

# Electronics Etching Gases Global Market Insights 2025, Analysis and Forecast to 2030, by Market Participants, Regions, Technology, Application

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## Abstracts

### Electronics Etching Gases Market Summary

#### Introduction

Electronics etching gases are specialized chemicals used in the microfabrication of semiconductors, photovoltaic cells, and flat panel displays. These gases enable precision etching, a process that removes material to create intricate circuit patterns, refining semiconductor line widths and enabling high-resolution displays. Common etching gases include fluorocarbons, chlorine-based compounds, and sulfur hexafluoride, selected for their reactivity and selectivity. The market is driven by the booming semiconductor industry, fueled by artificial intelligence (AI), high-performance computing (HPC), and consumer electronics like wearables and smart home devices. Photovoltaic growth, spurred by renewable energy adoption, and advancements in display technologies further propel demand. The industry is highly technical, requiring consistent innovation to meet shrinking node sizes and environmental regulations.

The global Electronics Etching Gases Market is projected to reach a market size of USD 2.2-3.6 billion by 2025, with an estimated CAGR of 6.0%-9.2% from 2025 to 2030, reflecting robust growth in electronics and clean energy sectors.

#### Market Size and Growth Forecast

The electronics etching gases market is expected to achieve a valuation of USD 2.2-3.6 billion by 2025, with a CAGR of 6.0%-9.2% through 2030. This growth is driven by the semiconductor market's expansion, projected to surpass USD 1 trillion by 2030, and

the photovoltaic sector's rise, with global installations expected to reach 540 GW by 2028. Demand for high-purity gases to support advanced nodes (e.g., 3nm and below) and eco-friendly formulations to comply with regulations further fuels the market. Challenges like supply chain constraints and environmental concerns may moderate growth, but innovation in gas compositions sustains momentum.

## Regional Analysis

The etching gases market thrives in regions with strong electronics and renewable energy ecosystems, notably Asia Pacific, North America, and Europe.

**Asia Pacific:** Growth ranges from 7.0%-10.0%. China, South Korea, and Japan dominate due to their semiconductor foundries and display manufacturing. China's push for self-reliance in chips and South Korea's leadership in OLED displays drive demand. Trends focus on scaling production for AI and 5G applications. Asia Pacific are home to industry giants in semiconductors (e.g., TSMC, Samsung, SK Hynix), PV module production (e.g., LONGi, JA Solar), and display panels (e.g., BOE, LG Display).

**North America:** Growth is estimated at 5.5%-8.5%. North America led by the United States, is experiencing renewed interest in domestic chip production driven by national security concerns and initiatives like the CHIPS and Science Act.

**Europe:** Growth ranges from 4.5%-7.5%. Germany and the Netherlands support demand through equipment suppliers and clean energy initiatives. Trends highlight low-GWP (global warming potential) gases to align with EU climate policies.

**Rest of the World:** Growth is 4.0%-6.5%. Emerging hubs like India show potential as semiconductor investments grow, with trends toward cost-effective etching solutions.

## Application Analysis

Etching gases serve three primary applications: semiconductors, photovoltaic cells, and flat panel displays.

**Semiconductors:** Growth is 6.5%-9.5%. Etching gases enable precise patterning for advanced nodes, critical for AI, HPC, and 5G chips. Trends focus on high-selectivity gases for 2nm processes and beyond.

**Photovoltaic Cells:** Growth ranges from 5.5%-8.5%. Gases support silicon wafer etching for efficient solar cells, driven by global renewable energy targets. Trends emphasize cost reduction and scalability.

**Flat Panel Displays:** Growth is 5.0%-8.0%. Gases facilitate high-resolution OLED and LCD patterning, spurred by AR/VR devices like Apple Vision. Trends target uniformity for next-gen displays.

## Key Market Players

The market features global and regional leaders in specialty gases.

Linde is a major global industrial gases company with a comprehensive portfolio that includes high-purity deposition gases tailored for semiconductor and PV applications. It supports fabs across North America, Europe, and Asia, and is recognized for its robust on-site supply and electronic materials infrastructure.

Air Liquide provides a wide range of electronics specialty gases, including silane, ammonia, and high-k precursor gases. The company leverages its strong presence in Asia and expanding footprint in the U.S. to support the evolving needs of chip and solar manufacturers.

