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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-01
Client Reference: 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Aquatic Blue
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Aquatic Blue Synthesis Commercial 95 Shadecloth

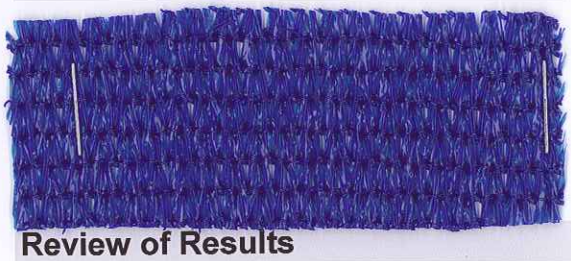
Shadecloth Test Results

Cover Factor:	92.8 ± 4.1
Shade Factor:	87.4 ± 5.0
% Tav:	12.6 ± 5.0
% UVA	8.2 ± 3.8
% UVB	7.7 ± 4.0
% UVR:	7.3 ± 3.8
% PAR:	14.7 ± 5.4
% UVR Block:	92.7 ± 3.8

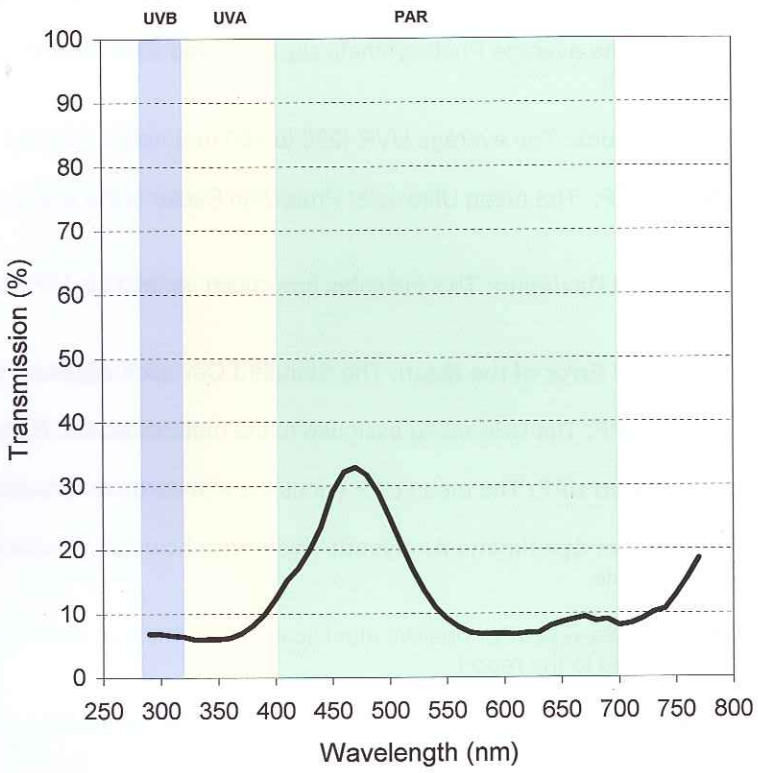
UPF Results

Mean UPF:	14.0
Standard Deviation:	3.7
Standard Error of the Mean:	3.8
Calculated UPF:	10.2
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-02
Client Reference: 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Black
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Black Synthesis Commercial 95 Shadecloth

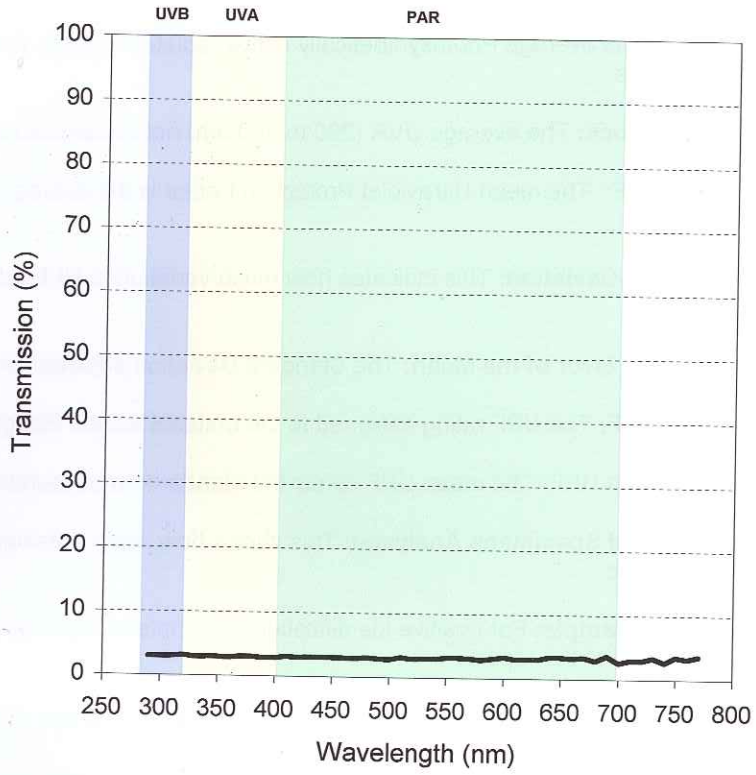
Shadecloth Test Results

Cover Factor:	96.7 ± 3.6
Shade Factor:	96.9 ± 3.6
% Tav:	3.1 ± 3.6
% UVA	3.3 ± 4.1
% UVB	3.4 ± 4.4
% UVR:	3.0 ± 3.6
% PAR:	3.1 ± 3.7
% UVR Block:	97.0 ± 3.6

UPF Results

Mean UPF:	47.1
Standard Deviation:	40.2
Standard Error of the Mean:	41.4
Calculated UPF:	5.8
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Transmission Characteristics



Material Sample

Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-03 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth **Sample Colour:** Brunswick Green
Analysis Date: 17/03/2009 **Instrumentation:** Varian Cary 50, s/n EL05083263

