State-of-the-art solutions for performing many of the steps in sample preparation prior to either light or electron microscopy

Laboratory Microwave Ovens
Overview

The EMS 9000 Laboratory Microwave Oven represents a state-of-the-art solution for performing many of the steps in sample preparation prior to either light or electron microscopy. Procedures such as fixation, staining, dehydration, decalcification, impregnation, polymerization as well as immunohisto and cytochemistry can be done with ease in the EMS 9000.

The EMS 9000 offers a significant reduction in processing times while obtaining improved results.

Features

- 900 watt nominal output with variable wattage
- Bubble manifold for 5 tubes
- Forced exhaust system with fail-safe interlock
- Adjustable duty cycle—one second and greater for very precise process control
- Magnetron pre-warming
- Right side closet
- Vacuum system for rapid infiltration (optional)
- Load cooler/circulation system (optional)
- Three different timer modes
- Multiple safety interlocks
- Visual and aural warnings on errors and malfunctions
- All controls are automated
- Flexible temperature probe

Advantages

- Ease of use: User-friendly touch keypad to set and store all parameters-programmable
- Multiple running modes
- Multiple bubble mixing (5 ports)
- Adjustable temperature probe
- Ventilation
- Optional vacuum cycling for rapid infiltration
- Optional Load cooler
- Safety exhaust fans with fail safe interlock
- Integrated on board digital controller

For Optimum Results

The EMS 9000 features a touch pad keyboard that allows for all settings to be programmed quickly and easily. With a very well defined adjustable effect, accurate temperature control, well ventilated chamber, and three different timing modes, the EMS 9000 is the most advanced microwave processor available today.

For Temperature Control

Our temperature control not only prevents the tissue in the chamber from becoming denatured (by high temperature) but it also assists in pulsing the microwave effect in small precise portions. The temperature control has a direct effect on the magnetron for it allows the unit to switch on and off in the most efficient way at the preset effect level. The temperature probe is mounted on a ball swivel that allows for easy placement of the probe within the microwave chamber. In addition, the probe is made from stainless steel and it is quite flexible so that it may be bent and formed as required to place it in various shaped containers. The temperature sensor is located at the tip of the probe.

Bubble Mixing from up to 5 Tubes

Inside the chamber there is a manifold for up to 5 tubes that allows you to achieve bubble mixing in from one to five containers at the same time. There is a built in air pump that facilitates the mixing and avoids temperature gradients in the mixing process. These adjustable bubble mixers make the EMS 9000 ideal for decalcification.
### Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microwave Output</td>
<td>825 W</td>
</tr>
<tr>
<td>Effect Range</td>
<td>0-100%</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>0-120°C</td>
</tr>
<tr>
<td>Temperature Accuracy</td>
<td>Timer error: &lt;0.1% in all modes</td>
</tr>
<tr>
<td>Temperature Readout Update Rate</td>
<td>once/sec</td>
</tr>
<tr>
<td>Temperature Readout Accuracy</td>
<td>&lt;0.5°C</td>
</tr>
<tr>
<td>Power Control Accuracy</td>
<td>error &lt;1%</td>
</tr>
<tr>
<td>Air Agitation</td>
<td>Chamber air agitator flow is 1 liter per minute nominal</td>
</tr>
<tr>
<td>Internal Lighting</td>
<td>Chamber Lighting available at all times via keyboard switch (40 watt incandescent lamp)</td>
</tr>
<tr>
<td>Fluid Ports</td>
<td>2 ports supplied as a standard - accepts up to 3/16&quot; hose.</td>
</tr>
<tr>
<td>Pulse Length</td>
<td>1 second</td>
</tr>
<tr>
<td>Timer Value</td>
<td>0-99:59:59</td>
</tr>
<tr>
<td>Vent System</td>
<td>Vent fan rated at 106 CFM nominal</td>
</tr>
<tr>
<td>Input Power</td>
<td>15A at 120 Volts nominal</td>
</tr>
<tr>
<td>System Dimensions</td>
<td>19&quot;High x 21.5&quot;Wide x 24.5&quot;Diameter (48.3cm x 54.6cm x 62.2cm)</td>
</tr>
<tr>
<td>Microwave Chamber</td>
<td>9.5&quot; High x 13.5&quot; Wide x 15.5&quot; Diameter (24.1cm x 34.3cm x 39.4cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>70 lbs.</td>
</tr>
<tr>
<td>Continuous Run</td>
<td>Timer override works as a count up timer for an indefinite period of time.</td>
</tr>
<tr>
<td>Safety Interlocks</td>
<td>* Vent interlock inhibits operation unless vent airflow is normal</td>
</tr>
<tr>
<td></td>
<td>* Primary Door Interlock</td>
</tr>
<tr>
<td></td>
<td>* Secondary Door Interlock</td>
</tr>
<tr>
<td></td>
<td>* Monitor Switch - Short circuit of the magnetron when door is open</td>
</tr>
<tr>
<td></td>
<td>* Oven temperature Switch</td>
</tr>
<tr>
<td></td>
<td>100, 120, 230 volt models FCC approved, CSA NRTL approved.</td>
</tr>
</tbody>
</table>

