

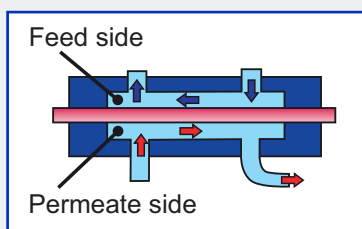
### Valued clients,

welcome to the 2nd Newsletter on HiBarSens® technology. We would like to wish everybody a prosperous and successful 2013. SEMPA Systems is proud to announce another improvement on our HiBarSens® device offering a new diffusive measurement mode enabling exact determination of permeation rate of ultra barrier films in  $10^{-6}$  range and potentially beyond.

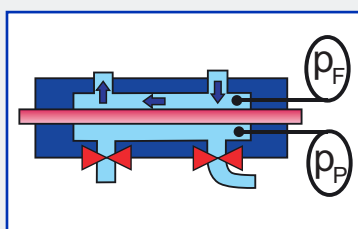
## HiBarSens® Technology

### HiBarSens® - One device - 3 measurement modes

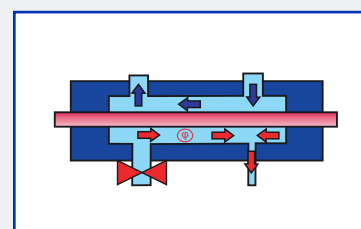
**DYNAMIC**  
(Isostatic setup)



**COMBINATION**  
(Quasi isostatic setup)

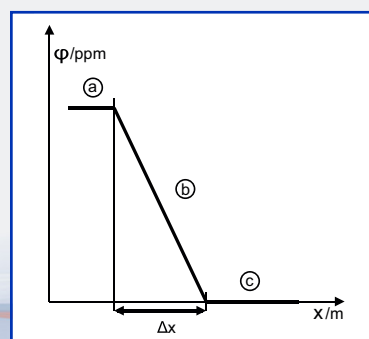
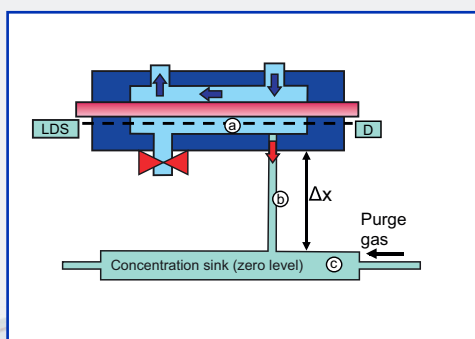


**DIFFUSIVE**  
(Isocapnic setup)



Setup	Dynamic	Combination	Diffusive
Detection limit g/m <sup>2</sup> d	10 <sup>-5</sup>	10 <sup>-6</sup>	10 <sup>-6</sup> - 10 <sup>-7</sup>
Permeation rate	Quantitatively exact	Only qualitative information	Quantitatively exact

Diffusive measurement principle combines the advantages of dynamic (quantitative exact measurement) and static setup (low detection limits)

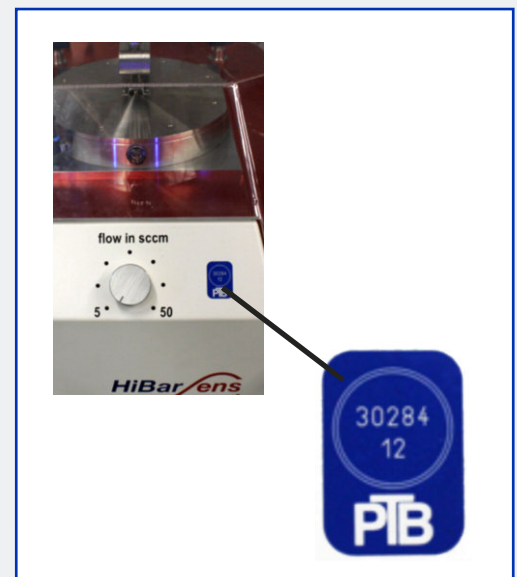
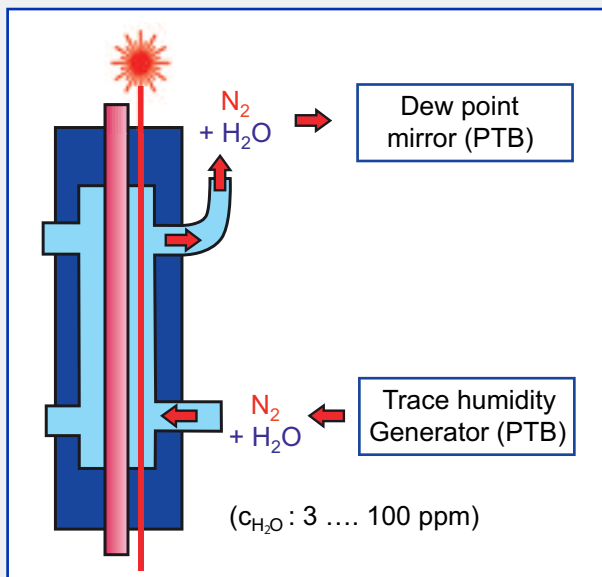


Diffusive measurement offers the unique possibility to measure exactly permeation rates down to  $10^{-7} \text{ gm}^{-2} \text{ d}^{-1}$ . Applying a capillary connected to the measurement cell results in constant conditions for measurement through diffusion. The choice of capillary diameter and length tunes the detection limit. Initial test results of ultra barrier samples using the different exact modes (dynamic and diffusive) show an excellent agreement. Further experiments on ultra barrier films in the  $10^{-6}$  range are on it's way and detailed information will be available on request shortly.

## HiBarSens® Technology

### HiBarSens® is a certified technology

HiBarSens® moisture concentration measurement via Laser diode spectroscopy has been certified by the German federal institute of metrology (PTB). The PTB has calibrated the measurement system using a certified moisture standard. The HiBarSens® measurement cell got purged by a constant moisture level provided by a high accuracy trace humidity generator. The moisture content has been confirmed at the exhaust by a dew point mirror. The calibration was carried out over a wide range between 3 and 100 ppm and exhibits minimal errors in moisture measurement below 2%.



## HiBarSens® Technology on display

### Japanese Barrier Society (JBS) Workshop, Tokyo, 15th Oct 2012

SEMPA Systems has been proud getting the opportunity to present HiBarSens® technology to the JBS community. On October 15th 2012 Dr. Wulf Grählert of Fraunhofer IWS Dresden (Institute of Material and Beam Technology) held a lecture to the JBS members in Tokyos Sumitomo Twin Building

### AIMCAL Conference, Myrtle Beach, October 21-24th 2012

HiBarSens® technology focusing on the different measurement modes has been presented at the Web coating conference in Myrtle Beach, South Carolina.



### 18th New Industrial Chemistry and Engineering (NICHe) Workshop September 19- 20th 2012; Renaissance View Capital Hotel Arlington VA

SEMPA Systems has been invited giving an introduction into HiBarSens® technology at this prestigious workshop. Especially scientific background on limitations and ways to conquer the challenges have been presented and discussed.

## Meet us at the next upcoming events:

**Highly Functionally Film Exhibition,**  
10-12th April 2013, Tokyo  
International Exhibition Center (Tokyo Big Sight)

**Workshop on High Barrier and OptoElectronics  
Related Technologies**  
16th April 2013, Tokyo, German Culture Center,  
7-5-56, Akasaka Minato-ku, Tokyo, 107-0052



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