

Lasers and laser-related equipment - Test methods for laser beam parameters - Beam positional stability

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for laser beam parameters - Beam positional stability

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 11670:2003 sisaldab Euroopa standardi EN ISO 11670:2003+AC:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 14.08.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 11670:2003 consists of the English text of the European standard EN ISO 11670:2003+AC:2004.</p> <p>This document is endorsed on 14.08.2003 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This International Standard defines methods for determining the beam positional as well as angular stability. The test methods given in this International Standard are intended to be used for testing and characterization of lasers</p>	<p>Scope:</p> <p>This International Standard defines methods for determining the beam positional as well as angular stability. The test methods given in this International Standard are intended to be used for testing and characterization of lasers</p>
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ICS 31.260

Võtmesõnad:

English version

**Lasers and laser-related equipment - Test methods for laser
beam parameters - Beam positional stability (ISO 11670:2003)**

Lasers et équipements associés aux lasers - Méthodes
d'essai des paramètres du faisceau laser - Stabilité de
visée du faisceau (ISO 11670:2003)

Laser und Laseranlagen - Prüfverfahren für
Laserstrahlparameter - Strahllagestabilität (ISO
11670:2003)

This European Standard was approved by CEN on 21 February 2003.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN ISO 11670:2003) has been prepared by Technical Committee ISO/TC 172 "Optics and optical instruments" in collaboration with Technical Committee CEN/TC 123 "Lasers and laser-related equipment", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

This document supersedes EN ISO 11670:1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

NOTE FROM CMC The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

Endorsement notice

The text of ISO 11670:2003 has been approved by CEN as EN ISO 11670:2003 without any modifications.

Contents

	Page
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Coordinate systems and beam axis	3
4.1 Beam axis distribution	3
4.2 Coordinate systems	3
5 Test principles	5
5.1 Beam positional stability	5
5.2 Beam angular stability	5
6 Measurement arrangement, test equipment and auxiliary devices	5
6.1 Preparation	5
6.2 Control of environment	5
6.3 Detection system	6
6.4 Beam-forming optics, optical attenuators, beam splitters, focusing elements	6
6.5 Calibration	6
7 Test procedures	7
7.1 General	7
7.2 Beam positional stability	7
7.3 Beam angular stability	7
8 Evaluation	7
8.1 Beam positional stability	7
8.2 Beam angular stability	8
9 Test report	10
Annex A (informative) Propagation of absolute beam stability	12
Annex B (informative) Decoupling of short- and long-term fluctuations	15

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.

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.

ISO 11670 was prepared by Technical Committee ISO/TC 172, *Optics and optical instruments*, Subcommittee SC 9, *Electro-optical systems*.

This second edition cancels and replaces the first edition (ISO 11670:1999), Clauses 3 and 9 of which have been technically revised. Annexes A and B have been added.

Introduction

The centre of a laser beam is defined as the centroid or first-order spatial moment of the power density distribution. The current propagation axis of a beam is then the straight line connecting two centroids measured at two different planes simultaneously in a uniform, homogeneous medium. Beam axis instability may be characterized by transverse displacements and angular movements that are either monotonic, periodic or stochastic in time.

The movement of a laser beam may be randomly distributed and uniform in amplitude in all directions. In general, the beam may move a greater amount in one direction. If one direction predominates, the procedures specified in this International Standard can be used to identify that dominant direction (the beam x -axis) and its azimuthal location relative to the axes of the laboratory system.

This International Standard provides general principles for the measurement of these quantities. In addition, definitions of terminology and symbols to be used in referring to beam position are provided.

Lasers and laser-related equipment — Test methods for laser beam parameters — Beam positional stability

1 Scope

This International Standard specifies methods for determining laser beam positional as well as angular stability. The test methods given in this International Standard are intended to be used for the testing and characterization of lasers.

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 11145:2001, *Optics and optical instruments — Lasers and laser-related equipment — Vocabulary and symbols*

ISO 11146:1999, *Lasers and laser-related equipment — Test methods for laser beam parameters — Beam widths, divergence angle and beam propagation factor*

IEC 61040:1990, *Power and energy measuring detectors, instruments and equipment for laser radiation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61040, ISO 11145 and ISO 11146 and the following apply.

3.1

angular movement

α_x, α_y

angular movement of the laser beam in the x - z and y - z planes, respectively

NOTE These quantities are defined in the beam axis system x, y, z . If the ratio of the quantity in the x direction to that in the y direction does not exceed 1,15:1, the quantity is regarded as rotationally symmetric and only one number may be given. The symbol α without index is used in that case.

3.2

beam angular stability

$\delta\alpha_x, \delta\alpha_y$

twice the standard deviation of the measured angular movement

NOTE These quantities are defined in the beam axis system x, y, z . If the ratio of the quantity in the x direction to that in the y direction does not exceed 1,15:1, the quantity is regarded as rotationally symmetric and only one number may be given. The symbol $\delta\alpha$ without index is used in that case.

3.3

pivot

point of intersection of all momentary beam axes with the z -axis

NOTE The measurement of the pivot is not a subject of this International Standard, because it does not necessarily exist.