First edition
1997-09-15

Optics and optical instruments — Accuracy of optical transfer function (OTF) measurement

Optique et instruments d'optique — Exactitude du mesurage de la fonction de transfert optique (OTF)

Reference number
ISO 11421:1997(E)

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Printed in Switzerland

Foreword

ISO (the International Organization for Standardization) is a world-wide 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.

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.

International Standard ISO 11421 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*, Subcommittee SC 1 *Fundamental standards*.

Annex A forms an integral part of this International Standard.

Annexes B, C and D are for information only.

Introduction

The optical transfer function (OTF) is one of the main criteria used for objectively evaluating the image-forming capability of optical, electro-optical and photographic systems.

The terms used in the measurement of OTF are defined in ISO 9334, whilst ISO 9335 covers the actual principles and procedures of measurement. A further International Standard, ISO 9336, deals with specific applications in various optical and electro-optical fields and is in several parts, each dealing with a particular application.

Although ISO 9335 lists the main factors which influence the accuracy of OTF measurement and describes procedures which are aimed at achieving accurate and repeatable results, it does not cover in detail the techniques and procedures for evaluating the accuracy of OTF measuring equipment and for estimating the uncertainty in measurements made on specific imaging systems.

The present International Standard lists the main sources of inaccuracy in OTF measuring equipment and provides guidance on how these can be assessed and how the results of these assessments can be used in estimating the error band in any measurement of OTF. One of the aims in preparing this International Standard is to encourage the setting of more realistic uncertainty levels for the results of OTF measurements. Another is to encourage the use of methods of expressing the accuracy of OTF test equipment which recognize the fact that the accuracy of a particular measurement is a function of both the equipment and the test piece.