Description: Brunswick Green Synthesis Commercial 95 Shadecloth

Shadecloth Test Results

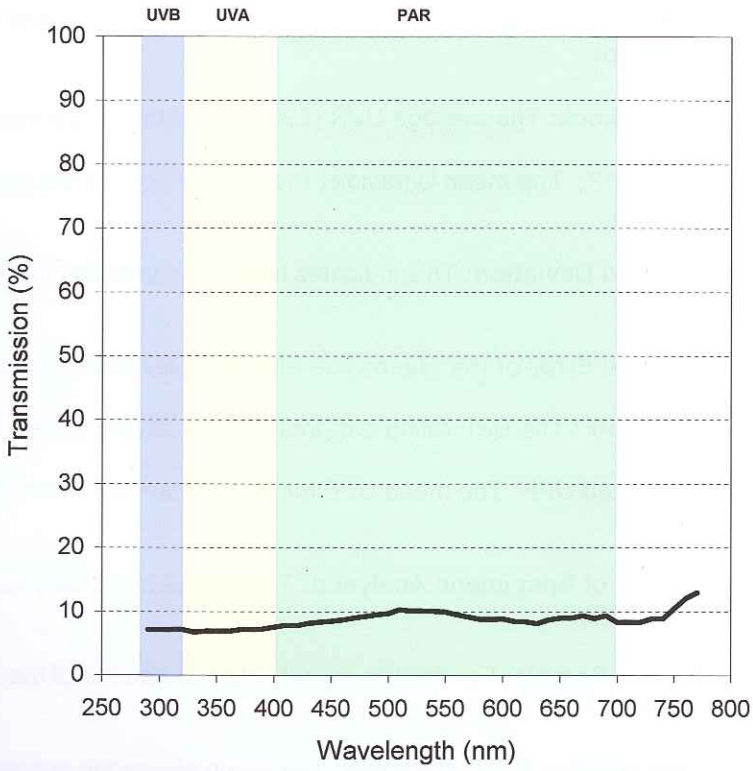
Cover Factor:	92.8 ± 6.8
Shade Factor:	91.3 ± 6.7
% Tav:	8.7 ± 6.7
% UVA	7.3 ± 4.1
% UVB	7.4 ± 4.5
% UVR:	7.1 ± 6.8
% PAR:	9.0 ± 6.7
% UVR Block:	92.9 ± 6.8

UPF Results

Mean UPF:	15.1
Standard Deviation:	6.5
Standard Error of the Mean:	6.6
Calculated UPF:	8.5
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample

Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-04 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Charcoal
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Charcoal Synthesis Commercial 95 Shadecloth

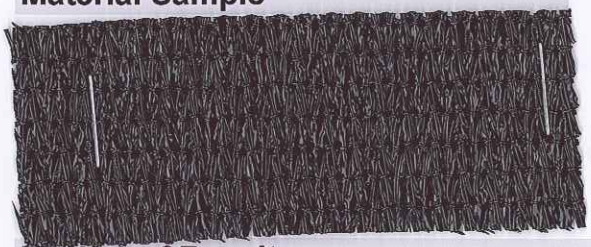
Shadecloth Test Results

Cover Factor:	94.7 ± 3.3
Shade Factor:	94.2 ± 3.2
% Tav:	5.8 ± 3.2
% UVA	5.3 ± 5.2
% UVB	5.5 ± 5.5
% UVR:	5.3 ± 3.2
% PAR:	5.8 ± 3.1
% UVR Block:	94.7 ± 3.2

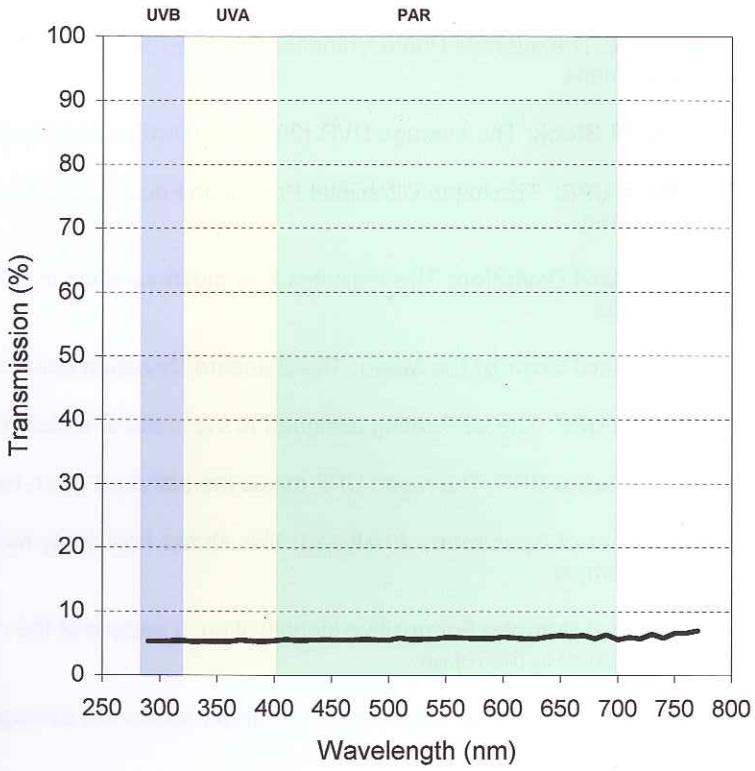
UPF Results

Mean UPF:	23.2
Standard Deviation:	11.5
Standard Error of the Mean:	11.8
Calculated UPF:	11.4
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-05 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Cherry Red
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Cherry Red Synthesis Commercial 95 Shadecloth

