International Standard

ISO/CIE 28077

# Photocarcinogenesis action spectrum (non-melanoma skin cancers)

*Spectre d'action de la photocarcinogenèse (cancers de la peau hors mélanome)*

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# Foreword

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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 document 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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This document was prepared by the International Commission on Illumination (CIE) Technical Committee 6-32, *Action Spectrum for Photocarcinogenesis*, in cooperation with Technical Committee ISO/TC 274, *Light and lighting*.

This third edition cancels and replaces the second edition (ISO/CIE 28077:2016), which has been technically revised.

The main changes are as follows:

— text giving historical background shifted to Annex A;

— Normative reference updated;

— Bibliography updated;

— minor editorial changes.

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.

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# Introduction

Solar ultraviolet radiation (UVR) is recognized as a major cause of non-melanoma skin cancer in humans. Skin cancer occurs most frequently in the areas of the body most exposed to solar radiation, and correlates with the duration and intensity of outdoor exposure to UVR. Describing the relationship of exposure (dose) to risk (skin cancer) requires the availability of a spectral weighting function or action spectrum for photocarcinogenesis. This document proposes the adoption of an action spectrum derived from experimental laboratory data and modified to estimate the non-melanoma tumour response in human skin. The experimental data are not sufficient for specifying effectiveness above 400 nm, but are sufficient for estimating effectiveness from 400 nm down to 250 nm.

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# Photocarcinogenesis action spectrum (non-melanoma skin cancers)

## 1 Scope

This document specifies the action spectrum for photocarcinogenesis of non-melanoma skin cancers.

## 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.

CIE S 017/E, ILV: International Lighting Vocabulary

## 3 Terms, definitions, symbols and abbreviations

### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions given in CIE S 017 and the following apply.

ISO and IEC maintain terminology 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/

CIE maintains a terminology database for use in standardization at the following address:

— ILV: International Lighting Vocabulary: available at http://cie.co.at/e-ilv

**3.1.1**
**ultraviolet radiation**
**UV radiation**
**UVR**
optical radiation for which the wavelengths are shorter than those for visible radiation

Note 1 to entry: The range between 100 nm and 400 nm is commonly subdivided into: UV-A: 315 nm to 400 nm; UV-B: 280 nm to 315 nm; UV-C: 100 nm to 280 nm.

[SOURCE: CIE S 017/E:2020, entry 17-21-008, modified — Notes 2 to 5 have been omitted.]

### 3.2 Symbols and abbreviations

| | |
|---|---|
| SCUP | Skin Cancer Utrecht-Philadelphia (an action spectrum proposed in Reference [1]) |
| SCUP-m | original SCUP action spectrum, based entirely on mouse data |
| SCUP-h | proposed action spectrum estimated by correcting for differences in UV transmissions between human and murine epidermis |
| UV-A1 | wavelength range from 340 nm to 400 nm |

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