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Photoresist Chemicals for Advanced Lithography Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

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Abstracts

The Global Photoresist Chemicals For Advanced Lithography Market was valued at USD 5.5 billion in 2024 and is estimated to grow at a CAGR of 11% to reach USD 15.6 billion by 2034.

The market is being propelled by rising investments in the Asia-Pacific region, the commercialization of High-NA EUV systems, and advancements in 3D packaging technologies. The adoption of sub-7nm and sub-5nm process nodes, growing use of EUV lithography, and increasing demand for high-performance chips in AI, 5G, and automotive applications are driving this transformation. Extreme Ultraviolet (EUV) lithography at 13.5 nm wavelengths is enabling the patterning of 5nm line widths, significantly boosting demand for chemically amplified resists (CARs) and metal-oxide-based EUV photoresists. The evolution toward High-NA EUV, hybrid lithography combining DUV and EUV, and directed self-assembly (DSA) is reshaping resist chemistries. Industry leaders like JSR, TOK, Dongjin Semichem, and Fujifilm are aligning product roadmaps with 2nm and 1.4nm node readiness, marking a clear shift from traditional KrF/i-line resists to EUV-focused platforms.

The positive photoresists segment generated USD 3.4 billion in 2024 and is expected to reach USD 9.5 billion by 2034, growing at a CAGR of 10.7%. Chemically amplified resists dominate this segment, offering high sensitivity for sub-10nm geometries and enabling precise process control. Innovations in this space focus on improving etch resistance, developing modular photoresist options, and minimizing secondary electron blur in EUV lithography, all critical to maximizing yields at small dimensions.

The semiconductor device fabrication segment held a 69.5% share in 2024 owing to its

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need for high-purity, high-performance photoresists used in advanced logic, memory, analog, and AI-focused chips. Increasing multi-patterning complexity and High-NA EUV adoption make logic devices, including CPUs, GPUs, and SoCs produced at 5nm, 3nm, and soon 2nm nodes, the largest consumers of photoresist materials.

U.S. Photoresist Chemicals for Advanced Lithography Market generated USD 817.4 million in 2024 and is expected to grow at a CAGR of 10.8% to reach USD 2.3 billion by 2034. North America's growth is being fueled by semiconductor revitalization policies, including legislation encouraging domestic chip production. These policies are driving the demand for locally sourced photoresist and advanced lithography materials as new fabrication facilities are established by major manufacturers.

Key players in the Photoresist Chemicals for Advanced Lithography Market include Merck KGaA, Brewer Science, Inc., Dow, Fujifilm Holdings Corporation, Inpria Corporation, Dongjin Semichem Co., Ltd., Eternal Materials Co., Ltd., Shin-Etsu Chemical Co., Ltd., JSR Corporation, Kayaku Advanced Materials, Tokyo Ohka Kogyo Co., Ltd., Micro Resist Technology GmbH, Sumitomo Chemical Company, Jiangsu Nata Opto-electronic Material Co., Ltd., and Irresistible Materials Ltd. Leading companies are investing heavily in R&D to develop next-generation resist chemistries suitable for High-NA EUV and sub-5nm process nodes. Strategic collaborations with semiconductor manufacturers help align product innovations with commercial lithography requirements. Firms are expanding production capacities in Asia-Pacific and North America to meet rising regional demand. Some players focus on hybrid lithography solutions and directed self-assembly technologies to broaden product applicability.

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CHAPTER 9 COMPANY PROFILES

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