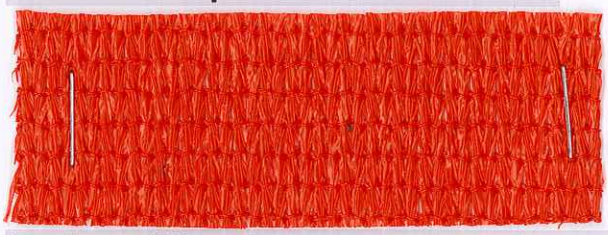
Shadecloth Test Results

Cover Factor:	90.1 ± 4.4
Shade Factor:	75.3 ± 6.5
% Tav:	24.7 ± 6.5
% UVA	10.1 ± 4.0
% UVB	8.5 ± 3.9
% UVR:	10.7 ± 4.2
% PAR:	22.4 ± 6.2
% UVR Block:	89.3 ± 4.2

UPF Results

Mean UPF:	12.1
Standard Deviation:	3.2
Standard Error of the Mean:	3.3
Calculated UPF:	8.8
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



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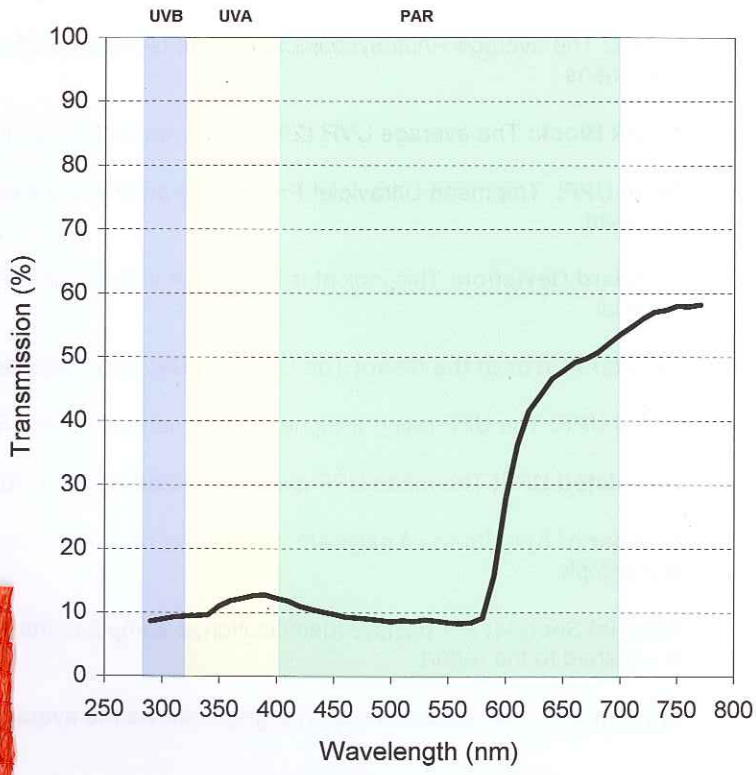

Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-06 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth **Sample Colour:** Desert Sand
Analysis Date: 17/03/2009 **Instrumentation:** Varian Cary 50, s/n EL05083263

Description: Desert Sand Synthesis Commercial 95 Shadecloth

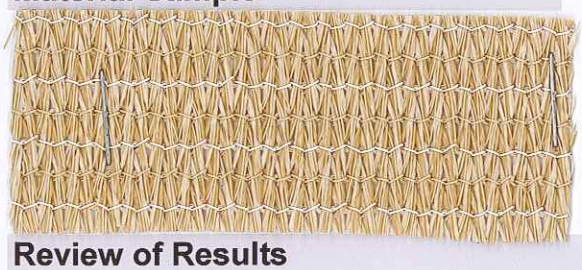
Shadecloth Test Results

Cover Factor:	90.6 ± 3.8
Shade Factor:	80.8 ± 4.7
% Tav:	19.2 ± 4.7
% UVA	9.6 ± 7.8
% UVB	9.6 ± 8.3
% UVR:	8.1 ± 3.7
% PAR:	20.4 ± 4.6
% UVR Block:	91.9 ± 3.7

UPF Results

Mean UPF:	12.1
Standard Deviation:	4.7
Standard Error of the Mean:	4.9
Calculated UPF:	7.2
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



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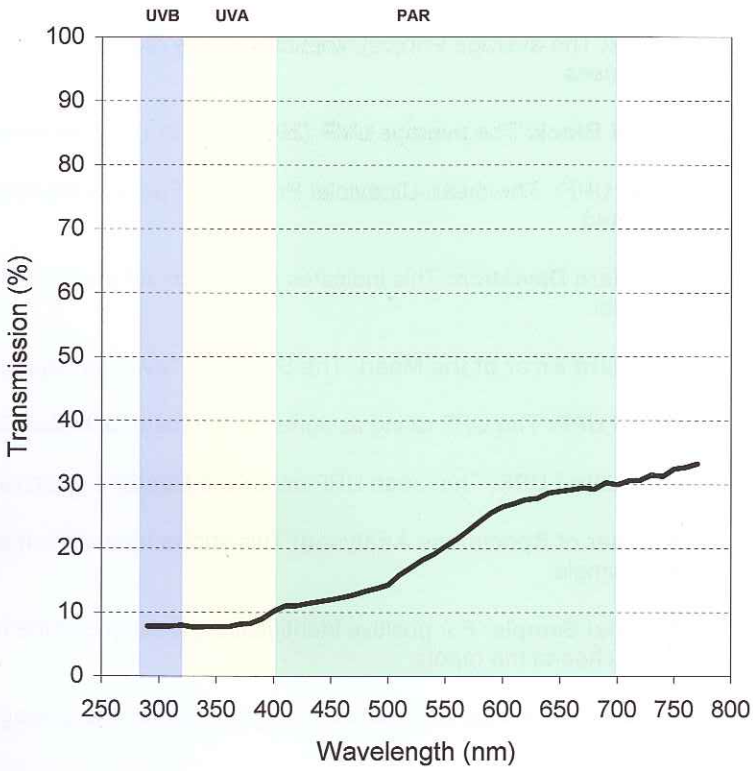

