

## Modular systems for precision oxygen analysis of packaging film barriers



### Applications

Barrier Film    PET Bottles    Containers    Canisters    Flexible pouches    Bags

### Features & Benefits

- Analytical Systems Manufactured Traceable to NIST.
- System validation with certified gas or film for speed and convenience.
- Wide measurement range.
- Flow, temperature and humidity control for ultimate responsiveness and repeatability.
- Fast permeation results.
- Coulometric oxygen sensor enhances analytical precision.
- Intuitive Windows based software.
- For medical and pharmaceutical permeation testing, we can now offer software which conforms to 21CFR Part 11.
- No liquid coolants, catalysts or special gas mixtures required.

## Wide measurement range

All Systech Illinois 8000 Series analysers offer a wide measurement range providing:

- Research grade flexibility.
- Research grade accuracy and repeatability.
- Quality Assurance orientated speed and agility.
- Measurement Range ranging from 0.005 cc/m<sup>2</sup>/day to 432,000 (8001L). 0.008 cc/m<sup>2</sup>/day to 432,000 (8001/2 & 3).
- Up to five Expansion Modules available to increase testing throughput.

## Coulometric oxygen sensor

- Extremely fast purge down time.
- Accurate readings at the lowest levels enhancing analytical precision.
- The highest quality sensor in the market with the lowest replacement cost.

## Precision control

The 8000 Series analysers offers precision temperature and humidification flow control providing ultimate responsiveness and repeatability.

- Test gas and carrier gas flow is controlled by premium electronic flow controllers.
- Wide sample temperature range from 5°C to 50°C.
- Most measurable and controllable Relative Humidity range 20% to 90% RH.
- Fastest changeover from wet to dry sample runs.
- No need for liquid coolants, catalysts or expensive gas mixtures - just simple Nitrogen and Oxygen.

## 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.
- Complete system diagnostics.

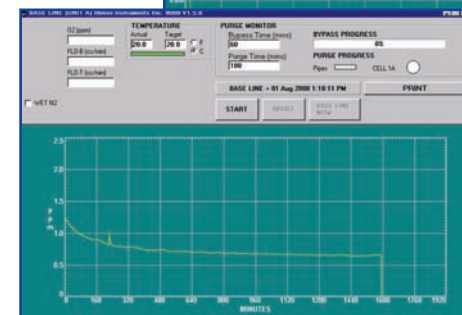
## Test Results

Customer	High Quality Barrier Package			
Date	16/07/2009			
Instrument	Model 8001			
	OTR	Test Conditions		
Sample	cc/pack/day	Temperature	RH Air	RH N <sub>2</sub>
Sample 1	0.00163	Room	Room	0%
Sample 2	0.00165	Room	Room	0%
Room temperature during the test: 23°C				
Air RH during the test: 35-45%				

## 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
- Fast Turnaround
- Independent non-biased results
- 25 Years Experience

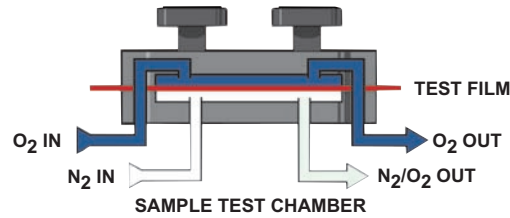




## Principle of Operation

Utilising our proprietary coulometric sensor technology to detect oxygen transmission rates samples are clamped or attached to a diffusion chamber. Pure oxygen (99.9%) is then introduced into the upper half of the chamber while an oxygen-free carrier gas flows through the lower half.

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



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

## New to the 8000 Oxygen Permeation Range

### 8001L

Combines the outstanding quality of the model 8001 with the benefits of the new 'L' coulometric oxygen sensor.

- New oxygen sensor enhances analytical precision.

- Wide measurement range providing research grade flexibility.
- Up to five Expansion Modules available to increase testing throughput.

## 8700 range for bottles and packages

The ultimate solution for fast and reliable oxygen permeation testing for multiple bottles, packages or films.

- Avoid production scrap and expensive re-work costs
- Measurement of 11 samples simultaneously - individually started, stopped or delayed.
- Expandable to 66 measurement chambers when higher throughput is required.
- Ultra fast testing within 3 - 12 hours - Systech Illinois' Turbopurge technology ensures the fastest stabilisation time possible.
- Modular adaptors can be installed in seconds, making this the most versatile package analyser available.
- High level of stability and performance with a measuring range of  $0.00004 - 1000\text{cc}/\text{pack}/\text{day}$ .
- Simple Windows based software control with an intuitive menu structure, allows each chamber to operate independently.



