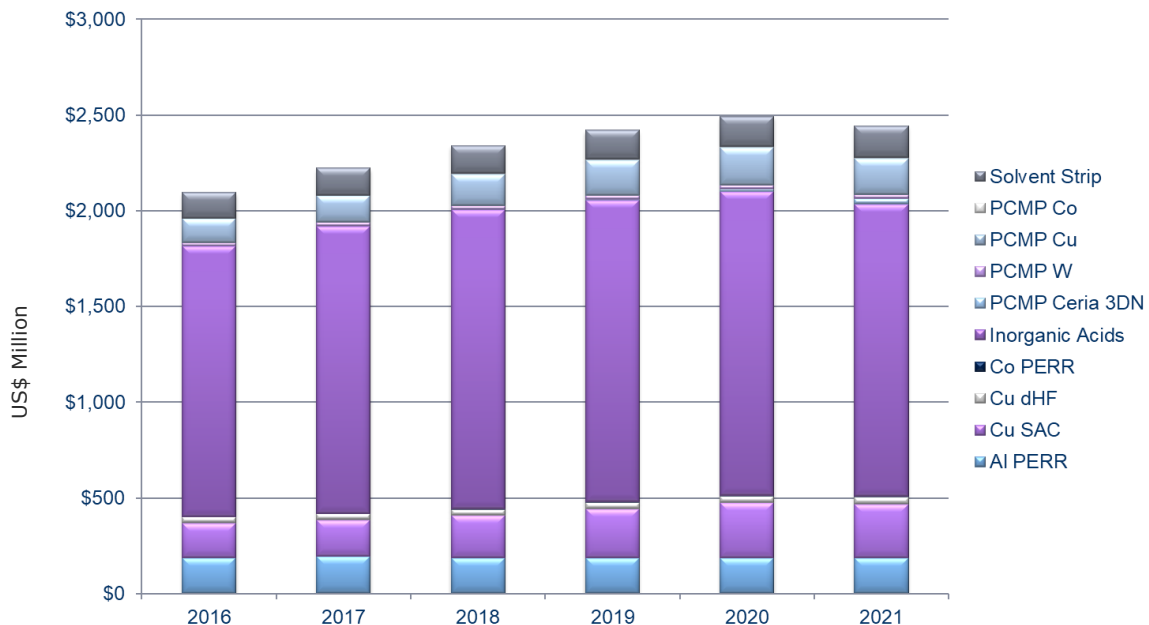
- Wet and formulated chemical volume demand, and market, 2018 — 2023
 - Formulated Cleans
 - Post Etch Residue Removers
 - Aluminum

- Copper
- Cobalt
- Post CMP Cleans
 - Copper
 - Cobalt
 - Tungstun
 - Ceria
- Critical Cleans
- Solvents

6. SUPPLIER ANALYSIS

- 2018 Supplier share by application
- Company review
- Supplier global footprint
- Supply chain trends

Total Cleans Chemicals Market, 2017



Benefits

- A report of approximately 200 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 initiated in 3Q 2018 and completed in 4Q 2018.

Fees

Regular Subscriber — \$7,900, which includes:

1. Global corporate license.
2. Electronic copy of report and all data tables.
3. One day of consulting time.*
4. Scenario based forecasts with the Linx Consulting models.

* Note: All travel expenses incurred will be billed separately.

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