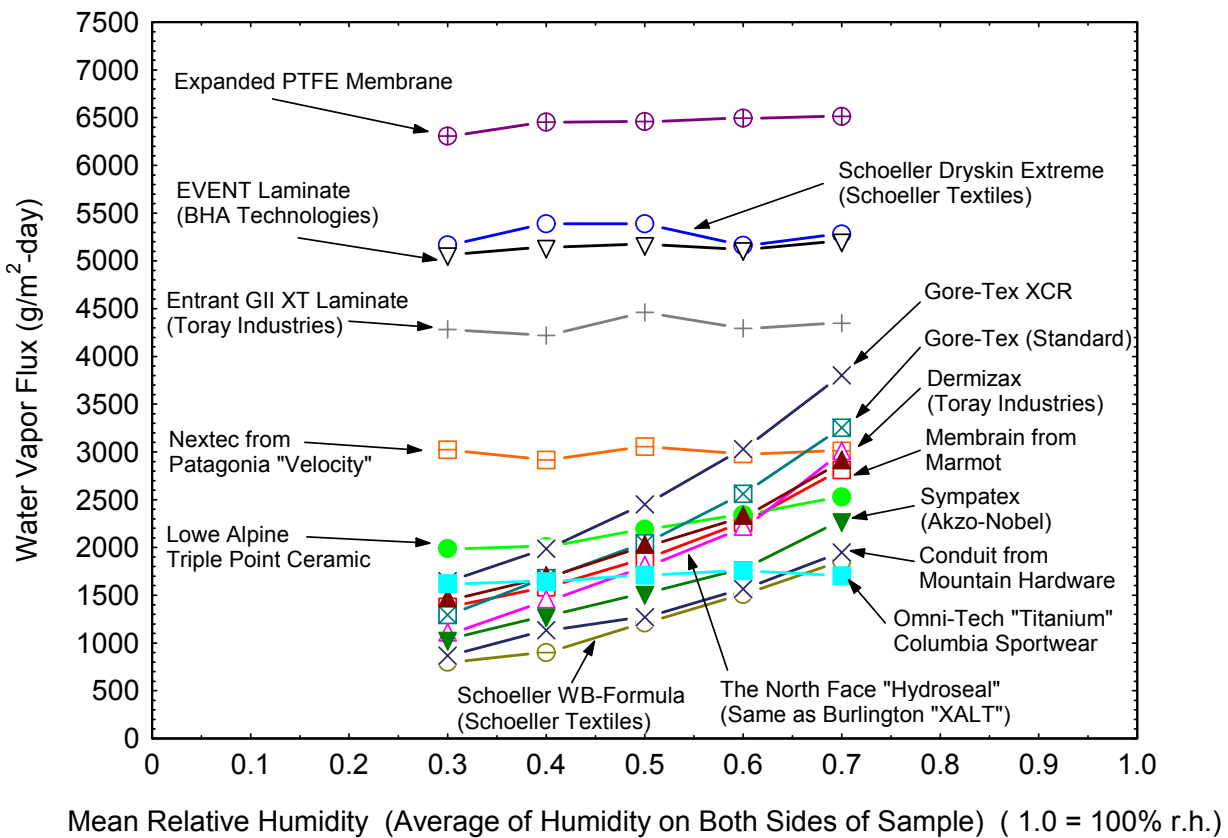
