

SOLAR[®]
L I G H T



**SPF-290AS™ SPF Testing And
UV Transmittance Analyzer System**
Wavelength Selection Solutions

Part Number: 210135
Revision Level: E

SPF Testing Analyzer System

SPF-290AS™



Analyzer for In-Vitro SPF Testing and Ultraviolet Protection Factor (UPF) Analysis

The SPF-290AS™ is a recording UV spectrophotometer designed and optimized for the determination of SPF values on a variety of sunscreen and cosmetic products, reducing the need (and cost!) for *in-vivo* testing.

Covering both the UVB and UVA spectral regions, the system automatically scans from 290 to 400nm, accumulating and storing data at intervals of 1, 2 or 5nm. The monochromatic protection factor (MPF) is determined for each of the selected wavelengths and is used to calculate the SPF value, using solar irradiance and erythral constants that are programmed into the software but which can be easily modified. Liquids, creams and gels are applied in small “dabs” or “spots” to the Transpore Tape® or other substrate, with the pipette supplied with the system. The substrate is placed on an open metal frame. The sample is spread lightly and evenly over a 50 cm² area at 2 µl/cm², equivalent to *in-vivo* testing.

Quartz plates are available from Solar Light for sprays and other difficult samples. The high correlation between the SPF-290AS™'s *in-vitro* measurements and *in-vivo* test results gives you confidence that the instrument will be a reliable guide to product performance. The SPF-290AS™ can provide reliable results on the most difficult samples.

An easy-to-use testing methodology combined with reproducible results opens the door to efficient and low cost experimental design techniques for formulation optimization. This will result in faster formulation and lower development cost due to a reduction in the need for extensive *in-vivo* panel studies.

Validation Kit

Solar Light offers a Comprehensive Test Plate for use with the SPF-290AS™ and WinSPF™ software. The test plate is designed to provide the user with a clear understanding of how their SPF-290AS™ analyzer is performing. The test plate contains several optical filters that are measured by the SPF-290AS™ and the results are compared to NIST traceable factory measurements. Equipped with this tool, users will not spend time performing tests on an analyzer that is in need of repair nor will they spend money for repairs that are not necessary.

In addition to the test plate, the Validation Kit contains:

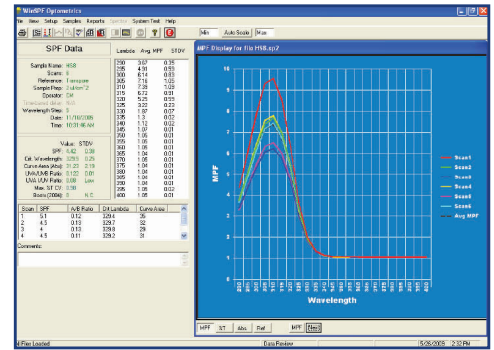
- Transpore™ Tape
- Hard Carrying Case
- (10) Syringes with tips
- Set of 3 PMMA Plates
- PMMA Plate Holder
- Calibration Plate Assembly
- (2) standard formulations:
 - 1 oz. of 8% Homosalate
 - 1 oz. of Colipa Standard



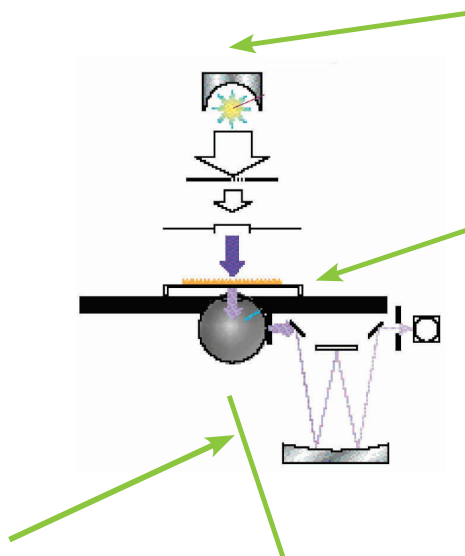
SPF-290AS™ • Analyzer System

SPF-290AS SPECIFICATIONS	
Wavelength Range	290 – 400 nm <i>(Range Specified By International Methods)</i>
Wavelength Accuracy	0.2% (0.58 nm – 0.80 nm)
Wavelength Reproducibility	0.25 nm
Spectral FWHM Bandwidth	1.66 nm
Absorbance	0 – 3.2 A <i>(Dual Doped PMMA Method)</i>
SPF Measurement Range	1 – 100+
Scan Time	As Little As 24 Seconds
Wavelength Step Interval	1 nm, 2 nm, or 5 nm <i>(User selectable)</i>
Lamp	Power stabilized Xenon 150W, 100% Ozone Free
Detector	High Sensitivity Multialkali side-on PMT
Sample Positioning	Automated X-Y Stage
Power Options	110VAC-220VAC, 50/60 Hz

