

# 2022 CRITICAL MATERIALS REPORT<sup>TM</sup> WAFER LEVEL METAL PLATING CHEMICALS

FOR FRONT END SEMICONDUCTOR  
MANUFACTURING AND ADVANCED  
PACKAGING APPLICATIONS 2022

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## RESEARCH METHODOLOGY

TEHCET employs subject matter experts having first-hand experience within the industries which they analyze. Most of TEHCET's analysts have over 25 years of direct and relevant experience in their field. Our analysts survey the commercial and technical staff of IC manufacturers and their suppliers, and conduct extensive research of literature and commerce statistics to ascertain the current and future market environment and global supply risks. Combining this data with TEHCET's proprietary, quantitative wafer forecast results in a viable long-term market forecast for a variety of process materials.

## READER'S NOTE

This report represents the interpretation and analysis of information generally available to the public or released by responsible agencies or individuals. Data was obtained from sources considered reliable. However, accuracy or completeness is not guaranteed.



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**Karey Holland, Ph.D.** is TECHCET's Chief Strategist & Sr. Technical Analyst and is a co-founder of TECHCET. Dr. Holland has led advances in interconnect technologies, CMP, photolithography, vacuum technology, reactive ion etch, metrology, and metals and dielectric depositions for over 35 years. She specialized in advanced semiconductor transistor fabrication evolutions for the next 10 years. She was previously CTO of Revasum, a SiC polish process and equipment supplier. Before joining Revasum, she was Global Market Sector Manager Semiconductor Process Technology at Edwards Vacuum, VP Process Technology at Mega Fluid Systems, Senior Manager Technology Roadmap at FEI, CTO of NexPlanar, member of the Board of Directors at Nova Measuring Instruments, VP Technology at Thomas West, and CTO and VP of Process Technology IPEC-Westech / SpeedFam-IPEC. Her career began in process engineering at IBM where she managed the first 248nm DUV lithography technology development team, and also developed interconnect integration for 4 and 16 Mb DRAMs which were the first chips in the world to use CMP for all interconnect dielectrics. Dr. Holland holds a Ph.D. in electro-analytical chemistry from Pennsylvania State University, a M.S. in analytical chemistry from Purdue University, and a B.A. in chemistry from Albion College.

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# 2

## SCOPE, PURPOSE AND METHODOLOGY



## 2.1 SCOPE

- This report covers the Metal Chemicals market trends and supply-chain as it applied to **Advanced Packaging** (wafer level) and **Semiconductor Device Manufacturing** (damascene process).
- Included are forecasts for copper plating and additives, market shares, technical trends, and supplier profiles. Also included in the appendix is a supplier product comparison table of publicly available information on plating products used for advanced packaging.
- The report contains data and analysis from TECHCET's data base and Sr. Analyst experience, as well as that developed from primary and secondary market research. For more information on TECHCET Critical materials Reports™ please go to <https://TEHCET.com>

## 2.2 PURPOSE

- This Critical Materials Report™ (CMR) provides focused information for supply-chain managers, process integration and R&D directors, as well as business development managers, and financial analysts. The report covers information about key suppliers, issues/trends in the material supply chain, estimates on supplier market share, and forecast for the material segments.
- Providing current information and actionable content is the intent of the information contained within this report and the quarterly updates.
- As important as the supply side of the equations is the demand requirements of the market in terms of the economic variables, leading edge technology requirements and the wafer start forecast.

## 2.3 METHODOLOGY

TEHCET employs subject matter experts having first-hand experience within the industries which they analyze. Most of TEHCET's analysts have over 25 years of direct and relevant experience in their field. Our analysts survey the commercial and technical staff of IC manufacturers and their suppliers and conduct extensive research of literature and commerce statistics to ascertain the current and future market environment and global supply risks. Combining this data with TEHCET's proprietary, quantitative wafer forecast results in a viable long-term market forecast for a variety of process materials.

## 2.4 OVERVIEW OF OTHER TECHCET CMR™ REPORTS

TEHCET produces electronic material supply chain reports each year as one of its functions for the Critical Materials Council. Reports to be published in 2019 can be found at [www.techcet.com](http://www.techcet.com) and are listed in the table below:

2022	CMR Report Schedule
1	<b>CMP Pads and Slurry</b>
2	<b>Electronic Gases</b>
3	<b>Photoresist</b>
4	<b>Precursors - Dielectric Precursors</b>
5	<b>Precursors - Hi K / ALD CVD Metal Precursors</b>
6	<b>Silicon Wafers</b>
7	<b>Specialty Cleaning Chems / Wet Chems</b>
8	<b>Metal Chemicals</b>
9	<b>Targets</b>
10	<b>Equipment Components – Quartz</b>
11	<b>Equipment Components – Ceramics/SiC</b>
12	<b>Equipment Components- Si parts</b>
13	<b>Impact of Fab Expansion on EU Wet Chemicals</b>
14	<b>2021 Impact of Fab Expansion on US Wet Chemicals</b>