

**CGATS/ISO 12646:2016  
(Identical to ISO 12646:2015)**

AMERICAN NATIONAL STANDARD

# Graphic technology — Displays for colour proofing — Characteristics

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APPROVED FEBRUARY xx, 2016  
AMERICAN NATIONAL STANDARDS INSTITUTE

**CGATS**



## AMERICAN NATIONAL STANDARD

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## Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Requirements</b> .....	<b>2</b>
<b>4.1 General</b> .....	<b>2</b>
<b>4.2 Uniformity of luminance and chromaticity</b> .....	<b>3</b>
<b>4.2.1 General</b> .....	<b>3</b>
<b>4.2.2 Evaluation of tone uniformity</b> .....	<b>3</b>
<b>4.2.3 Tonality evaluation (uniformity)</b> .....	<b>3</b>
<b>4.3 Viewing cone characteristics</b> .....	<b>3</b>
<b>4.4 Reflective characteristics</b> .....	<b>5</b>
<b>5 Test methods</b> .....	<b>5</b>
<b>5.1 General</b> .....	<b>5</b>
<b>5.2 Preparation and display set-up</b> .....	<b>5</b>
<b>5.3 Viewing angle dependent tonality evaluation (“<math>\Delta</math>Gamma”)</b> .....	<b>5</b>
<b>5.4 Measurement conditions</b> .....	<b>6</b>
<b>5.4.1 Photometric and colorimetric measurements</b> .....	<b>6</b>
<b>5.4.2 Measurements as a function of viewing direction</b> .....	<b>8</b>
<b>Bibliography</b> .....	<b>10</b>

## Foreword

ANSI CGATS/ISO 12646 is an identical adoption of ISO 12646:2015. ISO 12646 was prepared by ISO Technical Committee 130, *Graphic technology*, with the support of the ANSI Committee for Graphic Arts Technologies Standards (CGATS).

Minor edits have been made to this standard to prepare it as an ANSI CGATS standard. No technical changes have been made.

The CGATS consensus body approved the national adoption of ISO 12646 for issuance as CGATS/ISO 12646 in accordance with the *ANSI Procedures for the National Adoption of ISO and IEC Standards as American National Standards* and the CGATS Operating Procedures.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. Neither ISO, ANSI nor CGATS shall be held responsible for identifying any or all such patent rights.

## Introduction

The ability to match colour images displayed on colour displays to the images produced when the same digital file is rendered by proofing and printing systems (commonly referred to as “soft” proofing) is increasingly expected in graphic arts. Obtaining such a match is not simple and to be fully accurate requires careful control of many aspects of the process. The primary purpose of this International Standard is to make recommendations with respect to the soft proof displays requirements. If these are met, it is then possible for a soft proofing system such as defined in ISO 14861 to accurately colour match to the hard copy proof. Hence, this International Standard is intended for display manufacturers in order to qualify their display for use in graphic arts proofing systems.

The appearance of a colour image on a colour display is influenced by many physical factors other than controlled ambient viewing conditions. Among the most important of these are uniformity, size and resolution (in order to permit rendition of the proof at close to its normal size and with the finest detail visible on the hard copy at normal viewing distances), variation of electro-optical properties with viewing direction, freedom from flicker and glare (specular reflections with distinct images), the opto-electronic calibration of the display, and the settings of its display driver software. In this regard, to be acceptable in a proofing system that provides a reasonable level of image quality, the display needs to also exhibit these properties at an acceptable quality.

Note that even for displays of the highest quality, the appearance of the displayed image will be limited by the accuracy of the colour transformation used for converting the digital file from its encoded colour space to that required for display purposes.

This International Standard specifies requirements for displays to be used in soft proofing systems defined by ISO 14861. ISO 14861 primarily focuses on applications where the displayed image will be compared to a hard copy in an adjacent viewing cabinet or where the viewing cabinet intentionally contains the display. Furthermore, in order to address the different needs for the soft proofing use cases, two different conformance levels (class A and class B) will be defined in this International Standard.

However, in some practical situations, the image on the screen is evaluated in the absence of a hard copy. This International Standard might be used as reference, but this is not required. Users of this International Standard will also benefit from CIE Publication 122 which provides an overview of the relationship between digital and colorimetric data. Those unfamiliar with the evaluation of displays will also find it helpful to read IEC 61223 2 5 which contains much useful detailed information about evaluation and testing of image display devices.

This is a preview of "ANSI/CGATS/ISO 12646...". [Click here to purchase the full version from the ANSI store.](#)

# Graphic technology — Displays for colour proofing — Characteristics

## 1 Scope

This International Standard specifies requirements for two conformance levels for the characteristics of displays to be used for soft proofing of colour images. Included are requirements for uniformity and variations of electro-optical properties with viewing direction for different driving signals.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13655, Graphic technology — Spectral measurement and colorimetric computation for graphic arts images

## 3 Terms and definitions

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

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### 3.1 calibration

set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system or values represented by a material measure of a reference material and the corresponding values realized by standards

[SOURCE: ISO International Vocabulary of Basic and General Terms in Metrology]

Note 1 to entry: However, in typical graphic arts, use cases calibration is understood as an active process where a display or a printer is adjusted such that it produces the defined aim values.

### 3.2 colorimeter

instrument for measuring colour values such as the tristimulus values of a colour stimulus

[SOURCE: ISO 12637 2:2008, 2.18]

### 3.3 design viewing direction DVD

direction for which specific electro-optical characteristics of the display have been optimized

Note 1 to entry: Examples of important electro-optical characteristics are maximum luminance and maximum contrast in definite direction.

### 3.4 gamma