
Imaging materials — Scratch resistance of photographic prints —

Part 2: Sclerometer test method

*Matériaux pour l'image — Résistance à la rayure des épreuves
photographiques —*

Partie 2: Méthode d'essai au scléromètre





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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
4.1 General	1
4.2 Constant load	2
5 Test device	2
5.1 Test device description	2
5.2 Selection of stylus	3
6 Samples	4
6.1 General	4
6.2 Test target	4
6.3 Preparation	4
6.4 Conditioning	4
7 Test procedure	5
7.1 General	5
7.2 Testing conditions	5
7.3 Constant load	5
8 Evaluation	6
8.1 General	6
8.2 Visual evaluation of surface deformation	6
8.3 Scratch susceptibility	6
9 Test report	7
Bibliography	8

Foreword

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Introduction

This method is one of a series ISO 189xx relating to permanence and durability of image prints, which is their resistance to mechanical, chemical and/or environmental stresses in conditions of use. The permanence of the image under environmental stresses is tested by each stress factor individually: light (ISO 18937^[6]), heat (ISO 18936^[5]), ozone (ISO 18941^[7]), and humidity (ISO 18946^[8]). These stress factors are given by the ambient conditions, over which the user often has limited control. The exposure to mechanical and physical stress may often be controlled by the user, unless intense handling is integral to intended use. Tests for rubbing of prints resulting in abrasion or smearing of the image are handled in ISO 18947-1^[9] and ISO 18947-2^[10], scratch resistance (of film) is addressed in ISO 18922^[3] and durability tests to simulate accidental exposure to water are described ISO 18935^[4].

Photographic prints are also susceptible to scratching when handled. This problem is particularly evident with digital prints, which may be composed of various layers and may include colorants on the surface that are not protected from physical damage. Test methods for evaluating the scratch resistance of photographic prints are another means to characterise the physical durability of photographic prints.

This document provides standardized requirements to evaluate the scratch resistance of image prints in their various formats. Scratch might occur accidentally or repeatedly by handling of the image. The following are some examples of sources of scratching:

- fingernails;
- sharp edge of metallic or mineral object (e.g. accessories such as rings);
- improper cleaning.

Test devices for scratch tests allow a wide variety of test conditions and parameters. Therefore, the test method and test conditions should be carefully determined considering the print material and its expected use.

Scratching tends to occur in a specific location at a single point of contact, as opposed to abrasion which affects larger areas of the print material.

There is no general correlation between damage to digital prints from abrasion and from scratches. For example, some inkjet prints show both abrasion and scratch damage, while other inkjet prints are damaged from scratches but not abrasion. Similarly, some digital press samples are damaged by abrasion, but not from scratches^[14].

All types of digital prints may benefit from additional protection against abrasion and scratches. Polyester or polyethylene sleeves and laminates, including liquid, thermal, and pressure-sensitive materials, can provide this additional protection. Eliminating contact with adjacent surfaces, which is achieved with window-matted prints, is also effective in preventing damage from abrasion and scratches^[5].

As a test method for scratching, the pencil test is well-known^[2]. However, it was determined to be insufficient for photographic prints through round-robin testing in this committee because scratch resistance of photographic prints has wider variety than the scale of pencil hardness. The pencil test also proved difficult to carry out in a reproducible manner with photographic prints.

The sclerometer^[13] is also used extensively in determining the scratch resistance of paints and varnishes^{[1][12]}.