

## What is water vapor transmission rate (WVTR) and the test method ?

water vapor transmission rate (WVTR), also Moisture vapor transmission rate (MVTR), is a measure of the passage of water vapor through a substance. It is a measure of the permeability for vapor barriers.

There are many industries where moisture control is critical. Moisture sensitive foods and pharmaceuticals are put in packaging with controlled MVTR to achieve the required quality, safety, and shelf life.






In clothing, MVTR as a measure of breathability has contributed to greater comfort for wearers of clothing for outdoor activity. The building materials industry also manages the moisture barrier properties in architectural components to ensure the correct moisture levels in the internal spaces of buildings.

Optoelectronic devices based on organic material, generally named OLEDs, need an encapsulation with low values of WVTR to guarantee same performances over the device lifetime.



At present, there are mainly 3 methods to analyze WVTR which are Infrared Sensor Method, Electrolytic Sensor Method and gravimetric method.

Method	Infrared Sensor Method	Electrolytic Sensor Method	Gravimetric Method
Standards	ASTM F1249	ASTM E398-2013	ASTM E96
	ISO 15106-2	BS EN ISO 15106-3-2005	ASTM D1653
	GB/T26253	YBB 00092003-2015	ISO 2528
	TAPPI T557	GB/T 21529-2008	JIS Z0208
	JIS K7129	DIN 53122-2	TAPPI T464
			DIN53122-1

Test Principle	The principle of infrared detector is adopted. Fix the pre-processed sample in the middle of the test cavity. The sample divides the test cavity into upper and lower chambers. Relatively stable humidity flows in the upper cavity of the film, and dry gas flows in the lower cavity of the film; Under the action, water molecules diffuse through the sample into the dry gas on the other side, and are carried by the flowing gas to the infrared detector. The water vapor concentration measured by the detector is analyzed to calculate the water vapor transmission.	Using electrolytic sensor principle. Fix the pre-processed sample in the middle of the test chamber. The sample divides the test chamber into upper and lower chambers. Relatively stable humidity flows in the upper chamber of the film, and dry gas flows in the lower chamber of the film; Under the action, water molecules diffuse through the sample into the dry gas on the other side, and are carried by the flowing gas to the electrolysis sensor. The water vapor concentration measured by the sensor is analyzed to calculate the water vapor transmission.	The test specimen is mounted in the test dish which contains water or desiccant inside. The test dish is placed in the test chamber with stable temperature, humidity and air flow. The water vapor permeates through the specimen and into the dry side. By measuring the weight changes of the test dish periodically, water vapor transmission rate and other parameters can be obtained.
GBPI WVTR Instrument	<a href="#">WVTR Tester W405</a>	<a href="#">WVTR Tester W203</a>	<a href="#">WVTR Tester W303</a>
			
Test range	0.005~500 g/m <sup>2</sup> ·24h (film and sheet)	0.001~100g/ (m <sup>2</sup> · 24h)	0.01~10000 g/ m <sup>2</sup> · 24h
Resolution ratio	0.001 g/m <sup>2</sup> ·24h (film and sheet)	0.001g/(m <sup>2</sup> · 24h) (film and sheet)	0.001 g/ m <sup>2</sup> · 24h

We can help you select or customize the proper unit for your test requirements.

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