



HelioNews

News about In Vitro Sun Protection Testing by



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News from HelioScreen Labs

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The surface treatment of oxides of Ti and Zn (2 parts)



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Updated version

Few modifications have been performed (highlighted with *) in order to avoid misleading in comparison with original version in French.

HELIOPLATE®.HD: A new substrate for reliable in vitro evaluation....

Edito of the month

At present time, PMMA is internationally accepted as a substrate for in vitro measurement . Besides, it's the proposed substrate of the recent UVA COLIPA's method .

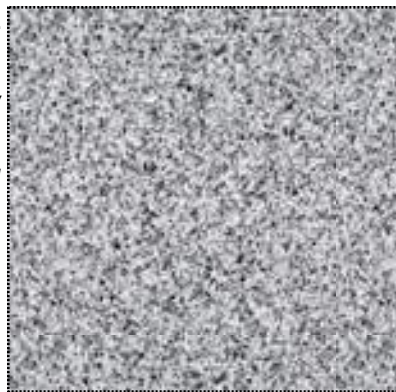
As previously with Transpore, proposed by B. Diffey in his publication « a new substrate for in Vitro SPF determination » (JSCC 40,127-133, May June 1989), present plates are produced from an existing material, not specifically designed for this application. They are produced by sandblasting and cutting up of large PMMA plates.

The material is characterized only by its absorption level and its surface condition (roughness) by the SA .

Even if these characteristics and checks are supposed to be sufficient, there still would remain serious difficulties in terms of plate to plate, or of batch to batch reproducibility (due to the sandblasting) !

Now, HelioScreen, together with a plastic injection company (see below) for R and D and with a specifically equipped laboratory (see below) for the definition and checking of roughness parameters, devoted two years to propose a new solution .

Therefore, it's a brand new manufacturing process which is used and partly patented for a perfect plate to plate reproducibility. *See last page*



have not been taken.

Nearly ten years ago, our laboratories offered PPMA Helioplate first generation which since became the most used substrate. As distributors and users, very soon were we aware of the plates non-homogeneity and of the absolute need to find a more appropriate process to at last make plates specifically designed for this very particular need. After two years of development work , we can at last present HELIOPLATES HD for which we assure the plate to plate reproducibility, based on their design. We are quite proud of this new step forward and the obtained results show without any doubt the superiority of this product.

D. Lutz

Many thanks to HelioScreen.labs partners for this innovating project:

La Française des Plastique LFP : Mould design and production.

Coty Lancaster :Checking card definition .

Oséo : Within a global project about Quality Control .



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Review of patents in solar

b1 - Cosmetic composition comprising ginkgo biloba and sunscreen agents – 27/09/07 -US2007224138 - PROCTER & GAMBLE – Use of an extract of Ginkgo biloba diphenylacrylate derivatives and dibenzoyl derivative methane.

Interest of extract of ginkgo biloba?... (Ed)

b2 - METHOD FOR PREPARING SURFACE MODIFIED, NANOPARTICULATE METAL OXIDES, METAL HYDROXIDES AND/OR METAL OXYHYDROXIDES – 5/04/07 - WO2007036475 - BASF AG (DE); HIBST HARTMUT (DE); RIEGER JENS (DE); KISSEL JUTTA (DE); ANDRE VALERIE (DE); MC KEE GRAHAM EDMUND (DE) – Description of surface modification and the preparation of aqueous dispersions.

b3 - UV-ABSORBING POLYMERS CONSISTING OF GELATIN AND AMINOBUTADIENE – 19/07/07 - WO2007081209 - FUJIFILM MFG EUROP B V (NL); KLUIJTMANS SEBASTIANUS GERARDU (NL); BOUWSTRA JAN BASTIAAN (NL) – UV-absorbing polymer made by reacting a derivative of aminobutadiene with a polymer having at least one amino group.

Other polymers with UV absorbing properties can also be produced. (Ed)

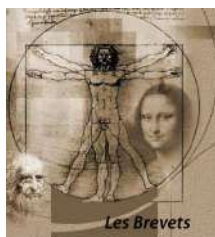
b4 - Cosmetic composition containing pentamethoxyflavone, useful as sunscreen and antiinflammatory for skin, nails and hair, filters out ultra-violet A radiation – 19/01/07 - FR2888508 - SZIRAKY PATRICK (FR) – **This flavone could have anti-inflammatory properties and UVA filter. (Ed)**

b5 - SUNSCREEN AGENT COMPRISING MEROCYANINES AND TRIAZINES – 21/06/07 - WO2007068707 - BEIERSDORF AG (DE); LERG HEIKE (DE); MUNDT CLAUDIA (DE); SKUBSCH KERTIN (DE); SMUDA CHRISTOPH (DE); TESCH MIRKO (DE).

