

## ***PTC1™ Paint Test Cell*** ***PortHoles™ Electrochemical Sample Masks***

### ***PTC1™ Paint Test Cell***

The PTC1™ Paint Test Cell is a low-cost sample cell for electrochemical testing of coated samples. The PTCI can also be used to test bare metal samples using PortHoles™ Electrochemical Sample Masks.

The PTCI is perfect for testing of painted metal specimens using Electrochemical Impedance Spectroscopy with Gamry's EIS300™ EIS Software. The exposed area of almost 15 cm<sup>2</sup> is sufficiently large to incorporate a statistically significant number of defects in the coating. The large area is also a positive attribute from the data acquisition standpoint, since high impedance samples such as coatings are characterized by low current densities. Because of the low cost, laboratories can justify the multiple cells that are necessary for long-term exposure testing of coatings.

The design of the PTCI is elegantly simple. A glass tube with an O-ring seal is clamped to the flat sample under test. The tube is filled with the test electrolyte and sealed with a rubber stopper. A Saturated Calomel Reference Electrode and a graphite rod counter electrode are mounted through the stopper.



### ***PortHoles™*** ***Electrochemical Sample Masks***



PortHoles Electrochemical Sample Masks define a known area of the sample surface for electrochemical testing with the PTCI. PortHoles are available in 1, 3, or 10 cm<sup>2</sup> area to accommodate any specimen.

PortHoles Electrochemical Sample Masks are used with the Gamry PTCI Paint Test Cell for a complete test cell for flat metal samples. After the PortHoles Mask is attached to the sample, the body of the PTCI Paint Test Cell is placed on the Mask. The O-ring seal of the PTCI body insures that no leakage takes place. Since the O-ring contacts the PortHole, not the metal surface, crevice corrosion is not an issue. The body of the PTCI is filled with the appropriate electrolyte, which contacts only the area exposed by the PortHole. When the experiment is complete, the PortHole is removed and discarded. PortHoles Electrochemical Sample Masks are fabricated from 3M Model 470 Electroplater's Tape. Model 470 Tape incorporates a special adhesive to bond aggressively to the metal sample surface to discourage

underflow of the tape edge by the electrolyte, which would cause crevice corrosion. The hole in the tape is carefully cut for a smooth edge with minimum burring. Model 470 Tape is formulated to withstand lengthy exposure to chemicals commonly found in electroplating applications.

### ***PTC1 Paint Test Cell Specifications***

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Volume: Approximately 40 ml.

Metal Specimen Size

- Disk: Diameter > 50 mm
- Square: >50 mm on each side
- Thickness: 1-10 mm

Reference Electrode: Saturated Calomel

Counter Electrode: Graphite

Test Area: 14.6 cm<sup>2</sup> ± 5% (typical)

PTCI Paint Test Cell Part No.: 990-139

The PTCI is also available without the reference electrode.

### ***PortHoles Electrochemical Sample Masks Specifications***

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PortHoles Electrochemical Sample Masks are provided as individual 3 inch (7.6 cm) square masks with a pre-cut hole and removeable backing. PortHoles are designed for a single use. PortHoles are fabricated from 3M Model 470 Electroplaters Tape. PortHoles are provided with 1, 3, or 10 cm<sup>2</sup> hole in lots of 60, or as an assortment with 20 of each size.

<b><u>Part Number</u></b>	<b><u>Description</u></b>
935-49	1 cm <sup>2</sup> PortHoles, 60 each
935-50	3 cm <sup>2</sup> PortHoles, 60 each
935-51	10 cm <sup>2</sup> PortHoles, 60 each
990-161	1 cm <sup>2</sup> , 3 cm <sup>2</sup> , and 10 cm <sup>2</sup> PortHoles, 20 each

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All specifications subject to change without notice.

