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Semiconductor Dry Strip Equipment Market - Forecast from 2026 to 2031

https://marketpublishers.com/r/S4F8B111C7D7EN.html
Date: January 2026
Pages: 140
Price: US$ 3,950.00 (Single User License)
ID: S4F8B111C7D7EN

Abstracts

Semiconductor Dry Strip Equipment Market is expected to grow at a 4.28% CAGR, achieving USD 364.336 million in 2031 from USD 283.370 million in 2025.

emiconductor dry strip systems perform critical photoresist and post-etch residue removal through plasma-based processes, preserving delicate front-end-of-line (FEOL) and back-end-of-line (BEOL) structures where wet chemistry is no longer viable. These tools have become indispensable as device geometries shrink, new channel materials emerge, and 3D architectures proliferate. Primary demand originates from logic foundries, memory manufacturers, and power-device fabricators processing wafers at ?7 nm nodes and below, alongside the rapid scale-up of wide-bandgap compound semiconductors.

Core Growth Drivers

1. Surging global semiconductor fab capacity Sustained volume expansion across logic, DRAM, 3D NAND, and foundry services directly correlates with higher wafer starts and increased dry-strip processing steps per wafer. The parallel ramp of 5G infrastructure, edge AI, automotive electronics, and high-performance computing continues to drive front-end loading of strip chambers.

2. Relentless device complexity and miniaturization Gate-all-around (GAA) nanosheets, CFET architectures, backside power delivery, and advanced packaging schemes dramatically increase the number of strip cycles while imposing atomic-level selectivity requirements. Dry strip tools must deliver damage-free polymer removal and residue-free surfaces without degrading high-k dielectrics, low-k materials, or novel channel semiconductors.

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Fastest-Growing Segments

The compound semiconductor segment is the most dynamic portion of the dry strip equipment market:

Gallium Nitride (GaN): Accelerated adoption in RF front-end modules, fast chargers, and electric-vehicle traction inverters requires dedicated strip recipes that prevent surface pitting and gallium re-deposition. Specialized downstream plasma systems optimized for GaN-on-Si, GaN-on-SiC, and GaN-on-sapphire are seeing the strongest unit growth.

Silicon Carbide (SiC): The shift to 150 mm and 200 mm SiC platforms for 800 V+ EV powertrains and renewable-energy inverters demands robust high-temperature implant strip and post-etch cleaning processes that maintain basal plane integrity and minimize micro-pipe propagation.

Regional Dynamics

Asia-Pacific maintains overwhelming dominance, accounting for the majority of installed base and new tool shipments. Taiwan, South Korea, and Japan benefit from massive logic, memory, and power-device investments, reinforced by aggressive national semiconductor initiatives:

South Korea’s Semiconductor Industry Promotion Plan

Japan’s Rebirth of Japan’s Electronics Industry strategy

Taiwan’s continuing foundry and memory megafab expansions

These programs channel subsidies, tax incentives, and R&D funding directly into advanced-node and compound-semiconductor capacity, ensuring sustained pull-through demand for next-generation dry strip platforms.

North America retains a strategic position through design leadership and early adoption of advanced packaging and GAA technologies at Intel, AMD, and Qualcomm, but lags in raw manufacturing footprint.

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Key Equipment Platforms

Lam Research GAMMA® family: Remains the volume leader for logic and memory with differentiated downstream microwave plasma technology offering high throughput, residue-free performance, and minimal device impact at advanced nodes.

Kao CLEANTHROUGH A-06 & A-19: Specialty chemical dry-film strippers targeting back-end photoresist removal with emphasis on speed (A-06) and amine-free environmental compliance (A-19).

Market Constraints

High system cost, extreme selectivity challenges with new materials (e.g., ruthenium, molybdenum, EUV resists), and the intrinsic cyclicality of semiconductor capex continue to moderate growth velocity despite strong underlying wafer-fab-equipment (WFE) intensity trends.

The confluence of logic/memory node scaling and the structural rise of GaN and SiC devices nevertheless positions semiconductor dry strip equipment for sustained mid-to-high single-digit annual growth, with compound-semiconductor-specific systems exhibiting the highest incremental demand through the remainder of the decade.

Key Benefits of this Report:

Insightful Analysis: Gain detailed market insights covering major as well as emerging geographical regions, focusing on customer segments, government policies and socio-economic factors, consumer preferences, industry verticals, and other sub-segments.

Competitive Landscape: Understand the strategic maneuvers employed by key players globally to understand possible market penetration with the correct strategy.

Market Drivers & Future Trends: Explore the dynamic factors and pivotal market trends and how they will shape future market developments.

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Actionable Recommendations: Utilize the insights to exercise strategic decisions to uncover new business streams and revenues in a dynamic environment.

Caters to a Wide Audience: Beneficial and cost-effective for startups, research institutions, consultants, SMEs, and large enterprises.

What do businesses use our reports for?

Industry and Market Insights, Opportunity Assessment, Product Demand Forecasting, Market Entry Strategy, Geographical Expansion, Capital Investment Decisions, Regulatory Framework & Implications, New Product Development, Competitive Intelligence

Report Coverage:

Historical data from 2021 to 2025 & forecast data from 2026 to 2031

Growth Opportunities, Challenges, Supply Chain Outlook, Regulatory Framework, and Trend Analysis

Competitive Positioning, Strategies, and Market Share Analysis

Revenue Growth and Forecast Assessment of segments and regions including countries

Company Profiling (Strategies, Products, Financial Information, and Key Developments among others.

Semiconductor Dry Strip Equipment Market Segmentation:

By Semiconductor Type

Element Semiconductor

Compound Semiconductor

By Technology

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Plasma Strip

Gas-Phased Reaction

By Application

Power Semiconductors

MEMS

CMOS Image Sensors

Others

By Geography

Americas

USA

Europe Middle East and Africa

Germany

France

United Kingdom

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Others

Asia Pacific

China

Japan

South Korea

Taiwan

Others

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