b6 - POLYSILOXANE COATED METAL OXIDE PARTICLES – 28/09/06 - WO2006100018 - DSM IP ASSETS BV (NL); BERG SCHULTZ KATJA (CH); VOLLHARDT JUERGEN H (CH); WESTENFELDER HORST (DE); SIT FINTAN (CH). The particles are coated with an UV filter on polysiloxane basis.

b7 - O/W EMULSION COMPRISING INORGANIC UV FILTER PIGMENTS AND ALKYL SULFATE – 06/04/06 - WO2006034985 - BEIERSDORF AG (DE); NISSEN BENITE (DE); LERG HEIKE (DE); MUELLER ANJA SABINE (DE) – Coupling of an inorganic UV filter agent with an alkyl sulfate at a concentration between 0.05 and 1.5%.

The purpose of the surfactant is probably to facilitate the spread and coverage on the skin but this should also increase the irritation, what about another surfactant softer? (Ed)



What happens in the solar...

Publications:



- International Journal of Cosmetic Science – Vol.29, N°4, august 2007 pp 282-291R.Hagens, T.Mann, V.Schreiner, H.G.Barlag, H.Wenck, K.- P.Wittern, W.Mei
Contact angle measurement – a reliable supportive method for screening water-resistance of ultraviolet- protecting products in vivo. – The authors, from Beiersdorf, propose a method for measuring the contact angle of a drop of water in contact with skin treated with the sunscreen. They show that the correlation with the COLIPA standardised method of measuring water resistance is excellent.

- Journal of Cosmetic Science USA, Vol.58, July/August (4) 2007, pp 385-391 Hair melanin content and photodamage – A.C.Santos Nogueira, I.Joekes. The authors studied the degradation of hair (color, mechanical properties) in conjunction with UV irradiation; To do this, they used a mercury vapor lamp exposure until 1800h. White, blond and brown hair were studied.

- In International Journal of Cosmetic Science volume 29 Issue 5, Page 361-367, October 2007, S. Pedersen, F. Marra, S. Nicoli, P. Santi have studied: In vitro skin permeation and retention of parabens from cosmetic formulations. They show that the skin penetration decreases in the order methyl-, ethyl-and propyl paraben. Remember that parabens can cause allergic contact dermatitis and they possess estrogenic activity.

- International Journal of Cosmetic Science Volume 29 Issue 5 Page 409-409, October 2007 - David C. Steinberg (2007) - Global regulations of sunscreens. Regulatory point.

- Photodermatology, Photoimmunology & Photomedicine Volume 23 Issue 5 Page 155-162, October 2007 - Ho-Song Cho, Min-Ho Lee, Jae Woong Lee, Kyong-Ok No, Sang-Ki Park, Heon-Sik Lee, Sangjin Kang, Wan-Goo Cho, Hye Ji Park, Ki Wan Oh, Jin Tae Hong. On hairless mouse irradiated with UVB, the authors show the antiwrinkle effect provided by the ingestion of a mixture of vitamins C and E, picrogenol and primrose oil officinale.

- Contact Dermatitis Volume 57 Issue 4 Page 273-275, October 2007 - SHYAMAL WAHIE, JAMES J LLOYD, PETER M FARR (2007) - Positive photocontact responses are not elicited to sunscreen ingredients exposed to UVA prior to application onto the skin. The study shows that a photoallergic reaction can occur only when the product is in the skin before irradiation UVA.

- International Journal of Dermatology Volume 46 s1, African Hair and Skin: Proceedings of the L'Oréal Workshop on African Hair and Skin Page 26-29, October 2007 - Hugues Adegbi MD, Hubert Yedomon MD, Felix Atadokpede MD, Marie-Claire Balley-Pognon MD, Florencia do Ango-Padonou MD (2007) - Skin cancers at the National University Hospital of Cotonou from 1985 to 2004 This study shows: the very low rate of skin cancer in the black population and the fact that basal cell carcinomas only affect younger individuals.

- Pigment Cell Research - Volume 20 Issue 5 Page 334-335, October 2007 - Vincent J. Hearing (2007) - Regulating melanosome transfer: who's driving the bus? This study shows that melanocytes are not only important in the pigmentation of skin but keratinocytes also play an important role.

- Skin Research and Technology - Volume 13 Issue 4 Page 360-368, November 2007 - K.-S. Suh, H.-J. Roh, S.-Y. Choi, Y.-S. Jeon, K.-S. Doh, J.-H. Bae, S.-T. Kim (2007) - The impact of different UV wavelengths was studied In Vivo in relation to the induced erythema and pigmentation caused.