Review of Results

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-07 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Deep Ochre
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Deep Ochre Synthesis Commercial 95 Shadecloth

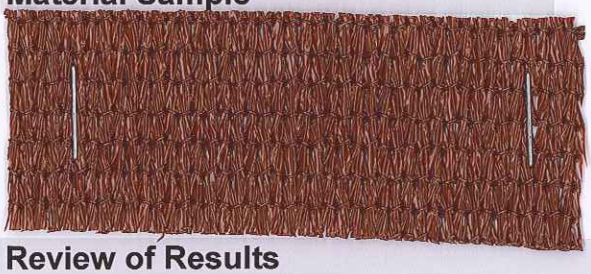
Shadecloth Test Results

Cover Factor:	95.1 ± 3.0
Shade Factor:	91.3 ± 4.0
% Tav:	8.7 ± 4.0
% UVA	5.1 ± 4.9
% UVB	4.9 ± 5.3
% UVR:	5.6 ± 3.1
% PAR:	8.5 ± 3.7
% UVR Block:	94.4 ± 3.1

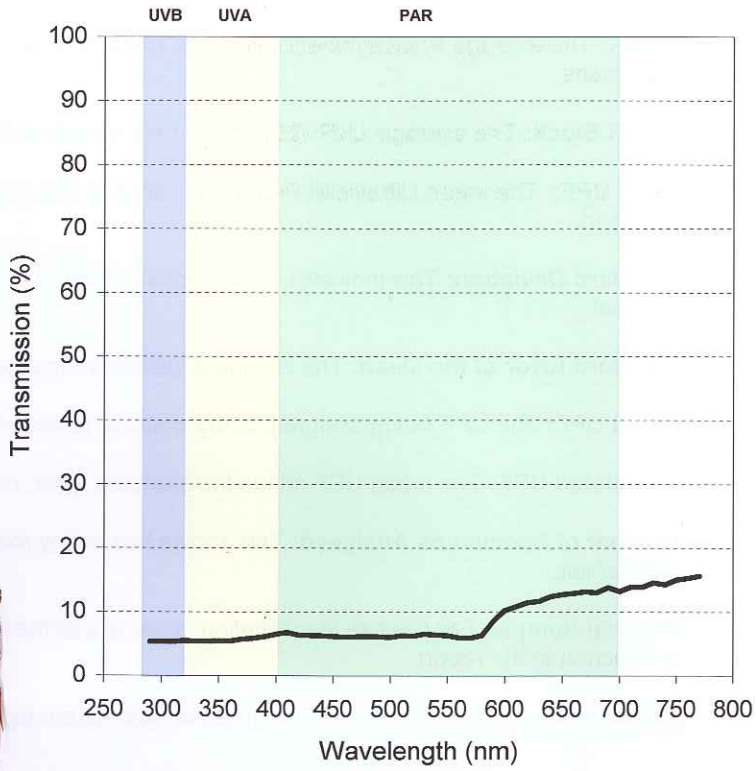
UPF Results

Mean UPF:	26.3
Standard Deviation:	13.8
Standard Error of the Mean:	14.2
Calculated UPF:	12.1
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

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When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-08 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth **Sample Colour:** Natural
Analysis Date: 17/03/2009 **Instrumentation:** Varian Cary 50, s/n EL05083263

Description: Natural Synthesis Commercial 95 Shadecloth

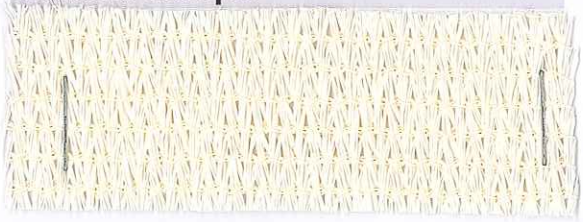
Shadecloth Test Results

Cover Factor:	91.8 ± 3.2
Shade Factor:	73.4 ± 8.1
% Tav:	26.6 ± 8.1
% UVA	8.6 ± 5.3
% UVB	8.4 ± 5.6
% UVR:	5.9 ± 3.4
% PAR:	30.8 ± 9.3
% UVR Block:	94.1 ± 3.4

UPF Results

Mean UPF:	13.2
Standard Deviation:	4.8
Standard Error of the Mean:	4.9
Calculated UPF:	8.3
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



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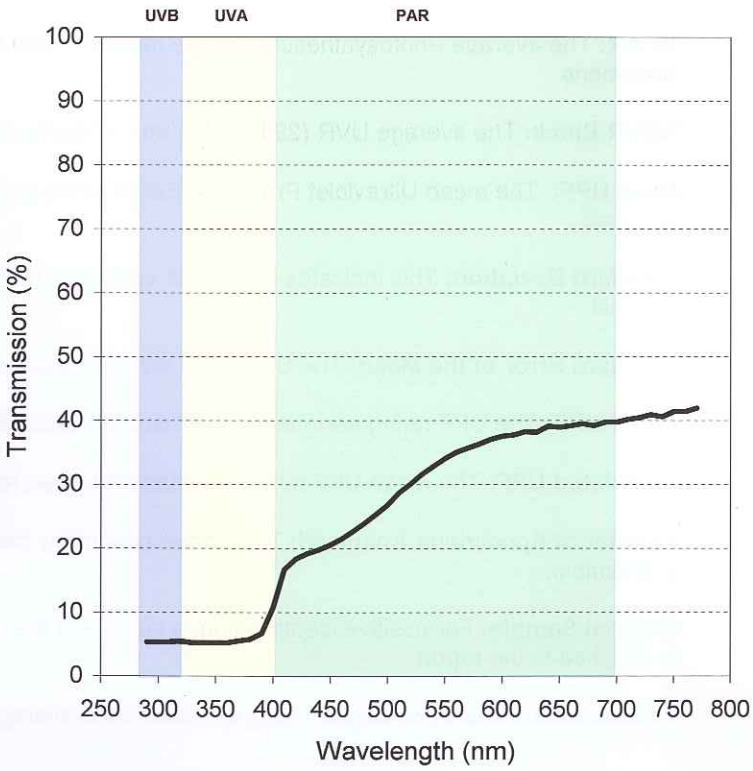

