INTERNATIONAL STANDARD

ISO 17901-1

First edition
2015-07-01

Optics and photonics — Holography —

Part 1: Methods of measuring diffraction efficiency and associated optical characteristics of holograms

Optique et photonique — Holographie —

Partie 1: Méthodes de mesurage de l'efficacité de diffraction et caractéristiques optiques associées aux hologrammes

Reference number
ISO 17901-1:2015(E)

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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.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 172, *Optics and Photonics*, Subcommittee SC 9, *Electro-optical systems*.

ISO 17901 consists of the following parts, under the general title *Optics and photonics — Holography*:

— *Part 1: Methods of measuring diffraction efficiency and associated optical characteristics of holograms*

— *Part 2: Methods for measurement of hologram recording characteristics*

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Introduction

The aim of this part of ISO 17901 is to specify the terms related to holograms and basic measurement methods to characterize them.

A hologram is an optical device utilizing interference and diffraction phenomena and is characterized differently from optical devices based on reflection, refraction, and scattering. By exploiting the characteristics of holograms, they have been successfully applied in numerous applications such as displays, metrology, and anti-counterfeit security.

The expanded market in holography has generated a need to agree on basic terms and definitions for holograms and measurement methods and this part of ISO 17901 aims to satisfy that need.

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Optics and photonics — Holography —

Part 1: Methods of measuring diffraction efficiency and associated optical characteristics of holograms

1 Scope

This part of ISO 17901 specifies the terms related to optical characteristics of holograms, the method to measure their diffraction efficiency, and the angular and wavelength selectivity measurement methods. These measurement methods are applicable to any type of hologram if the hologram yields a simple diffraction pattern, which means the reconstructed wave can be clearly separated from other diffracted and non-diffracted waves. In other words, holograms that yield complex diffraction patterns are excluded. There are no restrictions on the materials used to form the holograms.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15902, *Optics and photonics — Diffractive optics — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15902 and the following apply.

3.1
hologram
interference pattern formed between the wave emitted from the object and its coherent reference wave, which is recorded in the recording material

Note 1 to entry: The holograms also include those formed through embossed copying of surface relief or those recording the periodic structure spatially by etching or engraving.

3.2
object wave
object beam
wave emitted from an object and entering the recording material in the course of recording the hologram

3.3
reference wave
reference beam
wave entering the recording material while forming a certain angle with the object wave in the course of recording the hologram

3.4
illuminating wave
illuminating beam
wave allowed to enter the hologram when reconstructing the image from the hologram

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