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Second edition  
2010-09-01

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## Imaging materials — Processed safety photographic films — Storage practices

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



Reference number  
ISO 18911:2010(E)

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Published in Switzerland

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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.