SL/SPF-290AS_07/2023
Specifications subject to change without notice.



Designed to Meet the Needs of SPF Assays



Ultraviolet (UVB) and near ultraviolet (UVA) radiation is provided by a 125W CW Xenon arc lamp.

A horizontal sample area permits testing of liquids, creams, emulsions and sprays.

An integrating sphere placed just below the sample collects light scattered by the product and its supporting substrate, increasing measurement accuracy.



SPF-290AS™ Sample Handling and Support Media

Liquids, creams and gels are applied in small “dabs” or “spots” to the Transpore Tape® or other substrate, with the pipette supplied with the system. The substrate is placed on an open metal frame. The sample is spread lightly and evenly over a 50cm² area at 2 µl/cm², equivalent to in-vivo testing.

Quartz plates are available from Solar Light for sprays and other difficult samples.

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Data Acquisition & Analysis

SPF-290AS™

NEW with WinSPF™ Software

- Full compliance to FDA2011 and ISO24443
- Export data direct to ISO Spreadsheet
- Includes calculations and displays screens in compliance with AATCC 183, BS EN 13758-1, GBT18830-2009, and NZS 4399 UPF fabric test methods.
- USB connectivity
- Includes UVA Protection Factor and Erythemal Protection Factor calculations.
- Updated Help System
- Comes with audio visual training aids and intuitive computerized modules designed to assist the operator with everything from spreading a sample to routine maintenance.

Single Step Control Icons

Switch Between Display Formats

Fully Functional Toolbar

System Test and Validation

Complete On-Line Help System

Utilizes All Windows Features: Printing, Screen, Capture, Etc.

The screenshot shows the WinSPF software interface. On the left, there is a 'SPF Data' panel with fields for Sample Name (HS8), Scans (6), Reference (Transparent), Sample Prep (2 ul/cm²), Operator (CM), Wavelength Step (5), Date (11/18/2005), and Time (10:31:46 AM). Below this is a table of 'Value: STDV' for various parameters like SPF, Crt. Wavelength, Curve Area (Abs), UVA/UVB Ratio, UVA/UVB Ratio, Max. XT CV, and Boots (2004). At the bottom left is a table with columns 'Scan', 'SPF', 'A/B Ratio', 'Crt. Wavelength', and 'Curve Area'. On the right, a graph titled 'MPF Display for file HS8.sp2' shows MPF on the y-axis (0 to 10) and Wavelength on the x-axis (200 to 400 nm). The graph displays multiple colored lines representing different scans and an average MPF line. The software window includes a menu bar (File, View, Setup, Samples, Reports, System Test, Help) and a toolbar with icons for file operations and system functions.

Data can be acquired in approximately 20 seconds. Results displayed in easy to read format.

Software Features

- Calculate and Print SPF Values
- Both Tabular and Graphical Formats
- Boots Star Ratings Calculated
- Create Formulation Assays of Up to 36 Scans
- Display MPF and Absorbance Values
- Photo-Stability Testing
- Calculate Area Under the Curve
- Critical Wavelength Calculation
- UVA/UVB Ratio
- Complete On-Line Help Menu
- View Scans Individually
- Calculates TNUV Standard
- Supports FDA UVA In-Vitro Test Procedure
- UPF per AATCC 183, BS EN 13758-1, GBT18830-2009, and NZS 4399
- 150 Spreadsheet Export Function