SK Materials, a key supplier in South Korea, plays a critical role in supplying gases for advanced semiconductors and displays. It continues to expand production capacities and invest in ultra-high-purity gas technologies.

KANTO DENKA KOGYO and Foosung are notable players with significant shares in the high-purity fluorinated gas market. They contribute to the ecosystem by offering specialized compounds for CVD and etching applications.

Haohua Chemical Science, PERIC Special Gases, and China Shipbuilding Industry Corporation Limited are emerging Chinese suppliers responding to the country's strategic ambition to localize its semiconductor materials supply chain. These companies are increasing their R&D investment and expanding capacity for key gases

like silane and WF?

Merck KGaA, through its Electronics division, is enhancing its advanced materials portfolio, including specialty gas delivery systems and tailored deposition gas chemistries for EUV lithography and advanced nodes.

### Porter's Five Forces Analysis

**Threat of New Entrants:** Low. High R&D costs, purity requirements, and established supply chains deter entry.

**Bargaining Power of Suppliers:** Moderate to High. Limited raw material sources give suppliers leverage, though long-term contracts mitigate this.

**Bargaining Power of Buyers:** Moderate. Foundries and display makers demand quality but rely on few gas suppliers.

**Threat of Substitutes:** Low. Alternatives lack the precision of etching gases for advanced nodes.

**Industry Rivalry:** High. Competition among Linde, Air Liquide, and others drives innovation and capacity expansion.

### Market Opportunities and Challenges

#### Opportunities

Semiconductor growth in AI and HPC boosts demand for precision etching gases.

Photovoltaic expansion offers opportunities for cost-effective gas solutions.

Eco-friendly gas formulations align with global sustainability trends.

#### Challenges

Supply chain volatility for raw materials impacts production stability.

Regulatory restrictions on high-GWP gases require costly R&D.

High capital intensity limits market entry and scalability.

## Contents

### **CHAPTER 1 EXECUTIVE SUMMARY**

### **CHAPTER 2 ABBREVIATION AND ACRONYMS**

### **CHAPTER 3 PREFACE**

- 3.1 Research Scope
- 3.2 Research Sources
  - 3.2.1 Data Sources
  - 3.2.2 Assumptions
- 3.3 Research Method
- Chapter Four Market Landscape
- 4.1 Market Overview
- 4.2 Classification/Types
- 4.3 Application/End Users

### **CHAPTER 5 MARKET TREND ANALYSIS**

- 5.1 Introduction
- 5.2 Drivers
- 5.3 Restraints
- 5.4 Opportunities
- 5.5 Threats

### **CHAPTER 6 INDUSTRY CHAIN ANALYSIS**

- 6.1 Upstream/Suppliers Analysis
- 6.2 Electronics Etching Gases Analysis
  - 6.2.1 Technology Analysis
  - 6.2.2 Cost Analysis
  - 6.2.3 Market Channel Analysis
- 6.3 Downstream Buyers/End Users