# 8000 Series - Oxygen Permeation Analysers

Systech Illinois' range meets the requirement for the testing of any application.



## 8001

533 x 533 x 305(mm) 28.1kg  
2 stations for films or packages,  
precise humidity control, can switch  
between wet or dry samples within  
minutes.



## 8200

533 x 533 x 305(mm) 28.1kg  
2 station for films or packages.



## 8001L

533 x 533 x 305(mm) 28.1kg  
As 8001, with new coulometric oxygen  
sensor.



## 8501

356 x 356 x 279 (mm) 18.2kg  
Reduced specification single station  
for film or package, dry test only.



## 8002

533 x 533 x 305(mm) 28.1kg  
As 8001, but tests only dry or wet  
(assumed 100% RH).



## 8700

760 x 590 x 350 (mm) 65kg  
11 stations for films or packages.



## 8003

533 x 533 x 305(mm) 28.1kg  
As 8001, but tests dry only.

## Technical Specifications

8001 8001L 8002 8003 8200 8501 8700

	8001	8001L	8002	8003	8200	8501	8700
<b>OTR Test Range</b>							
<b>Films</b>							
0.005 - 432,000 cc/m <sup>2</sup> /day (0.0003 - 28,000 cc/100in <sup>2</sup> /day) No masking required		✓					
0.008 - 432,000 cc/m <sup>2</sup> /day (0.0005 - 28,000 cc/100in <sup>2</sup> /day) No masking required	✓		✓	✓			
0.04 - 100,000 cc/m <sup>2</sup> /day (0.0001 - 5,000 cc/100in <sup>2</sup> /day) No masking required					✓		✓
1 - 99,999 cc/m <sup>2</sup> /day (0.07 - 6,800 cc/100in <sup>2</sup> /day) No masking required						✓	
<b>Package</b>							
0.000025 - 1,000 cc/pack/day		✓					
0.00004 - 1,000 cc/pack/day	✓		✓	✓	✓		✓
<b>Test Temperature Range</b>							
5°C to 50°C (41°F to 122°F)	✓	✓	✓	✓	ambient		ambient
15°C to 40°C (59°F to 104°F)						✓	
<b>Controlled RH Testing</b>							
Dry (0% RH) or generated RH (20% to 90%)	✓	✓					
Dry and Unknown Wet RH (Assumed saturated or 100% RH)			✓				✓
Dry only				✓	✓	✓	✓
<b>Expansion</b>							
Expandable up to 5 Modules (Total 12 test cells)	✓	✓	✓	✓	✓		
Expandable up to 5 Modules (Total 66 test cells)							✓
<b>Test Sample Size</b>							
Films 50cm <sup>2</sup>	✓	✓	✓	✓	✓		✓
Films 100cm <sup>2</sup>						✓	
Packages	✓	✓	✓	✓	✓		✓
<b>Calibration</b>							
Films or NIST gas	✓	✓	✓	✓	✓	✓	✓
<b>Automatic Temperature Control</b>							
	✓	✓	✓	✓	ambient	✓	ambient
<b>Power rating</b>							
100-240 VAC, 50/60 Hz, 840 VA (max)	✓	✓	✓	✓	✓		
100-240 VAC, 50/60 Hz, 150 VA (max)						✓	✓

**Systech Instruments Ltd (UK)**  
17 Thame Park Business Centre,  
Wenman Road,  
Thame, Oxfordshire OX9 3XA  
Tel: +44 (0)1844 216838  
Fax: +44 (0)1844 217220  
E-mail: sales.uk@systechillinois.com  
www.systechillinois.com

**Illinois Instruments, Inc (U.S)**  
2401 Hiller Ridge Road  
Johnsburg, Illinois 60051  
U.S.A.  
Tel: +1 815 344 6212  
Fax: +1 815 344 6332  
E-mail: sales.usa@systechillinois.com  
www.systechillinois.com

**Illinois Instruments (Thailand)**  
6th fl Nopnarong Bldg No7  
Ladprao23, Jatujak, Bangkok 10900  
Thailand  
Tel: +66 (0)2938 0798  
Fax: +66 (0)2938 1058  
E-mail: sales.ap@systechillinois.com  
www.systechillinois.com

**Systech Illinois (China)**  
Room 1105, Forte Building  
No. 910 Quyang Rd, Hongkou district,  
Shanghai, China 200434  
Tel: +86 21 65533022  
Fax: +86 21 65539651  
Email: info@systechillinois.cn  
www.systechillinois.cn