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Dentistry — Guidance on colour measurement

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Dentistry — Guidance on colour measurement

Médecine bucco-dentaire — Directives relatives au mesurage de la couleur

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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 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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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 106, *Dentistry*, Subcommittee SC 2, *Prosthodontic materials*.

This second edition cancels and replaces the first edition (ISO/TR 28642:2011), which has been technically revised.

Introduction

The colour appearance of teeth and other dentistry-related tissues need to be matched and reproduced in order to achieve acceptable aesthetics in an efficient manner. Three major groups of issues, related to colour compatibility, colour stability and colour interactions, are identified and considered in this document. Interpretation of colour differences associated with these three groups through 50:50 % perceptibility and acceptability visual thresholds is suggested. Colour is a psychophysical phenomenon that is assessed by both visual and instrumental methods. Other elements of appearance, including gloss and translucency, affect aesthetics and may influence the characterization of colour appearance.

The International Commission on Illumination (CIE) colour difference formulae and resources, in particular CIE Pub No 15.3, were used in this document.

TECHNICAL REPORT **ISO/TR 28642:2016(E)**

Dentistry — Guidance on colour measurement

1 Scope

This document identifies three types of topics related to shade conformity and interconvertibility of monochromatic and polychromatic tissues and materials related to the discipline of dentistry; it describes visual and instrumental methods for assessment of these topics.

This document suggests interpretation of the findings through colour difference thresholds and provides guidelines for future standardization related to dental shade conformity and interconvertibility. It also includes guidelines related to colour vision of persons undertaking visual colour assessments and instructions for reporting of colour and colour difference assessments.

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 1942, *Dentistry — Vocabulary*

ISO 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
colour difference
single number or metric expressing the distance from complete match in colour or shade

Note 1 to entry: A colour distance metric defined by the International Commission on Illumination (CIE) is called delta E (ΔE).

Note 2 to entry: Two formulae for calculating ΔE are recommended in this document: CIE 76 (denoted ΔE^*_{ab}) and CIEDE2000 (denoted ΔE_{00}).

3.2
50:50 % perceptibility threshold of colour difference
PT
difference in colour that can be detected by 50 % of observers under controlled conditions, with the other 50 % of observers noticing no difference in colour between the compared objects

Note 1 to entry: A nearly perfect colour match in dentistry is a colour difference at or below the 50:50 % perceptibility threshold.