File of the month:

UV and IR rays



We know that ~ 40% of incoming solar radiation on earth consist of infrared radiation (according to CIE - International Commission on Illumination - definition: IR-A: 700 nm – 1 400 nm; IR-B: 1 400 nm – 3 000 nm; IR-C: 3 000 nm – 1 mm *); solar radiation is polychromatic, the final effect on the skin is the result of the effect of each individual wavelength, and also the interaction between these effects. These interactions could explain the relatively small number of skin cancers compared to what might be expected under conditions of high-risk exposure (eg tropical beach).

To explain the relatively small number of skin cancers, several hypotheses can be put forward:

- the repair capacity of the cells was underestimated
- the dose of solar UV is not correctly estimated

The action of polychromatic radiation is different from the monochromatic radiation. Some authors have shown that the infrared radiation between 800 nm and 1000 had an inhibitory action of the cytotoxic effects of UVA and UVB sun in normal human skin fibroblasts, regardless of the temperature rise. (Fig 1)

	Reference		UVA		UVB	
	Without IR	With IR	Without IR	With IR	Without IR	With IR
% surviving cells	100	110	55	85	25	55

Using the following doses:

IR: 810 kJ/m² (this irradiation occurs **before** the UV irradiation) UVA (365 nm): 250 kJ/m² et UVB (312 nm): 500 J/m²

It was found that this protection was **long protection**, ie if the cells are irradiated with IR and UVA or UVB immediately, 4, 24, 48, or 72 hours later, we see that protection is detectable immediately but curiously, it still increases after 24 and 48 hours to decrease to 72 hours.

It was also shown that the protection by IR was a cumulative phenomenon. An IR pre-irradiation was followed, 3 hours after a second IR irradiation and a third, the following results are observed:

	UVA (without IR)	UVA + 1 IR	UVA + 2 IR	UVA + 3 IR
% surviving cells	55	85	94	100

It was also shown that the temperature was not involved in the conditions of the experiments: The use of antibodies specific for the heat shock proteins are not detected in these experiments.

In contrast to UVC and UVB, UVA is not absorbed by the nucleic acids: the mechanism of cytotoxicity is different from UVA UVB and UVC. It has been found that UVA strongly induce lipid peroxidation of membranes irradiated cells. The evaluation of lipid peroxidation assay substances by reacting with thiobarbituric acid IR showed that do not protect the membrane against lipid peroxidation due to UVA irradiation.

The protection induced by the infrared radiation is linked to improving the ability to repair damage induced in DNA by UVA and in dependence on the p53 protein. It seems that the cell «know» after irradiation by infrared follow a UV irradiation, so it operates a system of preventive repair strengthened to cope with UV.

This hypothesis is to relate with what happens on the surface of the earth since the early hours of day light radiation are made as visible and infrared radiation while high UV doses only happen later. This reinforces the idea of an adaptive mechanism of protection.

Our comments...

These different studies challenge the protection claimed by some infrared solar products. Others, however, demonstrate the negative effects that may result from such radiation. Even as we begin to be familiar with the effects of UV radiation, a lot of work is waiting for researchers to clearly define those visible and IR radiation. This protection is mainly by radiation reflective substances (pearlescent). The question is: Should or may not include in a sun produces substances that absorb infrared radiation. A true way of work to dig?



Roughness and spread on quantity : Helioplate HD2 and HD6

Two different Helioplate HD types will be offered, corresponding to two roughness levels, 2 and 6 microns (HD2 and HD6). Only the HD2 type is available right now as validation tests have not yet been fully finalized on HD6. HD2 type is proposed when performing the Colipa's method, using a spread on quantity of 0.75mg/cm². However, having performed these tests for many years, always have we been in favour of a higher roughness, around 6 microns with a spread on quantity of 1mg to 1.2 mg/cm². We know, and this has been proven in a recently published paper (Ferrero L. and Pissavini M;) [Importance of Substrate Roughness for In Vitro Sun Protection Assessment. *IFSCC, Volume 9, No. 2 (2006)*], that this roughness level not only makes the spreading easier but also considerably restricts variability.

P1 continuation

To develop new plates meaning many tests to check the reproducibility as well as the correlation with « formed » plates, unexpected and surprising facts appeared. While it seemed that only the roughness criteria (SA) was important, together with transmission properties, it was found necessary to define a checking card with not less than 9 roughness criteria, among the 19 which were previously evaluated.

This study is to be published later on, as it can't be fully reported here, but it already shows what is at present time proposed for the checking of existing plates is not sufficient.

