MicroChem 455 Developer

PRODUCT PROFILE
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.

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
MicroChem 455 Developer

Determination of Total Alkaline Normality

I. Reagents
   a) Hydrochloric acid (HCl), 0.1N, standardized
   b) Methyl red indicator solution

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

III. Calculations

\[
\text{ml HCl titrated} \times \frac{n \text{ HCl}}{5 \text{ ml}} = \text{Normality of MicroChem 455 Developer}
\]

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 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.

Waste Treatment
Due to the nature of MicroChem 455 Developer, disposal of it, or residues therefrom, should be made in compliance with federal, state, and local environmental laws.

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.

Handling Precautions
DANGER! MicroChem 455 Developer is an alkaline liquid containing potassium hydroxide. Contact with eyes, skin and mucous membranes causes irritation and burns. Handle with care. Do not get in eyes, on skin or on clothing. Avoid breathing vapors or mists. Use with adequate ventilation. Wash thoroughly after handling.

Consult product Safety Data Sheet before using.

FLUSH EMPTY CONTAINERS THOROUGHLY WITH WATER BEFORE DISCARDING.
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° and 25°C, 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 MicroChem 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 MicroChem 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.
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