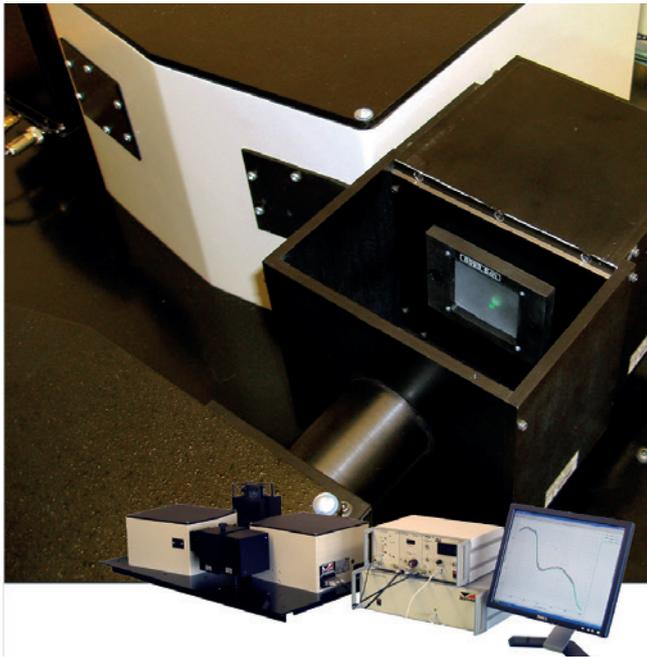


B-SSUV300

In vitro sunscreen spectrophotometer



Turnkey solution performing detailed analysis of UV transmittance in thin film sunscreen, centred on the high-performance DTMc300 double monochromator

The B-SSUV300 boasts numerous advantages in the performance of accurate measurement of UV absorbance of thin film sunscreen samples. Including a dual monochromator based spectrophotometer, a simple magnetic PMMA plate carrier and integrating sphere collection of transmitted light, accurate measurements in accordance with international standards is ensured.

The challenging measurement of sunscreen products, including high absorbance, fluorescing samples and diffuse transmission properties are fully taken account of in the design of the B-SSUV300.

Core benefits

- Measure absorbance down to 6 OD
- Avoid incorrect results due to fluorescence
- Easy to use
- Accurate and repeatable measurements

Features

- Split double monochromator configuration
- Monochromatic sample illumination (290-400 nm)
- Integrating sphere collection of transmitted light
- Monochromator detection (290-400 nm)
- Fully automated and reporting of results

Applications

- ISO 24443:2012 - Determination of sunscreen UVA photoprotection in vitro
- EN ISO 24443:2012 - Determination of sunscreen UVA photoprotection in vitro
- AS/NZS 2604:2012 - Sunscreen products - evaluation and classification
- FDA, Final rule 2011 - Rulemaking history for OTC sunscreen drug products

Reported parameters

- UV absorbance
- UVAPF
- Critical wavelength
- UVA/UVB ratio

Specifications	
Measurement	
Spectral range of operation	290-400 nm
Bandwidth	1 nm
Wavelength accuracy	± 0.1 nm (2400g/mm)
Beam diameter at sample plane	4 mm diameter
Measured absorbance range	0-6 OD
PMMA plate dimensions	5x5 cm
Bench space required	1 m deep x 2.5 m wide
Services requirements	5 x main sockets 1200 W power consumption
Monochromatic probe source	
UV source	150 W short-arc xenon lamp
Monochromator configuration	Symmetric, single Czerny-Turner
Monochromator focal length	2x300 mm
Diffraction gratings	2400 g/mm
Dispersion	5.4 nm/mm (2400 g/mm)
Wavelength accuracy	± 0.1 nm (2400 g/mm)
Beam diameter at sample plan	4 mm diameter
Computer requirements	
OS	Windows 7, Windows 8 (32-/64-bit) operating systems (or newer)
Software control	BenWin+ Spectral acquisition software
Minimum hard disk space	Approx. 100 MB
Minimum RAM	2 GB
Interface	4 x USB 2.0 ports

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In vitro UVA testing of sunscreen products (COLIPA)

The B-SSUV300 performs the accurate measurement of UV transmittance through thin film sunscreen samples in strict accordance with the COLIPA guideline "Method for the In vitro Determination of UVA Protection Provided by Sunscreen products". There are a number of fundamental difficulties with this method that all require careful instrument design. Bentham has drawn on its extensive instrument design experience and applications knowledge to produce a turnkey solution that offers accurate and repeatable measurements.