Advantages for users

- Fully identical plates, plate to plate (no sorting out, no rejects) and batch to batch (relevance of over time measurements)
- Dispersion of measures greatly reduced.
- Designed to be easily piled up and for easy transport, no plastic film to get rid of, no dust.
- No need for a « blank » with glycerine.
- Plate thickness smaller and constant for optimal transmission.
- Two roughness levels: HD2 for COLIPA's method, and HD6 for SPF or others.
- Quality control and traceability certificate available with each delivery.

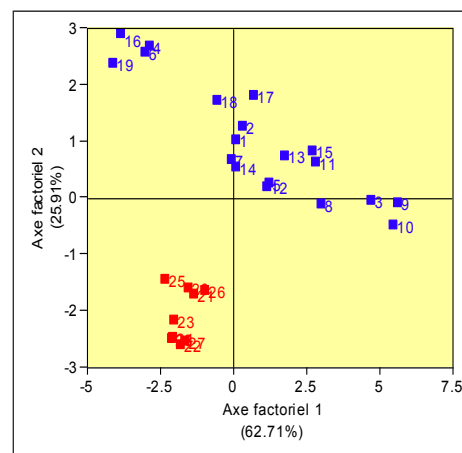
A better reproducibility.....

Many roughness measurements series have been performed (applying our checking card) with Helioplate HD2 following COLIPA's method on various products, versus Schönberg plates used during the COLIPA's Ring Test.

Following roughness measurement and in order to avoid variability, the Schönberg plates were previously selectively sorted out, which was not the case with Helioplate HD. Results obtained in terms of roughness reproducibility prove an undeniable superiority for HD2 plates.

HD2 plates go along with an on average 4 times less dispersion as with Schönberg plates for 2D characteristics (Fisher's test). (fig 1). As for results correlation with in vitro UVA Colipa's method, it is good for the 2 types of plates but with a clear advantage for HD2 (improved residual standard deviation) and this despite the previous selection of a Schönberg plates batch respecting Colipa's criteria:

HD 2 Plates: PPD in vitro = 0.147 + 0.854 PPD in vivo (residual standard deviation = 1.006)



2D plates roughness characteristics: Helioplate HD2 (red) and Schönberg (blue)

Technological intelligence...

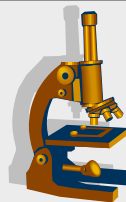
1 – Unusual eye blink

The author Sasha Madronich (Photochemistry and Photobiology 83 (6), 1537-1538) gives a formula for calculating the UV index according to the zenith angle of the sun and the ozone density expressed in Dobson units. Studies (Photochemistry and Photobiology 83 (6), 1465-1470.), conducted in Australia during two summers have shown that the protection afforded by the trees varied from SPF 5 to 10. It depends on the season, the foliage density and botanical variety.

2 – Information about raw materials:

Letter to ACVon Eschenbach (FDA) dated 26/09/07 from EWG (Environmental Working Group). According to EWG, FDA excludes during the meetings on the safety of cosmetics the consumer organizations and environmental while allowing manufacturers to participate. Annexes (~ 150 pages) listing the raw material problems and cosmetics containing them. (see section 5).

Comparative studies (Contact Dermatitis 58 (1), 47-48) between the periods 1988-1996 and 1997-2005 showed a significant increase in contact allergy to propyl gallate used as an antioxidant. Scientists of the laboratory of the energy of Brookhaven have shown that titanium oxide nanofibers made porous absorb better (25%) UV radiation. The treatment consists of heating a titanate and the evaporation of water would cause these microcavities. Recall that the nanoparticles are criticized by the FDA and EWG (11/09/07).



3 – Economic Information:

In the Cosmeticnews.com 01/09/08: Avon restructures the company which ultimately lead to the elimination of 2,400 jobs. In all, in the end, 4,000 jobs have been affected since 2005. This will save \$ 430 million Maturity 2011-2012. GCI news of 08/01/08: Tri-K acquired by Kemira will change its name to that of its new parent company.

4 - Environment:

Regardless of weight and thickness of a fabric, chemical treatment processes can have a decisive influence on the transmission of UV radiation through the fabric. (Photodermatology, Photoimmunology & Photomedicine Volume 23 Issue 5 Page 191-196, October 2007 - Ajoy K. Sarkar (2007))

5 –Formulas:

Letter to ACVon Eschenbach (FDA) dated 26/09/07 (continued Paragraph 2) ... Note also that EWG provides a list of solar products (135 products), mainly containing titanium oxide and / or zinc and are considered good formulas.

6 – Regulation:

In Britain, the company Boots provided the Laurel Pub Company (who runs pubs and restaurants) free sunscreen samples. These are aimed at consumers who smoke outside of buildings to protect them from UV radiation ... (11/09/07).