

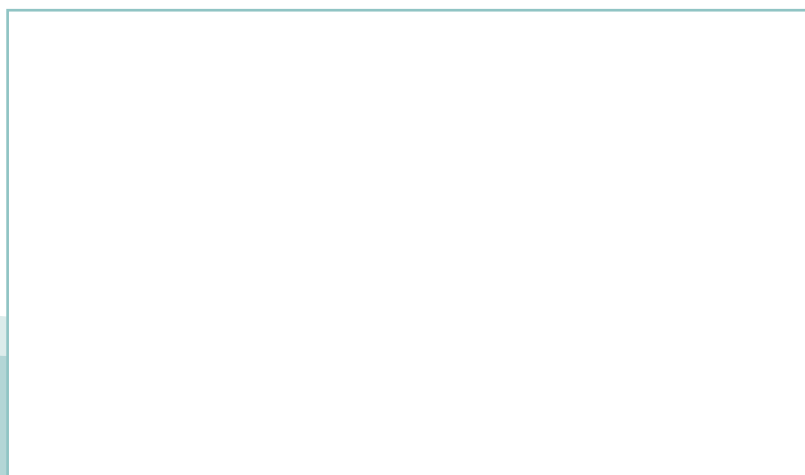
SVENSK STANDARD

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Imaging materials – Processed imaging materials – Photographic activity test for enclosure materials (ISO 18916:2007, IDT)



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The International Standard ISO 18916:2007 has the status of a Swedish Standard. This document contains the official version of ISO 18916:2007.

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Denna standard är framtagen av kommittén för Bildteknik, SIS/TK 547.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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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 18916 was prepared by Technical Committee ISO/TC 42, *Photography*.

This first edition cancels and replaces ISO 14523:1999, which has been technically revised.

Introduction

The use of photographic materials for the storage of records having a long-term value has necessitated the development of International Standards to specify important considerations in this field. The important elements affecting the useful life of imaging materials are as follows:

- a) humidity and temperature of the storage environment;
- b) hazards of fire, water, and light exposure;
- c) fungal growth;
- d) contact with certain chemicals in solid, liquid or gaseous form;
- e) physical damage;
- f) proper processing;
- g) enclosures and containers in contact with the imaging material.

International Standards have been published which specify the material requirements for silver-gelatin type film (ISO 18901), diazo film (ISO 18905), and vesicular film (ISO 18912). Specifications for proper processing are also included in these documents. ISO 18918, ISO 18911, and ISO 18920 specify the storage conditions for photographic plates, films, and paper prints, respectively.

In addition to the storage conditions, the filing materials used are extremely important. Processed photographic materials in archival collections require a high degree of individual packaging to protect them from atmospheric influences, dust, and handling damage, and also to keep them from contaminating each other. For this purpose, a wide variety of paper and plastic materials is commercially available, fabricated into albums, boxes, sleeves, envelopes, folders, mat boards, and interleaving tissues. However, it is absolutely essential that these storage enclosures not cause harm to the photographic image. For optimum stability, it is necessary that storage enclosures and their components meet the requirements in ISO 18902, which includes passing the criteria of the photographic activity test.

The photographic activity test described in this International Standard is a predictive test of interactions between the storage enclosure and the photographic image. It can also be used to evaluate possible photographic activity caused by components of enclosures such as adhesives, inks, paints, labels, and tape.

Imaging materials — Processed imaging materials — Photographic activity test for enclosure materials

1 Scope

This International Standard specifies the procedure for the photographic activity and dye coupler reactivity tests.

This International Standard is applicable to general photographic enclosure materials such as paper, tissue, cardboard, mat board and plastics. It is also applicable to components of photographic enclosure materials such as adhesives, inks, paints, labels, and tape.

This International Standard evaluates possible chemical interactions between enclosures with processed silver-gelatin, colour (dye-gelatin), inkjet prints made with dye-based and pigment-based inks, thermal dye diffusion transfer (“dye sub”) prints, digitally printed dye-diffusion-transfer prints, liquid- and dry-toner xerographic prints, liquid-toner electrostatic prints, and diazo images after long-term storage. It does not pertain to harmful physical interactions such as blocking (sticking together), dye bleed, adhesive migration, or plasticizer exudation. It does not pertain to important criteria of enclosures such as their inherent chemical stability, physical integrity, and workmanship. Passing the photographic activity test (PAT) does not indicate that a material is archival. This term has no clear definition and is not used in this standard. Photo-safe, storage enclosures and their components are covered in ISO 18902, which includes passing the criteria of the photographic activity test.

If a particular brand of commercially made enclosure materials is found to be safe for long-term storage purposes, there is no assurance that subsequent batches will contain the same ingredients of the same purity, chemical inertness, concentrations, or sound and sturdy construction. For this reason, materials are tested annually or upon each formulation or supplier change. For materials which are manufactured in a variety of colours, such as papers and inks, each colour is evaluated and reported separately.

For enclosures intended for use with any of the above imaging processes, only the black-and-white PAT described in Clauses 4 to 7 are applicable. The dye coupler reactivity test is optional as the results are valid only for the specific colour print product being investigated. Different colour print products can have different staining sensitivities.

For enclosures intended for use with diazo images, only the diazo PAT described in 8.5 is applicable.

