



International

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ISO 23675

**Cosmetics — Sun protection test
methods — In vitro determination
of sun protection factor (SPF)**

*Cosmétiques — Méthodes d'essai de protection solaire —
Détermination in vitro du facteur de protection solaire (FPS)*

**First edition
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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Chronic exposure to solar ultraviolet radiation (UVR) is the main environmental source of damage to human skin. Consumer protection against exposure to solar UVB and UVA radiation is, therefore, an important public health issue. The use of sunscreens is a critical part of holistic programs of consumer UVR protection, including the use of appropriate clothing, hats and minimising exposure to the sun around its zenith.

The in vivo sun protection factor (SPF) is historically measured by an in vivo method (see ISO 24444) to communicate the amplitude of protection offered by sunscreens from erythemally-effective solar UVR.^[1]^[2] In recent years, additional test methods have been developed to measure the breadth of protection from solar UVR, namely the in vivo human persistent pigment darkening (PPD) test^[3] (and associated UVA-PF) and an in vitro equivalent.^[4]^[5]^[6]^[7]

Invasive methods based on tests conducted on human beings are ethically problematic, time-consuming and very costly. Therefore, it has for long been a desire to develop an in vitro SPF test method,^[8]^[9]^[10]^[11]^[12]^[13]^[14]^[15]^[16]^[17] recognising the potential advantages of such methodology, including:

- a) the use of a non-human model,
- b) the significant improvements in speed and cost,
- c) the improved repeatability and reproducibility,
- d) the elimination of technically-challenging procedures (e.g., MED determination) and
- e) the use of a method which is significantly more amenable to continuous improvement.

This in vitro SPF method is based on UVR transmittance spectroscopy, whereby spectrophotometric measurement of UVR transmission through appropriate UVR-transparent substrates, allows prediction of in vivo SPF values.^[18]^[19]^[20]^[21]^[22] This in vitro SPF method revealed a strong reproducibility and correlation with in vivo SPF values.^[23]^[24]^[25]