

# MicroChem 455 Developer

## PRODUCT PROFILE

MicroChem 455 Developer is an aqueous alkaline solution. Specifically formulated for use with Dow MICROPPOSIT™ 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

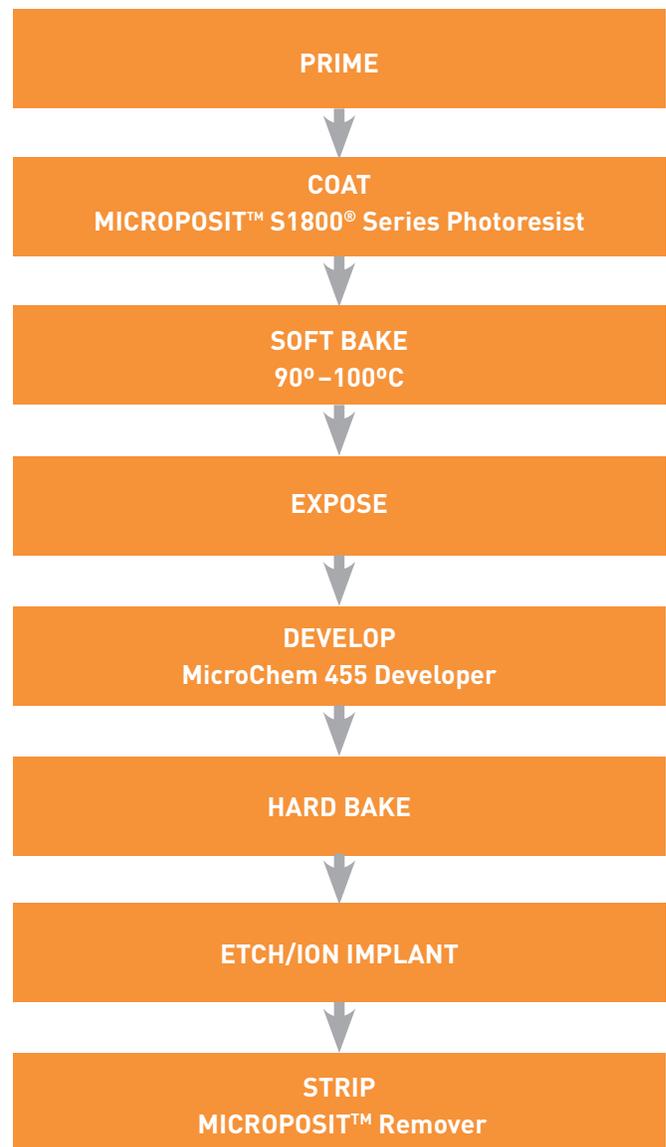
## HIGH INSPECTION YIELDS

- Clean, residue-free development
- Wide process latitude

## COST EFFICIENT

- Excellent exposure throughput

## SUBSTRATE PREPARATION



## 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

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

- 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.

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

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 MicroChem.

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

### 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.

## MicroChem 455 Developer

### 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  $\pm 1^\circ\text{C}$ . 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.

# Global Distribution

## United States

**Headquarters**  
**MicroChem Corp.**  
200 Flanders Road  
Westborough, MA 01581  
Tel: 617 965 5511  
Fax: 617 965 5818  
URL: [www.microchem.com](http://www.microchem.com)  
E-mail: [sales@microchem.com](mailto:sales@microchem.com)

## France, Belgium, Portugal, Spain

**Chimie Tech Services**  
7, rue Marcelin Berthelot  
Zone Industrielle  
92762 Antony Cedex, FRANCE  
Tel: +33 (0) 1 55 59 55 75  
Fax: +33 (0) 1 55 59 55 90  
URL: [www.chimietech.com](http://www.chimietech.com)  
E-mail: [anerozzi@chimietech.com](mailto:anerozzi@chimietech.com)  
Contact: Annabel Nerozzi

**Germany, Denmark, Finland, Greece, Luxemburg,  
Netherlands, Norway, Sweden, Poland, Czech Republic,  
Bulgaria, Romania, Turkey, Iceland, Slovenia, Slovakia,  
Russia, Armenia, Azerbaijan, Estonia, Georgia, Kazakhstan,  
Kyrgyzstan, Latvia, Lithuania, Moldova, Tajikistan, Belarus,  
Uzbekistan, Switzerland, Austria, Italy**

**Micro Resist Technology GmbH**  
Köpenicker 555 Berlin, GERMANY  
Tel: +49 (0) 30 64 16 70 100  
Fax: +49 (0) 30 64 16 70 200  
URL: [www.microresist.de](http://www.microresist.de)  
E-mail: [sales@microresist.de](mailto:sales@microresist.de)  
Contact: Anja Hinz, Gabi Gruetzner

## Israel

**Science Technologies & Services Limited**  
Beit Taasiot Haela  
Kibbutz Netiv Halamed He 99855, ISRAEL  
Tel: +972-2-9922268  
Fax: +972-2-9922278  
URL: [www.sts-israel.com](http://www.sts-israel.com)  
E-mail: [adan@sts-israel.com](mailto:adan@sts-israel.com)  
Contact: Nachum Adan

## United Kingdom, Ireland

**A-Gas Electronic Materials**  
Unit 3, IO Centre  
Swift Valley  
Rugby, Warwickshire  
CV21 1TW, UK  
Tel: +44 0 1788 537535  
Fax: +44 0 1788 535835  
URL: [www.agasem.com](http://www.agasem.com)  
E-mail: [customerservice.em@agas.com](mailto:customerservice.em@agas.com)  
Contact: Simon Willoughby

Manufactured by MicroChem Corp  
Licensed from the Dow Chemical Company



For countries not listed: please contact your local Dow distributor.

**MICRO • CHEM**

**MicroChem Corp**  
200 Flanders Road, Westborough, MA 01581 USA  
+1.617.965.5511 [sales@microchem.com](mailto:sales@microchem.com)  
[www.microchem.com](http://www.microchem.com)

(v01.16)