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BSI Standards Publication

Imaging materials — Processed safety photographic films — Storage practices

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National foreword

This British Standard is the UK implementation of ISO 18911:2010. It supersedes BS ISO 18911:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee CPW/42, Photography.

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INTERNATIONAL STANDARD

ISO 18911

Second edition
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Imaging materials — Processed safety photographic films — Storage practices

Matériaux pour l'image — Films photographiques de sécurité traités — Techniques d'archivage

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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.

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 18911 was prepared by Technical Committee ISO/TC 42, *Photography*.

This second edition cancels and replaces the first edition (ISO 18911:2000), which has been technically revised.

This International Standard is one of a series of International Standards dealing with the physical properties and stability of imaging materials. To facilitate identification of these International Standards, they are assigned a number within the block from ISO 18900 to ISO 18999.

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Introduction

0.1 General

The value of records used in archives, museums, libraries, government, commerce and universities has focused attention on the care of these records to ensure their longest possible life (see References [1][2][3]). Photographic film is an important documentary and pictorial material, and there is a recognized need for information on safeguarding photographic film having legal, scientific, industrial, artistic or historical value.

Films are susceptible to degradation from many sources. These factors can be divided into three general categories as described below.

0.2 Nature of the photographic film

The stability of photographic film records depends on the physical and chemical nature of the film. The specification for safety photographic film which is suitable for storage is described in ISO 18906.

For preservation purposes, processed photographic films are classified according to their life expectancy (LE) or LE designation. These are specified in the appropriate International Standards. The term “archival” is no longer specified to express longevity or stability in International Standards on imaging materials, since it has been interpreted to have many meanings that range from “preserving information forever” (which is unattainable) to “temporary storage of actively used information”.

For optimum preservation of photographic information, it is advisable that a high LE film be used and that it be stored under extended-term storage conditions. A film material suitable for preservation is silver-gelatine-type film on polyester base that meets the requirements of ISO 18901. However, this International Standard also applies to processed colour, diazo (see ISO 18905), vesicular (see ISO 18912) and thermally processed silver (see ISO 18919) films. Although these film types sometimes do not have as high an LE designation, excellent keeping properties have been obtained with many of them.

0.3 Photographic processing of the film

For black-and-white silver-gelatine-type film, ISO 18901 specifies a maximum residual thiosulfate level for different LE classifications and a residual silver compounds level.

For diazo film, ISO 18905 specifies a proper development test. ISO 18912, for vesicular film, includes both a proper development test and a residual diazonium salt test.

0.4 Storage conditions

The conditions under which safety photographic film records are stored are extremely important for the preservation of film and are the subject of this International Standard (see also ISO 18906). The same environmental conditions are advisable for nitrate-base films, but it is advisable that they be stored in a separate storage area having suitable fire protection safeguards (see Reference [4]).

The important elements affecting preservation of processed film are humidity, temperature and air pollutants, as well as the hazards of fire, water, light, fungal growth, insects, microbiological attack, contact with certain chemicals in solid, liquid or gaseous form, and physical damage. Direct contact with other generic types of film can be detrimental to either film.

The extent to which humidity, temperature and atmospheric contaminants, or variations thereof, can be permitted to reach beyond recommended limits without producing adverse effects will depend upon the duration of exposure, the biological conditions conducive to fungal growth, and the accessibility of this atmosphere to the emulsion and support surfaces. Exposure to high temperatures, and in particular to high

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humidities, can lead to degradation of the film support and the photographic emulsion (see References [5][6][7]). Cellulose ester-base films are more subject to base degradation than polyester-base films.

There are two levels of storage conditions:

— medium-term, and

— extended-term.

Medium-term storage can be used for films where the information is to be preserved for a minimum of 10 years, while extended-term storage conditions can extend the useful life of a majority of freshly processed films to 500 years. However, extended-term storage conditions will prolong the life of all films, independent of age, type or processing conditions. The storage protection provided by each level will differ in degree, as will the cost of providing and maintaining the storage facility.

Immediate availability of space and cost often need to be considered when selecting storage conditions. It is recognized that many facilities will not be able to obtain the low humidity and low temperature levels specified in this International Standard because of energy considerations, climate conditions or building construction. Such deviation from the specified conditions will reduce the degree of protection offered, and in such cases maintaining a humidity and temperature as low as possible will still provide some benefits.

This International Standard is not designed to provide protection against natural or man-made catastrophes, with the exception of fire and associated hazards, which are sufficiently common to warrant inclusion of protection measures.

In addition to the recommendations in this International Standard, good storage practices consider filing enclosures. These are covered in ISO 18902 and ISO 18934.

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INTERNATIONAL STANDARD ISO 18911:2010(E)

Imaging materials — Processed safety photographic films — Storage practices

1 Scope

This International Standard provides recommendations concerning the storage conditions, storage facilities, handling and inspection for all processed safety photographic films in roll, strip, aperture-card or sheet format, regardless of size.

This International Standard is applicable to extended-term and medium-term storage of photographic film.

This International Standard is applicable to photographic film records intended as storage copies, which are not in frequent use. It does not apply to “work” or “use” copies (see Annex A).