Review of Results

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-09 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Navy Blue
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Navy Blue Synthesis Commercial 95 Shadecloth

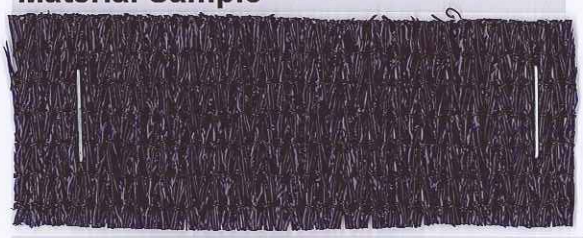
Shadecloth Test Results

Cover Factor:	96.2 ± 3.2
Shade Factor:	94.4 ± 3.5
% Tav:	5.6 ± 3.5
% UVA	4.1 ± 4.0
% UVB	4.0 ± 4.3
% UVR:	4.8 ± 3.3
% PAR:	5.7 ± 3.4
% UVR Block:	95.2 ± 3.3

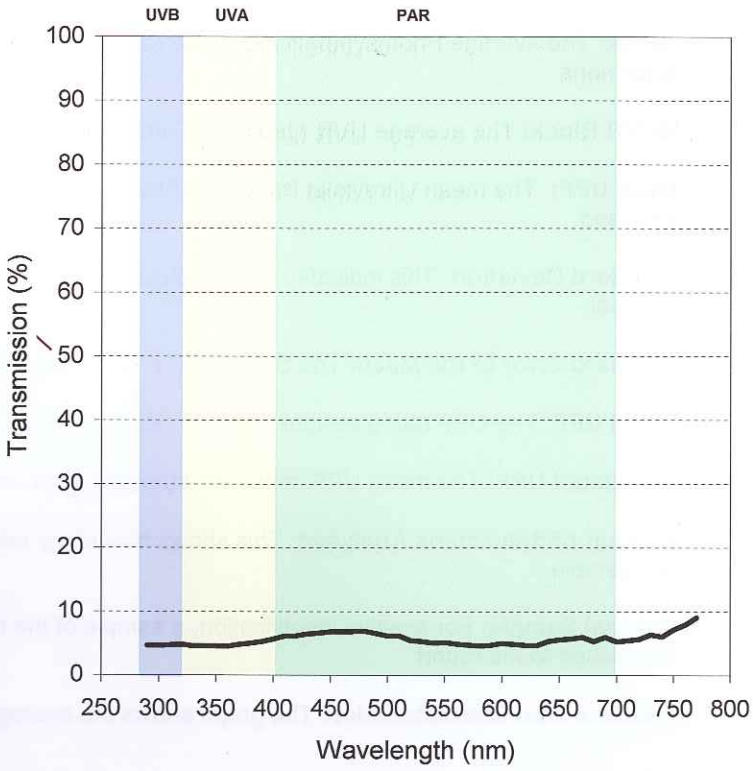
UPF Results

Mean UPF:	33.3
Standard Deviation:	18.1
Standard Error of the Mean:	18.6
Calculated UPF:	14.7
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-10 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: River Gum Green
Instrumentation: Varian Cary 50, s/n EL05083263

Description: River Gum Green Synthesis Commercial 95 Shadecloth

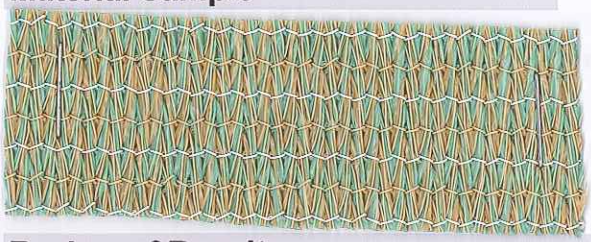
Shadecloth Test Results

Cover Factor:	94.7 ± 7.0
Shade Factor:	85.0 ± 8.5
% Tav:	15.0 ± 8.5
% UVA	5.7 ± 4.1
% UVB	5.5 ± 4.3
% UVR:	7.7 ± 7.0
% PAR:	15.6 ± 8.6
% UVR Block:	92.3 ± 7.0

