AQUATRAN® and PERMATRAN-W®
WATER VAPOR PERMEATION ANALYZERS

WVTR Testing for Barrier Films & Packages

AMETEK® | mocon®

Introduction to WVTR instruments

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

FILM ANALYZERS

High Performance

PERMATRAN-W 3/34 Series, H and G

- Most popular
- Most capability
- Low detection limit
- Exclusive modulated IR sensor
- Wide range of applications

AQUATRAN 3

- Broad application
- Ultra low detection limit
- AquaTrace Coulometric sensor
- Wide range of applications

Performance

PERMATRAN-W 1/50

- Entry level price
- Lower output
- Mid range test capability
- Limited RH range testing

High Throughput

AQUATRAN 3/38 H

- Double the testing throughput
- Simplified operation for QC labs
- Exclusive modulated IR sensor
- Limited RH range testing

Available with and without built-in display screen

WHOLE PACKAGE ANALYZERS

Package Testing

AQUATRAN 3/40

- Controlled condition package testing
- Exclusive modulated IR sensor
- Interchangeable package testing cartridges
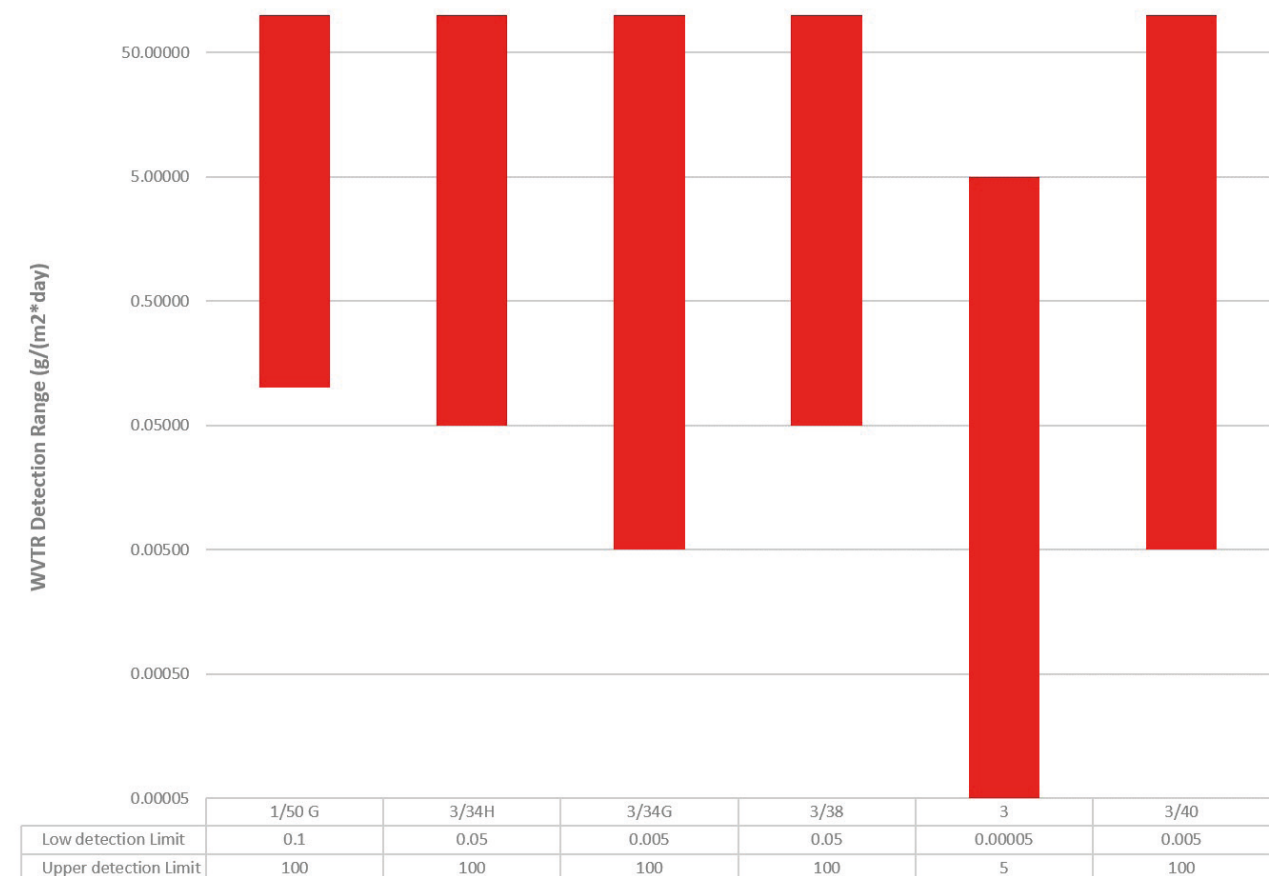- Simplified package mounting

