
**Photography — Electronic scanners for
photographic images — Dynamic range
measurements**

*Photographie — Scanners électroniques pour images
photographiques — Mesurages d'intervalles dynamiques*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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Introduction

The use of scanners to provide digital image files is rapidly growing. A standard is needed in order to measure the ability of scanners to capture tones especially in the dark areas of the original. At the present time most manufacturers calculate the dynamic range from the bit depth of the implemented A/D conversion which is usually higher than the actual capabilities of the scanner. This International Standard can be used for photofinishing, professional, graphic arts and consumer scanners.

This International Standard specifies methods for measuring the ability of scanners to capture tones especially in the dark areas of the original. The scanner measurements described in this International Standard are performed in the digital domain, using digital analysis techniques. A test chart of appropriate size and characteristics is scanned and the resulting data is analysed. The test chart described in this International Standard is designed specifically to evaluate continuous tone film and reflection scanners. It is not designed for evaluating electronic still-picture cameras, video cameras, or bi-tonal document scanners.

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Photography — Electronic scanners for photographic images — Dynamic range measurements

1 Scope

This International Standard specifies methods for measuring and reporting the dynamic range of electronic scanners for continuous-tone photographic media. It applies to scanners for reflective and to scanners for transmissive media.

2 Normative references

The following referenced documents are indispensable for the application 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 5-2, *Photography — Density measurements — Part 2: Geometric conditions for transmission density*

ISO 5-4, *Photography — Density measurements — Part 4: Geometric conditions for reflection density*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 12231, *Photography — Electronic still-picture cameras — Terminology*

ISO 12232:1998, *Photography — Electronic still-picture cameras — Determination of ISO speed*

ISO 14524, *Photography — Electronic still-picture cameras — Methods for measuring opto-electronic conversion functions (OECFs)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12231 and the following apply.

3.1

addressable photoelements

number of active photoelements in an image sensor

NOTE This is equal to the number of active lines of photoelements, multiplied by the number of active photoelements per line.

3.2

aliasing

output image artefacts that occur in a sampled imaging system for input images having significant energy at frequencies higher than the Nyquist frequency of the system

3.3

digital output level

numerical value assigned to a particular output level, also known as the digital code value