Sunscreens are highly absorbing in the UV

The need to measure highly absorbing samples in the UV requires the system to have a large dynamic range. Therefore, high scattered light rejection within the system is essential. The B-SSUV300 is based on the DTMc300 double monochromator which has excellent scattered light rejection proven in many demanding UV applications. Absorption levels over 6 decades (down to 6 O.D.) can be measured with confidence.

Sunscreen products fluoresce

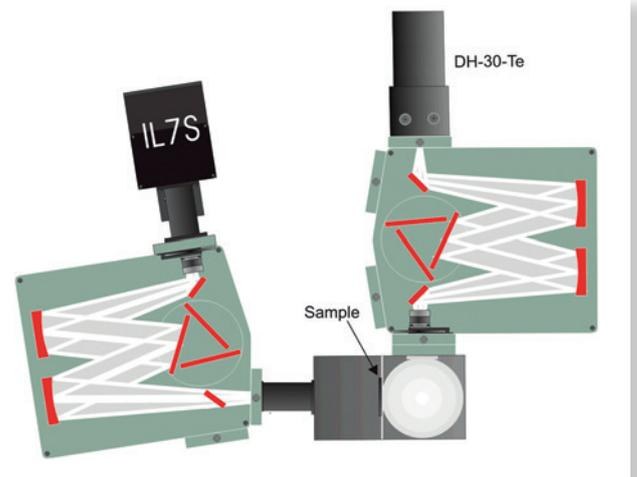
Sunscreen products typically exhibit strong fluorescent effects which need to be suppressed during a measurement. The B-SSUV300 minimises fluorescent effects in a most elegant way. The sample is placed in between the two halves of the double monochromator. This eliminates the fluorescence effects more effectively than conventional filter techniques whilst retaining the full scattered light rejection performance of the double monochromator. Additionally, because the two halves can be independently controlled, it is possible to fully investigate fluorescence effects by producing both excitation and emission spectra of any sample.

Sunscreens are very light scattering

As sunscreens are so highly scattering it is essential to ensure that the sample chamber optics maximise the collection of light transmitted through the sample. This requires careful design of the integrating sphere's entrance port and the ability to hold the sample in very close proximity to it. The measurement beam diameter within the B-SSUV300 can be set to accommodate sample non-uniformity.

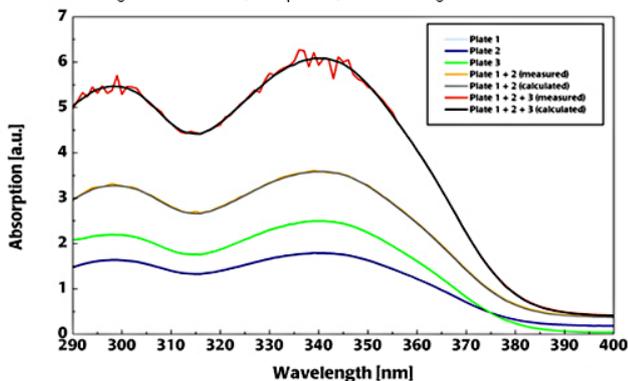
Sunscreens require careful sample preparation and handling

Sample preparation is always an issue for anyone involved with testing of sunscreen products. The COLIPA guideline details the appropriate method using PMMA plates. The B-SSUV300 sample chamber provides good access and a very convenient to use magnetic sample carrier. This can be easily positioned to permit the measurements at a number of different sites on the sample as set out in the guidelines. An optional cuvette holder can also be used within the sample chamber.



Absorption Spectra of UV - Absorbing Standard Plates

Integration time 0.1 s, - for plate 1, 2 and 3 integration time 0.5 s



Measurement result courtesy of Institut Dr Schrader, Holzminden, Germany

Ordering information

B-SSUV300

In vitro sunscreen spectrophotometer