

WHY?



Revolutionizes cosmetic products' screening thanks to microfluidics



Reduces the time-to-market of cosmetics products worldwide



Helps foster a lower carbon future



HOW?



Uses scientific innovation to evaluate your products' performance



Provides objective results within two hours



Uses less materials and energy than other screening techniques

WHAT?



Data analysis using camera and integrated software

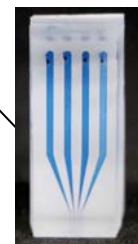


Reservoir:
mimics human
sudation gland

Water chamber

SOD4 instrument analyzes your product's performance

• Humidity chamber
• **Human-like ducts go up here and are connected to the chip**



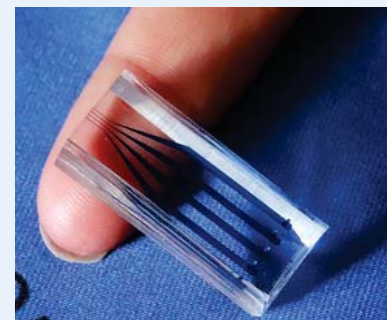
Smart-Pore™ chip - four bio-pores and 4 human canals





THE TECHNOLOGY SMART-PORE™:

First *in vitro* test, assessing in 1h, your antiperspirants product's performance while proving its *in vivo* correlation. This cutting-edge innovation, based on microfluidics, combines an optical instrument with a synthetic polymeric skin (that mimics human sweat excretion) and a sensitive sensor (to measure the efficiency of the clog).



CORRELATION STUDY - 3 ROLL-ON PRODUCTS

Over the many tests that were conducted, Microfactory proved the *in vivo* / *in vitro* correlation of Smart-Pore™ with Sensenet:



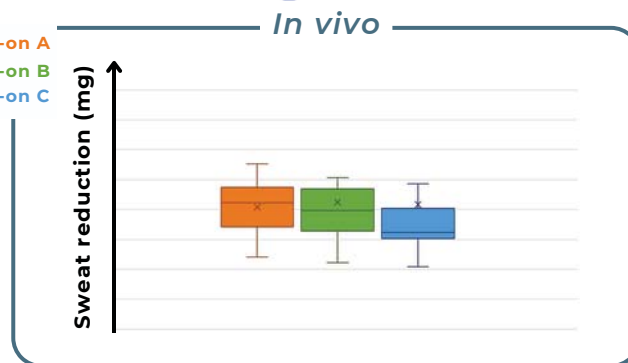
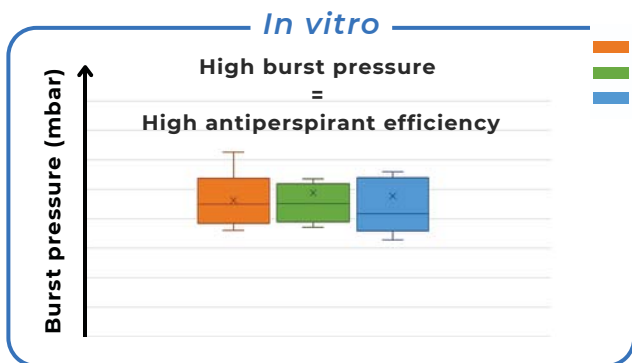
In vivo study - for each product



- FDA guidelines
- 14 to 20 volunteers selected
- Sauna exposure for 30 min
- **Gravimetry measures** before and 24h after product application

In vitro study - for each product

- 4 tests = 16 measures for accuracy
- **Burst pressure measures** using Smart-Pore™ sensitive sensor
- Continuous analysis



In vivo study shows that the three products have a similar efficiency against sweat (24h reduction). A slight difference in sweat reduction is observed for product C, indicating a lower sweat reduction than roll-on A and B.

In vitro study shows a similar burst pressure for the three products. Product C has a lower median, indicating a slightly lower efficiency than roll-on A and B.