### Ordering Information

- **Includes:**
  - 8' Ventilation Hose
  - User's Manual
  - Microwave Companion
  - Processor Tray
  - Vacuum Processor Bowl (when ordering vacuum option)
  - Vacuum Processor Cover (when ordering vacuum option)
  - 74 Position Cassette Basket Set
  - (2) Histoprocessing Bowls
  - (2) Microwave Transparent Containers
  - Polar Heat Sample Pack
  - Preserve Solution

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>97030</td>
<td>EMS 9000 Laboratory Microwave Precision Pulsed Microwave Oven, Complete with: Integrated Vacuum Pump, Remote Temperature Probe, Stirrer Antenna, Microwave Cookbook, Microwave Tool book</td>
<td>each</td>
</tr>
</tbody>
</table>
### EMS EXCLUSIVE

#### EMS 9000 Processing Chamber

Microwave processing tissues for electron microscopy can yield inconsistent results caused by different microwave distribution patterns within the microwave chamber. Exact, consistent placement of samples within the chamber is key to achieving uniform results. After two years of development and testing at a leading University Hospital, Electron Microscopy Sciences is proud to introduce the MPC 9000. The MPC 9000 developed only for our use in our top-of-the-line EMS 9000 laboratory microwave processor, hits the target that every laboratory needs: consistent processing, vacuum infiltration, and quick specimen turnaround.

**Features:**
- Sturdy heat and chemical resistant guide frame.
- Uses standard EMS Lynx I & II specimen handling technology.
- Two tip-proof processing stations for disposable processing vials.
- A wide range of processing baskets configurations available.
- Feed-through for process temperature probe placement while under vacuum.
- Low maintenance chamber disassembles for easy cleaning.

**Specifications**

- **Vessel** — **Dimensions:** Tray: 12" x 10" x 5"  
- **Bowl** — **Diameter:** 9.75"  
- **Liquid Capacity:** 2.9 liters  
- **Vacuum Cover** — **Dimensions:** 12" x 10" x 5"

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### EMS 9002 Vacuum Processor (factory-installed option)

Made from Pyrex® glass which offers better temperature conductivity and stability than any other material and is chemically resistant and microwave transparent.

The EMS 9002, when used in conjunction with our EMS 9000 processor, improves ultra-structural preservation during microwave assisted chemical fixation and reduces infiltration times dramatically.

**Accessories for the EMS 9002 Vacuum Processor**

**Vacuum Processor Kit:** For processing tissue samples in the Vacuum Microwave Processor.

**Includes:**
- Vacuum Processor Bowl (2825/1), Processor Tray (2825/3), Vacuum Processor Tubing Kit (2825/4), 74 Cassette Processing Rack (2825/6)

**Vacuum Processor Tubing Kit:** Used in conjunction with Vacuum Processor Bowl (H2825/1) and Vacuum Processor Cover (H2825/2).

