

Photoresist - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2026 - 2031)

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Report description:

Photoresist Market Analysis

The Photoresist Market was valued at USD 2.60 billion in 2025 and estimated to grow from USD 2.89 billion in 2026 to reach USD 4.94 billion by 2031, at a CAGR of 11.29% during the forecast period (2026-2031). The widespread deployment of extreme-ultraviolet (EUV) lithography at sub-10-nanometer dimensions, the fast-growing demand for artificial-intelligence (AI) accelerators, and government-funded fab incentives underpin this expansion. Semiconductor manufacturers in Taiwan, South Korea, and the United States are increasingly favoring metal-oxide and dry photoresists that deliver higher EUV absorption and lower line-edge roughness, thereby boosting throughput and reducing per-layer resist usage. Parallel momentum in 5G and Internet-of-Things (IoT) devices sustains demand for mature-node G-line, I-line, and KrF materials. Meanwhile, advanced packaging architectures-such as chiplets, fan-out wafer-level packaging, and co-packaged optics-require thick-film resists that are compatible with copper pillar and through-silicon-via (TSV) structures. Supply-chain risks remain elevated because three Japanese suppliers collectively account for roughly 60% of advanced resists, prompting regional diversification and localized capacity additions in North America and Europe.

Global Photoresist Market Trends and Insights

Growing Demand from Semiconductor and AI Accelerators

Chipmakers producing hardware for training large language models and powering inference workloads now pattern multiple

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redistribution layers, interposers, and TSVs for each device. NVIDIA's H100 and forthcoming Blackwell series adopt chiplet layouts that consume three to five times more photoresist per finished part than previous monolithic GPUs. Taiwan Semiconductor Manufacturing Company's (TSMC) expansion of CoWoS capacity lifts thick-film resist of up to 50 μm , while advanced copper pillar plating uses negative-tone formulations optimized for aspect ratios above 3:1. Volume gains occur first in Taiwan and South Korea but ripple into new fabs in the United States by 2027.

Accelerated EUV Lithography Adoption and High-NA Roadmap

ASML's 0.55-NA EUV scanners enable single-exposure patterning with an 8 nm pitch, eliminating costly multiple-patterning steps. To meet the tighter line-edge roughness target of below 1.5 nm, fabs qualify metal-oxide resists based on hafnium and zirconium clusters that absorb EUV 9 times more effectively than organic formulations. The dose can be reduced from 40 mJ/cm^2 to sub-20 mJ/cm^2 , increasing throughput and lowering the cost per wafer. Pilot runs at Samsung's Pyeongtaek lines in 2025 suggest commercial adoption at 2 nm nodes in 2026.

Stringent HSE Regulations on Solvents and Photo-Acid Generators

The European Union's 2024 revision to Regulation (EU) 2024/573 schedules a phase-down of hydrofluorocarbon usage by 90% before 2045. Many EUV photoresists now employ perfluorinated photoacid generators and solvents, which are subject to registration, evaluation, and authorization. Compliance requires analytical verification of impurity levels below 1 ppb, which drives up quality-control costs and forces formulators to test alternative chemistries that may risk lower performance.

Other drivers and restraints analyzed in the detailed report include:

5G/IoT Device Proliferation Expanding Wafer Starts
Government Fab-Incentive Programs (US/EU Chips Acts)
Supply-Chain Concentration and Export-Control Exposure

For complete list of drivers and restraints, kindly check the Table Of Contents.

Segment Analysis

ArF immersion formulations retained a 31.85% share of the photoresist market size in 2025, thanks to sustained demand for 7 nm and 5 nm volumes at TSMC, Samsung, and Intel. Conversely, EUV metal-oxide and dry resists are projected to post a 12.94% CAGR, generating the largest incremental value as fabs transition to 2 nm logic. Hafnium-based clusters deliver etch resistance exceeding 25 times that of organic polymers, enabling direct transfer into dielectric layers without a hard mask and thus shortening the process flow.

Lam Research's dry-deposited resist eliminates spin waste and cuts chemical consumption by up to 90%. With mass production targeted for 2026, this platform could shift material revenue from wet-chemistry suppliers toward equipment-integrated delivery. KrF, G-line, and I-line resists remain essential for automotive and industrial nodes, anchoring a steady base revenue even as advanced nodes dominate growth.

Positive-tone materials dominated the photoresist market with a 71.45% share in 2025. Negative-tone resists, particularly epoxy-based and metal-oxide systems, are forecast to rise at 11.38% CAGR through 2031 as demand for high-thickness layers in advanced packaging surges.

Negative resists withstand high current densities during copper-pillar plating and achieve aspect ratios exceeding 3:1, which is critical for fine-pitch bump formation. Emerging dual-tone tin-oxide platforms offer process flexibility by switching tone with dose

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control; early tests at imec show sub-16 nm resolution at 20 mJ/cm² exposure.

The Photoresist Market Report is Segmented by Resist Type (ArF Immersion and More), Tone (Positive and Negative), Application (Semiconductors and ICs and More), End-User Industry (Electronics and Electricals and More), and Geography (Asia-Pacific, North America, Europe, South America, and Middle-East and Africa). The Market Forecasts are Provided in Terms of Value (USD).

Geography Analysis

The Asia-Pacific region accounted for 72.10% of global revenue in 2025, driven by dense logic capacity in Taiwan and South Korea, as well as the expansion of mature-node fabs in China. TSMC's 2nm ramp and high-performance computing package lines consume increasing volumes of EUV and thick-film materials, while Samsung's 3D NAND capacity drives demand for high-selectivity KrF resists. Japan's equipment ecosystem, Tokyo Electron coating tracks, and Nikon steppers, support domestic suppliers, creating a tightly integrated supply chain.

North America is forecast to record an 11.49% CAGR through 2031 as the CHIPS Act stimulates the construction of new greenfield fabs. Intel's Ohio campus, TSMC's Arizona site, and Samsung's Texas facility together add more than 300,000 wpm of leading-edge capacity by 2028, underpinning local resist and ancillary chemical demand. DuPont's Colorado expansion and Dow's Michigan expansion aim to supply the region and reduce trans-Pacific logistics risk.

Europe faces stringent REACH compliance, which raises formulation costs, yet benefits from Intel's large-scale investment in Ireland and prospective fabs in Germany. Local material suppliers, Merck KGaA and BASF, utilize their regulatory expertise to secure qualification for EUV lines. Eastern European countries court packaging and test operations, further diversifying the regional footprint.

Middle East & Africa and South America remain nascent but pursue specialty packaging and MEMS manufacturing, particularly for telecom base-stations and automotive sensors. Regional governments offer tax credits to attract backend assembly, bringing incremental photoresist volumes for G-line and I-line processes while advanced nodes stay concentrated elsewhere.

List of Companies Covered in this Report:

ALLRESIST GmbH Asahi Kasei Corporation Avantor, Inc. Brewer Science, Inc. DJ MicroLaminates DONGJIN SEMICHEM CO. LTD DuPont Eternal Materials Co., Ltd. FUJIFILM Corporation Inpria JSR Corporation SEMI Kolon Industries, Inc. LG Chem Merck KGaA micro resist technology GmbH Microchemicals GmbH Shin-Etsu Chemical Co., Ltd. Sumitomo Chemical Co., Ltd. TOKYO OHKA KOGYO CO., LTD. Jiangsu Nata Opto-electronic Material Co., Ltd.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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6.4.3 Avantor, Inc.

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6.4.8 Eternal Materials Co., Ltd.

6.4.9 FUJIFILM Corporation

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