

Modular systems for precision water vapour analysis of packaging film barriers



Applications

Barrier films PET bottles Containers Closures Flexible Pouches Bags

Features & Benefits

- Analytical Systems Manufactured traceable to NIST.
- System validation with certified gas or film for speed and convenience.
- Over 25 yrs experience of Proprietary Coulometric P_2O_5 sensor.
- Absolute moisture measurement - No calibration required.
- Widest measuring range in the market providing research grade flexibility.
- Electronic flow, temperature and humidity control for ultimate responsiveness and repeatability.
- Intuitive Windows based software.
- No archaic liquid coolants, catalysts or special gas mixtures required.

Manufacture traceable to NIST

All Systech analysers are certified traceable to NIST. In addition, analytical performance is validated using NIST certified gases and NIST traceable films. A set of validation films and a spare P_2O_5 sensor comes as standard with all of the water vapour permeation analysers.

P_2O_5 Sensor Technology

The two most common sensor types for measuring moisture are IR (infra-red) and P_2O_5 (phosphorous pentoxide). The P_2O_5 sensor is more sensitive and stable than IR and does not require calibration. P_2O_5 is the primary method for absolute moisture measurement. Systech have over 20 years experience of using P_2O_5 sensor technology.

*The Systech 7000 series analysers comply with ASTM standard F-1249 with the exception of the sensor technology. The standard relates to an infra red sensor whilst the Systech analyser uses a coulometric sensor - a dedicated method of moisture analysis.

Widest measuring range

The 7000 series offer you the widest measurement range in the market providing research grade flexibility.

- Measurement range of 0.002-1000 $g/m^2/day$ with masking.
- Quality Assurance orientated speed and agility.
- Up to five expansion modules available to increase testing throughput.



Precision control

These analysers offer precision electronic, temperature and humidity flow control providing ultimate responsiveness and repeatability.

- Test gas and carrier flow gas controlled by premium electronic mass flow controllers.
- Accurate relative humidity range from 0% to 90%.
- Widest sample temperature range available of 5 to 50°C.

Laboratory Testing Services

Our test laboratory will perform your Permeation Testing and Headspace Analysis. Whether you are developing innovative materials and packages or validating that your supplier is meeting specification. We can exceed your expectations with:

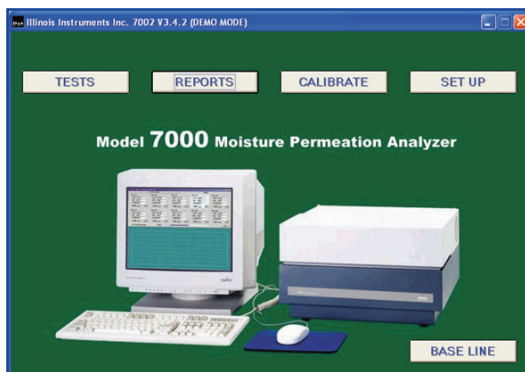
- Competitive Prices
- Independent non-biased results
- Fast Turnaround
- 25 Years Experience

Software

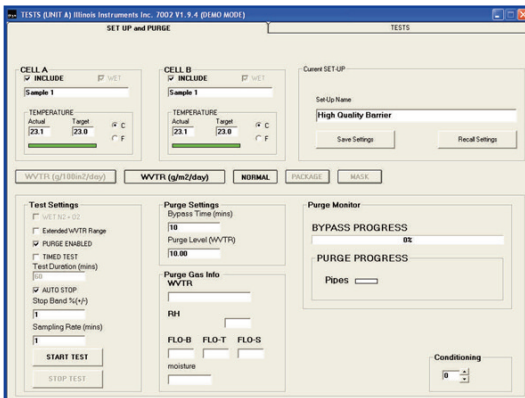
The intuitive Windows based software offers:

- Easy input and recall of operating parameters and test protocols.
- User-friendly data tracking, searches, sorts, storage and output capabilities.
- Graphical representation of measurement data in real time.
- Auto-stop feature stops test when samples have reached equilibrium or by user entered elapsed time value.
- Complete system diagnostics.

