



Electronics Materials Information

*TECHCET's Critical Materials Regional Report:*

## ***The Impact of Chip Expansion on the US Wet Chemical Supply-Chain***

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### **Report Contents**

#### **1. (Introduction) The Current State of Affairs:**

- Semiconductor Production in the US
- Number of Fabs
- Estimated Wafer Starts per month

#### **2. The competitive landscape for key wet Chemicals:**

##### 2.1 Overview

- H<sub>2</sub>SO<sub>4</sub> (sulfuric acid)
- H<sub>2</sub>O<sub>2</sub> (hydrogen peroxide)
- HCl (hydrogen chloride)
- NH<sub>4</sub>OH (ammonia hydroxide)
- HNO<sub>3</sub> (nitric acid)
- HF (hydrofluoric acid)
- H<sub>3</sub>PO<sub>4</sub> (phosphoric acid)
- IPA (isopropyl alcohol)

##### 2.2 The Total Available US Market estimates (demand) for each of the materials listed above, and 5 year CAGR:

###### 2.2.1 By Volume

###### 2.2.2 By Revenue

##### 2.3 The Total Available US Supply capacity estimates for each of the materials

##### 2.4 The top 3 Tier I suppliers for each of the electronic chemicals and their associated market share by chemical volume

##### 2.5 Leading US Tier 2 (Sub-Tier, feedstock materials) suppliers for each of the electronic chemicals and their ranking if applicable

##### 2.6 The top 3 US consumers (IDM and foundry) of each material including estimates of total consumption

##### 2.7 Required purity levels, on average, of the leading-edge IDMs and Foundries (currently fabricating devices at 10 nm or less) for each chemical

###### 2.7.1 Current

###### 2.7.2 Projected during the forecast period

##### 2.8 Most widely used package configuration and returnable container requirements

- 2.9 Profile of each Tier I (and leading Tier 2) suppliers of the targeted materials, including
  - 2.9.1 Overview of how each Tier I supplier sources the applicable chemical
  - 2.9.2 Whether they manufactured or purchased
  - 2.9.3 Technology in use

### **3 Pending and Anticipated Changes**

- 3.1 Fab expansions
  - 3.1.1 By Type of device and technology node
  - 3.1.2 By Location
- 3.2 Changes in Bulk Chemical Purity requirements
- 3.3 Lingering effects of the Pandemic
- 3.4 Impact of the American Foundries Act
- 3.5 Aggressive Expansion by Asian Suppliers
  - 3.5.1 Potential Entrants
  - 3.5.2 Strengths & Weaknesses

### **4 Supply & Demand Forecasts by chemical types, upside and downsides**

- 4.1 H<sub>2</sub>SO<sub>4</sub> (sulfuric acid)
- 4.2 H<sub>2</sub>O<sub>2</sub> (hydrogen peroxide)
- 4.3 HCl (hydrogen chloride)
- 4.4 NH<sub>4</sub>OH (ammonia hydroxide)
- 4.5 HNO<sub>3</sub> (nitric acid)
- 4.6 HF (hydrofluoric Acid)
- 4.7 H<sub>3</sub>PO<sub>4</sub> (phosphoric acid)
- 4.8 IPA (isopropyl alcohol)

### **5 Potential Impacts—TEHCET Assessment of Risks and Opportunities**

- 5.1 For IDMs
- 5.2 For Existing and Potential Suppliers

## TEHCET Analysts Biographies

- **Bruce Lipisko – Business Development Director & Sr. Market Analyst** – covers program management and business development consulting. He has extensive semiconductor industry experience in product management, business development and operations management for materials and equipment product lines. He has held multiple leadership positions at companies, including General Manager / Head of Operations at Arch Chemicals(Olin), General Chemicals, and RASIRC/Matheson, as well as start-ups such as On Wafer (KLA-Tencor). He has successfully developed and executed M&A strategies, including due diligence, headed-up product management and business development efforts, and managed chemical & equipment manufacturing operations. These efforts have led to both turn arounds of struggling businesses as well as rapid, profitable growth for early stage companies. A published author, he also holds multiple domestic and international patents. He holds a B.S. in Chemistry and an M.B.A. from Penn State, and an M.S. in Chemistry from the University of Pittsburgh.
- **Lita Shon-Roy – President/CEO and Founder of TEHCET**—has worked throughout the semiconductor supply chain, leading strategy, business development, marketing and sales for chip designers, equipment OEMs, and material suppliers for over 30 years. She is considered an expert in market analysis and competitive strategy. Her experience spans from process development of flat panel displays to business development of metal organic precursors. Lita developed new business opportunities for companies such as RASIRC/Matheson Gases, Air Products & Chemicals, and IPEC/Speedfam, and managed marketing and sales in companies such as Air Products/Schumacher, Brooktree/Rockwell, and Hughes Aircraft. She has authored and co-authored articles and texts on semiconductor processing, materials market trends, and worldwide supply chain issues as related to the world economy, and is considered expert in electronic materials marketing and business development. She holds an M.B.A. from California State University, Dominguez Hills, a M.S. in Electrical Engineering from the University of Southern California, and a B.S. in Chemical Engineering from UC San Diego.