

Australian/New Zealand Standard[®]

**Sun protective clothing—
Evaluation and classification**

AS/NZS 4399:1996

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TX/21, Sun Protective Clothing. It was approved on behalf of the Council of Standards Australia on 26 April 1996 and on behalf of the Council of Standards New Zealand on 22 May 1996. It was published on 5 July 1996.

The following interests are represented on Committee TX/21:

Apparel & Textile Federation of New Zealand
Australia Post
Australian Association of Certification Bodies
Australian Cancer Society
Australian Radiation Laboratory
Cancer Society of New Zealand
Consumers Federation of Australia
Council of Textile & Fashion Industries of Australia
Federal Bureau of Consumer Affairs (Commonwealth)
Measurements Standards Laboratory, New Zealand
New Zealand Furniture Manufacturers Federation
Office of Consumer Affairs, Qld
Queensland University of Technology School of Physics
Retailers Council of Australia
Skin & Cancer Foundation, Australia
South Western Sydney Area Health Service
Textile Distributors Association, Australia
University of New South Wales School of Fibre Science and Technology
University of New South Wales School of Optometry
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TX/21 on Sun Protective Clothing.

This Standard is intended to provide information to the consumer on the relative capability of textiles and articles of personal apparel to provide protection against solar ultraviolet radiation. This information is provided to the consumer in the form of a labelling scheme based on an objective, reproducible test method. It is applicable to all such articles for which the claim of an advantage of protection against solar ultraviolet radiation is made. Similar protection offered by synthetic shade cloth, sunscreens, sunglasses and eye protectors are the subject of other Standards.

In determining the test method, and thus the rating system, given in this Standard, this Committee considered the relative merits of in vivo and in vitro test methods, and the relationship between sunglasses and sun protective textiles (which are inert products) and sunscreens (where there may be an interaction such as bioactivation or a variability in the sunscreen film thickness because of the uneven surface of human skin). Many consumers will be familiar with the term 'sun protection factor' (SPF) which is used to rate sunscreens. The test method used to determine an SPF value is an in vivo one, using minimum erythema on human skin as an endpoint, and the procedure is given in AS/NZS 2604, *Sunscreens—Evaluation and classification*. However, the term 'ultraviolet protection factor' (UPF) is used in this Standard to rate sun protective fabrics and apparel, and it is based on an in vitro test method similar to the one used in AS 1067, *Sunglasses and fashion spectacles*. The UPF measurement is a relative ranking of the sun protective capabilities of a textile and should not be construed as a burn time.

The test method given in this Standard is intended for determining the UPF of an unstretched, dry textile. The public comment received on DR 94321 indicated that there was considerable interest in the level of protection offered by garments which were wet or stretched. These comments were considered by the Committee, however, the relevant variables for a wet test procedure and a stretched test procedure are not yet known. Research to identify these variables is currently underway, with the intention of including suitable test methods when this Standard is revised. It is expected that some textiles will have a lower UPF rating when wet, and that the amount of protection offered by knitted textiles is likely to vary according to how much they are stretched.

Other public comment addressed the issue of garment design, which is not covered by this Standard. The Committee felt that people should be made aware that the more skin they cover, the less UVR they will receive.

Of the interests represented on the Committee shown on the inside front cover, the University of Sydney School of Veterinary Science did not agree with the publication of this Standard.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Sun protective clothing—Evaluation and classification**

1 SCOPE This Standard sets out requirements for determining the rated ultraviolet protection factor of sun protective textiles, garments and other items of personal apparel (such as hats) which are worn in close proximity to the skin. It also specifies appropriate detailed labelling requirements. It does not cover sunscreen products for topical application to the human skin, fabrics for architectural or horticultural use such as shade cloth, sunglasses or items which offer protection at a distance from the skin, such as umbrellas or shade structures. It does not cover protection from ultraviolet radiation sources other than the sun.

NOTES:

- 1 Requirements for sunscreens are specified in AS/NZS 2604.
- 2 Requirements for sunglasses are given in AS 1067, Parts 1 and 2.
- 3 Requirements for shade cloth are given in AS 4174.
- 4 Products such as umbrellas and shade structures which are not in close proximity to the skin will provide a lesser degree of protection than would be indicated by the rating of the material from which the product is made, because of the amount of scattered radiation that could enter from around the edges of the product. The amount of this radiation will vary with the area of the product, and the distance of the product from the body. This Standard is therefore not appropriate for evaluating such items.

2 OBJECTIVE This Standard is intended to provide information to the consumer on the relative capability of textiles and articles of personal apparel to provide protection against solar ultraviolet radiation in order to assist consumers in the selection of those items which best suit their need for sun protection.

3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1067 Sunglasses and fashion spectacles

1067.1 Part 1: Safety requirements

1067.2 Part 2: Performance requirements

4174 Synthetic shade cloth

AS/NZS

2604 Sunscreen products—Evaluation and classification

CIE

85 Solar spectral irradiance

4 DEFINITIONS For the purpose of this Standard, the definitions below apply.

4.1 Shall—the use of the word ‘shall’ indicates that a requirement is mandatory.

4.2 Should—the use of the word ‘should’ indicates that the relevant sentence is not a requirement but is advisory.



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