**Non-Vacuum Processor Kit:** For processing of tissue samples in the H2850 Microwave Processor.

**Includes:**
- Non Vacuum Processor Bowl (H2825/3), Processor Tray (H2825/3), 74 Cassette Processing Rack (H2825/6)

**74 Cassette Processing Rack:** For cassette storage during tissue processing.

**Vacuum Processor Bowl:** Used in conjunction with Vacuum Processor Cover and Vacuum Processor Tubing Kit.

**Non-Vacuum Processing Bowl:** Not for use with vacuum attachments.
Staining and General Purpose Microwave Oven

All-in-one-microwave provides continuous power controller and 2-second magnetron cycle time for super fine control. Excellent for rapid special stain procedures.

Features
- “Dial in” desired power from 20% - 100%
- Adjustable air agitation ensures even temperature and reagent dispersion for all specimens
- Stainless steel interior and exterior for easy maintenance, long life
- Preset & variable time entry
- Digital countdown timer, accurate to 1 second
- High-performance vent system with standard 4" output; connect to fume hood or vent stack
- Microwave stirrers (no carousel necessary) for even microwave distribution, no “hot spots”
- “User friendly” controls, icon-based functions
- Tall chambers, for tall containers and vessels
- Illuminated interiors with stain-resistant ceramic floors
- USA manufacture; FCC compliance

General Purpose Microwave Oven

The most affordable general-purpose laboratory microwave oven ever, featuring high-performance fume extraction. Excellent for general laboratory use (slide drying, histology staining, etc.).

Features
- (5) built-in calibrated power settings
- Stainless steel interior & exterior for easy maintenance, long life
- Digital countdown timer, accurate to 1 second
- High-performance vent system with standard 4" output; connect to fume hood or vent stack
- Microwave stirrers (no carousel necessary) for even microwave distribution, no “hot spots”
- “User friendly” controls, icon-based functions
- Tall chambers, for tall containers and vessels
- Illuminated interiors with stain-resistant ceramic floors
- USA manufacture; FCC compliance

Specifications:

Exterior dimensions (WxHxD): 22" x 13.5" x 23 9/16" (55.88cm x 34.29cm x 59.85cm)
Interior dimensions (WxHxD): 14.5" x 9 25/32" x 14.5" (36.83cm x 23.5cm x 36.83cm)
Weight: 70 lbs
Power output: 840W
Input power: 15A at 120v nominal
Vent system output: 100cfm
Presets available: 20
Number of power settings: 5

Accessories

The General Purpose Microwave Oven includes:
- 8' Ventilation Hose
- User’s Manual

Ordering Information

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>97550</td>
<td>General Purpose Laboratory Microwave</td>
<td>each</td>
</tr>
</tbody>
</table>

Accessories

The Staining and General Purpose Microwave Oven includes:
- 8' Ventilation Hose
- User’s Manual

Ordering Information

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Qty.</th>
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</thead>
<tbody>
<tr>
<td>97500</td>
<td>Staining and General Purpose Laboratory Microwave</td>
<td>each</td>
</tr>
</tbody>
</table>
Microwave Leakage Detector

Evaluate microwave oven leakage and other environmental safety concerns. Features maximum and minimum hold, an audible alarm, and a zero adjustment to eliminate background EMF. The display also indicates overload and low battery. Comes with a soft carrying case and standard 9V battery, which provides approximately 100 hours of use.

