



ANSI/ISO 9718-1995,

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**American National Standard**

*for Imaging Materials –  
Processed Vesicular Photographic Film –  
Specifications for Stability*

ANSI/ISO 9718-1995, ▼  
ANSI/NAPM IT9.12-1995

 **ANSI** American National Standards Institute

11 West 42nd Street  
New York, New York  
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ANSI/ISO 9716-1991,  
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American National Standard  
for Imaging Materials –  
Processed Vesicular Photographic Film –  
Specifications for Stability

Secretariat

**National Association of Photographic Manufacturers, Inc.**

Approved December 13, 1995

**American National Standards Institute, Inc.**

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## National Standard

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9718:1995 and the following five paragraphs are the original foreword as it appeared in that standard.)

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.

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.

International Standard ISO 9718 was prepared by Technical Committee ISO/TC 42, *Photography*.

This second edition cancels and replaces the first edition (ISO 9718:1991), which has been technically revised.

Annex A forms an integral part of this International Standard. Annexes B, C, D, E, F, G and H are for information only.

Suggestions for improvement of this standard are welcome. They should be sent to the National Association of Photographic Manufacturers, Inc., 550 Mamaroneck Avenue, Suite 307, Harrison, NY 10528-1612.

This standard was processed and approved for submittal to ANSI by NAPM Technical Committee IT9 on the Physical Properties and Permanence of Imaging Materials. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the IT9 Committee had the following members:

Peter Z. Adelstein, Chairman  
A. Tulsi Ram, Vice-Chairman

<i>Organization Represented</i>	<i>Name of Representative</i>
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Association of Reproduction Materials Manufacturers, Inc. ....	Philip Nowers
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## Introduction

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Films for the preservation of records. The preservation of records on film by national, state and municipal governments, by banks, insurance companies, industry and other enterprises, has been stimulated by recognition of the resultant economies in storage space, organization, accessibility and ease of reproduction. The safe-keeping of pictorial film records having legal, scientific, industrial, medical, historical, military or other values has also become increasingly important.

The use of film for records having long-term values necessitated the development of International Standards to specify the characteristics of film suitable for this purpose. ISO 10602 specifies the requirements for silver-gelatin films which are suitable for storage. This International Standard (for vesicular film) and ISO 8225 (for diazo film) give the requirements for photographic duplicate films suitable for storage.

The term "archival film" has been discontinued and the new concept of "life expectancy" is introduced. Film life is classified by the LE or life expectancy rating as defined in this International Standard. For example, LE-100 represents film with a life expectancy of 100 years when stored under extended-term storage conditions specified in ISO 5466.

Criteria for properties of LE-10 and LE-100 vesicular films are based upon the dark-ageing stability of  $D_{min}$  processed areas. Different dark-incubation tests are specified for LE-10 and LE-100 films but all other properties and processing requirements are identical.

In addition to tests to ensure that the density of  $D_{min}$  areas does not increase to unacceptable levels during storage, a test is also specified on high-density areas. This is to guard against the possibility of vesicle (or bubble) collapse during storage. This test has to be carried out at temperatures below the softening point of the image binder, as tests above this temperature have no practical meaning (see references [1, 2]). However, to give confidence of acceptable image stability, the permissible density change was made very small at the measurement error of the densitometer. Both LE-10 and LE-100 vesicular films must meet the same requirement.

It is recognized that vesicular images may show density changes after exposure to light. However, this International Standard covers only films used as storage copies, not as work copies (as defined in annex C). The light-fading requirements specified in this International Standard ensure satisfactory behaviour for storage copies which are not intended to be subjected to frequent light exposure.

In addition to the characterization of films with respect to their expected storage life, vesicular films are also separated into two classes (A and B), these classes are dependent upon their intended use. Class A films are those which retain density in both the visual and actinic region (printing) after storage. Such films can be viewed directly or reprinted onto ultra-

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violet (UV)-sensitive materials. However, some films are not intended to be reprinted onto UV-sensitive materials. Such films require only visual capabilities after storage and are designated as Class B films. Obviously, both Class A and Class B films can fall into the LE-10 and LE-100 categories. The requirements for Class A and Class B films are identical, with the exception of change in the  $D_{min}$  area after dark-ageing and after light-fading.

Everyone concerned with the preservation of records on photographic film should realize that specifying the chemical and physical characteristics of the material does not, by itself, assure satisfactory behaviour. It is also essential to provide the correct storage temperature and humidity, and protection from the hazards of fire, water, light and certain atmospheric pollutants. Conditions for the storage of record films are specified in ISO 5466 and ISO 10214.

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## American National Standard for Imaging Materials –

# Processed Vesicular Photographic Film – Specifications for Stability

## 1 Scope

**1.1** This International Standard establishes specifications for the stability of polyester-base safety film which has a heat-processed vesicular photographic image formed by nitrogen bubbles. It covers photographic film intended for LE-10 and LE-100 records.

**1.2** This International Standard applies to photographic film in which the image layer is a discrete layer attached to a transparent support.

**1.3** It applies to roll film and sheet film.

**1.4** This International Standard characterizes only the inherent keeping behaviour of the film. However, the suitability of a film record after extended storage depends on both the inherent ageing characteristics of the film and the original image quality. The latter is discussed in annex B.

**1.5** This International Standard applies only to vesicular photographic film intended and used as LE-10 and LE-100 storage copies. It does not apply to vesicular film records intended and used as "work" or "use" copies (as discussed in annex C). Most film records used in libraries are work copies and have to be durable. LE-10 and LE-100 storage copies should be stored in accordance with ISO 5466 and ISO 10214. The effects of heat and pressure are discussed in annex D and those of high humidity in annex E.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publi-

cation, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5-1 1984, *Photography — Density measurements — Part 1 Terms, symbols and notations*

ISO 5-2 1991, *Photography — Density measurements — Part 2 Geometric conditions for transmission density*

ISO 5-3 1995, *Photography — Density measurements — Part 3 Spectral conditions*

ISO 527-3 1995, *Plastics — Determination of tensile properties — Part 3 Test conditions for films and sheets*

ISO 543 1990, *Photography — Photographic films — Specifications for safety film*

ISO 5466 1992, *Photography — Processed safety photographic films — Storage practices*

ISO 6077 1993, *Photography — Photographic films and papers — Wedge test for brittleness*

ISO 8225 1995, *Photography — Ammonia-processed diazo photographic film — Specifications for stability*

ISO 10214 1991, *Photography — Processed photographic materials — Filing enclosures for storage*

ISO 10602 1995, *Photography — Processed silver-gelatin type black-and-white film — Specifications for stability*