A Solution For Every Application

The MOCON family of WVTR analyzers offers a range of models to support your QC and R&D 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
PERMATRAN-W 1/50	Low output R&D	1	Film
PERMATRAN-W 3/34 H	Normal range R&D and QC	2	Film & Package
PERMATRAN-W 3/34 G	Low detection R&D and QC	2	Film & Package
AQUATRAN 3	Ultra low detection R&D and QC	2	Film & Package
AQUATRAN 3/38 H	Normal range QC	4	Film
AQUATRAN 3/40	Low detection R&D and QC	4	Package & Film

WVTR Detection Range Comparison

WVTR Detection Range (g/(m2*day))

	1/50 G	3/34H	3/34G	3/38	3	3/40
Low detection Limit	0.1	0.05	0.005	0.05	0.00005	0.005
Upper detection Limit	100	100	100	100	5	100

FEATURES OF MOCON ANALYZERS

Benefits

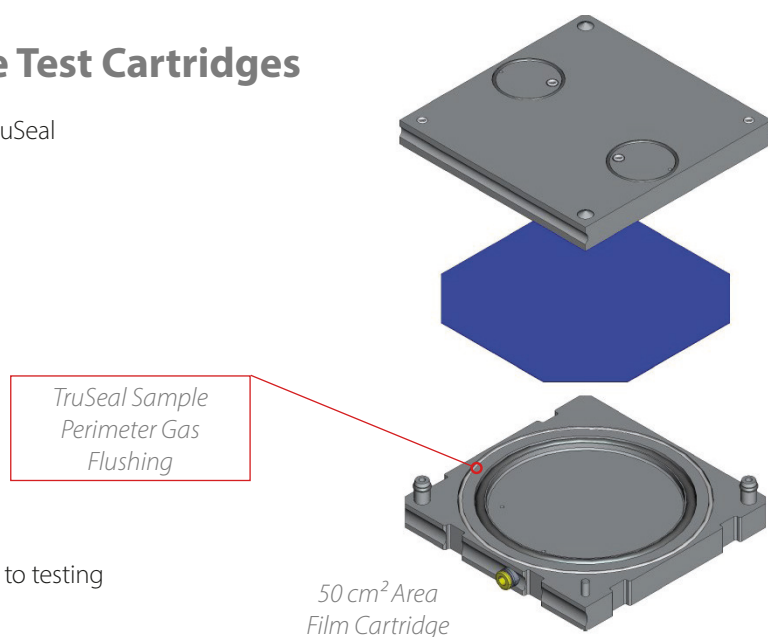The advanced features on MOCON's Next Generation analyzers provide:.

