

Comparison of Leading SPF Analyzers

Characteristic	Solar Light SPF-290AS™ Analyzer	Labsphere UV-2000S Analyzer
Lamp	The SPF-290™ uses a filtered, ozone-free, continuous spectrum Xenon lamp that is similar to the lamp used in in-vivo studies so that the optical system provides light that is spectrally analogous to solar UV.	The UV-2000S uses a Xenon flash lamp which, by definition, is not a continuous source like those used in in-vivo studies.
Measurement Quality	<p>A high throughput scanning monochromator using rotating gratings and a UV optimized PMT detector were designed into the system to ensure high levels of throughput and provide maximum signal to noise ratio which are particularly important at high SPF values (>20) where light levels are low. See Application Note #2.</p> <ul style="list-style-type: none"> - Wavelength Accuracy: 0.2% (0.58 nm – 0.80 nm) - Spectral FWHM Bandwidth: 1.66nm - Absorbance: 0 - 3.2 A (Dual Doped PMMA Method) - Wavelength Step Interval (software) 1nm, 2nm, or 5nm. User selectable. - Wavelength Reproducibility: 0.25nm 	<p>The UV-2000S analyzer uses fixed gratings and a diode array rather than the high signal to noise combination of the scanning monochromator and PMT detector.</p> <ul style="list-style-type: none"> - Wavelength Accuracy: ±1 nm - Bandwidth: (FWHM): <4 nm - Absorbance: 0 - 2.7 A (Dual Doped PMMA Method) - Wavelength Step: (Data Interval) 1 nm
Automation	The X-Y stage and WinSPF software automate sample positioning and data acquisition, freeing the technician to prepare the next sample or engage in other productive activities. It positions the sample/substrate in the first position (of up to 12 configurable) while the analyzer makes the measurement. It then moves the substrate to the next location and the process is repeated. When all scans are complete, the stage returns the substrate to the load position. See Application Note #3 .	Not available. Manual stage.
Photostability/Time-based Measurements	The X-Y stage also enables Photostability/Time-based measurements. In this type of analysis, a measurement is made on a sample, a user-defined, computer-controlled, period of time elapses and then the stage precisely repositions the sample for another measurement. The time interval between scans can be up to an hour and as many as twelve measurements can be made.	Not available.
Accessories	Quartz plates available for formulations for which other media, e.g. PMMA plates, are unsuitable.	Not available.

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Standards	<p>The WinSPF Software is compatible with Windows® 7 and 10 using a standard USB connection to the system with data storage, retrieval and exporting features. The software runs the following tests:</p> <table border="0"> <tr> <td>Sunscreens</td> <td>Fabrics/Materials</td> </tr> <tr> <td>1. ISO 24443:2012 UVA Photoprotection</td> <td>10. AATCC 183:2010</td> </tr> <tr> <td>2. US FDA 2011 Critical Wavelength</td> <td>11. AS/NZS 4399</td> </tr> <tr> <td>3. US FDA UVA Protection Factor, UVA I/UV</td> <td>12. EN 13758-1:2001</td> </tr> <tr> <td>4. Boots Star Rating 2008</td> <td>13. BG/T 18830-2009</td> </tr> <tr> <td>5. COLIPA UVA Protection Factor:2011</td> <td></td> </tr> <tr> <td>6. AS/NZS 2604</td> <td></td> </tr> <tr> <td>7. SPF</td> <td></td> </tr> <tr> <td>8. Bare Substrate Analysis</td> <td></td> </tr> <tr> <td>9. UVA/UVB ratios</td> <td></td> </tr> </table> <p>Direct import feature works with ISO Spreadsheet to eliminate manual data entry.</p>	Sunscreens	Fabrics/Materials	1. ISO 24443:2012 UVA Photoprotection	10. AATCC 183:2010	2. US FDA 2011 Critical Wavelength	11. AS/NZS 4399	3. US FDA UVA Protection Factor, UVA I/UV	12. EN 13758-1:2001	4. Boots Star Rating 2008	13. BG/T 18830-2009	5. COLIPA UVA Protection Factor:2011		6. AS/NZS 2604		7. SPF		8. Bare Substrate Analysis		9. UVA/UVB ratios		<p>The Windows® 7 or 10 compatible software, capture, archival, retrieval and export data.</p> <p>Sunscreens</p> <ol style="list-style-type: none"> 1. UVA Photoprotection Method: ISO 24443 2. UVA Protection Factor: FDA UV1/UVA (2011) 3. Critical Wavelength: FDA (2011) 4. UVA Protection: Revised Boots Star Rating (2011) 5. UVA Protection Factor: COLIPA Method (2011) 6. SPF 7. Bare Substrate Analysis 8. UVA/UVB ratios <p>Fabric/ Materials Tests not available with UV-2000S. Fabrics/Materials Tests only available with Model UV-2000F. Not combined.</p>
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Integrating Sphere	Yes	Yes																				
Sample Exposure Area	<p>The SPF-290 has a 58% larger sample exposure area which will help mitigate lotion spreading inconsistencies.</p> <p>Sample Exposure Area: 1.25 cm²</p>	Sample Exposure Area: 0.79 cm ²																				
UV Dose	UV Dose Per Measurement Cycle: < 0.2 J/cm ²	UV Dose Per Measurement Cycle: < 0.2 J/cm ²																				
Validation Kit	Yes, see Application Note #5	Yes																				

Notes:

1. Comparison based on information available on 03/08/2017.
2. Solar Light and SPF-290 are trademarks of Solar Light Company, Inc.
3. Labsphere, UV-2000S and UV-2000F are trademarks of Labsphere, Inc.
4. Windows is a trademark of Microsoft Corporation.

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