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Fire tests — Use of LED (light-emitting diode) as an alternative to white light for measuring smoke parameters

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Foreword

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This document was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth.*

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

Traditional white light bulbs including tungsten incandescent lamps, used until now for smoke density measurements in fire tests, are no longer available. Methods therefore need to be developed for their replacement with LED (light-emitting diode) light sources. This document is intended to provide guidance on replacing the light source in a smoke density measurement with an LED light source.

Fire tests — Use of LED (light-emitting diode) as an alternative to white light for measuring smoke parameters

1 Scope

This document specifies methodologies for comparing the smoke density and the smoke production rate during fire tests measured by LED (light-emitting diode) with those measured by white light. These methodologies are intended for the identification of suitable LEDs which can be used as alternatives to white light sources.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/

3.1
opacity of smoke
ratio of incident light intensity to transmitted light intensity through smoke, under specified conditions

3.2
optical density of smoke
measure of the attenuation of a light beam passing through smoke expressed as the logarithm to the base 10 of the opacity of smoke

3.3
transmittance
ratio of transmitted light intensity through smoke to incident light intensity, under specified conditions

3.4
smoke
visible part of fire effluent

3.5
smoke production
amount of smoke that is produced in a fire or fire test

3.6
smoke production rate
amount of smoke produced per unit of time in a fire or fire test

4 Symbols and units

For the purposes of this document, the symbols and units shown in Table 1 apply.