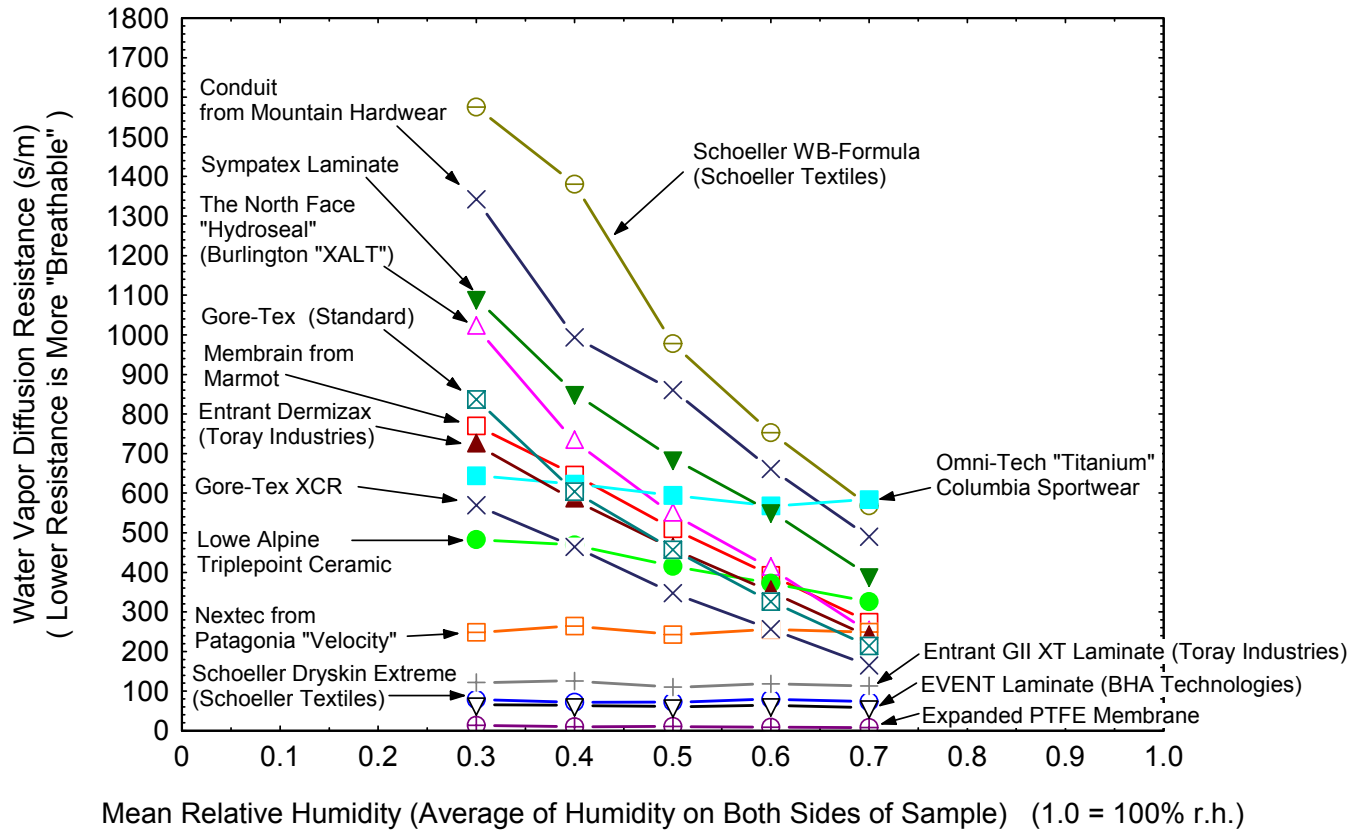


