ASTM F3299-18 AMETEK MOCON WELCOMES ANOTHER WVTR STANDARD TEST METHOD TO THE FAMILY

TECHNICAL BULLETIN

Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using an Electrolytic Detection Sensor (Coulometric P_2O_5 Sensor)

Summary

- ASTM F3299-18 is one of several WVTR industry standard test methods including ISO 15106-3, ASTM F1249 and ASTM E-398
- AMETEK MOCON Scientists are contributing members of the committee that developed ASTM F3299-18
- ASTM F3299-18 should be used for high barrier, low WVTR applications, to maintain the longest sensor lifetime and highest accuracy
- The AQUATRAN® Model 3 complies with ASTM F3299-18
- The type of barrier will determine the appropriate standard and instrument to be used:
  - For high barriers, low WVTR, use ASTM F3299-18 or ISO 15106-3
  - For moderate to low barriers, high WVTR, use ASTM F1249 or ISO 15106-2

Did you know?

AMETEK MOCON invented and patented the Aquatrace® Coulometric Water Vapor Sensor in 2004.

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ASTM F3299-18
WVTR TEST METHOD

AMETEK MOCON has worked in collaboration with ASTM International committee members for over 50 years in support of developing permeation testing standards. In parallel with ISO 15106-3 issued in 2003, ASTM F3299-18 WVTR test method calls for an absolute coulometric P_2O_5 sensor which does not require calibration. The AQUATRAN series of instruments has perfected this sensor technology since 2004.

The AQUATRAN Model 3 uses Aquatrace®, a proprietary P_2O_5 sensor, to comply with ASTM F3299-18 and ISO 15106-3. The Aquatrace sensor is absolute, follows Faraday's law, and requires no calibration. With this fundamental first principle's measurement of water flux, WVTR measurements are linear throughout the measurable range of the Aquatrace sensor. This linearity guarantees high accuracy and repeatability, even down to 10^{-5} WVTR levels, making it ideal for ultra-high barrier applications like organic light-emitting diode (OLED) and metalized film.

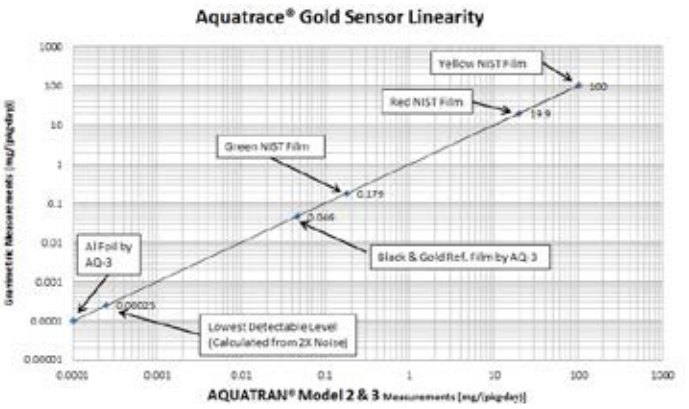

Fig. 1 Aquatrace Gold Sensor Linearity, testing on AQUATRAN Model 2 & 3

AQUATRAN and ASTM F3299-18 are best referenced for high barriers with low WVTR levels. Under such test conditions, the Aquatrace sensor can last for 1-2 years, maintaining outstanding sensitivity and repeatability.

AQUATRAN Model 3 Specifications:

- Test Range: 0.00005 to 50 g/(m² · day)
- Repeatability: ±0.00005 g/(m² · day) or 1% (whichever is greater)

Aquatrace Sensor Useful Life: 1-2 years

Complies with ASTM F3299-18 and ISO 15106-3

When testing moderate barriers with higher WVTR levels, trusted test methods like ASTM F1249 should be used. ASTM F1249 measures WVTR using a modulated infrared (IR) sensor. Such a sensor is used in the PERMATRAN-W® 3/34. This modulated IR sensor has a useful life of 4-5 years.

PERMATRAN-W 3/34 Specifications:

- Test Range: 0.005 to 1000 g/(m² · day)
- Repeatability: ±0.005 g/(m² · day) or 1% (whichever is greater)

Modulated IR Sensor Useful Life: 4-5 years

Complies with ASTM F1249 and ISO 15106-2

When it comes to WVTR testing, it is important to choose the right instrument, the right sensor and the right standard test method for your application. Choosing the appropriate instrument for your application will result in the most accurate measurements, longer lasting sensors, and lower maintenance costs.

Want to learn more?

Contact your local AMETEK MOCON Regional Sales Manager for more information or visit www.mocon.com

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