

The DVS payne cell was designed and developed to measure the permeability and rate of diffusion of a thin film.



Film Moisture/Organic Vapor Diffusion and Permeability using Dynamic Vapor Sorption (DVS). TEWL and WVTR for both Wet and Dry Cell Methods

### Large Payne Cell

(for use with DVS Ultrabalance high mass - Part #P21MA052)

Mass empty, with O-rings: 1.75 g  
Mass with 200 mg Zeolite or Water: approx. 1.95 g  
15.5-16 mm active sample diameter  
 $1.13 \times 10^{-4} \text{ m}^2$  active area  
Maximum film thickness: 2 mm with two O-rings, 2.4 mm with one O-ring  
Minimum film thickness: 50  $\mu\text{m}$  depends on film property, stiffness  
Minimum flux that can be measured: 0.13 g/m<sup>2</sup>/day



### Small Payne Cell

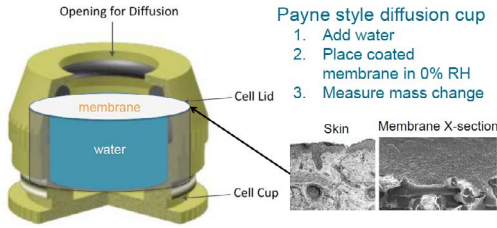
(for use with DVS Ultrabalance low mass - Part #P21MA031)

Mass empty, with O-rings: 500 mg  
Mass with 200 mg Zeolite or Water: approx. 600 mg  
6-6.5 mm active sample diameter  
 $1.55 \times 10^{-5} \text{ m}^2$  active area  
Maximum film thickness: 2 mm with two O-rings, 2.4 mm with one O-ring  
Minimum film thickness: 50  $\mu\text{m}$  depends on film property, stiffness  
Minimum flux that can be measured: 1 gram/m<sup>2</sup>/day

**Interested?** To find out more, please email [sales@surfacemeasurementsystems.com](mailto:sales@surfacemeasurementsystems.com) or call us at 1 610-798-8299.

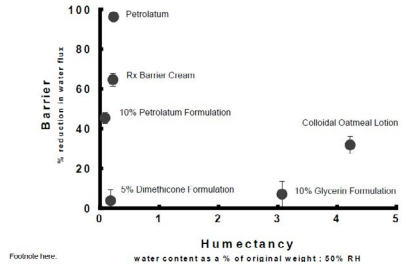


### Diffusion cup with synthetic skin membrane



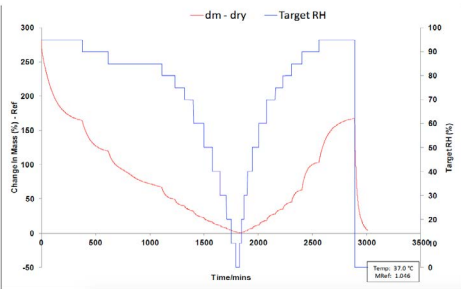
(a) Payne style diffusion cell was designed and developed to measure the permeability / rate of diffusion of a thin film.

### Moisturization Map

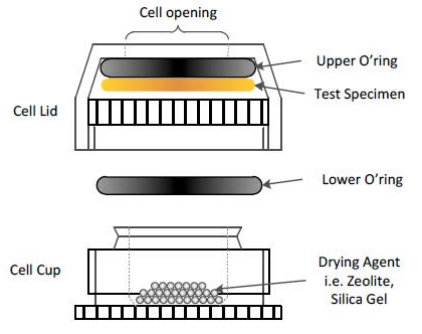


(b) A moisturization index may be made using the DVS diffusion data.

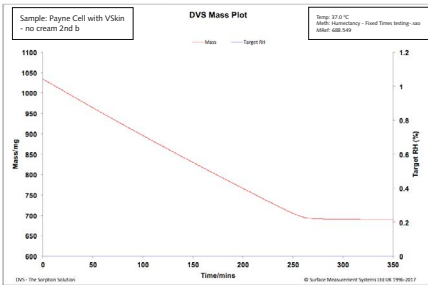
### Dynamic Vapor Sorption



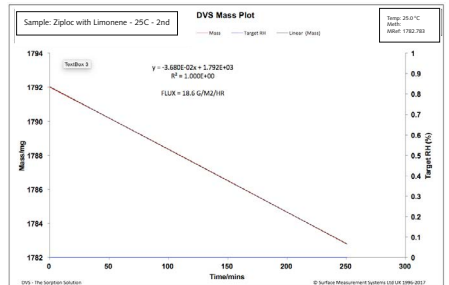
(c) The DVS allows continuous measurement of the sorption kinetics, which can be used to determine vapor diffusion coefficients.



(d) A typical experimental set-up for Moisture Vapor Transmission Rate (MVTR) measurement.



(e) Trans Epidermal Water Loss (TEWL) on untreated Viro-Skin® membrane at 37 °C.



(f) Limonene flux measurements using wet-cup method on Ziploc® film at 25 °C.