# "Breathability" Comparison of Commercial Outerwear Shell Layers



## Water Vapor Diffusion Test - Dynamic Moisture Permeation Cell

Air at two different relative humidities flows over the two sides of the test sample. By measuring the water vapor concentration at the exits of the cell, it is possible to measure how much water vapor crosses the sample. Results may be shown in terms of water vapor flux (grams/square meter/day) or resistance to the diffusion of water vapor (units of s/m). The resistance units make comparing results obtained at different environmental conditions much easier. The lower the diffusion resistance, the more water vapor gets through the material. The reason for doing the testing this way is that some materials like Gore-Tex, Sympatex, etc., have much better water vapor transport properties when they are in a humid environment than when they are in a dry environment, relatively speaking. Other materials, such as most textiles or microporous membranes, have a nearly constant water vapor diffusion resistance regardless of the environmental conditions

### Test Conditions – Water Vapor Diffusion

Temperature = 30 °C

Gas Flow Rate = 2000 cm<sup>3</sup>/minute.

Note: relative humidity of 100% is 1.0, so 0.50 is 50% r.h., etc.

Setpoint #	Humidity on Top of Sample	Humidity on Bottom of Sample	Mean Relative Humidity	Humidity Gradient
1	0.55	0.05	0.30	0.50
2	0.65	0.15	0.40	0.50
3	0.75	0.25	0.50	0.50
4	0.85	0.35	0.60	0.50
5	0.95	0.45	0.70	0.50

Further details on the test method are available in the following references:

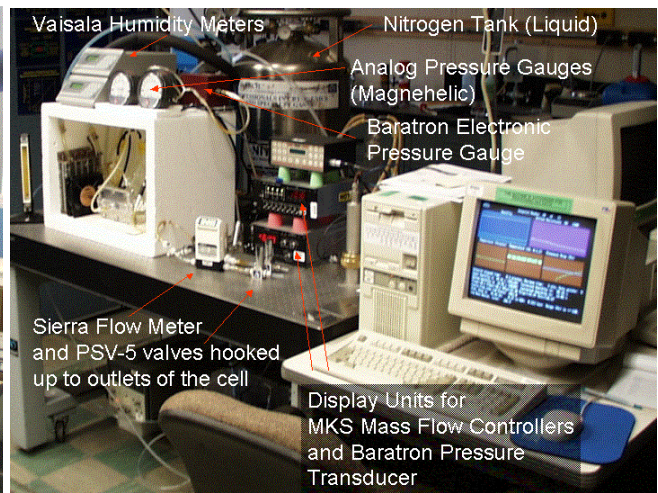
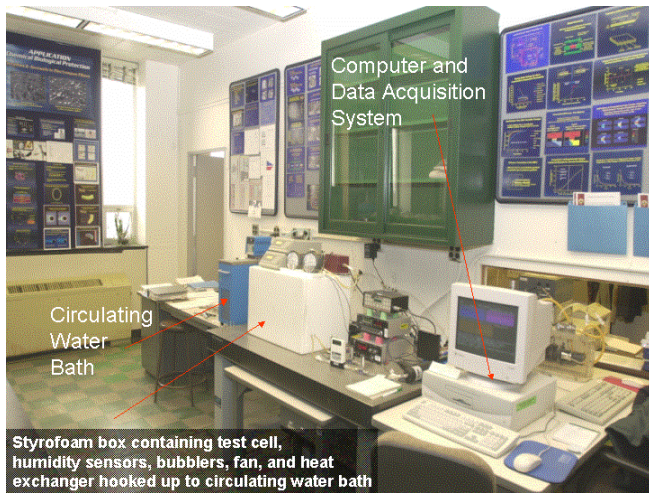
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Gibson, P.W., Rivin, D., Kendrick, C., "Convection/Diffusion Test Method for Porous Textiles," *International Journal of Clothing Science and Technology* **12** (2), 2000.

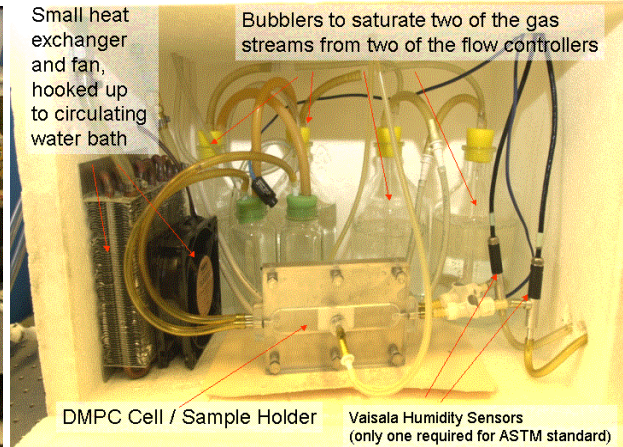
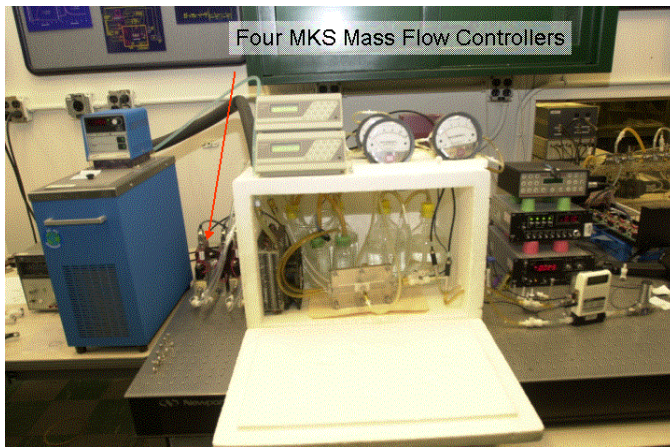
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### Dynamic Moisture Permeation Cell (DMPC)



### Conditioning Chamber and Sample Holder

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