Smart-Pore™ predicts *in vivo* results and efficiency claims in only 1h



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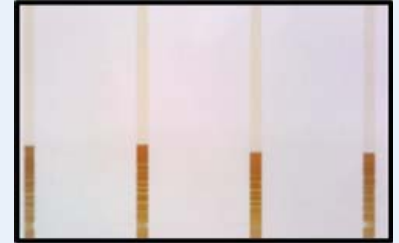
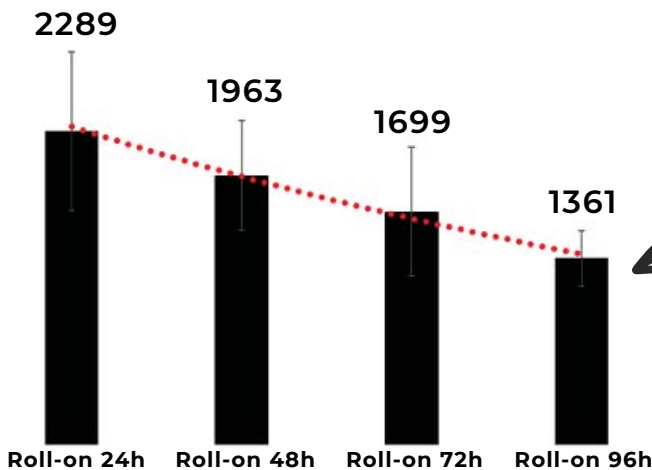


Image of the clogs formed in the 4 pores

CASE STUDY - ROLL-ON 24H, 48H, 72H, 96H

Screening test to demonstrate the correlation between parameters analyzed and antiperspirant efficiency:

Parameter 1: Clot formation time (s)



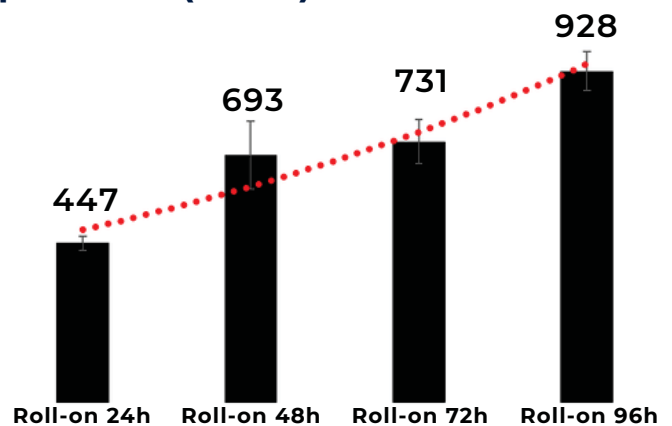
When the antiperspirant interacts with the sweat, it leads to the formation of a clog in each pore. The time needed to form the clogs in the pores is correlated to the efficiency of the antiperspirant.

Fast clot formation time = High antiperspirant efficiency

Parameter 2: Burst pressure (mbar)

At the end of the experiment, a gradual pressure is applied to eject the clogs from the pores. The pressure needed to release the clot is called the burst pressure.

High burst pressure = High antiperspirant efficiency



Smart-Pore™ evaluates antiperspirants efficiency and discriminate them regarding their clot formation time and burst pressure.



SOD4 is divided into 4 parts:

- 1 Polymeric synthetic skin
- 2 Parameters control
- 3 Data acquisition
- 4 Quantitative & qualitative analysis



SOD4 instrument analyzes your product's performance

1



Smart-Pore™ polymeric synthetic skin

- Polymeric microfluidic chip mimicking human skin's sweat excretion through pores
- The antiperspirant is applied to the surface with the pores. It interacts with the sweat excreted by the pores to form a clog, thus reducing sweat excretion

2



Parameters control

- Allows for the injection of the sweat at a controlled flow rate for a determined time period
- Controlled humidity, temperature and pressure

4



Quantitative & qualitative analysis

- Measurement of clog length and formation time in each pores
- Measurement of burst pressure needed to release the clogs from the pores

3



Data acquisition

- Continuous visual monitoring
- Support for image analysis
- Continuous pressure monitoring