

Technical Data Sheet (TDS)

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1. Product Overview

- **Product Name:** Photoresist (Positive/Negative Type)
- **CAS Number:** N/A
- **Formula:** Blend of Photoresist Resin, Photoinitiator, Propylene Glycol Methyl Ether Acetate (PGMEA), Adhesion Promoter & Stabilizer
- **Molecular Weight:** Variable (5000-50000 Da)
- **Chemical Source:** Synthetic lithography functional composite (customized for positive/negative lithography processes; synthesized by high-purity polymerization of resin monomers, compounded with photoinitiator and organic solvent, purified by precision filtration).
- **Product Trait:** Colorless to pale yellow transparent homogeneous liquid, slight organic solvent odor; combustible liquid, insoluble in water, freely soluble in organic lithography solvents; stable under normal storage/processing conditions, excellent substrate adhesion, high lithography resolution, and matched developing speed with standard lithography developers.
- **Core Properties: High-performance lithography photoresist** with high resolution ($\leq 3.0\mu\text{m}$), good film-forming property, excellent substrate adhesion (Si, glass, copper, FR-4), and stable developing performance; compatible with common UV lithography equipment and standard developers (alkaline aqueous solution/organic developer); customizable for positive/negative type and different resolution requirements; meets semiconductor/PCB/FPC lithography industry standards.
- **Main Application:** Semiconductor wafer (Si/III-V) lithography; PCB/FPC flexible circuit board manufacturing; micro-nano processing (MEMS/sensor); flat panel display (LCD/LED/OLED) production; precision optical device lithography.

2. Technical Specifications (Lithography Grade, Complies with SEMI/SJ/T Standards)

Item	Specification (Positive/Negative Type)
Appearance	Colorless to pale yellow transparent homogeneous liquid
Type	Positive / Negative (customizable)
Solid Content	20.0-25.0%
Lithography Resolution	$\leq 5.0 \mu\text{m}$ (Typ. $3.0 \mu\text{m}$)
Developing Speed (23°C)	30-60 s
Viscosity (25°C)	20-50 mPa·s
Flash Point (Closed Cup)	$\geq 60^\circ\text{C}$
Density (25°C)	1.02-1.08 g/cm ³
Substrate Adhesion	Grade 0 (no peeling, cross-cut test)
Particle Size ($\geq 1 \mu\text{m}$)	≤ 10 pcs/mL
pH Value (25°C)	6.0-7.0
Heat Resistance	Stable at $\leq 150^\circ\text{C}$ (pre/post bake)
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Compatible Developer	Alkaline aqueous solution (NaOH/KOH) / Organic developer
Compatible Lithography	UV lithography (365nm/405nm)

3. Product Advantages

1. **High Lithography Resolution:** Up to $3.0\mu\text{m}$ resolution, meets the precision requirements of semiconductor/PCB/micro-nano processing; clear pattern transfer, no edge burr.
2. **Excellent Film-Forming Property:** Uniform film formation on various substrates (Si, glass, copper, FR-4); no pinholes/cracks, good thickness consistency ($\pm 0.5\mu\text{m}$).
3. **Strong Substrate Adhesion:** Grade 0 adhesion (cross-cut test), no pattern peeling during developing/etching process; suitable for wet/dry etching processes.



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- 4. **Matched Developing Performance:** Moderate developing speed (30-60s), no over-developing/under-developing; pattern profile is controllable and consistent.
- 5. **Good Process Compatibility:** Compatible with common UV lithography equipment, alkaline/organic developers, and standard pre/post bake processes; easy to integrate into existing lithography production lines.
- 6. **Stable Storage & Quality:** 12-month shelf life under recommended conditions; no crystallization/stratification; batch-to-batch quality consistency is high (CV ≤3%).

4. Application Fields

4.1 Semiconductor Manufacturing

- Silicon wafer lithography (logic chip/memory chip); III-V semiconductor (GaAs/InP) device processing; MEMS/sensor micro-nano lithography.

4.2 PCB/FPC Industry

- Rigid PCB board fine line lithography; FPC flexible board flexible lithography; HDI board high-density interconnection lithography.

4.3 Flat Panel Display

- LCD/LED/OLED panel pixel lithography; touch screen (TP) pattern lithography; display driver board lithography.

4.4 Other Precision Manufacturing

- Precision optical device (lens/grating) lithography; microfluidic chip processing; electronic component (capacitor/inductor) fine pattern lithography.

5. Usage & Formulation Guidelines

5.1 Recommended Lithography Process Parameters

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Process Step	Parameter (23°C, 50% RH)
Substrate Pretreatment	Clean with solvent, dry at 80°C for 10 min (remove moisture/oil)
Coating Method	Spin coating (3000-5000 rpm) / Spray coating / Roll coating
Film Thickness	1-10 μm (adjustable by rotation speed/viscosity)
Pre-Bake	90-110°C, 10-15 min (hot plate/oven)
Exposure Energy	50-200 mJ/cm ² (UV 365nm/405nm)
Developing	Immerse in alkaline developer (0.5-2.0% NaOH) for 30-60s, rinse with deionized water
Post-Bake	120-150°C, 15-20 min (pattern curing)

6. Packaging & Storage

6.1 Packaging Specifications (Lithography Grade, Anti-Leakage & Dust-Free)

- 500 mL Amber glass bottle (laboratory/R&D/small-batch use, light protection + dust-free)
- 5 L HDPE plastic drum (medium-batch production use, anti-leakage + dust-free)
- 25 L HDPE plastic drum (bulk production use, anti-leakage + explosion-proof)
- 1000 L IBC tote (large-scale industrial use, explosion-proof valve + dust-free port)
- Custom packaging (1 L/2 L) available for R&D/small-batch formulation needs (all **anti-leakage + dust-free**).

7. Safety & Protection

- The product is a Class 3 flammable liquid with mild skin/eye/respiratory irritation; **all operations must be conducted by trained professional personnel** in a dust-free/ventilated lithography workshop with full specified PPE (half-face organic vapor respirator, chemical-resistant safety goggles, nitrile rubber gloves ≥0.20mm, flame-retardant lab coat).
- Operate in a well-ventilated fume hood with local exhaust ventilation; eliminate all ignition sources; avoid generating vapor/mist; do not inhale vapor or contact with skin/eyes for a long time; no eating/drinking/smoking in the work area.
- In case of eye contact: Immediately rinse with plenty of running water for 15 minutes and consult a doctor if irritation persists. In case of skin contact: Rinse with water/soap for 5 minutes; apply mild moisturizer for dry/irritated skin.