

What do the terms mean?

P.A.T. Test

There may be chemical compounds that are transferred when different kinds of packaging material comes into contact with processed photos (also known as developed photos). In the 150 years of photography, there are many cases documented by museums and archives where packaging materials have damaged photo material.

Defined in a wider sense, packaging material are things that come into contact with the front or rear sides of photo material, e.g. photo albums, envelopes, photo bags, and also adhesives on photo bags, the ink used for labeling photos or adhesive labels. Standardized tests are needed in order to test the potential chemical reactions of packaging material.

A suitable test has been developed and revised at a task force at ANSI (American National Standard Institute) together with industry representatives and independent research institutes. This test is known as PAT (Photographic Activity Test) and in particular it provides detailed information about black and white photographic material.

PAT is extremely important for the manufacturers of archive material and for potential customers at archives and museums. When new archive storage material is purchased, normally only material that has passed the PAT is selected. The only commercial provider of the PAT test is the IPI (Image Permanence Institute) in Rochester, New York². The IPI has a virtual monopoly on this test. From the beginning, IPI was a member of the standardization commission and is one of the rare organizations to own the test foils needed for this test. The test foil in question is an AGFA silver yellow (silver stain) foil that was only produced as a laboratory test product and never available as a commercial product.

PAT is a test method to identify the possible chemical effect of packaging material on processed photo material. The test consists of storing 2 different detectors together with the test material in a climatic chamber over a 15 day period at 70°C and 86 % relative air humidity. Test material are placed in special holders and the detectors are placed on top of them like a sandwich. The detectors and the tested materials are separated through an intermediate layer made of filter paper. This ensures that chemical compounds are diffused during the transfer between test material and detector, and also prevents the test material from sticking to detector surface.

One detector is the Image Interaction Detector, made of a finely distributed silver in gelatin on a polyester carrier. This detector is the heart of the test: it's the AGFA silver yellow foil that's not commercially available. The silver yellow detector stimulates chemical reactions on the silver image of the photographic material. If the reaction occurs homogeneously, the result is an even fading on the detector. If the reaction is non-homogeneous, the results are mottling (appearance of uneven spots) on the detector. Fading can be recorded by

measuring the density of blue prior to storage and during storage, while mottling can be measured by a visual scan only.

The other detector is the Stain Detector, made from non-developed, non-fixated black and white photo paper (barite paper) which is still commercially available. This detector stimulates damage to gelatin that occurs in the form of staining. Here, the density of blue can be measured prior to storage and after storage. On the rear side of the detector the test material is separated by a layer of polyester foil so there's no direct contact between the material and the detector.

Both types of detectors are universal and can be used for all black and white photo material regardless of product manufacturer.

Often, cost factors are the reason behind improper and unsuitable archiving materials are used at existing public archives. For example, the archive of a medium-sized city (population of 300,000) was interested to know whether the packaging materials used in their city archives had the right standards and were there any issues? When a selection of their commonly used packaging material was tested with the PAT method, 3 out of 6 samples failed the test criteria. Unsurprisingly, items such as a brown envelope failed the test and had created considerable mottling to photos.

The reality is: When archived materials are stored using improper materials, there is a risk of damage to inventories.