**Dimensions:** 5¼” x 2¼” x 1¼” (130 x 56 x 38mm). Weight: 6oz (170g).

**Specifications**

<table>
<thead>
<tr>
<th>Display</th>
<th>3½ digits, maximum reading 3999</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Power Density</td>
<td>0.003 – 2.700 mW/cm²</td>
</tr>
<tr>
<td>RF Frequency</td>
<td>50MHz – 3.5GHz</td>
</tr>
<tr>
<td>Microwave Frequency</td>
<td>2450MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.001mW/cm²</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±2dB @ 2.45GHz ±50MHz</td>
</tr>
<tr>
<td>Axis</td>
<td>Single</td>
</tr>
<tr>
<td>Alarm</td>
<td>@ readings &gt;1mW/cm²</td>
</tr>
<tr>
<td>Operating Temp</td>
<td>41°F – 104°F (5°C – 40°C)</td>
</tr>
<tr>
<td>Operating RH</td>
<td>&lt;80% RH</td>
</tr>
</tbody>
</table>

Cat. No. Description Qty.
72083-00 Microwave Leakage Detector each

AirChek® Badges

Monitor vapor levels, simply and effectively.

AirChek Badges provide an innovative, simple and effective system for monitoring vapor levels, including Formaldehyde, Glutaraldehyde, Xylene, Toluene, and Isopropanol.

The badges are simply clipped on to the technician’s clothing and a record is kept of name, location and time, providing continuous sampling for personal monitoring and allowing the measurements required under Government regulations.

One badge provides continuous sampling over 8 hours. A second badge can be used to supply information for analysis of 15-minute peak exposure periods.

Cat. No. Description Qty.
64472-10 AirChek® Badge, Formaldehyde 6/pk
64472-20 AirChek® Badge, Glutaraldehyde 6/pk
64472-30 AirChek® Badge, Xylene 6/pk
64472-40 AirChek® Badge, Toluene 6/pk
64472-50 AirChek® Badge, Isopropanol 6/pk

Alpha-Numeric Oven Tray*

**EMS EXCLUSIVE**

Made from polypropylene. Each line is spaced 1 cm apart with letters along the sides and numbers across the top and bottom. This tray has ruled lines that aid in the reproducible placement of the specimens in the oven.

Cat. No. Description Qty.
97035-01 Alpha-Numeric Oven Tray each

Microwave Calibration Slide Set*

**EMS EXCLUSIVE**

A calibration slide for microwave staining. A set which includes two glass slides. Slide #1 has liquid crystal squares corresponding to the following temperatures: 35°C, 40°C, 45°C; Slide #2 has liquid crystal squares corresponding to the following temperatures: 50°C, 55°C, and 60°C.

This calibration set will ensure reproducible programming of the oven to achieve an ideal target temperature of large staining volumes (50-200ml solution).

Cat. No. Description Qty.
97031-01 Microwave Calibration Slide Set set

Stain-’N’-Temp Slide*

**EMS EXCLUSIVE**

This device is used as an aid when programming a microwave oven to achieve an ideal target temperature of 20-100ml staining volumes. The tool is designed to give quantitative temperature information about the droplet during staining of tissue sections on electron microscope grids.

This unit is a 4-well PTFE-coated glass slide, each well 8mm in diameter which will maintain the uniform shape of the droplet; 4 liquid crystal temperature strips ranging from 35° to 50° are affixed to each well to monitor the microwave oven temperature.

Cat. No. Description Qty.
97030-01 Stain-’N’-Temp Slide each
97030-06 Stain-’N’-Temp Slide 6/pk

Fix-’N’-Temp Container*

**EMS EXCLUSIVE**

This container will permit rapid specimen handling and provides temperature information during microwave irradiation. A liquid crystal strip is affixed into the bottom of a 35mm diameter petri dish and covered with a thin layer of EMbed resin. The temperature range is 35°C–60°C. This container is ideal for tissue fixing by microwaves. The two active temperature windows are 45°C and 50°C.

Cat. No. Description Qty.
97033-01 Fix-’N’-Temp Container each
97033-06 Fix-’N’-Temp Container 6/pk
**Neon Bulb Array**

**EMS EXCLUSIVE**

This Neon Bulb Array is made from silicone and has many advantages:

1. Silicone has a high resistance to extreme heat.
2. The silicone holds each bulb snugly and prevents bulb spillage during handling.

