

# Ultraviolet Protection Factor Report

To AATCC Method 183

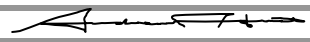
<b>Analyzed for:</b>		CUSTOMER	WO# 1XXXX
DESCRIPTION			
<b>Sample Type: FABRIC</b>	<b>Number of Specimens Analyzed: 2</b>		Top side; 3 places ea.
	<b>Sample Information</b>	<b>TYPE</b>	<b>Sample Color / Designation:</b>
	<b>COLOR</b>		
<b>Protection Factor Results</b>			
<b>UNSTRETCHED (RELAXED)</b>			
<b>Mean UVB Transmission:</b>	X.YY%		
<b>Mean UVATransmission:</b>	Y.YY%		
<b>Mean UVA+B Transmission:</b>			
<b>Mean UPF</b>	XX.Y		
<b>UPF RATING</b>	<b>XX.YY</b>		
<b>Standard Deviation:</b>	X.YY		
<b>Standard Error of the Mean:</b>	X.YY		
<b>Label UPF:</b> Ranges from 15 to 50, and 50+.	<b>XX</b>		
<b>% Block(UVA)</b>	9X.Y%		
<b>% Block(UVB)</b>	9X.Y%		
<b>Protection Category:</b>			

The maximum instrumental contribution to the uncertainty in the transmittance values T(%) used to calculate the results is 0.0024 at the 99% confidence level.

## Review of Results

This fabric is effective as protection against solar ultraviolet radiation (UVR) as it has an ultraviolet protection factor (UPF) greater than **XX**. Material with UPF rating of XX reduces the amount of solar UVR by a factor of **YY**. (**Z.Z%** transmission) A UPF rating of **XX** qualifies fabric for the UPF VVVVVVV protection category. The assigned UPF rating of **XX** may be quoted for advertising purposes. The UPF rating is for the material in the configuration tested only and does not address the design of the product. A garment can only protect the areas of skin that are covered by the material.

*Unless otherwise stated the sample was tested unstretched and dry. The results in this report are applicable to the sample tested and may not apply to other batches of the samematerial or similar materials. It is a condition the provision of these test results that you do not use Solar Light, or any words, marks or devices which may imply a connection with Solar Light, in connection with the promotion or sale of your products, unless Solar Light has given express written authority to do so. This test report may only be reproduced in full and without alteration.*



## Statistical Uncertainties

**Total Measurement Uncertainty:** This is a measure of the total uncertainty in the analysis and is equivalent to the Standard Error of the Mean.

**Coverage factor (99% confidence):** Known as **t-variate** This is a statistical value used in calculation of the Standard Error of the Mean, calculated at the 99% confidence level.

## Review of Results

### Additional Information

**UVA:** Ultraviolet radiation in the region 315 nanometres to 400 nanometres.

**UVB:** Ultraviolet radiation in the region 290 nanometres to 315 nanometres.

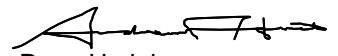
### How UPF ratings are calculated:

1. The transmission of ultraviolet through the material is determined using a calibrated ultraviolet transmission analyser. Measurements are made on at least four specimens.
2. The UPF result for each measurement is calculated.
3. The separate UPF values are averaged to determine the mean UPF.
4. The standard deviation is calculated.
5. The standard error is calculated.
6. The standard error is subtracted from the mean UPF.
7. This value is rounded down to the nearest multiple of five to determine the reported UPF rating. The UPF rating also determines the Protection Category assigned to the material.

