

Water Vapour Transmission Rate

Water Vapour transmission rate was tested using a Permatran W3/31 from Modern Controls Inc. (Mocon). Prior to testing the sample, a reference material with known transmission rate was tested to verify that the instrument was working properly. The testing conditions consist of : a nitrogen stream which is routed through the inner half of the test cell. Water vapour is supplied into the outer half as humidified nitrogen gas. Water vapour permeates the test material and is picked up by the nitrogen gas (carrier gas) flowing through the inner half. The amount of water vapour carried by the carrier gas is measured by the sensor to determine the transmission rate. The temperature and relative humidity were 37.8° C and 100% RH respectively. The testing was performed until 10 values of constant transmission rate (small fluctuation without upward / downward pattern) were obtained. The final transmission rate was calculated by averaging the last 10 constant values for duplicate samples. The final results are shown in Table 3.

Table 3 , Water Vapour Transmission Rate Test results

Sample	Thickness, mil	WVTR g/(m ² .day)		Permeability Kg.m / (m ² .s.Pa)
PET	18	3.48	⊕ 0.02	2.82E - 15 ⊕ 1.50E - 17
OPS	18	5.18	⊕ 0.03	4.18E - 15 ⊕ 2.07E - 17
OPLA	20	15.30	⊕ 0.04	1.34E - 14 ⊕ 3.61E -17

In terms of moisture barrier properties, PET showed the best performance followed by OPS and OPLA as tested.