APPLICATION NOTE

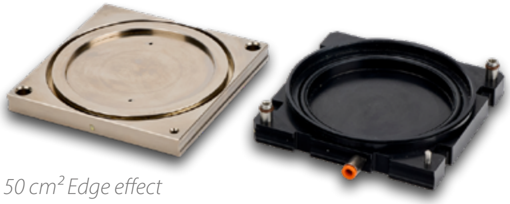
HOW TO ACHIEVE MORE CONSISTENT TEST RESULTS USING EDGE EFFECT CARTRIDGES

Edge Effect Cartridges minimize edge effect when testing transmission rates of coated paper materials.

Edge effect occurs when oxygen and/or moisture from the ambient environment leaks through the edge of a permeation test sample such as coated paper, coated paperboard or laminate.

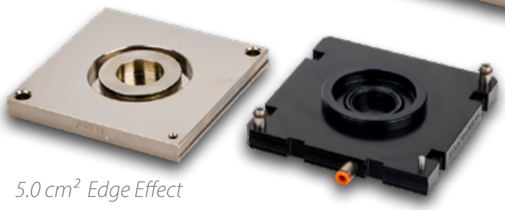
Many environmentally friendly packages utilize paper-based materials

Challenges with testing paper-based packaging.



50 cm² Edge effect

5.0 cm² Dual Film Edge Effect



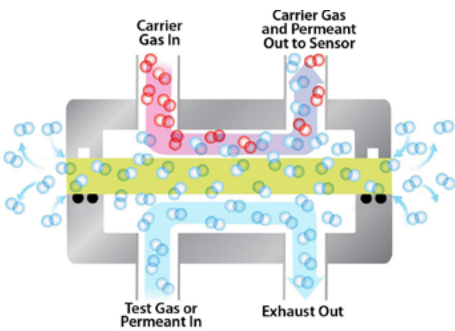
5.0 cm² Edge Effect

Legacy testing methods lack the ability to precisely test oxygen transmission rates (OTR) and water vapor transmission rates (WVTR) in coated paperboard packaging materials. Companies often have difficulty obtaining consistent permeation test results for coated paper materials due to an edge effect.

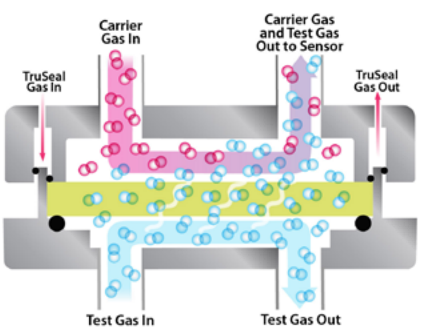
Typically, edge effect influences test results when ambient air or moisture increases or dilutes the desired test gas gradient.

EDGE EFFECT CAN LEAD TO INACCURATE & VARIABLE DATA

Addressing edge effect for better data.



Edge effect issues cause inaccurate and variable data



Edge Effect Cartridge design blocks leakage from the cross section of the barrier sample

At-a-glance specs

- Available as $50cm^2$ and $5cm^2$
- 100% RH or Precise RH
- Compatible with all Next Gen 2-cell film analyzers
- Edge Effect Cartridges available for 2-cell and 4-cell Film Permeation Analyzers

A specialized solution for testing coated paper barriers.

The AMETEK MOCON Edge Effect Cartridge is designed to eliminate edge effect by effectively sealing off the edge during testing to prevent oxygen and/or moisture from migrating into or out of the test cell. This ensures that the instrument only captures oxygen and water vapor that pass through the material, providing more precise and repeatable data on transmission rates. Edge Effect Cartridges are available in two sizes of $50cm^2$ or $5cm^2$ test area and can be used to test samples up to 125mil or 3.18mm thick.

Benefits of the MOCON® Edge Effect Cartridge.

When used with OX-TRAN® Model 2/12, 2/22, AQUATRAN 3/34 or PERMATRAN-W® Model 3/34, Edge Effect Cartridges provide accurate and consistent data, so customers can make better, more informed decisions about packaging materials to protect their products.

Obtaining accurate transmission rate results enables companies to select the most effective coatings and lightweight packaging that reduce costs and deliver desired shelf life while protecting the brand owner's integrity.

Case Study

The following test results illustrate the variability in WVTR for a single material using a standard cell compared to an Edge Effect Cartridge.

Test Date	WVTR g/(m^2 • day) at 23°C and 50% RH	
	Standard Cell	Edge Effect Cartridge
JANUARY 5	3.24	4.36
JULY 20	5.78	4.50
COMMENTS	More variation with seasonal ambient RH	Consistent, not influenced by environment RH

Conclusion

Test data demonstrated that the Edge Effect Cartridge can minimize the edge effect issues for the permeation testing process, and provide more consistent and accurate test results.

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