### **CHAPTER 7 LATEST MARKET DYNAMICS**

- 7.1 Latest News
- 7.2 Merger and Acquisition

7.3 Planned/Future Project

7.4 Policy Dynamics

## **CHAPTER 8 HISTORICAL AND FORECAST ELECTRONICS ETCHING GASES MARKET IN NORTH AMERICA (2020-2030)**

8.1 Electronics Etching Gases Market Size

8.2 Electronics Etching Gases Market by End Use

8.3 Competition by Players/Suppliers

8.4 Electronics Etching Gases Market Size by Type

8.5 Key Countries Analysis

8.5.1 United States

8.5.2 Canada

8.5.3 Mexico

## **CHAPTER 9 HISTORICAL AND FORECAST ELECTRONICS ETCHING GASES MARKET IN SOUTH AMERICA (2020-2030)**

9.1 Electronics Etching Gases Market Size

9.2 Electronics Etching Gases Market by End Use

9.3 Competition by Players/Suppliers

9.4 Electronics Etching Gases Market Size by Type

9.5 Key Countries Analysis

9.5.1 Brazil

9.5.2 Argentina

9.5.3 Chile

9.5.4 Peru

## **CHAPTER 10 HISTORICAL AND FORECAST ELECTRONICS ETCHING GASES MARKET IN ASIA & PACIFIC (2020-2030)**

10.1 Electronics Etching Gases Market Size

10.2 Electronics Etching Gases Market by End Use

10.3 Competition by Players/Suppliers

10.4 Electronics Etching Gases Market Size by Type

10.5 Key Countries Analysis

10.5.1 China

10.5.2 India

10.5.3 Japan

- 10.5.4 South Korea
- 10.5.5 Southeast Asia
- 10.5.6 Australia

## **CHAPTER 11 HISTORICAL AND FORECAST ELECTRONICS ETCHING GASES MARKET IN EUROPE (2020-2030)**

- 11.1 Electronics Etching Gases Market Size
- 11.2 Electronics Etching Gases Market by End Use
- 11.3 Competition by Players/Suppliers
- 11.4 Electronics Etching Gases Market Size by Type
- 11.5 Key Countries Analysis
  - 11.5.1 Germany
  - 11.5.2 France
  - 11.5.3 United Kingdom
  - 11.5.4 Italy
  - 11.5.5 Spain
  - 11.5.6 Belgium
  - 11.5.7 Netherlands
  - 11.5.8 Austria
  - 11.5.9 Poland
  - 11.5.10 Russia

## **CHAPTER 12 HISTORICAL AND FORECAST ELECTRONICS ETCHING GASES MARKET IN MEA (2020-2030)**

- 12.1 Electronics Etching Gases Market Size
- 12.2 Electronics Etching Gases Market by End Use
- 12.3 Competition by Players/Suppliers
- 12.4 Electronics Etching Gases Market Size by Type
- 12.5 Key Countries Analysis
  - 12.5.1 Egypt
  - 12.5.2 Israel
  - 12.5.3 South Africa
  - 12.5.4 Gulf Cooperation Council Countries
  - 12.5.5 Turkey

## **CHAPTER 13 SUMMARY FOR GLOBAL ELECTRONICS ETCHING GASES MARKET (2020-2025)**

- 13.1 Electronics Etching Gases Market Size
- 13.2 Electronics Etching Gases Market by End Use
- 13.3 Competition by Players/Suppliers
- 13.4 Electronics Etching Gases Market Size by Type

## **CHAPTER 14 GLOBAL ELECTRONICS ETCHING GASES MARKET FORECAST (2025-2030)**

- 14.1 Electronics Etching Gases Market Size Forecast
- 14.2 Electronics Etching Gases Application Forecast
- 14.3 Competition by Players/Suppliers
- 14.4 Electronics Etching Gases Type Forecast

## **CHAPTER 15 ANALYSIS OF GLOBAL KEY VENDORS**

### **15.1 Linde**

- 15.1.1 Company Profile
- 15.1.2 Main Business and Electronics Etching Gases Information
- 15.1.3 SWOT Analysis of Linde
- 15.1.4 Linde Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

### **15.2 Air Liquide**

- 15.2.1 Company Profile
- 15.2.2 Main Business and Electronics Etching Gases Information
- 15.2.3 SWOT Analysis of Air Liquide
- 15.2.4 Air Liquide Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

### **15.3 Arkema**

- 15.3.1 Company Profile
- 15.3.2 Main Business and Electronics Etching Gases Information
- 15.3.3 SWOT Analysis of Arkema
- 15.3.4 Arkema Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

### **15.4 Resonac**

- 15.4.1 Company Profile
- 15.4.2 Main Business and Electronics Etching Gases Information
- 15.4.3 SWOT Analysis of Resonac
- 15.4.4 Resonac Electronics Etching Gases Revenue, Gross Margin and Market Share

(2020-2025)

