
**Camera shutters — Timing — General
definition and mechanical shutter
measurements**

*Obturbateurs d'appareils photographiques — Durée d'exposition —
Définition générale et mesurages d'obturateur mécanique*



This document is a preview generated by ERS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols	4
5 Required characteristics and their tolerances	5
5.1 Exposure time	5
5.1.1 Exposure time marking	6
5.1.2 Tolerances	6
5.2 Delay time	6
5.2.1 Front shutters	6
5.2.2 Focal-plane shutters	8
6 Test methods	9
6.1 General	9
6.2 Apparatus	9
6.2.1 Apparatus	9
6.2.2 Detector	9
6.2.3 Time-interval meter	10
6.3 Front-shutter test	10
6.3.1 Test assembly	10
6.3.2 Procedure	10
6.4 Focal-plane-shutter test	11
6.4.1 Test assembly	11
6.4.2 Procedure	12
7 Explanatory notes	13
7.1 Tolerance	13
7.2 Test method	14
Annex A (normative) Graphic test methods	15
Bibliography	22

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 of 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 www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO 516:1999) which has been technically revised. The following changes have been made:

- The title and scope have been updated to reflect that the document is applicable to mechanical shutters.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

A superseded edition of this document was developed in the mechanical-shutters-only era. The scope of this edition has been changed as many digital still cameras with non-mechanical shutters are now introduced to the market.

Camera shutters — Timing — General definition and mechanical shutter measurements

1 Scope

This document provides a uniform basis for determining the exposure times for all types of shutters used in still cameras and contains suitable definitions of the terms used.

It specifies the exposure-time markings for all types of shutters and their tolerances.

The characteristics of all types of mechanical shutters, which are mounted in still cameras and affect the control of exposure, motion-stopping ability and synchronization with a photoflash light source are also defined.

The tolerances specified are the target values for the shutter performance that can be expected to give good results. They are not intended for application as a general inspection standard in controlling the performance of mechanical shutters, since tolerances may vary with the feature and price class of camera tested.

Test methods are described for routine manufacturing testing and quality control. These test methods require access to the focal plane of the camera and can therefore not be applied to assembled digital still cameras.

2 Normative references

There are no normative references in this document.

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>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

front shutter

any shutter in the vicinity of the lens

Note 1 to entry: The front shutter can be in front of, behind or between the lens elements and can consist of rotating discs, rotating slats, sliding blades, oscillating blades, etc. Programmed shutters are also included.

Note 2 to entry: The common characteristic for the front shutter is that the entire picture area is exposed almost simultaneously.

Note 3 to entry: When the shutter and diaphragm are located too far apart, both exposure and shutter speed may vary at different points in the picture area.

3.2

focal-plane shutter

any shutter in the vicinity of the focal plane

Note 1 to entry: The focal-plane shutter can consist of fixed or variable slit curtains, rotating discs, sliding blades, etc.