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

Stand Alone Control with Touch Screen

Test Method Library

Fast Sensor Response

Intuitive Auto Test Mode

Removable & Interchangeable Test Cell Cartridges

Digital Flow, Temp and RH Control

TruSeal Sample Perimeter Gas Flushing

One Button Pneumatic Cell Clamping

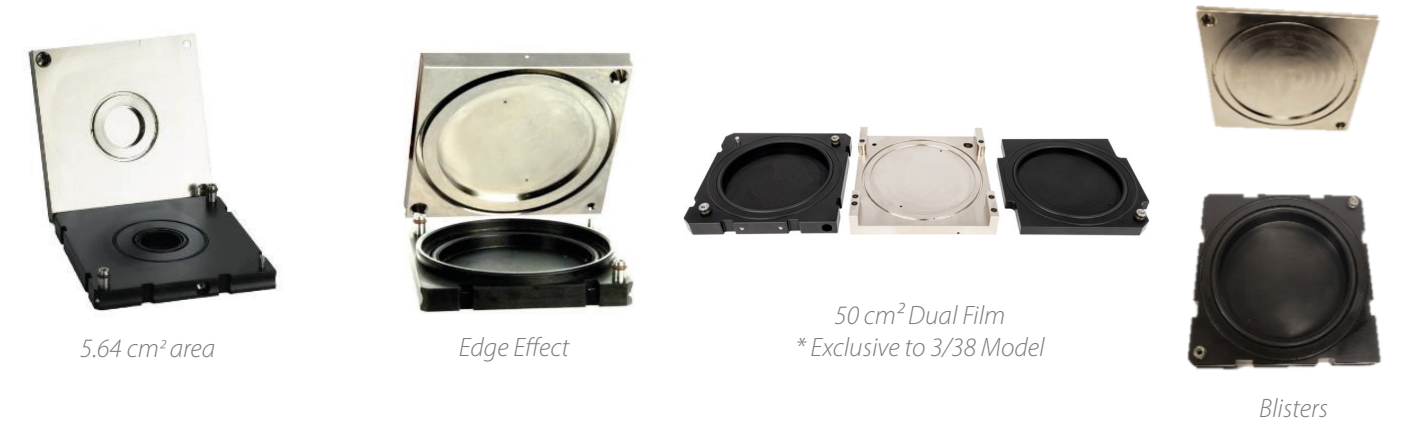## Removable & Interchangeable Test Cartridges

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

TruSeal Sample Perimeter Gas Flushing

50 cm² Area Film Cartridge

ACCESSORIES

Film Cartridges

5.64 cm² area

Edge Effect

50 cm² Dual Film
* Exclusive to 3/38 Model

Blisters

Package Testing Accessories for Film Analyzers

Package Adaptor

PackRack Package Testing Fixture

Package Cartridges (for use with PackRack and AQUATRAN 3/40)

Integrated Coffee Capsules

Integrated Pouch

Package Adapter

80 cm² Package

Large Tray

WinPerm 2

Fully Digital Testing Simplifies Operation

Easy to use control system features fully automated digital testing including temperature, gas flow and RH control.

Tests are controlled via configurable test methods that can be stored and reused. Final test reports are automatically saved and can be automatically print and exported
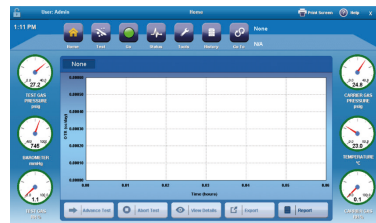
The Home screen shows the Carrier and Test Gas pressures, barometer, and block temperature.

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

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

PermNet Lite

Optional PermNet Lite provides remote access to Next Gen instruments

- Remote access and control to instrument via network connection
- Start and stop tests
- Review test status
- Print or export test data

PermWare

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

PermWare is the Master Data collection system for all Mocon Permeation Instruments. Use it to store, sort and manage all permeation test reports in one location. It provides a dashboard operations screen for all Next Gen Instruments, runs Windows 10 on desktop computers and allows safe connection to secure networks
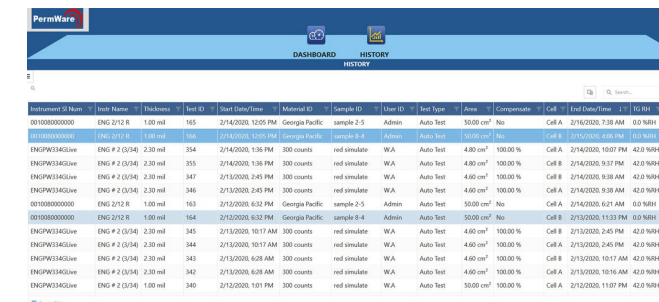
Test history of all MOCON analyzers on one screen

