



Explanatory notes for Shade Fabric Report/Certificate of Analysis

ARPANSA's Shade Fabric Testing Service is a NATA-accredited laboratory ([Site No. 22002 - NATA](#)), conducting testing in accordance with the Australian Standard AS 4174:2018 Knitted and Woven Shade Fabrics (Amd 1: 2019).

These notes are designed to support you in understanding your ARPANSA Shade Fabric test report (also referred to as a Certificate of Analysis). Each heading matches a section of the report and includes definitions and detailed explanations of the key information you need to know. The 'Additional Information' section explains common terms you may find in the report and provides extra guidance to help you interpret your results.

Which standard do we use for shade fabric?

ARPANSA applies AS 4174:2018 Knitted and Woven Shade Fabrics standard ('the Standard') to all fabrics, intended for shade. This includes shade fabrics intended for sun protection in horticultural and human applications.

Products tested in accordance with AS 4174:2018 Knitted and Woven Shade Fabrics will be issued with a test report, which includes:

- (a) Mass per unit area
- (b) Cover factor of the shade fabric, designation and colour code of the shade fabric (for horticultural applications).
- (c) Average percentage transmittance (Ultraviolet-Visible Transmittance), the shade factor, the average percentage ultraviolet radiation (UVR) transmittance, the percentage UVR block and the average percentage photosynthetically active radiation (PAR) transmittance (for horticultural applications).
- (d) Ultraviolet Effectiveness rating (UVE%), and protection category (for Human protection applications).

Sampling

To ensure products are correctly labelled in accordance with AS 4174:2018 Knitted and Woven Shade Fabrics standard, the material supplied to be tested should be the actual production material.

The ARPANSA test report reflects only the results of the actual sample tested by the laboratory.

It's important to note, materials can show significant batch-to-batch variation, and materials of similar specification from different manufacturers can show large variations.

Definitions

For the purpose of ARPANSA shade fabric reports, the definitions below apply:

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 you have any questions about the test report.

Analysis Date: The date the sample was tested.

Sample information

Sample Weight: The weight (mass) of the test sample is measured in accordance with AS 2001.2.13 and reported here. Weights are reported in grams per square meter (gsm), to an accuracy of ± 1 gram.

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

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

Description: Description of the sample analysed. This includes the material colour and the type of construction (i.e. knitted or woven), and any other relevant information provided such as manufacturer, quality and batch.

UV-visible transmittance characteristics

The graph shows the average of the measured transmittances, with a scale from 0 to 1, of the specimens from 290 to 770 nanometres (nm) wavelengths in 10 nm steps. Please refer below for more information regarding transmittance related calculations.

Shade fabric results for horticultural applications

Cover Factor: This is the UV radiation (350 nm) transmitted through the test sample determined in accordance with AS 4174:2018 Appendix A.

UV-Visible Transmittance (%): This is the Average Percentage Transmittance (290 nm-770 nm) ($\% \tau_{av}$) of the test sample in accordance with AS 4174:2018 Appendix B.

Shade Factor: This is the percentage of normally incident UV-Visible radiation (290 nm-770 nm) not transmitted through the test sample determined in accordance with AS 4174:2018 Appendix B.

UVR Transmittance (%): This is the average percentage UVR (290 nm-400 nm) transmittance ($\% \text{UVR}_{av}$) of the test sample calculated in accordance with AS 4174:2018 Appendix B.

UVR Block (%): This is the percentage UVR block of the test sample determined in accordance with AS 4174:2018 Appendix B.

PAR Transmittance (%): This is the average percentage photosynthetically active radiation (% PAR_{av}) transmittance in the range 400 nm to 700 nm determined in accordance with AS 4174:2018 Appendix B.

Designation: This is the designation of the test sample as set out in AS 4174:2018: Table 2. 1 – Designation and colour code according to cover factor range for horticultural application. The determined cover factor as above and its range shall be used to determine the designation of the test sample.

Colour Code: This is the colour code of the test sample as set out in AS 4174:2018: Table 2. 1 – Designation and colour code according to cover factor range for horticultural application. The determined cover factor as above and its range shall be used to determine the colour code of the test sample.

Shade fabric results for human protection applications

Ultraviolet Effectiveness (UVE %): This is the calculated UVE (%) of the test sample determined in accordance with AS 4174:2018 Appendix D. The UVE is a measure of the ability of a fabric to block ultraviolet radiation (290 nm to 400 nm) as defined in AS 4174:2018.

Standard Deviation (Std Dev): This the standard deviation of the mean UVE (%) determined in accordance with AS 4174:2018 Appendix D.

Protection Category: This is the protection category of the test sample as set out in AS 4174:2018: Table 3. 1 – Ultraviolet effectiveness (UVE) classification system. The determined calculated UVE (%) of the shade fabric and its range shall be used to determine the protection category of the of the test sample.

Review of results

This section outlines key information that forms part of the mandatory labelling requirements in accordance with AS 4174:2018. It also references additional requirements, which are summarised in the accompanying email for this report.

There may also be observations about the test samples, test results or products tested.

Material sample

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

Signatures

Each page of the report is signed by the technician who performed the analysis and by an approved signatory.

Disclaimer

This explains that the test results only apply to the specific sample tested under set conditions and may not represent other materials or batches. It also clarifies that the work followed a recognised standard, and it prevents the results from being used in marketing or promotion in a way that suggests ARPANSA or the Australian Government endorses the product without specific permission.

Additional information

Shade Factor: Shade factor is given by $\text{Shade factor} = 100 - \text{UV-Visible Transmittance (\%)}$.

UVR Block (%): Percentage UVR block is given by $\text{UVR Block (\%)} = 100 - \text{UVR Transmittance (\%)}$.

AS 4174:2018 - Table 2. 1 – Designation and colour code according to cover factor range for horticultural application

Type of shade fabric	Designation of shade fabric	Cover factor range %	Colour code
Knitted or woven	Ultra -light cover	10 to 25	Black
	Extra -light cover	26 to 49	Dark green
	Light cover	50 to 63	Red or orange
	Medium cover	64 to 73	Blue
	Heavy- cover	74 to 83	White
	Extra-heavy cover	84 to 93	Lime green
	Ultra-heavy cover	94+	Beige

AS 4174:2018 - Table 3. 1 – Ultraviolet effectiveness (UVE) classification system

UVE, (%)	Protection category
80.0 to 90.9	Effective
91.0 to 94.9	Very effective
95.0+	Most effective

Transmittance vs Transmission: The typical 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.

A note about AS 4399:2020 Sun Protective Clothing - evaluation and classification standard

Historically, the standard AS/NZS 4399:2017: Sun Protective Clothing, was also used for shade fabric testing. This standard has been superseded by the 2020 edition. AS 4399:2020 now explicitly excludes shade fabrics from the scope of the standard.

This Standard (i.e. AS 4399: 2020) excludes the following:

- (a) *Sunglasses.*
- (b) *Sunscreen products for topical application to human skin.*
- (c) *Materials for architectural or horticultural use such as shade cloth.*
- (d) *Items which offer protection at a distance from the skin such as shade structures.*
- (e) *Protection from UVR from sources other than sun.*

ARPANSA cannot apply a Ultraviolet Protection Factor (UPF) rating to shade fabric or other excluded items.

If you have any questions about ARPANSA UPF test reports, please contact ARPANSA Ultraviolet Radiation Services on +61 3 9433 2309, or at uvr-services@arpansa.gov.au. For further information about sun protection, sun protective materials and UPF testing, refer to www.arpansa.gov.au/uv

ARPANSA Ultraviolet Radiation Services
June 2026