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 5-2:2001, *Photography — Density measurements — Part 2: Geometric conditions for transmission density*

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

ISO 5-4:1995, *Photography — Density measurements — Part 4: Geometric conditions for reflection density*

3 Terms and definitions

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

3.1

image interaction

measurable density change in the image interaction

3.2

mottle

localized non-uniform visual density variation in the image interaction detector

3.3

stain

measurable density increase in the stain detector

3.4

blocking

sticking together of similar or dissimilar materials in physical contact

4 Test conditions

4.1 Principle

The photographic activity test applies to processed silver-gelatin, colour (dye-gelatin), inkjet prints made with dye-based and pigment-based inks, thermal dye diffusion transfer ("dye sub") prints, digitally printed dye-diffusion-transfer prints, liquid- and dry-toner xerographic prints, liquid-toner electrostatic prints, and diazo images. The test consists of incubating the enclosure material or its component against the surfaces of two sensitive detectors^[1]. The photographic density of these detectors is measured both before and after incubation and the density changes compared with those obtained when the detectors are incubated against a filter paper control. Three criteria are used to evaluate an enclosure, i.e. its tendencies to cause image interaction, stain, and mottle on the detectors. Specific details for each property are given in Clauses 5 to 7. The test conditions described in Clauses 4 to 7 pertain to paper and plastic enclosures. Modifications of the photographic activity test for enclosure components or interactions with diazo images or the residual dye couplers in colour photographic prints are given in Clause 8.

4.2 Apparatus and materials

4.2.1 Image interaction detector, consisting of unprocessed colloidal silver (i.e. Carey Lea silver) in gelatin on a polyester base¹⁾.

4.2.2 Stain detector, consisting of a conventional non-resin-coated black-and-white photographic paper processed to minimum density (D_{\min}) according to the manufacturer's instructions.

4.2.3 Non-resin-coated paper, consisting of premium-grade print material having a relatively thick emulsion layer. (A warm-tone paper base shall not be used.)

The paper shall be processed without development, using a fix, wash, hypo-clearing agent and wash stages.

1) The sensitivity of the colloidal silver detector is dependent upon the silver grain size and the degree of hardness. To ensure test sensitivity and reliability, the colloidal silver detector can be obtained from the Image Permanence Institute, Rochester Institute of Technology, 70 Lomb Memorial Dr., Rochester, NY 14623-5604, USA, or equivalent. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

4.2.4 Fix solution, consisting of 240 g of sodium thiosulfate pentahydrate and 15 g of anhydrous sodium sulfite added to 1 l of water at 50 °C.

4.2.5 Hypo-clearing agent, consisting of 5 g of anhydrous sodium sulfite and 26 g of sodium hydrogen sulfite per litre of water.

It is recommended that the final washing be for 0,5 h with good agitation. This will avoid uneven leaching of brightener.

NOTE Longer wash times can cause physical distortion. The uniformity of the fluorescent brightener can be checked by examination using a UV lamp.

4.3 Incubation

Subject sandwiches of the detectors and enclosure material to an accelerated ageing test of 70 °C ± 1 °C and 86 % RH ± 3 % RH for 15 days. Exposure to these temperature and humidity conditions may be provided by means of a conditioned air cabinet that provides 70 °C ± 1 °C and 86 % RH ± 3 % RH relative humidity.

To minimize moisture condensation when placing the sandwiches in the oven, put the sandwiches in the oven when it is at 70 °C ± 1 °C and 40 % RH ± 3 % RH. After the samples have equilibrated to test temperature (approximately one hour) the humidity can then be brought to 86 % RH ± 3 % RH.

Pull the sandwiches apart immediately after they are removed from the humidity chamber. Failure to do so may result in the adhering of adjacent layers and detectors.

4.4 Measurement

Measure the Status A blue diffuse density of the detector strips both before and after incubation at four locations for each strip. Make the after-incubation measurements at approximately the same locations as the before-incubation measurements. Measurements shall not be made at the edges of the strip. After incubation of highly mottled or unevenly stained samples, it may be necessary to take density readings at different locations on the same detector than the readings taken before incubation to ensure the reacted areas on the detector are measured. Use a densitometer having spectral conformance to ISO 5-3, and geometric conformance to ISO 5-2 and ISO 5-4 for the measurements. Determine the transmission density on the colloidal silver detector and reflection density on the photographic paper stain detector.

5 Image interaction test

5.1 Procedure

Make a stack of two image interaction test sandwiches of the enclosure material and the colloidal silver image interaction detector. Construct a sandwich so that the emulsion side of each image interaction detector strip faces a filter paper separator as shown in Figure 1. These two sandwiches shall consist of two strips of the image interaction detector, two strips of the enclosure material, two strips of a filter paper separator (see Note), and two pieces of glass. The glass shall be clean and shall be discarded if there are any signs of corrosion. Apply a pressure of 500 Pa to the enclosure materials and detectors in the sandwich (including the mass of glass), which can be obtained by adding weight pieces to the sandwich surface. Cut the enclosure material, filter paper separators, detectors and glass into strips having the same dimension, being at least 30 mm × 20 mm. Sandwich construction is facilitated by using a specimen jig (see Figure 2) to hold the materials in place.

NOTE The filter paper separator is used to prevent any physical interactions between smooth impermeable enclosures and the detector, as well as any fibre transfer, enclosure sticking, ink transfer, or adhesive sticking to the detector surface.