INTERNATIONAL STANDARD

ISO/IEC 11695-1

Redline version
compares Second edition to
First edition

Identification cards — Optical memory cards — Holographic recording method —

Part 1: Physical characteristics

Cartes d'identification — Cartes à mémoire optique — Méthode d'enregistrement holographique —

Partie 1: Caractéristiques physiques

Reference number
ISO/IEC 11695-1:redline:2015(E)

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1.x ... — Heading numbers containg modifications are highlighted in yellow in the Table of Contents

All changes in this document have yet to reach concensus by vote and as such should only be used internally for review purposes.

DISCLAIMER

This Redline version provides you with a quick and easy way to compare the main changes between this edition of the standard and its previous edition. It doesn't capture all single changes such as punctuation but highlights the modifications providing customers with the most valuable information. Therefore it is important to note that this Redline version is not the official ISO standard and that the users must consult with the clean version of the standard, which is the official standard, for implementation purposes.

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Contents

Page

Foreword

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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.

~~ISO/IEC 11695-1 was prepared by Joint Technical Committee~~The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identifcation*.

This second edition cancels and replaces the first edition (ISO/IEC 11695-1:2008), which has been technically revised.

ISO/IEC 11695 consists of the following parts, under the general title *Identification cards — Optical memory cards — Holographic Recording Method*:

— *Part 1: Physical characteristics*

— *Part 2: Dimensions and location of the accessible optical area*

— *Part 3: Optical properties and characteristics*

— *Part 4: Logical data structures*

Introduction

This part of ISO/IEC 11695 is one of a series of International Standards defining the parameters for optical holographic memory cards and the use of such cards for the storage and interchange of digital data.

These International Standards recognize the existence of different methods for recording and reading Information on optical memory cards, the characteristics of which are specific to the recording method employed. In general, these different recording methods will not be compatible with each other. Therefore, ~~these International~~the Standards are structured to accommodate the inclusion of existing and future recording methods in a consistent manner.

This part of ISO/IEC 11695 is specific to optical memory cards using the holographic recording method. Characteristics which apply to other specific recording methods are found in separate ~~International Standards~~Standards documents.

This part of ISO/IEC 11695 defines the physical characteristics and the extent of compliance with, addition to, and/or deviation from the relevant base document, ISO/IEC 11693-1.

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Identification cards — Optical memory cards — Holographic recording method —

Part 1: Physical characteristics

1 Scope

This part of ISO/IEC 11695 defines the physical characteristics of optical memory cards using the holographic recording method.

2 Normative references

The following ~~referenced documents~~documents, in whole or in part, are normatively referenced in this document and are indispensable for ~~the application of this document~~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/IEC 7810, *Identification cards — Physical characteristics*

ISO/IEC 7816-1, *Identification cards — Integrated circuit~~(s) cards with contacts~~ cards — Part 1: Cards with contacts — Physical characteristics*

ISO/IEC 10373-1, *Identification cards — Test methods — Part 1: General characteristics*

ISO/IEC 11695-2, *Identification cards — Optical memory cards — Holographic recording method — Part 2: Dimensions and location of accessible optical area*

ISO/IEC 11695-3, *Identification cards — Optical memory cards — Holographic recording method — Part 3: Optical properties and characteristics*

ISO/IEC 11695-4, *Identification cards — Optical memory cards — Holographic recording method — Part 4: Logical data structures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11695-2, ISO/IEC 11695-3 and the following apply.

3.1
holographic recording method
writing and/or pre-formatting of digital data on the holographic memory card in the form of holograms

3.2
hologram
microscopic structure which can be written by optical energy into an accessible optical area causing diffraction of a read-out beam of certain wavelength by illumination

Note 1 to entry: A hologram is the representation of a two-dimensional code of digital data on the holographic memory card.

3.3
amplitude hologram
type of hologram which modulates the amplitude of a read-out beam in the read-out process

3.4
phase hologram
type of hologram which modulates the phase of a read-out beam in the read-out process

3.5
thick hologram
hologram in which the thickness is n times the wavelength of the writing/reading beam where n >10

3.6
thin hologram
hologram characterized by the thickness of the recording medium containing the hologram, whereby the hologram has the same order as the wavelength of the writing/reading beam

3.7
holographic memory card
card containing an accessible optical area to which holograms can be written using external optical energy

3.8
accessible optical area
partition of the holographic memory card which is available to be accessed by the read and/or write beam of the holographic read-out and/or recording system used

3.9
storage layer
specific layer of the holographic memory card, located between the protective layer and the reflective layer, which contains specific materials to permit writing and/or reading back holographic recorded data by optical means

3.10
protective layer
transparent layer of material within the holographic memory card which is placed on top of the storage layer and able to provide protection against scratches, humidity and damage caused by environmental influence

3.11
reflective layer
layer of material within the holographic memory card placed between substrate layer and storage layer to reflect the writing and reading beam so that the holographic memory card can be read-out in reflection mode

3.12
substrate layer
layer of material of an holographic memory card providing a flat and smooth surface for both the reflective and storage layers attaching the storage medium to the card body, when the substrate layer is not the card body

3.13
polarization
property of electromagnetic waves, such as light, that describes the direction of the transverse electric field

Note 1 to entry: ~~The~~ More generally, the polarization of a transverse wave describes the direction of oscillation in the plane perpendicular to the direction of travel.