- Configurable columns with filters
- Simple to sort by any field or criteria
- Export function
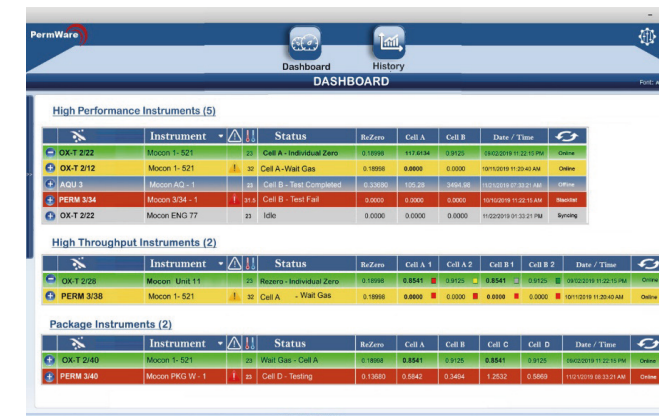
Status of all Next Generation MOCON analyzers on one screen

- Color code easily identifies instrument status
- Displays latest test result for each cell
- Includes vital instrument and testing information

Collect Data from All MOCON Instruments into one file location in a safe and secure Windows 10 and SQL database
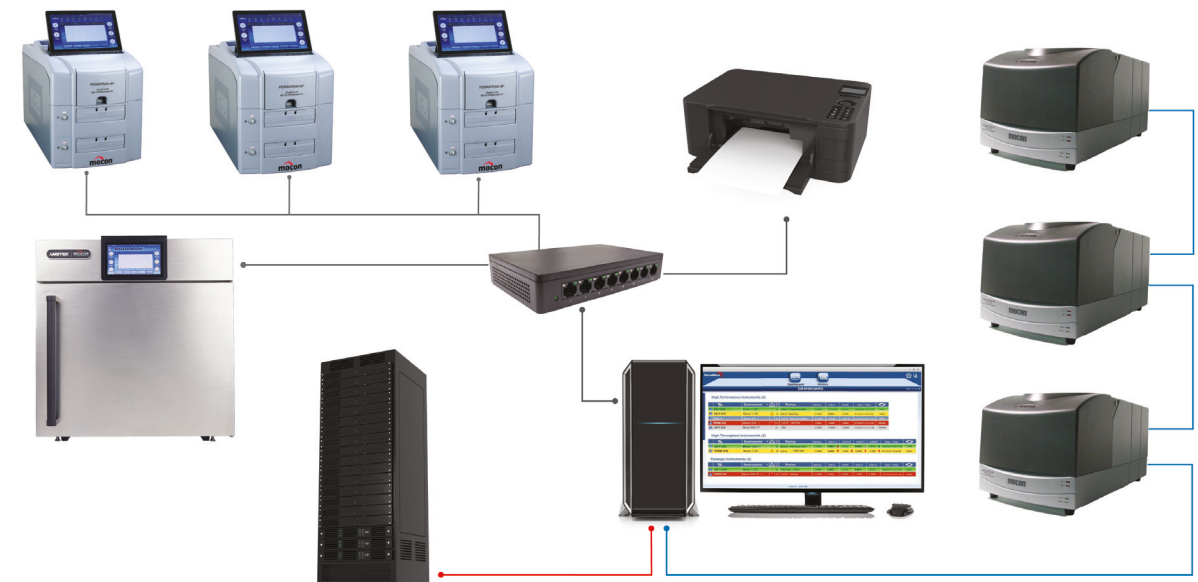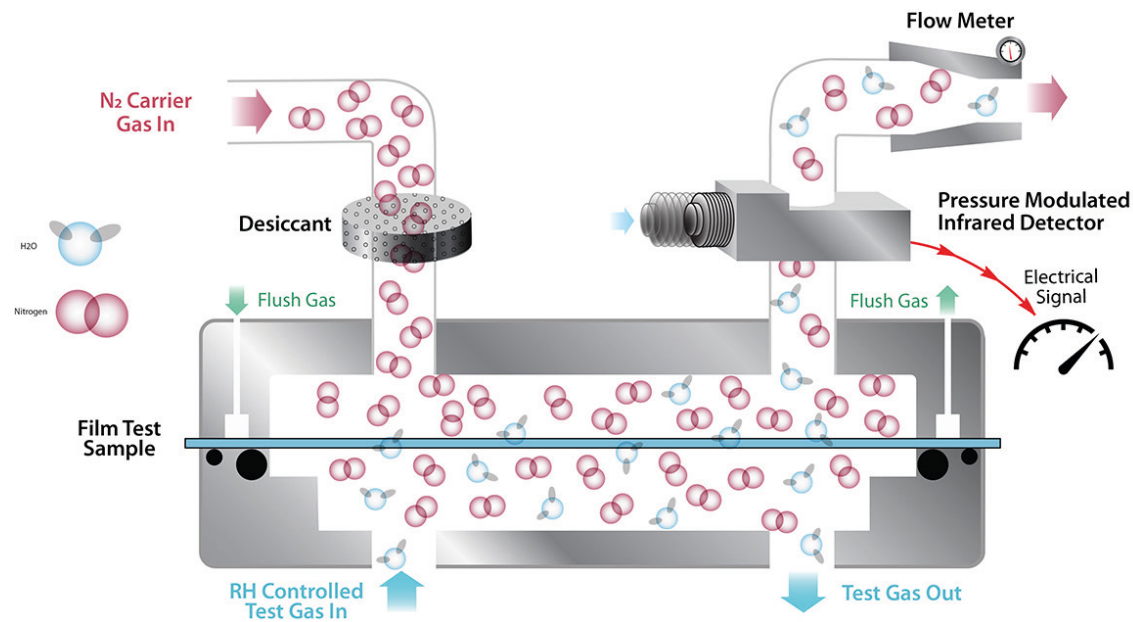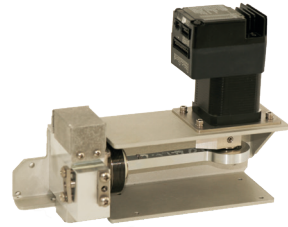
MOCON ADVANTAGE

MOCON Exclusive Modulated IR Sensors

The MOCON patented modulated infrared sensor provides precision measurement of water vapor transmission rate. It is one of the industries most trusted systems and is the only modulated sensor system on market meeting ASTM F1249.

Modulated IR Sensor Advantages

- Ultra long life
- Accurate detection without frequent replacement
- Only sensor that fully complies with ASTM F1249
- Proven reliability and repeatability

Flow Meter

N₂ Carrier Gas In

Desiccant

H2O

Nitrogen

Flush Gas

Pressure Modulated Infrared Detector

Flush Gas

Electrical Signal

Film Test Sample

RH Controlled Test Gas In

Test Gas Out

MOCON Exclusive AQUATRACE® Sensors

The AQUATRAN 3 uses the MOCON patented absolute coulometric phosphorous pentoxide sensor that does not require calibration and conforms with ASTM F3299. It is the longest lasting sensor of its kind on the market. The sensor has a linear output which guarantees the highest accuracy and repeatability throughout its entire detection range.

AQUATRACE Sensor Advantages

- Long life
- Absolute WVTR detection with no calibration
- First sensor to fully comply with ASTM F3299
- Proven accuracy and repeatability

EXPERTISE AND SUPPORT

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

AMECARE
PERFORMANCE SERVICES

WVTR ANALYZER PORTFOLIO OVERVIEW

Film Testing Overview

The PERMATRAN-W and AQUATRAN family of film testing analyzers offer Water Vapor Transmission Rate (WVTR) 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.