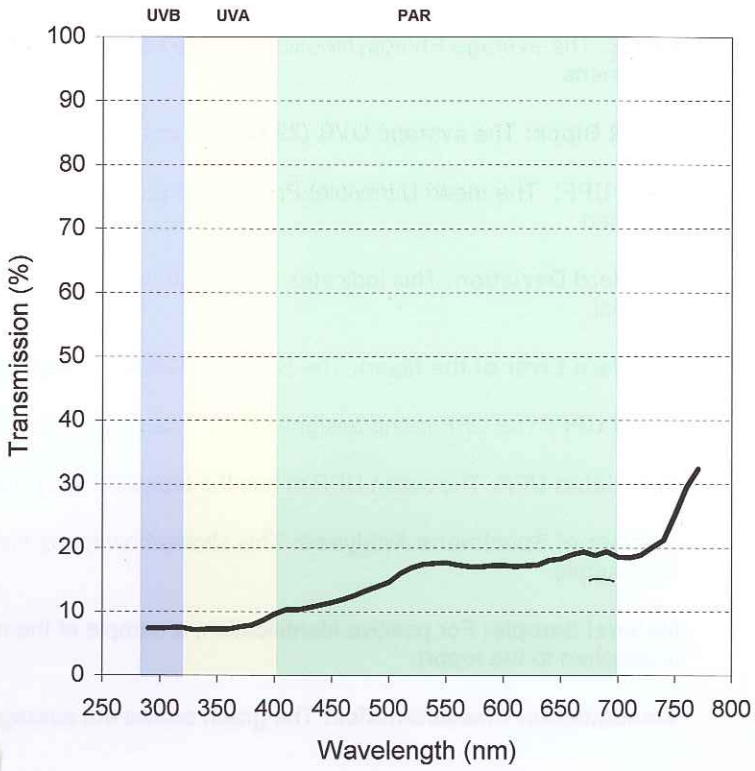
UPF Results

Mean UPF:	20.8
Standard Deviation:	8.0
Standard Error of the Mean:	8.2
Calculated UPF:	12.6
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-11 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Sky Blue
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Sky Blue Synthesis Commercial 95 Shadecloth

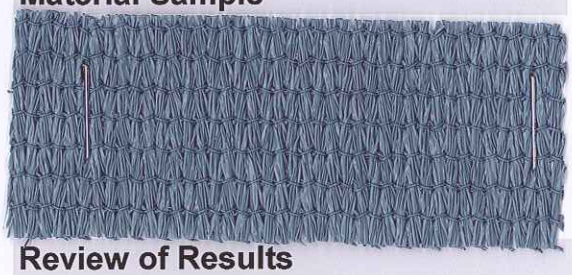
Shadecloth Test Results

Cover Factor:	95.2 ± 4.0
Shade Factor:	90.4 ± 4.2
% Tav:	9.6 ± 4.2
% UVA	5.3 ± 3.2
% UVB	5.0 ± 3.4
% UVR:	6.2 ± 4.0
% PAR:	9.9 ± 4.3
% UVR Block:	93.8 ± 4.0

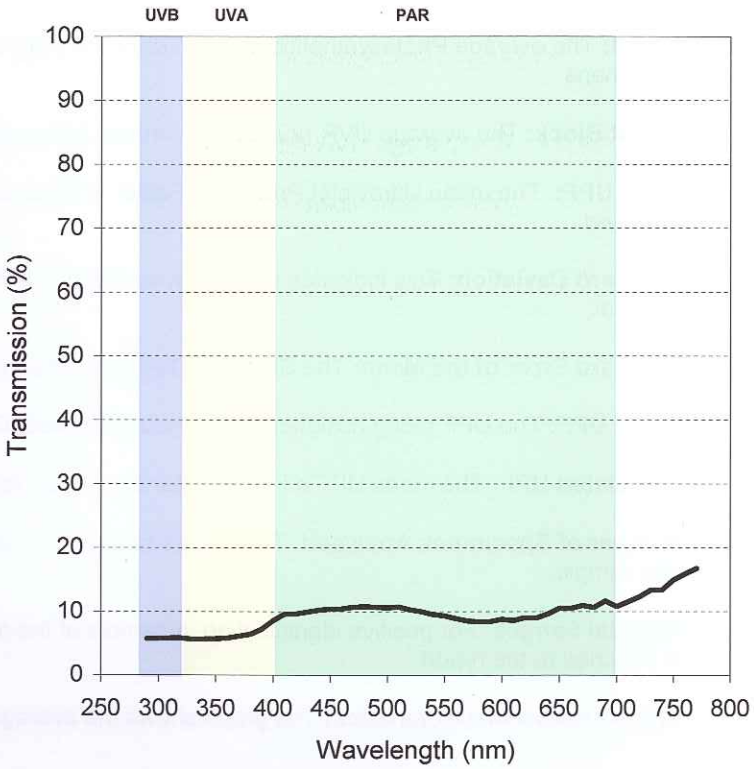
UPF Results

Mean UPF:	21.3
Standard Deviation:	5.1
Standard Error of the Mean:	5.3
Calculated UPF:	16.0
Rated UPF:	15
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-12 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Steel Grey
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Steel Grey Synthesis Commercial 95 Shadecloth

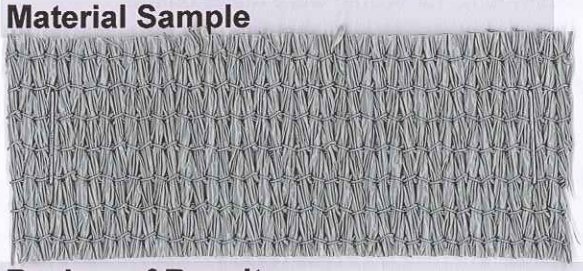
Shadecloth Test Results

Cover Factor:	95.6 ± 8.6
Shade Factor:	88.4 ± 9.3
% Tav:	11.6 ± 9.3
% UVA	5.0 ± 4.0
% UVB	4.7 ± 4.3
% UVR:	7.0 ± 8.7
% PAR:	12.3 ± 9.4
% UVR Block:	93.0 ± 8.7

