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(ICS 71.100.70)

SINGAPORE STANDARD

Cosmetics — Sun protection test methods — In vivo determination of sunscreen UVA protection

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National Foreword

This Singapore Standard was prepared by the Working Group on Cosmetics set up by the Technical Committee on Biotechnology and Laboratory Testing under the purview of the Biomedical and Health Standards Committee.

This standard is a revision of SS ISO 24442:2017. It is an identical adoption of ISO 24442:2022, “Cosmetics — Sun protection test methods — In vivo determination of sunscreen UVA protection”, published by the International Organization for Standardization.

NOTE 1 – Where appropriate, the words “International Standard” are read as “Singapore Standard”.

NOTE 2 – Where numerical values are expressed as decimals, the comma is read as a full point.

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NOTE

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- 3. Compliance with a SS or TR does not exempt users from any legal obligations.*

INTERNATIONAL
STANDARD

ISO
24442

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**Cosmetics — Sun protection test
methods — In vivo determination of
sunscreen UVA protection**

*Cosmétiques — Méthodes d'essai de protection solaire —
Détermination in vivo de la protection UVA d'un produit de protection
solaire*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 217, *Cosmetics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 392, *Cosmetics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 24442:2011), which has been technically revised.

The main changes are as follows:

- this document has been aligned with the revised ISO 24444.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies the procedure to determine the Ultraviolet A Protection Factor (UVAPF) of a sunscreen product using the persistent pigment darkening method according to the principles recommended by the Japan Cosmetic Industry Association (JCIA) in 1995^[1]. The outcome of this test method can be used to determine the UVA classification of topical sunscreen products according to local regulatory requirements.

Topical sunscreen products are primarily rated and labelled according to their ability to protect against sunburn, using a test method to determine the in vivo sun protection factor (see ISO 24444). This rating evaluates filtration of sunburn generating radiation across the electromagnetic UV spectrum (290 nm to 400 nm). However, knowledge of the sun protection factor (SPF) rating does not provide explicit information on the magnitude of the protection provided specifically in the UVA range of the spectrum (320 nm to 400 nm), as it is possible to have high SPF products with very modest UVA protection [for example SPF 50 with a UVA protection factor (UVAPF) of only 3 to 4]. There is demand among medical professionals, as well as knowledgeable consumers, to have fuller information on the UVA protection provided by their sunscreen product, in addition to the SPF, in order to make a more informed choice of product, providing a more balanced and broader-spectrum protection. Moreover, there is also a demand to prevent UVA-induced darkening of the skin from a cultural point of view even without sunburn. Thus, persistent pigment darkening (PPD) was selected as an endpoint relevant to UVA. Although PPD reflects merely photo-polymerization of melanin monomers^[2], it is evaluated as a representative of the biological reactions. The UVAPF value of a product provides information on the magnitude of the protection provided explicitly in the UVA portion of the spectrum, independent of the SPF values^{[3][4][5]}.

The test method outlined in this document is derived primarily from the UVAPF test methods as developed by the JCIA. Modifications have been made to attempt to be in line with updated International Standards for determination of sun protection factor without changing the integrity of the fundamental underlying principles of the test method.

Cosmetics — Sun protection test methods — In vivo determination of sunscreen UVA protection

1 Scope

This document specifies a method for the in vivo determination of UVA protection factor (UVAPF) of sunscreen products. It is applicable to products that contain any component able to absorb, reflect or scatter ultraviolet (UV) rays and which are intended to be placed in contact with human skin.

This document provides a basis for the evaluation of sunscreen products for the protection of human skin against UVA radiation induced by solar ultraviolet rays.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 24444, *Cosmetics — Sun protection test methods — In vivo determination of the sun protection factor (SPF)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

ultraviolet radiation

UVR

electromagnetic radiation in the range of 290 nm to 400 nm

3.1.1

ultraviolet B

UVB

electromagnetic radiation in the range of 290 nm to 320 nm

3.1.2

ultraviolet A

UVA

electromagnetic radiation in the range of 320 nm to 400 nm

Note 1 to entry: UVA II = 320 nm to 340 nm; UVA I = 340 nm to 400 nm.

3.2

erythema

reddening of the skin caused by UV radiation