PD ISO/TS 20791-2:2021



BSI Standards Publication

# Photography — Photographic reflection prints

Part 2: Evaluation of colour variation in printing

bsi.

# National foreword

This Published Document is the UK implementation of ISO/TS 20791-2:2021.

The UK participation in its preparation was entrusted to Technical Committee CPW/42, Photography.

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

**Contractual and legal considerations**

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2021
Published by BSI Standards Limited 2021

ISBN 978 0 539 06680 7

ICS 37.040.20

**Compliance with a Published Document cannot confer immunity from legal obligations.**

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2021.

**Amendments/corrigenda issued since publication**

| Date | Text affected |
|---|---|

PD ISO/TS 20791-2:2021

TECHNICAL SPECIFICATION

**ISO/TS 20791-2**

First edition
2021-10-20

# Photography — Photographic reflection prints —

## Part 2: Evaluation of colour variation in printing

*Photographie — Tirages photographiques par réflexion —*

*Partie 2: Évaluation de la variation de couleur dans l'impression*

Reference number
ISO/TS 20791-2:2021(E)

© ISO 2021



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

# Contents

Page

**Foreword** ..... **iv**
**Introduction** ..... **v**
**1 Scope** ..... **1**
**2 Normative references** ..... **1**
**3 Terms and definitions** ..... **1**
3.1 Terms ..... 2
3.2 Abbreviations ..... 2
**4 Test target** ..... **2**
**5 Printing** ..... **4**
5.1 Environmental conditions ..... 4
5.2 Procedures ..... 5
**6 Sampling** ..... **5**
6.1 Reproducibility within a job ..... 5
6.2 Colour variation between jobs ..... 5
6.3 Colour variation between printed images located in different areas on a large sheet ..... 5
**7 Measurement** ..... **6**
7.1 Measurement device ..... 6
7.2 Timing of measurement ..... 6
7.3 Measurement conditions ..... 6
**8 Calculation** ..... **6**
8.1 General ..... 6
8.2 Calculation of colour difference ..... 7
8.3 Colour variation between jobs ..... 10
**9 Test report** ..... **10**
9.1 In laboratory notebook ..... 10
9.2 For business communications ..... 11
**Bibliography** ..... **13**

© ISO 2021 – All rights reserved

# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, 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.

This document was prepared by Technical Committee ISO/TC 42, *Photography*.

A list of all parts in the ISO 20791 series can be found on the ISO website.


© ISO 2021 – All rights reserved

# Introduction

In photographic reflection colour prints, density and colour are essential quality attributes of an image. However, the density and colour of prints can fluctuate during repeated continuous printing or vary between two printings done at different times or days, even if the same input data and printer settings are used. This is a critical issue, particularly in the following cases:

a) When the same photographic image is reprinted to make an extra copy and there is obvious difference in density and colour between the original and the reprint when they are compared side by side, the customer might be dissatisfied with this difference.

b) When a photo book is produced by binding up photographic prints into different pages in a book, and the difference in the density and colour between adjacent pages is easily noticeable, this difference might be considered unsatisfactory by the customer.

c) When a customer and a print shop agree to the image quality of prints based on a sample or a proof print, and the difference between the proof sample and the actual prints is discernible, this might lead to customer dissatisfaction.

Moreover, colour management for high quality printing is attainable only with a stable printing system. If the colour and density of the actual print differ from that of the designated proof print or sample used as the basis for the colour management, the quality of the actual print may be different from the desired image quality.

To improve the reproducibility of printing, or to select the appropriate printing system, the evaluation of colour variation in printing is crucial. Although the evaluation of colour variation in graphic printing is described in ISO/TS 15311-1, standardized evaluation methods and procedures for quantifying colour variation specific to photographic prints are also necessary.

— test target design for the print ranging from a small size to large size;

— sampling procedures (within a job and between jobs);

— measurements and evaluation of colour variation and

— reporting (evaluation results, parameter and mode of printing).

The objective of this document is to provide standard procedures to evaluate colour variation in photographic printing.

© ISO 2021 – All rights reserved

**TECHNICAL SPECIFICATION** **ISO/TS 20791-2:2021**

# Photography — Photographic reflection prints —

# Part 2: Evaluation of colour variation in printing

## 1 Scope

This document describes the procedures for evaluation of colour variation in the printing of photographic reflection colour prints. The following procedures are described to evaluate colour variation in printing within a consecutive print job, between several print jobs, or between multiple photographic images printed in different areas of a large sheet:

a) test targets for small and large photographic prints;

b) printing procedures and conditions;

c) sampling in correspondence to the production scale;

d) measurement of colour;

e) calculation and analysis of colour variation and

f) reporting.

The procedures presented in this document are applicable for prints with a size of available picture area ranging from 35 $cm^2$ (e.g. 5 cm × 7 cm) to 5 400 $cm^2$ (e.g. 60 cm × 90 cm). This document is applicable to any of the photographic printing technologies, including inkjet, thermal dye transfer, electrophotography and silver halide (chromogenic) technologies.

## 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 5-4, *Photography and graphic technology — Density measurements — Part 4: Geometric conditions for reflection density*

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

ISO 11664-4, *Colorimetry - Part 4: CIE 1976 L*a*b* Colour space*

ISO 18944, *Imaging materials — Reflection colour photographic prints — Test print construction and measurement*

ISO/TS 21139-1:2019, *Permanence and durability of commercial prints — Part 1: Definition of use profiles and guiding principles for specifications*

## 3 Terms and definitions

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

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

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

© ISO 2021 – All rights reserved