



# **OX-TRAN<sup>®</sup>** **OXYGEN PERMEATION ANALYZERS**



OTR Testing for Barrier Films & Packages

# OX-TRAN PRODUCT FAMILY

## Introduction to OTR instruments

MOCON Oxygen Permeation Analyzers are recognized as the industry-leading solution in Oxygen Transmission Rate (OTR) testing. The extensive line of OX-TRAN® analyzers represent decades of technical leadership and continuous innovation in partnership with our customers, distributors and institutions. The family of OX-TRAN analyzers offer a solution for almost any OTR testing need from sheet or barrier films to all types of packages, bottles, cartons, and more.

### FILM ANALYZERS

#### High Performance

##### OX-TRAN 2/22 Series, H, L & 10X

- Most popular
- Most capability
- Ultra low detection limit
- MOCON Coulox Sensor
- Interchangeable cartridges
- Wide range of testing applications



#### Performance

##### OX-TRAN 2/12 Series, R & T

- Wide test range
- Interchangeable cartridges
- Affordable price

##### OX-TRAN 1/50

- Entry level price
- Lower output
- Mid range test capability



#### High Throughput

##### OX-TRAN 2/28 H

- Double the testing throughput
- Simplified operation for QC labs
- MOCON Coulox Sensor
- Dry testing only



Available with and without built-in display screen

### WHOLE PACKAGE ANALYZERS

#### Package Testing

##### OX-TRAN 2/40 Series, H, L & 10X

- Controlled condition package testing
- MOCON Coulox Sensor
- Interchangeable testing cartridges
- Simplified package mounting



##### OX-TRAN 2/48 H

- Ambient package testing
- MOCON Coulox Sensor
- Interchangeable testing cartridges
- Simplified package mounting



# OX-TRAN PERFORMANCE OVERVIEW

## A Solution For Every Application

The OX-TRAN family offers a range of models to support your QC and R&D testing applications with the accuracy and repeatability you need. Our instruments are optimized for different applications such as packaging films, whole packages or other barrier types and are designed fit-for-purpose depending on your application to provide the best efficiency and effectiveness.

They feature our digital control system and automated testing, making them easy to operate and provide reliable results. The removable cartridge feature simplifies sample prep and offers expanded capabilities with a range of cartridge options.

Model	Primary Application	Test Cells	Sample Type
OX-TRAN 1/50	Low output R&D	1	Film
OX-TRAN 2/12 R	Wide range R&D	2	Film & Package
OX-TRAN 2/12 T	High range R&D and QC	2	Film & Package
OX-TRAN 2/22 H	Normal range R&D and QC	2	Film & Package
OX-TRAN 2/22 L	Low detection R&D	2	Film & Package
OX-TRAN 2/22 10X	Ultra low detection R&D	2	Film & Package
OX-TRAN 2/28 H	Normal range QC	4	Film
OX-TRAN 2/40 H	Normal range R&D and QC	4	Package & Film
OX-TRAN 2/40 L	Low detection R&D	4	Package & Film
OX-TRAN 2/40 10X	Ultra low detection R&D	4	Package & Film
OX-TRAN 2/48H	Normal range R&D and QC	8	Package & Film

## OX-TRAN Detection Range Comparison



# FEATURES OF MOCON ANALYZERS

## Benefits

The advanced features on MOCON's Next Generation analyzers provide:

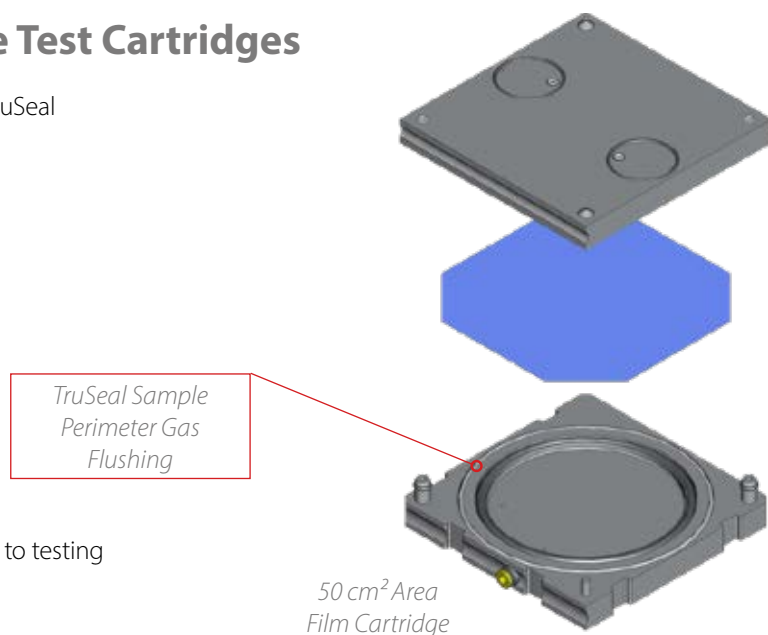
- High laboratory efficiency
- High repeatability
- Minimal training
- Wide testing capability
- Large dynamic range
- Variety of sample types



