



ISO 9335

**Optics and photonics — Optical
transfer function — Principles and
procedures of measurement**

*Optique et photonique — Fonction de transfert optique —
Principes et procédures de mesure*

**Third edition
2025-02**

This is a preview of ISO 9335:2025. Click [here](#) to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

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
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Measuring equipment and environment	1
4.1 General aspects.....	1
4.1.1 Measuring conditions.....	1
4.1.2 Uncertainty of measurement.....	1
4.2 Environment.....	2
4.2.1 General.....	2
4.2.2 Temperature and humidity control.....	2
4.2.3 Vibration.....	2
4.2.4 Electromagnetic disturbances.....	2
4.3 Measuring equipment.....	2
4.3.1 Optical mounts.....	2
4.3.2 Defocusing tolerance.....	3
4.3.3 Provision of measuring scales.....	3
4.4 System components.....	3
4.4.1 General.....	3
4.4.2 Optical benches.....	3
4.4.3 Test target unit.....	4
4.4.4 Mounting of the test specimen.....	9
4.4.5 Image evaluation system.....	9
4.4.6 Auxiliary imaging systems.....	10
5 Measurement procedures	10
5.1 General.....	10
5.2 Setting the measuring conditions.....	10
5.2.1 General.....	10
5.2.2 Environmental conditions.....	10
5.2.3 Spectral characteristics.....	11
5.2.4 Angular distribution and aperture considerations.....	11
5.2.5 Image scale and magnification.....	11
5.2.6 Focusing.....	11
5.3 Additional considerations of measurement.....	12
5.3.1 General.....	12
5.3.2 Linear range of test specimen.....	12
5.3.3 Isoplanatic region.....	12
5.3.4 Fixed pattern noise.....	12
5.3.5 Analysed area.....	12
5.3.6 Background radiation.....	12
5.3.7 Veiling glare.....	13
5.3.8 Parallelism of image and analysing element.....	13
5.3.9 Signal-to-noise ratio.....	13
5.4 Particular measuring conditions.....	14
5.4.1 Azimuths.....	14
5.4.2 Selection of image heights or field angles.....	14
5.4.3 Reference angles of the test specimen.....	14
6 Corrections to measured data	14
6.1 Normalization.....	14
6.2 Correction of the frequency scale.....	14
6.3 Correction of the measured modulation.....	15
6.4 Auxiliary imaging systems.....	15

This is a preview of ISO 9335:2025. [Click here to purchase the full version from the ANSI store.](#)

7.2	Statement of identification and measuring conditions	15
7.3	Graphical presentation of OTF data.....	16
7.4	Numerical presentation.....	17
8	Uncertainty checks.....	17
Annex A (informative) Examples of the presentation of OTF data.....		19
Bibliography.....		24

This is a preview of ISO 9335:2025. [Click here to purchase the full version from the ANSI store.](#)

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents ISO shall not be held responsible for identifying any or all such patent rights.

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 172, *Optics and photonics*, Subcommittee SC 1, *Fundamental standards*.

This third edition cancels and replaces the second edition (ISO 9335:2012), which has been technically revised.

The main changes are as follows:

- text was added concerned with distortion effects in [4.4.6](#);
- a note was added concerned with the notation tangential/sagittal in [7.2](#).
- the document has been revised to be in agreement with the terms and definitions of ISO/IEC Guide 98-3 (GUM) and ISO/IEC Guide 99 (VIM) regarding the expression of measurement uncertainties.”

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.

This is a preview of ISO 9335:2025. [Click here to purchase the full version from the ANSI store.](#)

The optical transfer function is an important aid to objective evaluation of the image-forming capability of optical, electro-optical and photographic systems.

In order that optical transfer function measurements achieved using different measuring principles or obtained from measuring instruments in different laboratories can be compared, it is necessary to ensure equivalence of measurement parameters such as focus setting and spatial frequency range. For this reason, an agreed terminology has been defined in order for the measurement parameters used in this document to be understood by all users. This document gives guidance for the construction and operation of equipment for optical transfer function measurement.

The specifications in this document form the basic requirements of measurement instrumentation and procedures for guaranteeing a defined uncertainty of measurement of the optical transfer function.