Package Testing Overview

The AQUATRAN 3/40 package testing analyzer offers Water Vapor Transmission Rate (WVTR) testing from high to low levels of detection. Purpose-built for efficient and accurate package testing using our revolutionary cartridges it can also test films, barrier sheets and more.

Feature	PERMATRAN-W 1/50	PERMATRAN-W 3/34 H	PERMATRAN-W 3/34 G	AQUATRAN 3/38 H	AQUATRAN 3
Sensor Type	Precision RH sensor	Modulated IR	Modulated IR	Modulated IR	AquaTrace Coulometric P2O5
WVTR Range* (g/(m²· day))	0.1 to 100	0.05 to 100	0.005 to 100	0.05 to 100	0.00005 to 5
WVTR Range (g/(pkg · day))	NA	0.00025 to 0.5	0.000025 to 0.5	NA	0.00000025 to 0.025
Cells (Qty x Size cm²)	1 x 50	2 x 50	2 x 50	4 x 50	2 x 50
Minimum sensor exam time per cell (minutes)	N/A	15	15	15	60
Repeatability (g/(m²· day))	±0.05 or 2%	±0.05 or 2%	±0.005 or 2%	±0.05 or 2%	±0.00005 or 1%
Test temperatures (°C)	10 to 40 ± 0.5	20 to 40 ± 0.2	10 to 40 ± 0.2	20 to 40 ± 0.2	10 to 40 ± 0.2
Controlled RH (%)	35 to 90, 100 ± 3	50 to 90, 100 ± 3	5 to 90, 100 ± 3	50 to 90, 100 ± 3	5 to 90, 100 ± 3
Industry standards	ASTM E398, TAPPI 523, ISO 15106-1 JIS K7129-1	ASTM F1249, TAPPI 557, ISO 15106-2, JIS K7129-2	ASTM F1249, TAPPI 557, ISO 15106-2, JIS K7129-2	ASTM F1249, TAPPI 557, ISO 15106-2, JIS K7129-2	ASTM F3299, ISO 15106-3, DIN 53122-2 JIS K7129-3
Approximate sensor life** (year)	4+	4+	4+	4+	1+
Sensor warranty (year)	1	4 pro-rated	4 pro-rated	4 pro-rated	1
Max barrier thickness mil (mm)	120 (3.0)	120 (3.0)	120 (3.0)	20 (0.5)	120 (3.0)
Package testing	No	Yes	Yes	No	Yes
Cartridge options	50 cm²	50 cm², 5.64 cm², Edge Effect, Blister, Package adapter	50 cm², 5.64 cm², Edge Effect, Blister, Package adapter	50 cm², 5.0 cm²	50 cm², 5.64 cm², Edge Effect, Blister, Package adapter
Automation	Automatic 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	Automatic testing, Advance test mode, Auto test mode, Sequential testing

Feature	AQUATRAN 3/40
Sensor Type	Modulated IR
WVTR Range (g/(m²·day))	0.005 to 100
WVTR Range (g/(pkg·day))	0.000025 to 0.5
Cells (Qty)	4
Minimum sensor exam time per cell (minutes)	30
Repeatability (%)	±0.005 or 2%
Test temperatures (°C)	10 to 50 ± 0.5
Controlled RH (%)	35 to 90 ± 5
Industry standards	ASTM F1249, TAPPI 557, ISO 15106-2, JIS K7129-2
Approximate sensor life (year)	4+
Sensor warranty (year)	4 pro-rated
Film testing	Yes
Cartridge options	Multiple package testing options, Integrated package testing options and Film
Automation	Automatic testing, Advance test mode, Auto test mode, Sequential testing, Auto Purge, Auto Conditioning

* Using Standard 50 cm² film cartridge
** Based on >80% continuous usage

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