3.14
birefringence
decomposition of a ray of light into two rays (the ordinary ray and the extraordinary ray) when it passes through certain types of material, depending on the polarization of the light

Note 1 to entry: This effect occurs when the structure of the material is anisotropic.

4 Holographic ~~memory cards — physical characteristics~~Memory Cards — Physical Characteristics

4.1 Dimensions

4.1.1 Card height and width

ISO/IEC 7810 applies.

4.1.2 Card thickness

ISO/IEC 7810 applies.

4.1.3 Card corners

ISO/IEC 7810 applies.

4.1.4 Card edges

ISO/IEC 7810 applies.

4.2 Construction

4.2.1 Card construction

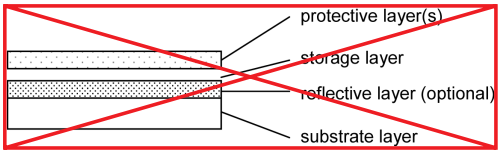
ISO/IEC 7810 applies.

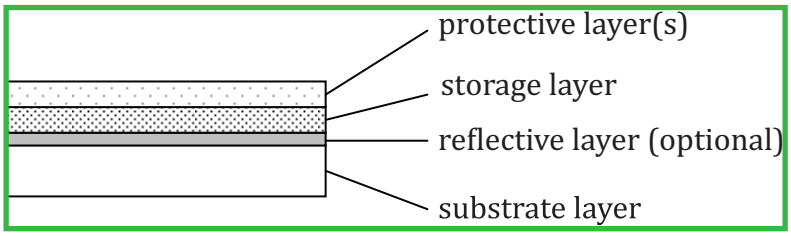
4.2.2 Cross-section at accessible optical area

See Figure 1.

The holographic memory card contains an accessible optical area which is laminated, bonded, or inserted into the card body.

The accessible optical area is composed of different layers: a substrate layer, a reflective layer, a storage layer and one or more protective layers to protect the sub-layers from damage e.g. by surface damage, humidity and other environmental influence.





NOTE Drawing not to scale.

Figure 1 — ~~Cross-section~~Section of a holographic memory card at the accessible optical area

4.3 Physical characteristics

4.3.1 Protective layer(s)

There are one or multiple protective layers to protect the sub-layers (storage layer, reflective layer) from surface damage, humidity and other environmental influence.

The protective layer has to be transparent for the writing and reading beam.

When using reading or writing light with linear or circular polarization, the protective layer has to be free of birefringence.

The protective layer ensures that the holographic memory card can survive the action of a destructive influence to the extent that it continues to show optical characteristics which conform to the base standard. ~~Destructive influences~~Test methods are specified in ISO/~~IEC~~ 10373-1.

4.3.2 Storage layer

The storage layer is a photosensitive material applied to the reflective or substrate layers. Examples of materials, which can be used are:

— high-resolution photographic silver-halide film (e.g. Kodak 649F, Agfa 8E75HD)~~.~~;

— silver-halide sensitized gelatin (e.g. BB-640 from Holographic Recording Technologies)~~.~~;

— dichromated gelatin (DCG) (e.g. Geola PFG-04)~~.~~;

— photoresists (e.g. Shipley AZ-1350)~~.~~;

— photopolymers (e.g. Dupont OmniDex)~~.~~;

— functionalized comb-shaped liquid crystalline polymers (see ~~bibliography item [12~~Reference [13]).

The thickness of the storage layer may vary depending on the specific optical characteristics of the material chosen. To be in compliance, materials used shall conform to the optical requirements as specified in ISO/IEC 11695-3.

The material composing the storage layer determines the parameters for recording and reading of holograms (wavelength of writing/reading beam, writing/reading power) as well as the type of holograms, which can be recorded (thin hologram/thick hologram, amplitude/phase). The material as well as the parameters for recording and/or reading holograms shall be specified by the card manufacturer.

4.3.3 Reflective layer

The reflective layer is necessary when the hologram is read out in reflection mode for thin holograms. The reflective layer is metallic: metals which can be used include aluminium, silver, gold, titanium and