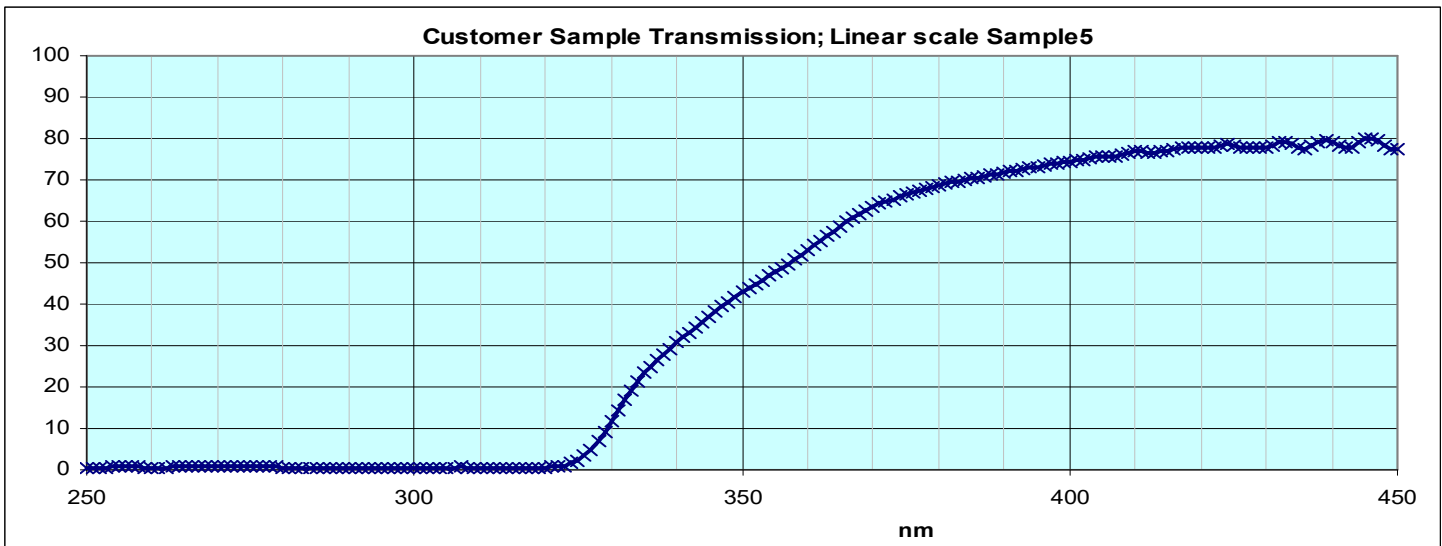
**UPF rating - rounding down:** The calculated UPF value (or lowest measured value) is rounded down to the nearest multiple of five to give the reported UPF rating. One effect of this is that materials actually need to achieve a calculated UPF value of 55 or higher in order to be classified as UPF 50+. In this case the Standard Deviation and Standard Error are not applicable and are not reported.

**Transmittance vs. Transmission: UPF Test Standards** cite that UVA and UVB radiation passing through the test sample is reported as transmittance. The transmittance scale is from 0 to 1. A familiar unit is transmission which has a scale from 0% to 100%. To convert from transmittance to transmission, multiply the transmittance value by 100.

**SOLAR  
L I G H T**

  
Drew Hmiel

Copyright 2017  
All rights reserved



The calculation and expression of results is similar in EN 13758-1, AATCC-183 and AS/NZS 4399.

All three standards report results as an UPF rating. When samples are found to have a UPF rating over 50, EN 13758-1 reports them as > 50 whereas ASTM D6603 and AS/NZS4399 report them as 50+.

EN 13758-1 (and BS 7914) stipulates that fabric samples are to be conditioned at a specified temperature and humidity before testing. AS/NZS 4399 does not specify any conditioning. ASTM D6603 specifies that the fabric samples should be conditioned with laundering, UV exposure and chlorinated pool water equivalent to two years of normal use.

EN 13758-1 and AATCC 183 uses a solar spectrum measured in Albuquerque whereas AS/NZS 4399 uses a solar spectrum measured in Melbourne. UPF results calculated with either spectrum do not differ significantly.

EN 13758-1 and AATCC 183 provide for reporting of measurements made when the fabrics are wet and/or stretched.

AS/NZS 4399 currently specifies testing in the dry and relaxed state only. AS/NZS 4399 specifies testing and labeling requirements whereas EN 13758-1 is concerned only with testing. ASTM D6603 specifies USA labeling requirements.