

# PERMATRAN-W® Model 398

## Water Vapor Transmission Rate Test System

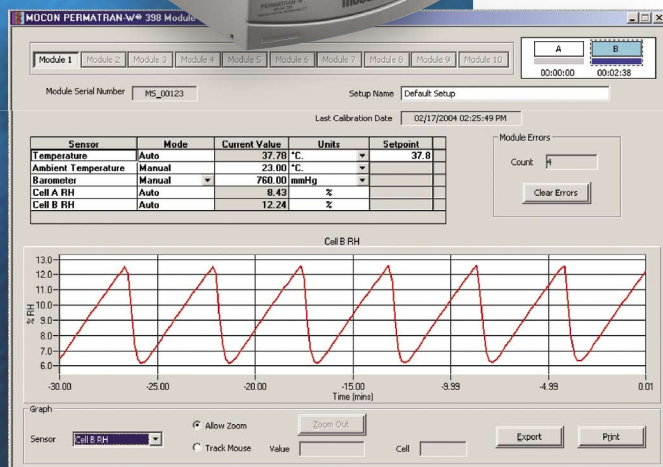
**WVTR/MVTR**



The new, easy to use, PERMATRAN-W Model 398 is the latest water vapor transmission rate system in a long line of quality systems available from MOCON, the world leader in permeation technology. This simple, low maintenance system conforms to the new ASTM Standard E-398 and produces the accurate and reliable data the industry has come to expect only from MOCON.

The low-cost Model 398 is designed for medium to high barriers and allows for two films to be tested independently. Each test cell has its own sensor, assuring greater throughput with accurate results. Because the Model 398 provides for precise relative humidity testing, two films may be tested simultaneously at two different RH conditions!

The new WinPerm™, Windows® based software, is simple and intuitive. Automated temperature and relative humidity control, as well as automatically determined equilibrium, all but eliminate operator error.



Software has the following features:

- Real time sensor analysis
- Stored calibration history
- Test method storage and retrieval
- Quick start feature
- Built-in help menu

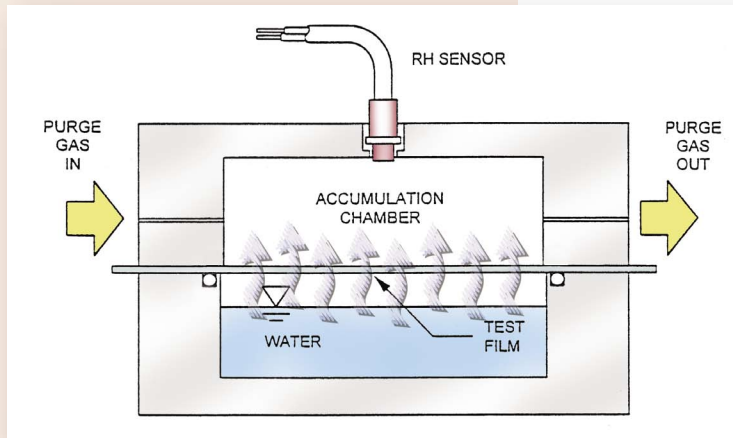
- Two, 50 cm<sup>2</sup> independently operated test cells, each containing state-of-the-art sensor technology
- For testing medium to high barriers
- Broad range of automatic temperature and RH testing
- Modular systems allow for control of up to ten modules from a single computer
- Compatible with PERM-NET™ database and networking software
- Set of three calibration films provided
- CE, UL, CSA Listed
- Ideal for polymer films and some coated paper samples

Conforms to  
ASTM Standard E-398

**mocon®**

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## Specifications

- WVTR test range:

Temp (C)	WVTR (gm/m <sup>2</sup> -day) Area = 50 cm <sup>2</sup>	WVTR (gm/m <sup>2</sup> -day) Area = 5 cm <sup>2</sup>
5	0.05 - 60	0.5 - 600
23	0.05 - 135	0.5 - 1350
37.8	0.05 - 300	0.5 - 3000
50	0.05 - 500	0.5 - 5000

- Temperature range:
  - Ambient module: ambient +5C-50C
  - Sub-ambient module: 5C-50C
- Relative humidity range:  
50-90% (driving force differential)
- Two 50 cm<sup>2</sup> test cells
- Expandable up to 10 modules  
(20 test cells)
- Set of 3 calibration films
- WinPerm, Windows 2000 software
- CE, UL, CSA Listed

## Theory of Operation - ASTM Standard E-398 Accumulation Method

The accumulation method of WVTR measurement is a proven approach that provides accurate measurements for medium/high barriers. The straightforward test method, shown here, involves a chamber containing a source of water that is separated from an accumulation chamber by the sample under test. The relative humidity (RH) within the accumulation chamber fluctuates between a *low* setpoint and a *high* setpoint in response to the periodic introduction of a dry purge gas such as nitrogen.

When the test begins, a set of valves open that allow a stream of dry purge gas to flow through the upper chamber, reducing the RH in the chamber until the low RH is reached. The valves close, and the humidity level within the chamber increases gradually in response to permeation through the film. When the high RH setpoint is reached, the valves open once again and the cycle repeats.

The computer then records the WVTR which is based on the number of seconds or minutes required for the RH within the chamber to reach the high setpoint. When the WVTR is stable over repeated cycles, the film is at equilibrium.

# mocon®

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