

# SIMPLIFIED PERMEATION TESTING FOR COATED PAPER AND TEXTURED FILMS

Specialized Edge Compression Cartridge simplifies permeation testing for paper-based films.

While coated paper materials are more sustainable and inexpensive to manufacture, they are often difficult to evaluate for gas permeability. Textured surfaces and free volume can cause edge diffusion and gas channeling.

The Edge Compression Cartridge simplifies film prep time, reduces overall testing time, and produces more reliable and repeatable results.

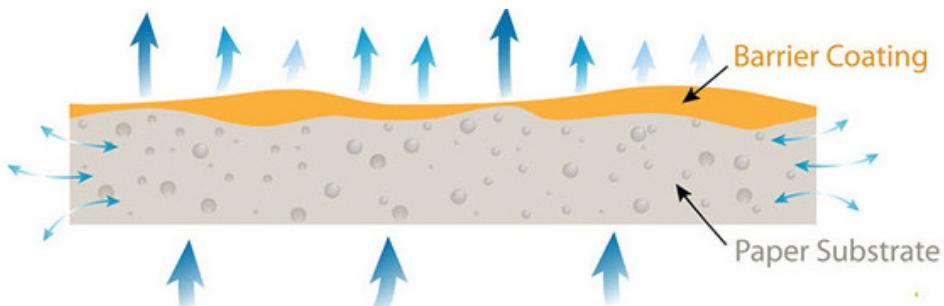


*Paper barriers often require additional coatings, making permeation testing more difficult*

## Thin and textured barriers can result in unreliable and unrepeatable permeation test data.

The inherent characteristics of coated paper or thin textured films mean that evaluating these materials is typically difficult and subjective. Increased free volume allows lateral diffusion, where both the test and carrier gas are able to enter the structure and compromise the driving force. This results in erroneous data as the test gas flux being analyzed may become diluted, producing lower transmission rates, or a leak may allow additional test gas to be seen by the detector, increasing the flux.

In addition to the common "edge effect" seen when testing paper barriers, textured surfaces can allow additional gas channeling throughout the entire area of a sample. The lack of hermetic seal and inconsistent driving force leads to erroneous results and unreliable shelf-life calculations. In short, the ability to hermetically seal the film and eliminate edge diffusion (often via traditional masking) directly correlates to accurate test data.



*A coated paper structure highlighting the diffusion mechanism and edge leakage*

# COATED PAPER SAMPLES POSE A RANGE OF TESTING CHALLENGES

APPLICATION NOTE

## Eliminate edge diffusion and simplify sample prep.

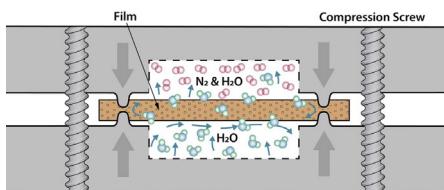
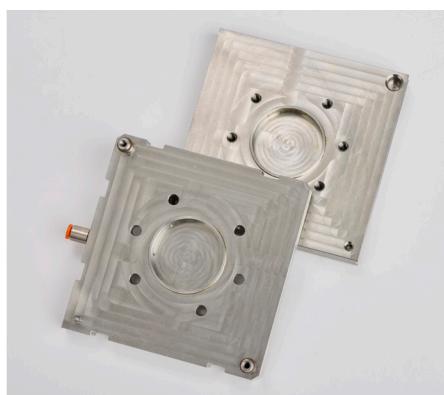


Fig. 1 Elimination of edge diffusion in paper structure.



Edge Compression Cartridge

## ACCURATE TESTING

- Eliminates edge diffusion
- Creates hermetic seal over rough and textured surfaces

## SIMPLER TESTING

- No need for time-consuming masking or epoxy application
- Durable cartridge is fully reusable

## A specialized solution for hard-to-test paper barriers.

Traditional masking is often the only choice for manufacturers evaluating the permeation rates of thin and textured paper barriers, but this requires extensive prep time and messy setup. Masking also leaves more room for human error, resulting in less repeatable data.

The Edge Compression Cartridge enables testing of thin paper-based film structures and/or thin textured films without using a foil mask, grease or epoxy. Testing a film with this reusable cartridge is as simple as loading a sample and applying torque to the screws around the test perimeter. The raised circular lip defines the test area (5 cm<sup>2</sup> or 10 cm<sup>2</sup>) and is the key to eliminating edge diffusion while forming a hermetic seal.

Once the proper torque is applied to the screws, this raised lip radially compresses the film, preventing lateral gas flow outside of the defined test area (Fig. 1). Because a seal is achieved through compression force, masking and epoxy is not necessary, increasing testing throughput. In some cases, masking is unable to adhere completely to all coatings and substrates, causing edge diffusion within the mask and a higher than accurate oxygen transmission rate (OTR) value.

Unlike masks, the Edge Compression Cartridge can form a hermetic seal over surface roughness or texture. This results in more accurate OTR values compared to traditional masking (Fig. 2).

The Edge Compression Cartridge interfaces with every MOCON® Next Generation film instrument with the push of a button.

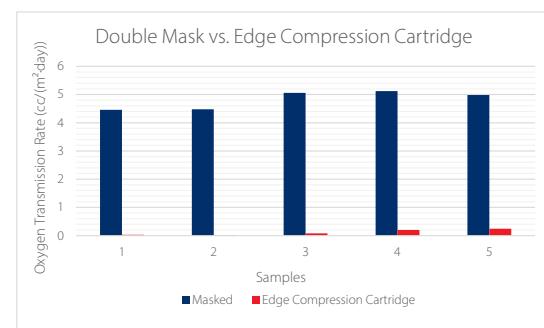


Fig. 2 OTR results using traditional mask vs. Edge Compression Cartridge

## Benefits

This specialized film cartridge is compatible with all Next Generation MOCON film instruments, allowing you to obtain reliable test data more easily for paper-based, textured films. If you are interested in optimal throughput while producing the most accurate data for characterizing coated paper films, contact us to see if the Edge Compression Cartridge is a good fit for your materials.