MICRO • CHEM

BENEFITS

- Optimized for PMMA, and copolymer resists
- Wide range of standard formulations
- Compatible with spray and immersion processes
- Sub 0.1µm resolution

NANO™ PMMA and Copolymer Developer

MicroChem's wide range of MIBK:IPA developer and rinse formulations are designed for high resolution, high throughput PMMA and copolymer resist processing. These developers are available in 4 liter packaging.

THE EXPOSURE AND DEVELOPMENT MECHANISM

PMMA (polymethyl methacrylate) is a high resolution, high contrast positive tone resist designed for e-beam, deep UV (220-250nm) and x-ray lithographic processes. Images are formed through the photo scission of the polymer backbone, which reduces the molecular weight and increases the develop selectivity.

MicroChem's developer formulations are blends of MIBK and IPA. MIBK is the solvent and active ingredient, which controls the solubility and swelling of the resist, while IPA is the alcohol (non-solvent). PMMA is most commonly developed using MIBK:IPA in the following ratios: 1:1, 1:2 or 1:3. Formulations containing higher amounts of solvent (MIBK) are more aggressive and offer higher throughput, while formulations containing higher amounts of non-solvent (IPA) are less aggressive and designed for higher resolution applications.

NANO™ PMMA AND COPOLYMER DEVELOPER IS AVAILABLE IN THE FOLLOWING BLENDS

PRODUCT	COMPOSITION	RESOLUTION	SENSITIVITY/THROUGHPUT
M/I 1:1	**1:1 MIBK to IPA**	**High**	**High**
M/I 1:2	**1:2 MIBK to IPA**	**Higher**	**Medium**
M/I 1:3	**1:3 MIBK to IPA**	**Very high**	**Low**
MIBK	**MIBK**	**Low**	**Very high**

TYPICAL DEVELOPMENT PROCESS

ACTION	SPRAY**	SPRAY PUDDLE **	IMMERSION (21°C)
Dispense	**500 rpm for 30-45 secs**	**500 rpm for 3-4 secs**	**30 secs**
Dispense		**0 rpm for 2 secs**	
No Dispense		**0 rpm for 25-40 secs**	
Rinse *	**500 rpm for 30-45 secs**	**500 rpm for 30-45 secs**	**30 secs**
Dry	**5000 rpm for 30 secs**	**5000 rpm for 30 secs**	**Nitrogen blow dry**

* Recommended Rinse solution is MIBK to IPA 1:3 in order to reduce the possibility of scumming
** Variables such as developer pressure, nozzle type & position, spray pattern, etc. should be optimized

HANDLING (ENVIRONMENTAL, HEALTH AND SAFETY)

Use precautions in handling PMMA and Copolymer Developer. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Avoid breathing fumes. Wear chemical-resistant eye protection, chemical gloves (butyl, neoprene) and protective clothing when handling PMMA and Copolymer Developer. Contact with eyes, skin, and mucous membranes causes irritation. In case of eye contact, flush with water for 15 minutes lifting eyelids frequently. Call a physician immediately. Review the current MSDS (Material Safety Data Sheet) for each solvent/blend before using.

MATERIAL AND EQUIPMENT COMPATIBILITY

PMMA and Copolymer Developer is compatible with glass, ceramic, high-density polyethylene, PTFE (TEFLON), polypropylene, stainless steel, and equivalent materials. MIBK, the primary ingredient, will attack various elastomers such as VITON A, NEOPRENE, and BUNA A over time. It will also attack PVC, CPVC and PVDF. PTFE (TEFLON) or EPDM is recommended for both O-rings and tubing.

STORAGE

Store PMMA and Copolymer Developer upright in original containers in a dry area between 4 and 27°C(40-80°F). Keep away from sources of ignition, light, heat, oxidants, acids, and reducers. Shelf life is 13 months from date of manufacture.

DISPOSAL

Each locality, state, and county has unique regulations regarding the disposal of organic solvent solutions of dissolved polymer such as used PMMA and Copolymer Developer. It is the responsibility of the customer to ensure proper disposal in compliance with all applicable Federal/Local codes and regulations. See MSDS for additional information.

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