Each bulb in the mat is 2.5cm apart. The mat is divided into quadrants. A mark on the back left corner of the array lid is used to key the back left corner of the oven. There are letters and numbers along each edge for easy placement on the Alpha-numeric tray. The mat size is 8’x 8”.

97036-01 Neon Bulb Array each

*The above microwave accessories are developed in collaboration with Dr. Gary Login, Beth Israel Hospital, Boston, MA.

**Incubation Tray for Microwave Immunostaining**

For immunostaining, we recommend a water load that is the same size as the bottom of the microwave cavity in order not to disturb the distribution of microwave energy within the cavity. In our research, we found that between 150 and 200ml of water in the bottom of the incubation tray prevents evaporation of the droplets of reagent. A PAP pen should be used to maintain the droplets at a uniform size and shape.

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>97060</td>
<td>Microwave Incubation Tray for Immunostaining</td>
<td>each</td>
</tr>
</tbody>
</table>

**Coverplate™ Technology**

*The Coverplate Microwave Immunostaining Systems*

Shandon Lipshaw's patented Coverplate technology is the foundation of our microwave immunostaining system. Increased quality control, time and reagent savings, specimen protection, and consistent superb quality stains can be expected when using our Coverplate Microwave Immunostaining protocols.

97091 Cover Plate™ each 10/pk
97092 Cover Plate™ Slide Rack (holds 10 cover plates) each

**Micro Tube Rack- Microwaveable**

Polypropylene floating racks keep microtubes submerged in a water bath – perfect for controlling sample temperature. Detachable legs give the users more options: attach legs so rack stands upright on benchtop, or detach legs so sample tubes can be quickly popped out by pushing down onto any surface. Ideally to hold microcentrifuge tube in water bath during polymerization, such as LR White®, JB4. These racks are not autoclavable.

Measures: 60 mm high, including legs.

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Wells</th>
<th>Tubes</th>
<th>Shapes/Color</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>72372-SB</td>
<td>16</td>
<td>0.4/0.5 ml</td>
<td>Square (102 mm) Black</td>
<td>each</td>
</tr>
<tr>
<td>72372-SW</td>
<td>16</td>
<td>1.5/2.0 ml</td>
<td>Square (102 mm) White</td>
<td>each</td>
</tr>
<tr>
<td>72372-RB</td>
<td>8</td>
<td>1.5/2.0 ml</td>
<td>Round (68 mm) White</td>
<td>each</td>
</tr>
<tr>
<td>72372-R20</td>
<td>20</td>
<td>1.5/2.0 ml</td>
<td>Round (88 mm) White</td>
<td>each</td>
</tr>
</tbody>
</table>

**Cassette Rack for Microwave Histoprocessing**

A simple and reliable device designed to hold up to 24 standard cassettes for histoprocessing in a microwave. This new rack is manufactured from PTFE resins, and will withstand repeated exposure to fixatives, dehydrating agents, clearing agents and paraffin. It is easily cleaned in hot water. It is intended for use with a disposable tray which holds the processing chemicals.

Four processing racks and trays will fit into the EMS 9000 Microwave Processor, so that up to 96 cassettes can be processed in one run. Using this system, the histotechnologist needs to handle the individual cassettes only once, to load them into the racks. The rack is then placed into a tray containing the dehydrating medium, usually 100% ethyl alcohol, and microwaved. After dehydration, the rack containing the cassettes is transferred into a tray containing the clearing agent, usually isopropanol, and microwaved. After clearing, the rack is transferred to a tray containing liquid paraffin, and microwaved. The whole process can take as little as 25 minutes (for small specimens, such as needle biopsies). There are no hazardous chemicals needed (no xylene!).