## 15.5 Central Glass

15.5.1 Company Profile

15.5.2 Main Business and Electronics Etching Gases Information

15.5.3 SWOT Analysis of Central Glass

15.5.4 Central Glass Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.6 SK Specialty

15.6.1 Company Profile

15.6.2 Main Business and Electronics Etching Gases Information

15.6.3 SWOT Analysis of SK Specialty

15.6.4 SK Specialty Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.7 Taiyo Nippon Sanso

15.7.1 Company Profile

15.7.2 Main Business and Electronics Etching Gases Information

15.7.3 SWOT Analysis of Taiyo Nippon Sanso

15.7.4 Taiyo Nippon Sanso Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.8 Kanto Denka Kogyo

15.8.1 Company Profile

15.8.2 Main Business and Electronics Etching Gases Information

15.8.3 SWOT Analysis of Kanto Denka Kogyo

15.8.4 Kanto Denka Kogyo Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.9 Merck KGaA

15.9.1 Company Profile

15.9.2 Main Business and Electronics Etching Gases Information

15.9.3 SWOT Analysis of Merck KGaA

15.9.4 Merck KGaA Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.10 ADEKA

15.10.1 Company Profile

15.10.2 Main Business and Electronics Etching Gases Information

15.10.3 SWOT Analysis of ADEKA

15.10.4 ADEKA Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)

## 15.11 WONIK MATERIALS

15.11.1 Company Profile

15.11.2 Main Business and Electronics Etching Gases Information
15.11.3 SWOT Analysis of WONIK MATERIALS
15.11.4 WONIK MATERIALS Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)
15.12 Jinhong
15.12.1 Company Profile
15.12.2 Main Business and Electronics Etching Gases Information
15.12.3 SWOT Analysis of Jinhong
15.12.4 Jinhong Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)
15.13 Peric
15.13.1 Company Profile
15.13.2 Main Business and Electronics Etching Gases Information
15.13.3 SWOT Analysis of Peric
15.13.4 Peric Electronics Etching Gases Revenue, Gross Margin and Market Share (2020-2025)
Please ask for sample pages for full companies list
Tables and Figures
Table Abbreviation and Acronyms
Table Research Scope of Electronics Etching Gases Report
Table Data Sources of Electronics Etching Gases Report
Table Major Assumptions of Electronics Etching Gases Report
Figure Market Size Estimated Method
Figure Major Forecasting Factors
Figure Electronics Etching Gases Picture
Table Electronics Etching Gases Classification
Table Electronics Etching Gases Applications
Table Drivers of Electronics Etching Gases Market
Table Restraints of Electronics Etching Gases Market
Table Opportunities of Electronics Etching Gases Market
Table Threats of Electronics Etching Gases Market
Table Covid-19 Impact For Electronics Etching Gases Market
Table Raw Materials Suppliers
Table Different Production Methods of Electronics Etching Gases
Table Cost Structure Analysis of Electronics Etching Gases
Table Key End Users
Table Latest News of Electronics Etching Gases Market
Table Merger and Acquisition
Table Planned/Future Project of Electronics Etching Gases Market

Table Policy of Electronics Etching Gases Market

Table 2020-2030 North America Electronics Etching Gases Market Size

Figure 2020-2030 North America Electronics Etching Gases Market Size and CAGR

Table 2020-2030 North America Electronics Etching Gases Market Size by Application

Table 2020-2025 North America Electronics Etching Gases Key Players Revenue

Table 2020-2025 North America Electronics Etching Gases Key Players Market Share

Table 2020-2030 North America Electronics Etching Gases Market Size by Type

Table 2020-2030 United States Electronics Etching Gases Market Size

Table 2020-2030 Canada Electronics Etching Gases Market Size

Table 2020-2030 Mexico Electronics Etching Gases Market Size

Table 2020-2030 South America Electronics Etching Gases Market Size

Figure 2020-2030 South America Electronics Etching Gases Market Size and CAGR

Table 2020-2030 South America Electronics Etching Gases Market Size by Application

Table 2020-2025 South America Electronics Etching Gases Key Players Revenue

Table 2020-2025 South America Electronics Etching Gases Key Players Market Share

Table 2020-2030 South America Electronics Etching Gases Market Size by Type

Table 2020-2030 Brazil Electronics Etching Gases Market Size

Table 2020-2030 Argentina Electronics Etching Gases Market Size

Table 2020-2030 Chile Electronics Etching Gases Market Size

Table 2020-2030 Peru Electronics Etching Gases Market Size

Table 2020-2030 Asia & Pacific Electronics Etching Gases Market Size

Figure 2020-2030 Asia & Pacific Electronics Etching Gases Market Size and CAGR

Table 2020-2030 Asia & Pacific Electronics Etching Gases Market Size by Application