This International Standard, while intended for materials that are properly processed, is also of considerable value in prolonging the useful life of photographic film whose processing conditions are unknown, or which has been toned or retouched, or has markings with materials of uncertain or unknown stability.

This International Standard is applicable only to safety photographic film (see ISO 18906). Nitrate-base films are not covered by this International Standard.

NOTE Nitrate-base films are hazardous (see Reference [8]). They require special storage considerations (see Reference [4]), but the environmental conditions specified in this International Standard are applicable.

The storage of photographic prints and photographic plates requires different considerations. They are not covered in this International Standard, but are described respectively in ISO 18920 and ISO 18918.

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 18902, *Imaging materials — Processed imaging materials — Albums, framing and storage materials*

ISO 18906, *Imaging materials — Photographic films — Specifications for safety film*

ISO 18916, *Imaging materials — Processed imaging materials — Photographic activity test for enclosure materials*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
duplicate
reproduction of a master, retaining the same polarity and size

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3.2
extended-term storage conditions
storage conditions suitable for the preservation of recorded information on the majority of freshly and properly processed photographic films for 500 years

3.3
fire-protective storage
facility designed to protect records against excessive temperatures, water and other fire-fighting agents, and steam developed by insulation of safes or caused by the extinguishing of fires and collapsing structures

3.4
life expectancy
LE
length of time that information is predicted to be acceptable in a system at 21 °C and 50 % RH

NOTE In the past, the term “archival” was used to define material that could be expected to preserve images forever, so that such images could be retrieved without significant loss when properly stored. However, as no such material exists, this is now a deprecated term and is no longer used in International Standards for imaging materials or in systems specifications.

3.5
LE designation
rating for the **life expectancy** (3.4) of recording materials and associated retrieval systems

NOTE The number following the LE symbol is a prediction of the minimum life expectancy, in years, during which information can be retrieved without significant loss when stored at 21 °C and 50 % RH, e.g. LE-100 indicates that information can be retrieved after at least 100 years' storage.

3.6
macroenvironment
atmospheric conditions (temperature, relative humidity and pollutants) in a large area in which records are kept

3.7
medium-term storage conditions
storage conditions suitable for the preservation of recorded information for a minimum of 10 years

3.8
microenvironment
atmospheric conditions (temperature, relative humidity and pollutants) inside a storage enclosure in which records are kept

3.9
open enclosure
enclosure that is intended for physical protection against mechanical damage, but is neither light-tight nor airtight

EXAMPLE Reels; cores; spools; cassettes; magazines; folders; envelopes; cartons; boxes; sleeves; transparency mounts; aperture cards.

3.10
protective enclosure
impermeable sealed container used for protection from outside factors such as reactive gases and moisture, including changes in relative humidity, and from light for certain kinds of products

EXAMPLE Taped cans; sealed envelopes.

NOTE Protective enclosures sometimes also need to be opaque.

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3.11
safety photographic film
photographic film
safety film
film that meets the flammability specifications defined in ISO 18906

3.12
storage housing
physical structure supporting materials and their enclosures

NOTE Storage housing can consist of drawers, racks, shelves or cabinets.

4 Film enclosures

4.1 Requirements

All enclosures used for medium-term and extended-term storage shall meet the requirements of ISO 18902. Safety photographic film shall comply with the flammability specifications defined in ISO 18906.

4.2 Film in roll format

4.2.1 Medium-term storage enclosures

Aerial film, microfilm, motion-picture film, and some portrait films are wound on reels or cores and stored in roll form. The rolls shall all be wound tightly, but not under extreme tensions. A tension caused by 0,3 N of pull-out force for a 35 mm film width is recommended. Rolls greater than 150 m in length shall be stored so that the radius of the roll is in the horizontal position and the film is supported on its edges. Rolls less than 150 m in length may also be stored with the radius of the roll in the vertical position, if the core itself is supported by a horizontal spindle inserted into the cores so as to avoid pressure on the bottom of the roll. However, if such rolls are on reels or spools which have flanges, a spindle is not required since the flanges support the weight of the roll.

Motion-picture prints shall be wound with the emulsion surface on the inside of the roll, as this improves subsequent projection performance (see Reference [9]).

Rolls of photographic film shall be stored in closed containers to provide protection against dirt and physical damage, unless the film is protected by the storage housing (see Clause 5).

Colour, diazo and thermally processed silver films shall be stored in closed, opaque enclosures or be otherwise protected from light exposure. Suitable enclosures are containers with telescoping, slip-type, or threaded twist-on lids. The materials used shall meet the same requirements as those for cores and reels. Closed enclosures are not necessarily airtight and may provide limited access to ambient air. Therefore, if they are used, the humidity of the ambient air shall not exceed the recommended limits.

Protective enclosures made from impermeable materials shall be used, where needed, to maintain the humidity limits of the film (see Clause 7), to protect against gaseous impurities in the atmosphere, or when low-temperature storage is used without humidity control (see Annex C). Suitable enclosures are closed containers with friction-type or threaded, twist-on lids having an incorporated seal. Rubber gaskets shall not be used. Cans within heat-sealed foil bags also provide protection from high humidity.

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