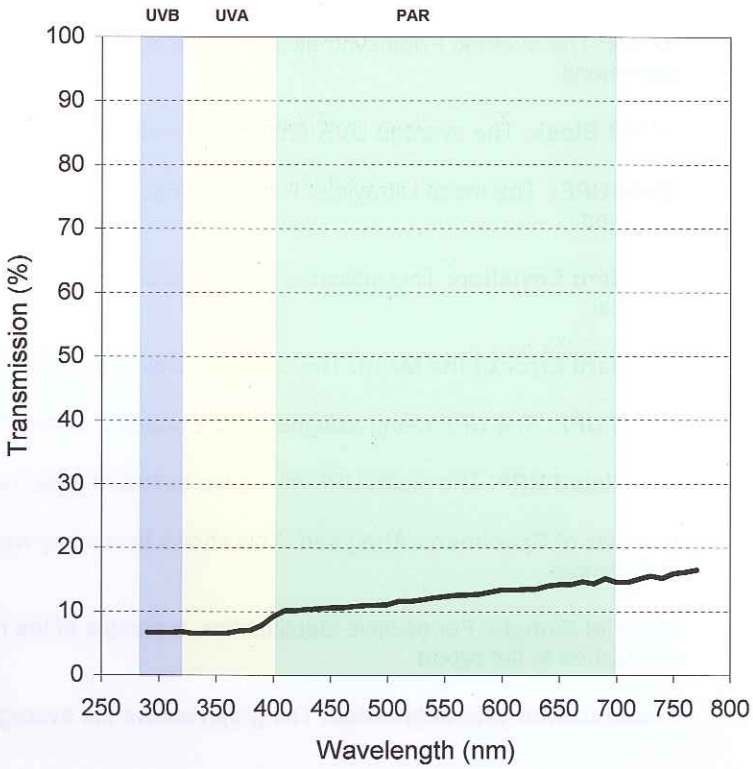
UPF Results

Mean UPF:	26.1
Standard Deviation:	12.6
Standard Error of the Mean:	13.0
Calculated UPF:	13.1
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-13 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Turquoise
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Turquoise Synthesis Commercial 95 Shadecloth

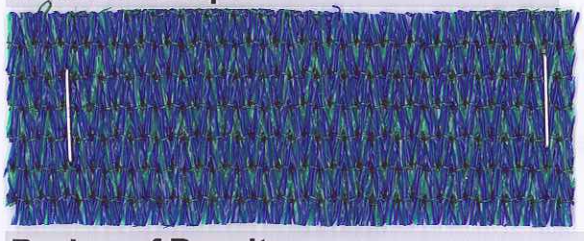
Shadecloth Test Results

Cover Factor:	94.0 ± 4.9
Shade Factor:	90.0 ± 5.2
% Tav:	10.0 ± 5.2
% UVA	6.5 ± 4.9
% UVB	6.4 ± 5.2
% UVR:	5.7 ± 4.8
% PAR:	11.7 ± 5.2
% UVR Block:	94.3 ± 4.8

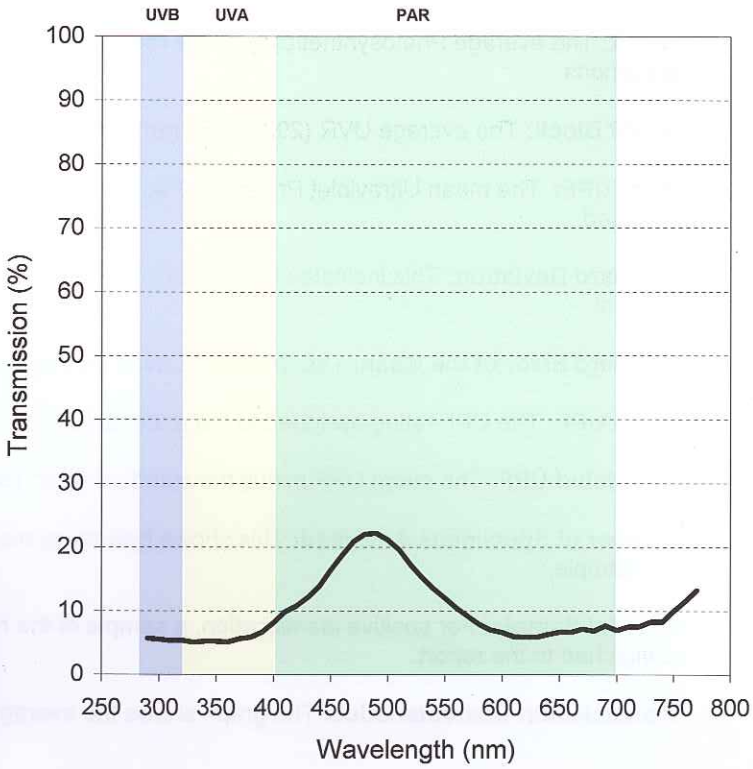
UPF Results

Mean UPF:	18.0
Standard Deviation:	6.0
Standard Error of the Mean:	6.2
Calculated UPF:	11.9
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample



Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Shadecloth Test Report

Analysed for: Gale Pacific
ARPANSA Ref: 7264-14 **Client Reference:** 49

Sample Information

Sample Type: Shadecloth
Analysis Date: 17/03/2009
Sample Colour: Yellow
Instrumentation: Varian Cary 50, s/n EL05083263