## Removable & Interchangeable Test Cartridges

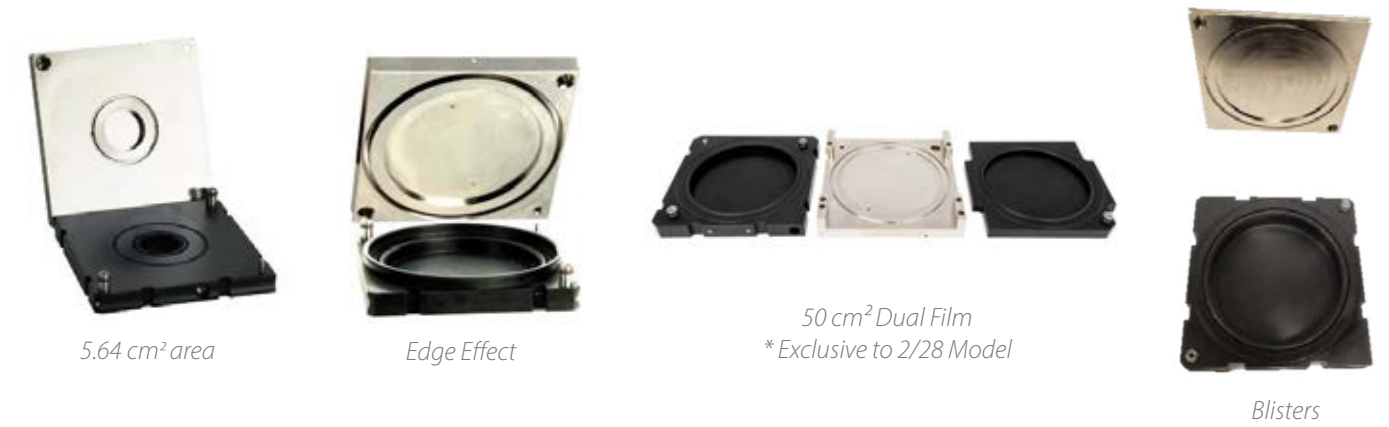
Removable cartridges utilize pneumatic clamp and TruSeal to provide repeatable results

- Expand testing capability
- Easy bench-top preparation
- Reduces operator variability
- Saves on set-up time
- Improves accuracy
- Reduces masking
- Some cartridges eliminate epoxy
- Reduce idle time by preparing samples in parallel to testing

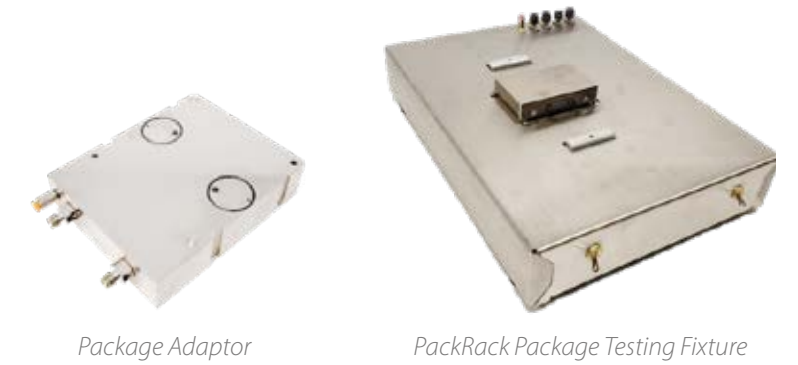


# ACCESSORIES

## Film Cartridges



## Package Testing Accessories for Film Analyzers



## Package Cartridges (for use with PackRack, OX-TRAN 2/40 and OX-TRAN 2/48)





## Digital testing provides industry leading accuracy and repeatability by removing operator variability

Easy to use control system features fully automated digital testing including temperature, gas flow and RH control. Final test reports are automatically saved and can be automatically print and exported



The Home screen shows the Carrier and Test Gas pressures, barometer, and block temperature.



