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Global Vapor Phase Decomposition Equipment Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Vapor Phase Decomposition Equipment market size is expected to reach $ 227 million by 2032, rising at a market growth of 12.9% CAGR during the forecast period (2026-2032).

Vapor Phase Decomposition Equipment is a high-sensitivity wafer surface preparation and contamination-analysis system used in semiconductor metrology. In this process, hydrofluoric acid vapor decomposes the ultra-thin surface oxide or other removable surface layer on a semiconductor substrate, after which a recovery liquid or droplet collects the residual metallic contaminants for subsequent analysis by ICP-MS or TXRF.

From an upstream perspective, VPD equipment mainly depends on precision clean subsystems, including VPD fume/decomposition chambers, scan-nozzle modules, drying/heating modules, aligners, motion stages, control software, and either an integrated or connected ICP-MS/TXRF analyzer. Downstream, it is used by wafer manufacturers, semiconductor fabs, and advanced materials/R&D laboratories for incoming wafer qualification, in-line contamination control during the process chain, thin-film and dielectric contamination assessment, edge/bevel or backside contamination checks, and—on advanced configurations such as hydrophilic VPD-TXRF—even for substrates such as SiC.

In 2025, global sales of Vapor Phase Decomposition Equipment reached approximately 46 units, with an average global market price of around US$ 2,046 K/unit. Production capacity varies significantly among manufacturers, with gross profit margins ranging from approximately 40% to 50%.

From a market-structure perspective, Vapor Phase Decomposition equipment is not a

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large-volume mainstream wafer-processing tool. It is a specialized, high-value metrology platform tied closely to wafer cleanliness control, incoming material qualification, process ramp, and failure analysis. As device architectures become more complex and tolerance for trace metallic contamination continues to tighten, fabs place greater emphasis on ultra-trace surface monitoring. That is why VPD, especially when combined with ICP-MS or TXRF, is valued not simply as a preparation step but as a yield-protection tool. In practice, buyers usually prioritize detection capability, automation, clean design, recipe stability, and factory data integration over lowest upfront price.

Demand is being supported by several layers of semiconductor manufacturing rather than a single niche. Official product materials show VPD-enabled systems being used after cleaning, lithography, etch, and film-related steps, while compound-semiconductor and power-device applications such as SiC are also becoming more relevant because surface contamination control directly affects yield and reliability. This gives the market a relatively resilient profile: it benefits from advanced logic and memory scaling, but it also gains from power electronics, advanced substrates, and quality-critical manufacturing environments where contamination monitoring is increasingly embedded into routine process control.

Competitive dynamics are defined by a small customer base, long qualification cycles, and strong stickiness after installation. Established suppliers benefit from accumulated process know-how, application libraries, automation expertise, integration with ICP-MS or TXRF, and global service coverage.

This report studies the global Vapor Phase Decomposition Equipment production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Vapor Phase Decomposition Equipment and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Vapor Phase Decomposition Equipment that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Vapor Phase Decomposition Equipment total production and demand, 2021-2032, (Unit)

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Global Vapor Phase Decomposition Equipment total production value, 2021-2032, (USD Million)

Global Vapor Phase Decomposition Equipment production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Unit), (based on production site)

Global Vapor Phase Decomposition Equipment consumption by region & country, CAGR, 2021-2032 & (Unit)

U.S. VS China: Vapor Phase Decomposition Equipment domestic production, consumption, key domestic manufacturers and share

Global Vapor Phase Decomposition Equipment production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Unit)

Global Vapor Phase Decomposition Equipment production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Unit)

Global Vapor Phase Decomposition Equipment production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Unit)

This report profiles key players in the global Vapor Phase Decomposition Equipment market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include PVA TePla, RORZE IAS, NAS Giken, Rigaku, Elemental Scientific (ESI), Korea Techno, VPD Integration Service LLC (VISL), etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Vapor Phase Decomposition Equipment market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (Unit) and average price (K US$/Unit) by

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manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Vapor Phase Decomposition Equipment Market, By Region:

- United States
- China
- Europe
- Japan
- South Korea
- ASEAN
- India
- Rest of World

Global Vapor Phase Decomposition Equipment Market, Segmentation by Type:

- VPD Pretreatment Equipment
- VPD Coupled Analytical Systems

Global Vapor Phase Decomposition Equipment Market, Segmentation by Automation Level:

- Manual
- Semi-Automatic
- Fully Automatic

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Global Vapor Phase Decomposition Equipment Market, Segmentation by Analytical Coupling:

Stand-Alone VPD Sample Preparation System

VPD-ICP-MS System

VPD-TXRF System

Global Vapor Phase Decomposition Equipment Market, Segmentation by Application:

Wafer Surface Trace Metal Analysis

Process Contamination Monitoring

Edge and Backside Analysis

Other

Companies Profiled:

PVA TePla

RORZE IAS

NAS Giken

Rigaku

Elemental Scientific (ESI)

Korea Techno

VPD Integration Service LLC (VISL)

Key Questions Answered:

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1. How big is the global Vapor Phase Decomposition Equipment market?
2. What is the demand of the global Vapor Phase Decomposition Equipment market?
3. What is the year over year growth of the global Vapor Phase Decomposition Equipment market?
4. What is the production and production value of the global Vapor Phase Decomposition Equipment market?
5. Who are the key producers in the global Vapor Phase Decomposition Equipment market?
6. What are the growth factors driving the market demand?

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