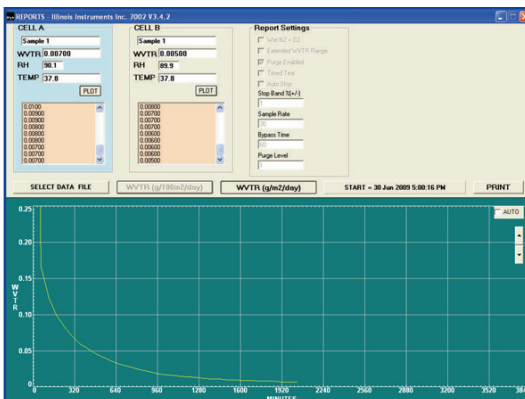
Start up



Set up



Actual data

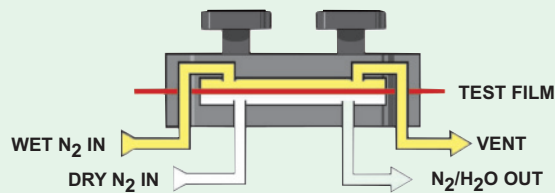


Principle of Operation

Utilising our proprietary sensor technology to detect water vapour transmission rates, samples are clamped or attached to a diffusion chamber. Wet nitrogen is then introduced into the upper half of the chamber while a moisture-free carrier gas flows through the lower half.

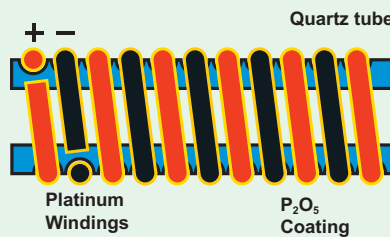
Molecules of water diffusing through the sample into the lower chamber are conveyed to the sensor by the carrier gas.

Sample Test Chamber



This allows a direct measurement of the water vapour without using complex extrapolations. Water vapour transmission rate of the test sample is displayed as either $\text{g/m}^2/\text{day}$ or $\text{g}/100\text{in}^2/\text{day}$.

P₂O₅ Sensor



To achieve an absolute measure, the technology draws upon a fundamental principle of physics.

The phosphorous pentoxide (P₂O₅) moisture sensor consists of a dual platinum winding formed around a quartz tube.

The change in the resistance across the windings creates a change in the measured current. According to Faraday's Law this is directly proportional to the amount of moisture in the gas stream.

System 7000 Series - Water Vapour Permeation Analysers

System's range meets the requirement for the testing of any application.



System 7002 Water Vapour Transmission Analyser delivers the same high performance as the 7001 but with an extended measurement range for more demanding applications.

Technical Specifications

Measurement Range

| | | |
|------------------------|----------|--|
| 7001 | Unmasked | 0.002 to 10 g/m ² /day |
| | Masked | 0.02 to 70 g/m ² /day |
| 7002 | Unmasked | 0.002 to 70 g/m ² /day |
| | Masked | 0.02 to 1000 g/m ² /day |
| Test Temperature Range | | 5°C to 50°C (41°F to 122°F) |
| Test RH Range | | 0 to 90% RH |
| Sample Size | | 50cm ² , adaptors available for smaller samples |

Operating Conditions

| | |
|----------------------|---------------------------------|
| Operating Conditions | Standard laboratory environment |
| Power Requirements | 110/220 VAC 50/60Hz |
| Supply Pressure | 25 - 45 PSI regulated |
| Gas Fittings | 1/8 in. Swagelok (supplied) |
| Enclosure | Epoxy coated heavy gauge steel |
| Dimensions | 533 x 533 x 305 (mm) |
| Weight | 23.6kg |

Options

| | |
|------------------------|--|
| Expansion Modules 7011 | Available for simultaneous WVTR analysis of up to 12 samples |
| Environmental Chambers | For finished package testing |

System Instruments have over 25 years experience of providing analysis solutions for a wide range of industries. From our manufacturing plant in the UK we produce gas analysers for industrial process industries, headspace analysers for monitoring gas flushing of food products, and our range of permeation analysers.



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