Digital testing include: Cell Temperature, Permeant Concentration, Instrument Rezero ON/OFF, Rezero Frequency



Digital test methods include; Sample ID, Material ID, Film/Package mode, material thickness, & Conditioning Time



Auto-Test mode automatically adjusts the testing parameters to provide results for unknown samples

## PermWare

Permeation laboratory management software designed to improve efficiency and simplify data handling

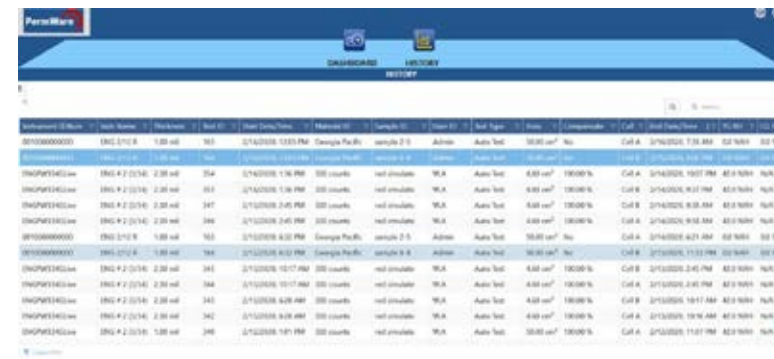
- Master Data collection system for all Mocon Permeation Instruments
- Store, sort and manage all permeation test reports in one location
- Provides dashboard operations screen for all Next Gen Instruments
- Runs Windows 10 on desktop computer
- Allows safe connection to secure networks



PermWare Network can connect all your MOCON instruments, printers and external network



Overview Screen for all Next Generation Instruments



Access Test Reports from any MOCON Instrument.

## MOCON Exclusive COULOX® Sensor

MOCON's patented Coulox absolute (intrinsic) coulometric sensor requires no calibration and is the basis for the ASTM standard D3985. Our OX-TRAN family of oxygen permeation analyzer are the only instruments proven to meet the precision and bias requirements of ASTM D3985 through independent and 3rd party testing.

### COULOX® Sensor Advantages

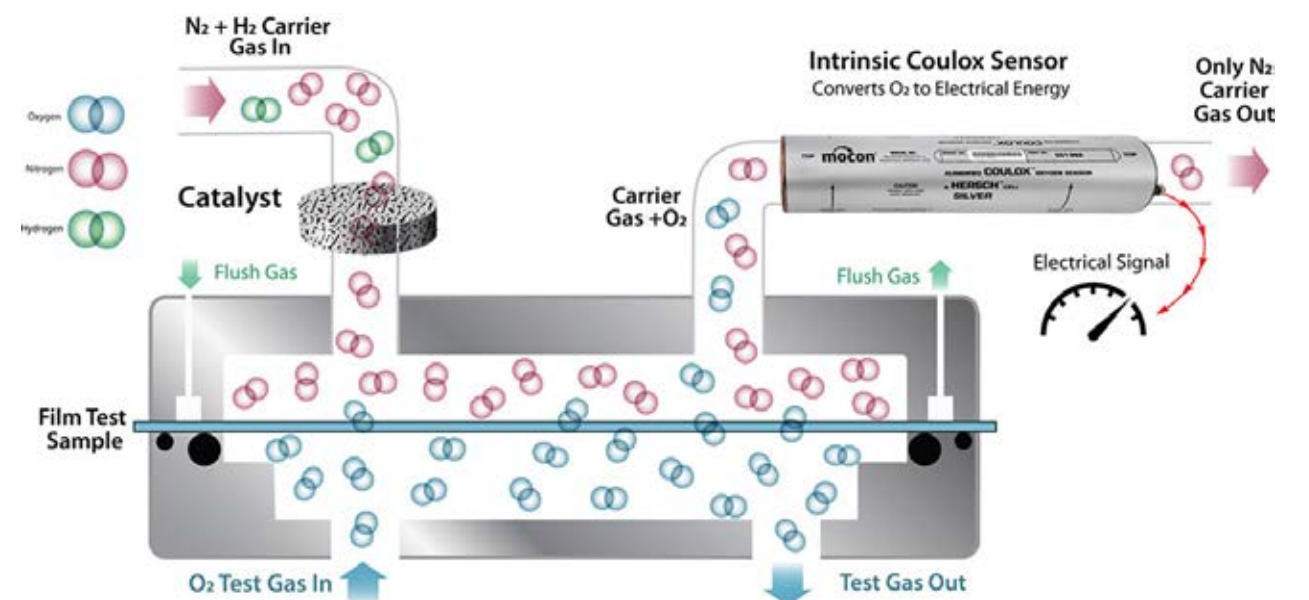
- Longest life
- Absolute OTR detection with no calibration
- Only sensor that fully complies with ASTM D3985
- Proven accuracy and repeatability