Table 2020-2025 Asia & Pacific Electronics Etching Gases Key Players Revenue

Table 2020-2025 Asia & Pacific Electronics Etching Gases Key Players Market Share

Table 2020-2030 Asia & Pacific Electronics Etching Gases Market Size by Type

Table 2020-2030 China Electronics Etching Gases Market Size

Table 2020-2030 India Electronics Etching Gases Market Size

Table 2020-2030 Japan Electronics Etching Gases Market Size

Table 2020-2030 South Korea Electronics Etching Gases Market Size

Table 2020-2030 Southeast Asia Electronics Etching Gases Market Size

Table 2020-2030 Australia Electronics Etching Gases Market Size

Table 2020-2030 Europe Electronics Etching Gases Market Size

Figure 2020-2030 Europe Electronics Etching Gases Market Size and CAGR

Table 2020-2030 Europe Electronics Etching Gases Market Size by Application

Table 2020-2025 Europe Electronics Etching Gases Key Players Revenue

Table 2020-2025 Europe Electronics Etching Gases Key Players Market Share

Table 2020-2030 Europe Electronics Etching Gases Market Size by Type

Table 2020-2030 Germany Electronics Etching Gases Market Size

Table 2020-2030 France Electronics Etching Gases Market Size
Table 2020-2030 United Kingdom Electronics Etching Gases Market Size
Table 2020-2030 Italy Electronics Etching Gases Market Size
Table 2020-2030 Spain Electronics Etching Gases Market Size
Table 2020-2030 Belgium Electronics Etching Gases Market Size
Table 2020-2030 Netherlands Electronics Etching Gases Market Size
Table 2020-2030 Austria Electronics Etching Gases Market Size
Table 2020-2030 Poland Electronics Etching Gases Market Size
Table 2020-2030 Russia Electronics Etching Gases Market Size
Table 2020-2030 MEA Electronics Etching Gases Market Size
Figure 2020-2030 MEA Electronics Etching Gases Market Size and CAGR
Table 2020-2030 MEA Electronics Etching Gases Market Size by Application
Table 2020-2025 MEA Electronics Etching Gases Key Players Revenue
Table 2020-2025 MEA Electronics Etching Gases Key Players Market Share
Table 2020-2030 MEA Electronics Etching Gases Market Size by Type
Table 2020-2030 Egypt Electronics Etching Gases Market Size
Table 2020-2030 Israel Electronics Etching Gases Market Size
Table 2020-2030 South Africa Electronics Etching Gases Market Size
Table 2020-2030 Gulf Cooperation Council Countries Electronics Etching Gases Market Size
Table 2020-2030 Turkey Electronics Etching Gases Market Size
Table 2020-2025 Global Electronics Etching Gases Market Size by Region
Table 2020-2025 Global Electronics Etching Gases Market Size Share by Region
Table 2020-2025 Global Electronics Etching Gases Market Size by Application
Table 2020-2025 Global Electronics Etching Gases Market Share by Application
Table 2020-2025 Global Electronics Etching Gases Key Vendors Revenue
Figure 2020-2025 Global Electronics Etching Gases Market Size and Growth Rate
Table 2020-2025 Global Electronics Etching Gases Key Vendors Market Share
Table 2020-2025 Global Electronics Etching Gases Market Size by Type
Table 2020-2025 Global Electronics Etching Gases Market Share by Type
Table 2025-2030 Global Electronics Etching Gases Market Size by Region
Table 2025-2030 Global Electronics Etching Gases Market Size Share by Region
Table 2025-2030 Global Electronics Etching Gases Market Size by Application
Table 2025-2030 Global Electronics Etching Gases Market Share by Application
Table 2025-2030 Global Electronics Etching Gases Key Vendors Revenue
Figure 2025-2030 Global Electronics Etching Gases Market Size and Growth Rate
Table 2025-2030 Global Electronics Etching Gases Key Vendors Market Share
Table 2025-2030 Global Electronics Etching Gases Market Size by Type
Table 2025-2030 Electronics Etching Gases Global Market Share by Type

## I would like to order

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