Description: Yellow Synthesis Commercial 95 Shadecloth

Shadecloth Test Results

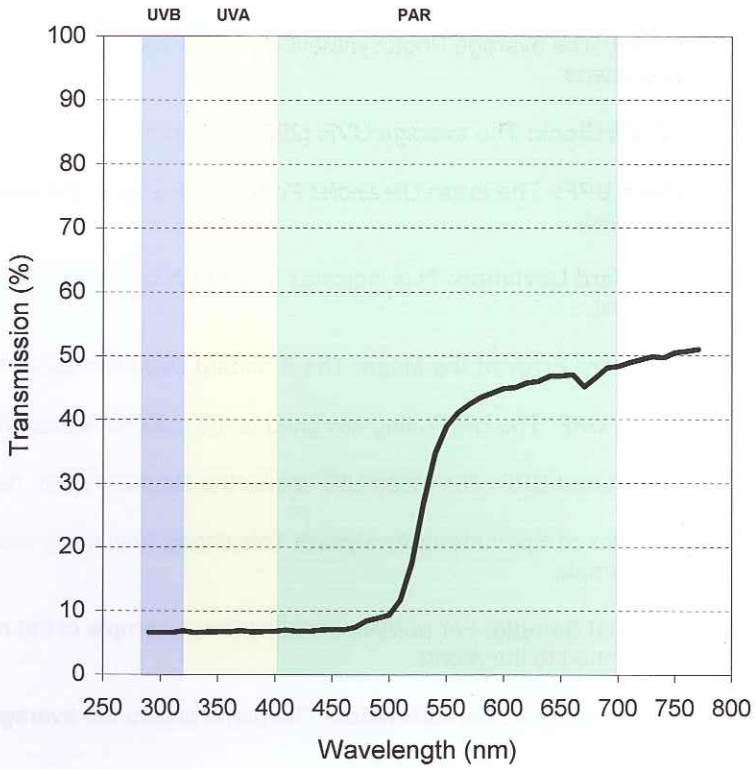
Cover Factor:	94.3 ± 4.9
Shade Factor:	73.1 ± 8.5
% Tav:	26.9 ± 8.5
% UVA	5.9 ± 4.7
% UVB	5.8 ± 5.0
% UVR:	6.7 ± 4.9
% PAR:	28.8 ± 9.0
% UVR Block:	93.3 ± 4.9

UPF Results

Mean UPF:	22.0
Standard Deviation:	13.2
Standard Error of the Mean:	13.5
Calculated UPF:	8.5
Rated UPF:	Unrated
Number of Specimens Analysed:	10

Material Sample

Transmission Characteristics



Review of Results

When designing shade structures, shade sails or other shade devices consider using the highest rated shadecloth available. Note that the UPF rating is for the material only and does not address the design of the product.

When shadecloth is to be used for domestic purposes such as shade structures or umbrellas, ultraviolet radiation transmission figures or solar radiation figures should be used as a guide only. These figures do not take into account vital factors such as the design and size of the shade structure, the distance of the shadecloth from the subjects, reflected and diffuse solar irradiance and the physical location of the subjects within the shade structure (e.g. at the edge or at the centre).

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Explanatory notes for Ultraviolet Protection Factor (UPF) reports

At ARPANSA, UPF testing is carried out in accordance with Australian Standard AS/NZS4399:1996 Sun protective clothing – Evaluation and classification. The ARPANSA UPF Testing Service is a NATA-accredited laboratory. These notes are intended as a guide to interpretation of ARPANSA UPF test reports. Each major heading corresponds to a section of the UPF report. Beneath each heading is a brief explanation of the important information presented in that section of the report. The Additional Information section defines some terms that may appear on UPF test reports and provides extra information that may be useful when interpreting reports.

An important note about sampling
The results reflect the sample tested by the laboratory. In order to achieve meaningful results, the sample tested must be representative of the material that is being used to make the products. Many materials show significant batch to batch variation in UPF rating and materials of similar specification from different manufacturers can show large variations. To ensure products are correctly labelled with a UPF rating the material tested should be the actual production material.

If you have any questions about ARPANSA UPF test reports please contact the ARPANSA UPF Testing Service on +61 3 9433 2211, or at upf-testing@arpansa.gov.au.

Client Information

Analysed for: The name of the client that the analysis was performed for.

ARPANSA Reference: A unique code identifying this test report. Please quote this code if there are any questions about the test report.

Sample Information

Description: Description of the sample analysed. Includes the material colour and type and any other relevant information provided such as manufacturer, quality, batch and weight. The weight (mass) of the test sample is measured and reported here, if applicable. Weights are reported in grams per square meter (gsm) and are reported to an accuracy of ± 1 gram. The weight reported is typically the mean of eight of more sample weighings.

Sample Type: AS/NZS4399 requires that the material type be reported.

Sample Colour: AS/NZS4399 requires that the material colour be reported.

Analysis Date: The date the sample was tested.

Instrumentation: The type of instrument used to perform the analysis.

UV Transmittance Characteristics

The graph shows the average of the measured transmittances.

Protection Factor Results

Number of Specimens Analysed: This shows how many UPF measurements (or scans) were made on the test sample. For variable samples more scans may be performed.

Mean UVB Transmittance: This is the average UVB radiation passing through the test specimens.

Mean UVA Transmittance: This is the average UVA radiation passing through the test specimens.

Mean UPF: The mean UPF is the average of the UPF values of each specimen analysed.

Standard Deviation: This indicates how much variation in UPF rating there is across the surface of the material.

Standard Error of the Mean: This is the Standard Deviation adjusted for the number of specimens analysed.

Rated UPF: This is the UPF rating assigned to the material tested. Ranges from 15 to 50, and 50+.

Protection Category: This is the Protection Category assigned to the material tested. May be Good protection, Very good protection or Excellent protection.

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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** in AS/NZS4399. This is a statistical value used in calculation of the Standard Error of the Mean, calculated at the 99% confidence level.

Review of Results

In this section the effectiveness of the material for sun protection is described. There may also be observations about the test samples, test results or products tested.

Material Sample

For positive identification, a sample of the material tested, or an image of the product, is attached to the report, if applicable.

Signatures

Every page of the report is signed by the technician who performed the analysis and by an ARPANSA or NATA signatory.

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 the 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+.

Reporting of high results: If the calculated UPF rating is over 300 then ARPANSA reports it as ">300" (greater than 300). In this case the Standard Deviation and Standard Error are not applicable and are not reported.

Transmittance vs. Transmission: AS/NZS4399 stipulates that UVA and UVB radiation passing through the test sample is reported as transmittance. The transmittance scale is from 0 to 1. A more familiar unit is **transmission** which has a scale from 0% to 100%. To convert from transmittance to transmission, multiply the transmittance value by 100.

For further information about sun protection, sun protective materials and Ultraviolet Protection Factor testing, refer to http://www.arpansa.gov.au/uvrg/rginfo.htm