97050 PTFE Cassette Rack for Microwave Histoprocessing each
97051 Microwave Histoprocessing Rack with 10 Disposable Trays set

**Formalin Solutions: A New Cassette Holder for Microwave Fixation and Processing**

Each holds 64 or 40 cassettes in a single horizontal plane, which conforms to research regarding the way to achieve the best distribution of microwave energy. It is based upon an original design in wood (the 'Bamboozle') developed by Dr. Richard Dapson of Anatech, Ltd. It is adapted to a pyrex container which allows the paraffin to easily hold its temperature, and minimizes the risk of overheating of specimens due to lack of sufficient microwavable load.

97070-10 Ceramic Holder and Tray, holds 64 cassettes each
97070-01 Tray only each
97070-02 Ceramic Holder only, holds 64 cassettes each
97071-10 Ceramic Holder and Tray, holds 21 cassettes each
97071-01 Tray only each
97071-02 Ceramic Holder, holds 21 cassettes each

**Other Holders, Racks, and Trays**

97052-01 Microwave transparent dish each
97052-04 Microwave Slide Staining Holder each
97090 Microwave Slide Staining Holders, with disposable tray (each rack holds 24 slides). 6/pk
97082 Microwave-Transparent Trays 50/pk

**Containers**

97084 Microwave-transparent jars with wide mouths and vented lids, (2 x 500ml, 1 x 1000ml) 3/pk
97088 Microwave transparent “dummy load” vented container each
97086 Microwave-transparent, small-capacity staining containers 10/pk
97087 Microtemp Coplin Jars with vented lid 3/pk
Laboratory Microwave Ovens Overview

Employing microwave technology in your laboratory, especially in Histology labs, is a simple process and will improve your operation on multiple levels. Whether you become an all-microwave lab or add microwave processing for stats, overflow, special stains and/or myriad other applications, you will find this line of laboratory microwave to be the most efficient and versatile tool in your lab.

Benefits

- Fix, Process, Stain, and Decalcify tissue, in a fraction of the time of any other method or Microwave Processor
- Provide greater throughput than any other Microwave processor on the market for samples up to 3mm
- Reduce reagent use
- Eliminate the need for Xylene in your processing
- Allow a 50% reduction in your use of Xylene and Alcohol for H&E staining
- Open the door to using many safe and environmentally friendly alternative fixatives and clearing agents
- Provide an opportunity to drastically improve the quality of your fatty tissue processing
- Will not reduce slide quality
- Will not damage or degrade specimen antigenicity
- Does not adversely impact IHC or molecular downstream testing
- Speeds up laboratory workflow

Time and Cost Savings

Automation does not necessarily equal speed. Microwaves process tissue far more efficiently and cost-effectively than any other Tissue Processor. These are the fastest Processors on the market.

- Reagent used is directly proportional to the volume of samples being processed
- Xylene Free: use only Alcohols and Paraffin to process tissue with no Xylene clearing steps required
- Process 74 biopsies in < 20 minutes. No other Tissue Processor even comes close.
- Patented Polar Heat Sheets allow ultra-fast Microwave paraffin infiltration

Tissue Processing Times

<table>
<thead>
<tr>
<th>Process Type</th>
<th>General Lab Microwave</th>
<th>Staining/General Lab Microwave</th>
<th>EMS-9000 Precision Pulsed Microwave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Biopsy</td>
<td>16-35 minutes</td>
<td>16-35 minutes</td>
<td>16-35 minutes</td>
</tr>
<tr>
<td>1-3mm Sections</td>
<td>1 hour</td>
<td>1 hour</td>
<td>1 hour</td>
</tr>
<tr>
<td>Thick, Fatty Sections</td>
<td>2-3 hours</td>
<td>2-3 hours</td>
<td>2-3 hours</td>
</tr>
<tr>
<td>Special Stains</td>
<td>1-20 minutes</td>
<td>1-20 minutes</td>
<td>1-20 minutes</td>
</tr>
<tr>
<td>Decalcifications</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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