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Photography — Digital cameras — Image flare measurement

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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).

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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*.

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Introduction

When images are produced by a digital camera, the camera captures not only the light from the scene but also stray, unwanted light (flare) that can reduce contrast in the image. Generally, the processing applied to the image will compensate for normal amounts of flare light, resulting in improved image quality. However, flare light can be quite variable, and image processing algorithms are not always successful at removing it. Poor or excessive flare removal processing can reduce the quality of the final image. For example, subtraction of the average flare across the image could result in over-subtraction of the flare in dark areas, resulting in loss of shadow detail. In evaluating digital cameras, it is therefore useful to measure the signal from the flare light remaining in processed images. This remaining flare signal is called "image flare."

Image flare in digital cameras is caused not only by lenses but also by camera bodies and image sensors, and is affected by image processing. Measurements of image flare include all contributing factors: the optical system, camera body, image sensor, and image processing. ISO 9358 specifies methods of measuring "veiling glare," the flare from lens systems, but it is not intended to be applied for the measurement of image flare. This document specifies a method to measure image flare using the image data output by digital cameras.

A standard method is needed in part because of the nature of image flare. It can vary both locally and from image to image depending on all the factors mentioned above. While it is possible to measure image flare at different positions in different images, the variability of image flare makes it difficult to compare such measurements out of context. This document provides a standard method for measuring image flare which can be useful for cross comparison.

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Photography — Digital cameras — Image flare measurement

1 Scope

This document specifies the definition of image flare for digital cameras, test patterns, measurement conditions, and methods, so as to enable the comparison of the results of measurement.

The methods of measurement are designed to enable the assessment of the performance of digital cameras by using image data output by the digital cameras.

This document does not specify the aim values or the allowable range of value for the image flare.

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.

IEC 61966-2-1, *Multimedia systems and equipment —Colour measurement and management — Part 2-1: Default RGB colour space — sRGB*

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:

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

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

3.1
image flare
unwanted increase in signal in a processed image output by a digital camera resulting from light detected by an image sensor that does not emanate from a corresponding subject point

Note 1 to entry: Image flare is measured for a camera system. The camera system includes lenses, camera body, image sensor, and image processing used for the measurement. The following four are common with regard to light detection: i) internal multiple reflections, scattering or diffraction of optics (including lens surfaces, filter surfaces, or sensors), ii) light diffusion at lens barrel, body, or edge of lens, iii) leaking of light, and iv) the optical system as measured by point spread function including spherical and chromatic aberrations. Differentiation between these four might be difficult once an image is captured, but it is more appropriate to isolate the last one with regard to the system resolution. Thus, care should be taken to minimize point spread function contribution in the measurement of image flare. Image flare also includes the effects of image processing. Even if the same camera is used to capture RAW image data, different image flare values might be measured if different image processing algorithms are applied. This is an intended result because the measurement of image flare includes all contributing factors of lenses, camera body, image sensor, and image processing.

Note 2 to entry: “Image flare” was defined in ISO 3664:2000 in another context, but it was deleted in ISO 3664:2009.

Note 3 to entry: “Image flare” is defined in ISO 12231:2012 but without any source standards. The definition is the same statement as in ISO 3664:2000. ISO 3664:2000 was replaced by ISO 3664:2009 and this does not include the definition of “image flare.”

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