

**Lasers and laser-related equipment - Test
methods for laser beam parameters -
Polarization**

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for laser beam parameters - Polarization

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 12005:2004 sisaldab Euroopa standardi EN ISO 12005:2003 ingliskeelset teksti.

Käesolev dokument on jõustatud 23.11.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 12005:2004 consists of the English text of the European standard EN ISO 12005:2003.

This document is endorsed on 23.11.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

Käsitlusala:

This International Standard specifies a method for determining the polarization status and, whenever possible, the degree of polarization of the beam from a continuous wave (cw) laser. It can also be applied to repetitively pulsed lasers, if their electric field vector orientation does not change from pulse to pulse.

Scope:

This International Standard specifies a method for determining the polarization status and, whenever possible, the degree of polarization of the beam from a continuous wave (cw) laser. It can also be applied to repetitively pulsed lasers, if their electric field vector orientation does not change from pulse to pulse.

ICS 31.260

Võtmesõnad:

English version

Lasers and laser-related equipment

Test methods for laser beam parameters – Polarization
(ISO 12005 : 2003)

Lasers et équipements associés aux lasers – Méthodes d'essai des paramètres du faisceau laser – Polarisation (ISO 12005 : 2003)

Laser und Laseranlagen – Prüfverfahren für Laserstrahlparameter – Polarisation (ISO 12005 : 2003)

This European Standard was approved by CEN on 2003-02-21.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist 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, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 12005 : 2003 Lasers and laser-related equipment – Test methods for laser beam parameters – Polarization,

which was prepared by ISO/TC 172 'Optics and optical instruments' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 123 'Lasers and laser-related equipment', the Secretariat of which is held by DIN, as a European Standard.

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

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

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

Endorsement notice

The text of the International Standard ISO 12005 : 2003 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

Contents

	Page
1 Scope	3
2 Normative references	3
3 Terms and definitions	3
4 Test method for state of polarization	5
4.1 Principle of measurement	5
4.2 Equipment arrangement	5
4.3 Components	6
4.4 Test procedure	7
4.5 Analysis of the results	8
5 Test report	9
Annex A (informative) Complete description of the polarization status of a monochromatic laser beam	11
Bibliography	12

Introduction

This International Standard specifies a relatively quick and simple method, requiring minimum equipment, for determining the state of polarization of a laser beam.

This method is for well-polarized laser beams, including those emitted by lasers with a high divergence angle. However, if more completeness in the determination of the polarization status is required, the use of a more sophisticated analysing device is necessary. Although not within the scope of this International Standard, the principle of operation of such devices is given in Annex A, together with a description of the Stokes parameters which are needed in that case.

1 Scope

This International Standard specifies a method for determining the polarization status and, whenever possible, the degree of polarization of the beam from a continuous wave (cw) laser. It can also be applied to repetitively pulsed lasers, if their electric field vector orientation does not change from pulse to pulse.

This International Standard also specifies the method for determining the direction of the plane of oscillation in the case of linearly polarized (totally or partially) laser beams. It is assumed that the laser radiation is quasi-monochromatic and sufficiently stable for the purpose of the measurement.

The knowledge of the polarization status can be very important for some applications of lasers with a high divergence angle, for instance when the beam of such a laser shall be coupled with polarization dependent devices (e.g. polarization maintaining fibres). This International Standard also specifies a method for the determination of the state of polarization of highly divergent laser beams, as well as for the measurement of beams with large apertures.

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*

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

CIE 59-1984, *Definitions and Nomenclature, Instrument Polarization*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11145:2001, IEC 61040:1990, CIE 59-1984 and the following apply.

3.1

polarization

restriction of oscillations of the electric field vector to certain directions

NOTE This is a fundamental phenomenon which can be explained by the concept that electromagnetic radiation is a transverse wave motion, i. e. the vibrations are at right angles to the direction of propagation. It is customary to consider these vibrations as being those of the electric field vector.

3.2

state of polarization

classification of polarization as linear, random, circular, elliptical or unpolarized