

## Valued clients,

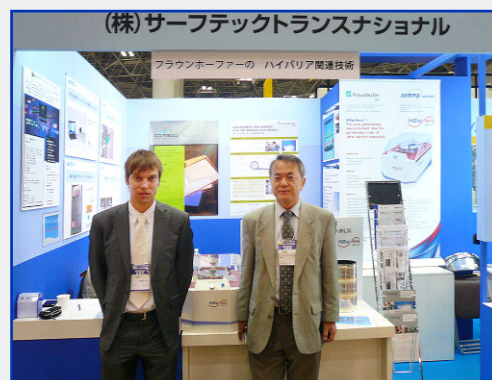
welcome to the 1<sup>st</sup> Newsletter on HiBarSens® (Water Vapor Permeation Rate Measurement Tool). 2012 is the year of global product launch for this innovative sensor technology which finally makes ultra barrier films reliably measurable. Our expert team has been active presenting HiBarSens® technology at various conferences, trade shows and workshops and we look forward discussing with you the details of our invention at one of the upcoming events or at a personal visit.

HiBarSens® offers the unique opportunity to measure both static (via accumulation of water vapor in the permeate cell – standard method) and dynamic (considering fully moisture adsorption/desorption effects), hence gives you the right tool for ultra barrier development in  $10^{-5}$  to  $10^{-6}$  WVTR range.

## HiBarSens® Technology on display

### Highly Functional Film and barrier workshop, Tokyo, April 2012

SEMPA made it's HiBarSens® product launch in Japan during 3<sup>rd</sup> Highly Functional Film in Tokyo. Additionally the new technology was presented in detail during a barrier layer workshop organized by our sales partner SurFtech Transnational Co.,Ltd. in Tokyo. A large group of barrier film experts attended the interesting event.



### OE-S Workshop, Dresden, May 2012

Sempa is an active participant at OE-S (Organic Electronics Saxony) to foster organic electronics innovations. The consortium out of industry, research and development has gathered for a workshop on latest developments in this exciting new field.

### LOPE-C LOPE-C, Munich, June 2012



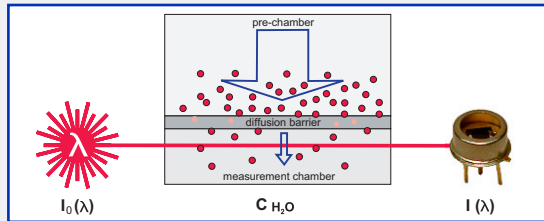
Organic and printed electronics are the technology of the future. Participants at this event soared up 36% from last years event. Ultra barrier films in the WVTR range of  $10^{-5}$  to  $10^{-6}$  g m<sup>-2</sup> d<sup>-1</sup> are key materials to enable this technology.



## HiBarSens® Technology

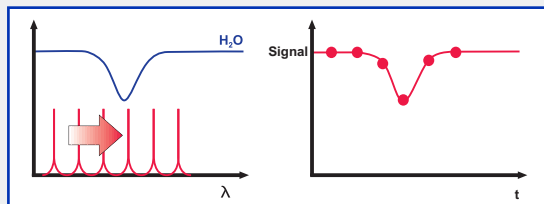
### HiBarSens® signal generation

Tunable diode laser spectroscopy is used as a high sensitive sensor for moisture concentration measurement



measurement principle

$$WVTR_{isostatic} = const \cdot \frac{V_{Purge}}{A_{Sample}} \cdot c_{H_2O}$$

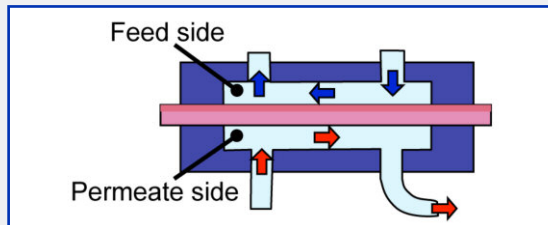


signal generation

$$I(\lambda) = I_0 \cdot e^{-\epsilon_i \cdot c \cdot d}$$

### HiBarSens® offers uniquely two measurement modes

#### DYNAMIC (Isostatic setup)



Carrier gas mode

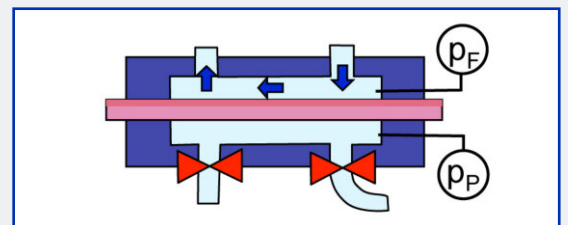
Total pressure in feed cell equals total pressure in the permeate cell

Permeation is driven by moisture partial pressure difference

$$WVTR \sim c_{H_2O}$$

Highest accuracy

#### STATIC (Quasi isostatic setup)

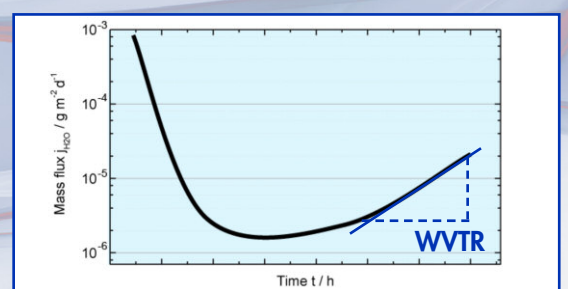
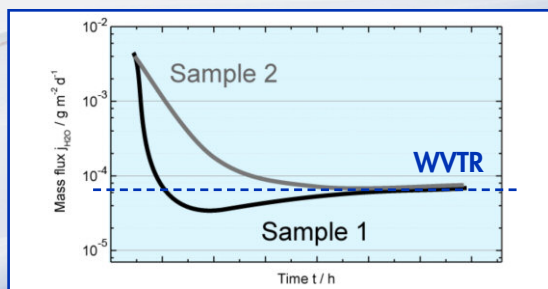


Permeate accumulation mode

Total pressure in the feed cell nearly equals total pressure in permeate cell

$$WVTR \sim \Delta c_{H_2O} / \Delta t$$

Highest sensitivity



**! One device – two measurement modes !**

## Meet us at the next upcoming events:

### Semicon-West/ Intersolar-US

July, 10.-12. 2012, Booth 1931 in South Hall, Moscone Center, San Francisco, California

### 18<sup>th</sup> New Industrial Chemistry and Engineering (NICHE) Workshop

September, 19. & 20. 2012, Renaissance View Capital Hotel Arlington VA

### PVSEC- Exhibition

September, 24.- 28. 2012, Messe Frankfurt am Main, Germany

### Semicon-EU

October, 9.-11. 2012, Messe Dresden, Germany

### JBS Japanese Barrier Society

October, 15<sup>th</sup> 2012, Tokyo, Advance metrology for WVTR

### Aimcal- Web Coating and Handling Conference

October, 21.-24. 2012, Marriott Grande Dunes, Myrtle Beach, South Carolina

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