Computer Controlled Sampling Stage

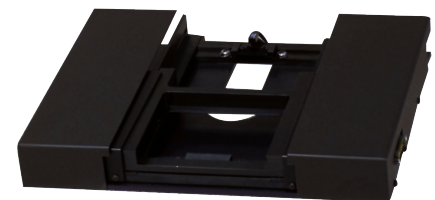
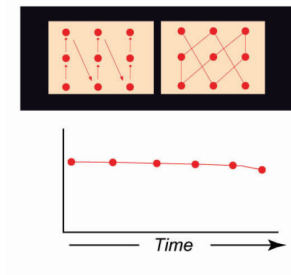
There are two modes of computer controlled operation:

- Programmed reading of up to 12 locations (Autoscan)
- Time based measurements (photo-stability)

Autoscan mode offers two methods of choosing up to 12 sampling locations. The operator can either specify the positions to be read or the computer can generate them randomly. Once set, the operation, data collection and reporting are performed automatically. The stage moves the sample on the holder into the light beam, takes the measurements, moves to the next position and continues until all the measurements have been completed.

Time-based (photo-stability) measurements monitor the SPF values for a sample at a user specified position against time. The effects of drying and exposure to air and light on a sample can be easily evaluated, making it particularly suitable for photostability testing. The system's computer provides a controlled repeatable time base for measurements.

Computation of statistics for multiple assays is provided by the software.



X-Y Sampling Stage

The Computer Controlled X-Y Sampling Stage:

- Reduces the overall cost of testing,
- Frees technicians for other tasks,
- Improves the repeatability and accuracy of measurements, and
- Facilitates photo-stability testing

Software • Analyzer System Automation

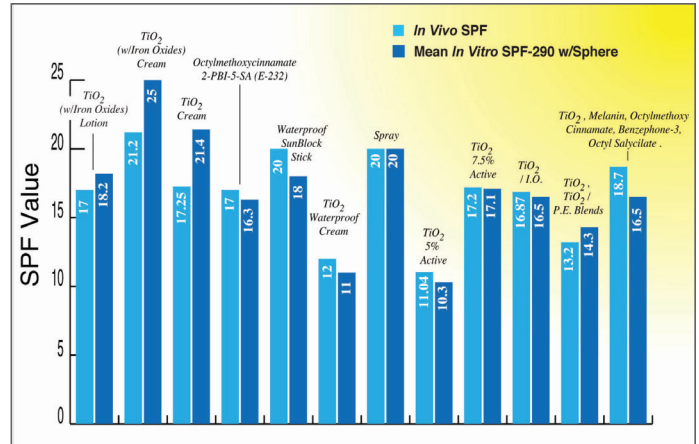
SPF-290AS™

Correlation Between SPF-290AS™ and In-Vivo SPF Testing

The high correlation between the unit's *in-vitro* measurements and *in-vivo* test results gives you confidence that the instrument will be a reliable guide to product performance.

The chart shows data comparisons for a variety of commercially available products including:

- Physical Sunscreens
- Sprays
- Waterproof Sunscreens and Stick Formulations



Korea Food & Drug Administration Qualify the SPF-290S as an Alternative Method to in-vivo Testing

"The results of this study for correlation between the in-vivo SPF and in-vitro SPF measured using SPF-290 analyzer are.....The in vitro SPF test method will be used as an alternative method for in vivo SPF and a new test item for quality control sunscreens."

– Drug Evaluation Department, Korea Food & Drug Administration,
5 Nokbun-dong, Eunpyung-gu, Seoul, Korea



Over 300 Customers Worldwide

- Avon
- BASF
- Clairol
- Elizabeth Arden
- Estee Lauder
- Good Housekeeping
- ISP
- Johnson & Johnson
- Lever Bros
- L'Oreal
- Mary Kay
- Merck
- Revlon
- Rohm & Haas
- Proctor & Gamble
- Unilever
- Andrew Jergens
- Helene Curtis
- Whitehall Robins
- Bayer
- S/C/Johnson
- Bristol-Myers Squibb
- Tanning Research
- Pfizer

The background of the entire page is a vibrant green sunburst pattern. The sunburst originates from a central point at the bottom and radiates outwards, creating a sense of energy and light. The rays are thin and closely spaced, filling the entire frame. In the center of the sunburst, the company name "SOLAR LIGHT" is displayed. "SOLAR" is in a bold, dark blue, sans-serif font, while "LIGHT" is in a lighter blue, spaced-out, sans-serif font. A registered trademark symbol (®) is positioned to the upper right of "SOLAR".

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