### Comparison of Coulox Sensor and Other Industry Sensors

	MOCON Coulox® Sensor	Other Coulometric Sensors	ASTM-D3985 Standard
Coulometric Reaction in Sensor	Yes	Yes	Required
Carrier Gas Analyzed by Sensor	100%	Only partial flow swept to sensor	100% Required
Sensor Calibration	Not Required	Required	Not allowed
Intrinsic Sensor	Yes	No	Required
Barometric Pressure Effect	No Effect	Yes	No
Temperature Effect	No Effect	Yes	No
Carrier Gas Flow Effect	No Effect	Yes	No
Full Compliance to ASTM D3985	Yes	No	Yes

## MOCON Coulox® sensor is more than just Coulometric

Only MOCON Coulox sensors analyze 100% of the carrier gas, are intrinsic, and thus meet the ASTM D3985 standard because they are not effected by temperature, flow or barometric pressure.



## Film Testing Overview

The OX-TRAN family of film testing analyzers offer Oxygen Transmission Rate (OTR) testing from high to ultra low levels of detection. Purpose-built for efficient and accurate film testing, many can also test for additional applications such as packages, bottles, cartons and more.

Feature	OX-TRAN 1/50	OX-TRAN 2/12 T	OX-TRAN 2/12 R	OX-TRAN 2/22 H	OX-TRAN 2/22 L	OX-TRAN 2/22 10X	OX-TRAN 2/28 H
Sensor Type	Coulometric	T-Mod Coulox®	Coulometric	Absolute Coulox®	Absolute Coulox®	Absolute Coulox®	Absolute Coulox®
OTR Range* @ 100% O <sub>2</sub> (cm <sup>3</sup> /(m <sup>2</sup> • day))	0.1 to 200	200 to 65,000	0.05 to 28,800	0.05 to 200	0.005 to 200	0.0005 to 200	0.05 to 200
OTR Range* @ 100% O <sub>2</sub> (cm <sup>3</sup> /(100in <sup>2</sup> • day))	0.0065 to 12.9	12.9 to 4200	0.003 to 1858	0.003 to 12.9	0.0003 to 12.9	0.00003 to 12.9	0.003 to 12.9
OTR Range @ 100% O <sub>2</sub> (cm <sup>3</sup> /(pkg • day))	N/A	1.0 to 323	0.00025 to 144	0.00025 to 1.0	0.000025 to 1.0	0.0000025 to 1.0	N/A
Cells ( Qty x Size cm <sup>2</sup> )	1 x 50 cm <sup>2</sup>	2 x 50 cm <sup>2</sup>	2 x 50 cm <sup>2</sup>	2 x 50 cm <sup>2</sup>	2 x 50 cm <sup>2</sup>	2 x 50 cm <sup>2</sup>	4 x 50 cm <sup>2</sup>
Minimum sensor exam time per cell (min)	45	15	45	15	20	30	15
Repeatability (cm <sup>3</sup> /(m <sup>2</sup> day))	±0.05 or 2%	±25 or 1%	±0.05 or 1.5%	±0.02 or 1%	±0.002 or 1%	±0.0005 or 1%	±0.02 or 1%
Test temperatures (°C)	10 to 40 ± 0.5	10 to 35 ± 0.2	10 to 40 ± 0.2	10 to 40 ± 0.2	10 to 40 ± 0.2	10 to 40 ± 0.2	20 to 40 ± 0.2
Controlled RH (%)	0, 5 to 90 ± 3	0	0, 5 to 90 ± 3	0, 5 to 90 ± 3	0, 5 to 90 ± 3	0, 5 to 90 ± 3	0
Industry standards	ASTM D3985, ASTM F1927, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3	ASTM F2622, ISO 15105-2, DIN 53380-3		ASTM D3985, ASTM F1927, ASTM F1307, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3			ASTM D3985, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3
Approximate sensor life** (year)	1	3	1	4	4	4	4
Sensor warranty (year)	1	1	1	4 pro-rated	4 pro-rated	4 pro-rated	4 pro-rated
Max barrier thickness mil (mm)	120 (3.0)	120 (3.0)	120 (3.0)	120 (3.0)	120 (3.0)	120 (3.0)	20 (0.5)
Package testing capability	No	Yes	Yes	Yes	Yes	Yes	No
Cartridge options	50 cm <sup>2</sup>	50 cm <sup>2</sup> , 5.64 cm <sup>2</sup> , Edge Effect, Blister, Contact Lens, Package adapter	50 cm <sup>2</sup> , 5.64 cm <sup>2</sup> , Edge Effect, Blister, Contact Lens, Package adapter	50 cm <sup>2</sup> , 5.64 cm <sup>2</sup> , Edge Effect, Blister, Contact Lens, Package adapter	50 cm <sup>2</sup> , 5.64 cm <sup>2</sup> , Edge Effect, Blister, Contact Lens, Package adapter	50 cm <sup>2</sup> , 5.64 cm <sup>2</sup> , Edge Effect, Blister, Contact Lens, Package adapter	50 cm <sup>2</sup> , 5.0 cm <sup>2</sup>
Automation	Automatic testing	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Cold temp comp	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Cold temp comp	Automatic testing, Advance test mode, Auto test mode, Sequential testing	Automatic testing, Advance test mode, Auto test mode, Sequential testing	Automatic testing, Advance test mode, Auto test mode, Sequential testing	Automatic testing, Advance test mode, QC test mode

