



SLOVENSKI STANDARD SIST EN ISO 13694:2019

01-marec-2019

Nadomešča:
SIST EN ISO 13694:2016

Optika in fotonska tehnologija - Laserji in laserska oprema - Metode za preskušanje gostote porazdelitve moči (energije) žarka (ISO 13694:2018)

Optics and photonics - Lasers and laser-related equipment - Test methods for laser beam power (energy) density distribution (ISO 13694:2018)

Optik und Photonik - Laser und Laseranlagen - Prüfverfahren für die Leistungs-(Energie-)dichteverteilung von Laserstrahlen (ISO 13694:2018)

Optique et photonique - Lasers et équipements associés aux lasers - Méthodes d'essai de distribution de la densité de puissance (d'énergie) du faisceau laser (ISO 13694:2018)

Ta slovenski standard je istoveten z: EN ISO 13694:2018

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EUROPEAN STANDARD

EN ISO 13694

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ICS 31.260

Supersedes EN ISO 13694:2015

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Optics and photonics - Lasers and laser-related equipment - Test methods for laser beam power (energy) density distribution (ISO 13694:2018)

Optique et photonique - Lasers et équipements
associés aux lasers - Méthodes d'essai de distribution
de la densité de puissance (d'énergie) du faisceau laser
(ISO 13694:2018)

Optik und Photonik - Laser und Laseranlagen -
Prüfverfahren für die Leistungs-(Energie-)
dichteverteilung von Laserstrahlen (ISO 13694:2018)

This European Standard was approved by CEN on 23 September 2018.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN ISO 13694:2018) has been prepared by Technical Committee ISO/TC 172 "Optics and photonics" in collaboration with Technical Committee CEN/TC 123 "Lasers and photonics" 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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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INTERNATIONAL
STANDARD

ISO
13694

Third edition
2018-11

**Optics and photonics — Lasers and
laser-related equipment — Test
methods for laser beam power
(energy) density distribution**

*Optique et photonique — Lasers et équipements associés aux
lasers — Méthodes d'essai de distribution de la densité de puissance
(d'énergie) du faisceau laser*

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ISO 13694:2018(E)

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 172, *Optics and photonics*, Subcommittee SC 9, *Laser and electro-optical systems*.

This third edition cancels and replaces the second edition (ISO 13694:2015), which has been technically revised. The main changes compared to the previous edition are as follows:

- a) the definition of beam ellipticity has been harmonized with ISO 11145 and ISO 11146-1;
- b) the term “second linear moments” has been replaced by “second moments”;
- c) the term “field of view” has been replaced by “aperture”;
- d) [Clause 9](#) was rewritten; the paragraphs on clip-levels were corrected to reflect that they are no longer intended for noise cancellation;
- e) the entries “Fitted distribution type”, “Roughness of fit R”, and “Goodness of fit G” have been removed from the Test Report;
- f) the term “aspect ratio” has been removed from the test report.

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

Many applications of lasers involve using the near-field as well as the far-field power (energy) density distribution of the beam. The power (energy) density distribution of a laser beam is characterized by the spatial distribution of irradiant power (energy) density with lateral displacement in a particular plane perpendicular to the direction of propagation. In general, the power (energy) density distribution of the beam changes along the direction of propagation. Depending on the power (energy), size, wavelength, polarization, and coherence of the beam, different methods of measurement are applicable in different situations. Five methods are commonly used: camera arrays (1D and 2D), apertures, pinholes, slits, and knife edges.

According to ISO 11145, it is possible to use two different definitions for describing and measuring the laser beam diameter. One definition is based on the measurement of the encircled power (energy); the other is based on determining the spatial moments of the power (energy) density distribution of the laser beam.

The use of spatial moments is necessary for calculating the beam propagation factor, K , and the beam propagation ratio, M^2 , from measurements of the beam widths at different distances along the propagation axis. ISO 11146-1 describes this measurement procedure. For other applications, other definitions for the beam diameter can be used. For some quantities used in this document the first definition (encircled power (energy)) is more appropriate and easier to use.

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