



MicroChem 455 Developer

Description

MicroChem 455 Developer is an aqueous alkaline solution. Specifically formulated for use with Dow MICROPOSIT™ S1800® photoresist systems, it can also be used with other commercially available photoresists. It has been optimized for wafer fabrication and other microelectronic applications for which high resolution is required.

Features

Automation

- Immersion
- Inline track
- Batch spray

High Process Reliability

- Tight product specifications
- Stringent quality control

Excellent Resolution

- High differential solubility
- Excellent development tolerance
- No swelling of photoresist

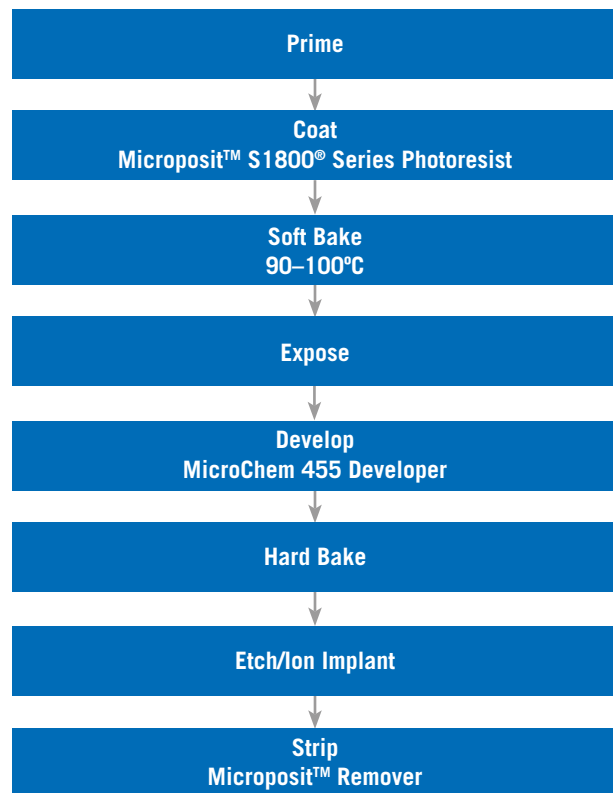
High Inspection Yields

- Clean, residue-free development
- Wide process latitude

Cost Efficient

- Excellent exposure throughput

Process Flow





Determination of Total Alkaline Normality

I. Reagents

- Hydrochloric acid (HCl), 0.1N, standardized
- Methyl red indicator solution

II. Procedure

- Pipette 5 ml aliquot MicroChem 455 Developer into a 250 ml Erlenmeyer flask.
- Add approximately 100 ml deionized water.
- Add 3 to 5 drops methyl red indicator.
- Titrate with 0.1N HCl from yellow to red color change.

III. Calculations

$$\frac{\text{ml HCl titrated} \times \text{N HCl}}{5 \text{ ml}} = \frac{\text{Normality of MicroChem 455 Developer}}{\text{MicroChem 455 Developer}}$$

IV. Results

The normality of fresh MicroChem 455 Developer should be approximately 0.35.

Equipment

Use polypropylene, polyethylene, polytetrafluoroethylene, or equivalent materials.

Storage

Store MicroChem 455 Developer only in upright, original containers in a dry area at 10°–32°C (50°–90°F). Store away from acids. Do not store in sunlight. Store away from heat and sources of ignition. Keep container sealed when not in use.

Properties as Delivered

Microchem 455 Developer is manufactured to the highest quality standards and is subjected to state of the art testing to assure the user of maximum lot-to-lot reproducibility.

MicroChem 455 Developer is filtered to 0.2 µm absolute directly into clean containers.

A Certificates of Analysis will be supplied with each shipment upon request. Quality Assurance Material Specifications and Analytical Testing Procedures may be obtained upon request from Kayaku Advanced Materials, Inc.

MicroChem 455 Developer, as delivered, will conform to the following specifications:

Specific Gravity at 20/20°C	Approximately 1.0
Color	Water white to very pale yellow solution
Turbidity	Non-turbid
Total Alkaline Normality	0.34 – 0.36

INSTRUCTIONS FOR USE

I. Bath Make-up

MicroChem 455 Developer is supplied as a ready-to-use solution.

II. Temperature

Operate MicroChem 455 Developer between 20°–25°C (68°–77°F), with the temperature controlled ±1°C. The photoresist dissolution rate increases with increasing developer temperature.

In spray equipment, the spray action causes a temperature drop in the developer solution. For this reason, developer temperature should be monitored at the substrate surface.

III. Time

Immersion: 40–60 seconds

Spin/spray: Varies with equipment.

Consult your Kayaku Advanced Materials' Technical Sales Representative. Longer development times permit the use of shorter exposure times. Shorter development times minimize developer attack on the unexposed photoresist. The range recommended is optimum. We recommend keeping the development time constant and adjusting the exposure time as necessary to meet critical dimension requirements.

IV. Agitation

Immersion: Mild, consistent agitation is recommended.



Spin/spray: Contact your Kayaku Advanced Materials' Technical Sales Representative.

V. Rinse

Immersion: Cascade rinse with deionized water to resistivity specification immediately after developing.

Spin/spray: Overlap deionized water rinse with developer cycle to prevent developer drying on substrate surface. Provide adequate rinsing of back side of substrates.

VI. Bath Control

Immersion: For maximum process control, replace bath with fresh developer solution at least once per shift. Keep bath covered when not in use.

Spin/spray: Not applicable.

Batch spray: As recommended by equipment manufacturer.

Disposal

The material and its container must be disposed in accordance with all local, state, federal and/or international regulations.

Handling

Consult Safety Data Sheet (SDS) for details on the handling procedures and product hazards prior to use. If you have any questions regarding handling precautions or product hazards, please email productsafety@kayakuAM.com.

Disclaimer

Notwithstanding anything to the contrary contained in any sales documentation, e.g., purchase order forms, all sales are made on the following conditions:

All information contained in any Kayaku Advanced Materials, Inc. product literature reflects our current knowledge on the subject and is, we believe, reliable. It is offered solely to provide possible suggestions for the customer's own experiments and is not a substitute for any testing by the customer to

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