\* Using Standard 50 cm<sup>2</sup> film cartridge

\*\* Based on >80% continuous usage

## Package Testing Overview

The OX-TRAN family of package testing analyzers offer Oxygen Transmission Rate (OTR) testing from high to ultra low levels of detection. Purpose-built for efficient and accurate package testing using our revolutionary cartridges, they can also test films, barrier sheets and more.

Feature	OX-TRAN 2/40 H	OX-TRAN 2/40 L	OX-TRAN 2/40 10X	OX-TRAN 2/48H
Sensor Type	Absolute Coulox®	Absolute Coulox®	Absolute Coulox®	Absolute Coulox®
OTR Range* @ 20.8% O <sub>2</sub> (cm <sup>3</sup> /(m <sup>2</sup> · day))	0.05 to 200	0.005 to 200	0.0005 to 200	0.05 to 200
OTR Range @ 20.8% O <sub>2</sub> (cm <sup>3</sup> /(pkg · day))	0.00025 to 1.0	0.000025 to 1.0	0.0000025 to 1.0	0.00025 to 1.0
Cells	4	4	4	8 (4+4)
Minimum sensor exam time per cell (minutes)	30	45	60	15
Repeatability (cm <sup>3</sup> /(pkg · day))	±0.0001 or 1%	±0.00001 or 1%	±0.000025 or 1%	±0.0001 or 1%
Test temperatures (°C)	10 to 50 ± 0.5	10 to 50 ± 0.5	10 to 50 ± 0.5	Ambient
Controlled RH (%)	0, 5 to 90 ± 5	0, 5 to 90 ± 5	0, 5 to 90 ± 5	0, 50 to 80 ± 5 (carrier gas)
Industry standards	ASTM D3985, ASTM F1927, ASTM F1307, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3	ASTM D3985, ASTM F1927, ASTM F1307, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3	ASTM D3985, ASTM F1927, ASTM F1307, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3	ASTM D3985, ASTM F1927, ASTM F1307, ASTM F2622, ISO 15105-2, JIS K7126-2, DIN 53380-3
Approximate sensor life** (yr)	4	4	4	4
Sensor warranty (yr)	4 pro-rated	4 pro-rated	4 pro-rated	4 pro-rated
Film testing capability	Yes	Yes	Yes	Yes
Cartridge options	Multiple package testing options, Integrated package testing options, Film	Multiple package testing options, Integrated package testing options, Film	Multiple package testing options, Integrated package testing options, Film	Multiple package testing options, Integrated package testing options, Film
Automation	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Auto Purge, Auto Conditioning	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Auto Purge, Auto Conditioning	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Auto Purge, Auto Conditioning	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Auto Purge, Auto Conditioning

\* Using Standard 50 cm<sup>2</sup> film cartridge  
 \*\* Based on >80% continuous usage

Going beyond supplying just equipment, AMETEK MOCON is a full service partner to help keep your lab running efficiently and effectively for many years.

AMETEK MOCON is recognized as the industry standard in precision gas permeation and package testing instruments. Our people and products deliver the best value with the broadest range of solutions. For over 55 years, we have provided the most accurate and repeatable results that world leading companies count on to protect and enhance their product quality and integrity.

### We deliver expertise through our colleagues around the world:

- Sales
- Service
- Engineering & Development
- Testing Labs
- Application Scientists
- Distribution Partners



### Custom application development and lab testing services across diverse industries:

- Food & Beverage
- Packaging
- Healthcare
- Electronics



### Over 70 patents developed in our instrument solutions.

### Helping achieve and maintain the maximum efficiency of your laboratory operations

- Predictive Preventative Maintenance Offering
- Avoid Unexpected Downtime
- Insure Accurate Test Results
- Maximized Laboratory Throughput
- Reduced Unplanned Costs
- Minimize Paperwork
- Custom Tailored Program to Fit any Budget and Need





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