

ICS 37.040.20
CCS G 81



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18117-2025

Replacing GB/T 18117-2000

**Photography - Processed photographic colour films and paper
prints - Methods for measuring image stability
(English Translation)**

Issued on: August 1, 2025

Implemented on: February 1, 2026

**Issued by: State Administration for Market Regulation, Standardization
Administration of China**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and Definitions	
4 Test Method	
4.1 Sensitometric Exposure	
4.2 Processing	
4.3 Density determination	
4.4 Definition of density terms	
4.5 Density value to be measured	
4.6 Density measurement correction method for dmin changes	
4.7 Calculation of Image Life Parameters	
4.8 Effects of Dye Fading and Dyeing on the Quality of Color Negative Image Printing	
5 Dark stability test method	
5.1 General Principles	
5.2 Test conditions	
5.3 Sample size	
5.4 Test equipment and operation of free hanging specimens	
5.5 Test equipment and operation of specimens sealed in moisture-barrier bags	
5.6 Handling and packaging of samples in moisture-barrier bags	
5.7 Aging conditions for specimens sealed in moisture-barrier bags	
5.8 Calculation of Dark Stability	
6 Light stability test method	
6.1 General	
6.2 Sample size	
6.3 Irradiance measurement and normalization of test results	
6.4 Backing of specimens during irradiation testing	
6.5 Standard window glass specifications	
6.6 High-intensity filtered xenon arc ID65 light source (50klx~100klx) for simulating indoor indirect sunlight through window glass	
6.7 Glass-filtered fluorescent interior lighting - cool white fluorescent lamps (80klx or less)	

6.8 Incandescent tungsten lamp indoor illuminance 30klx - CIE illuminant A spectral distribution	
6.9 Simulated outdoor sunlight (xenon arc lamp) 100klx-CIE-D65 spectral distribution	
6.10 Intermittent halogen lamp slide projection 1000klx	
6.11 Calculation of photostability	
7 Test Report	
7.1 General Principles	
7.2 Dark stability test	
7.3 Light stability test	
Appendix A (Informative) An interpolation method for step wedge exposure	
Appendix B (Informative) Reflective Photo Power Formula d_{min} Correction Method	
B.1 Overview	
B.2 Background	
B.3 Basic formula representing the relationship between D_{dye} , d_{dye} , and d_{min}	
B.4 Comparison of the accuracy of full d_{min} correction, 1/2 d_{min} correction, and power formula d_{min} correction	
B.5 D_{dye} Calculation Principles	
B.6 Notes on n	
Appendix C (Informative) Arrhenius Calculation of Dark Stability	
C.1 Fading curve diagram	
C.2 Arrhenius diagram	
C.3 Computerization of the Arrhenius method	
Appendix D (Informative) Importance of Initial Density on Dye Fading and Color Balance Changes in Light Stability Tests	
Appendix E (Informative) "Encapsulation Effect" When Photos are Framed and Covered with Glass or Plastic Sheets in Light Stability Tests	
Appendix F (Informative) Data Processing of Color Image Photostability	
F.1 Overview	
F.2 Data processing procedures	
F.3 Results	
Reference	

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 18117-2000 "Test method for stability of photographic image of processed photographic color film and paper" Compared with GB/T 18117-2000, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) Changed the names of the Wratten filters in Table 1 and added the Fuji type (see 4.1, 3.1 of the 2000 edition);
- b) Added relevant content that processing liquids and processing procedures will have a significant impact on the dark retention and light stability of photographic color materials Capacity (see 4.2);
- c) Added "Explanation of the density measurement method for translucent materials" and added the reflective photographic material replacement in the dark stability test in Table 2. Substitution method (see 4.6.1);
- d) Added "Calculation of image life parameters" (see 4.7);
- e) Added "The effects of dye fading and staining on the quality of color negative film printing" (see 4.8);
- f) Added relevant content on "Dark Stability Test Method" (see Chapter 5, Chapter 4 of the 2000 edition);
- g) Added test equipment and operation (see 6.6, 5.6 of the 2000 edition);
- h) Changed the illumination of cool white fluorescent lamps, added the introduction of two types of cool white fluorescent lamps, and changed the surface temperature of the specimen (see 6.7, 5.7 of the 2000 edition);
- i) The specimen surface temperature has been changed (see 6.8, 5.8 of the 2000 edition);
- j) The operating temperature has been changed (see 6.10, 5.10 of the 2000 edition);
- k) Added "General principles for test reporting" and deleted the image life parameter (see 7.1, 6.1 of the 2000 edition).

This document is equivalent to ISO 18909:2022 "Photographic processed photographic colour films and papers - Test methods for photographic image stability" Test Methods".

Introduction

This document is divided into two parts. Part I covers methods and procedures for predicting the long-term dark storage stability of photographic color images; Part II this section covers the determination of photographic image stability at specific temperatures and relative humidity and under specific intensity and spectral distribution of light.

Methods and procedures for testing.

Most continuous-tone photographs today are made with photographic color materials, and the time it takes to store these photographs can range from a few days to several hundred years.

The final use of a photograph is often determined by the initial for many users, it is important to understand the lifespan of color photos, especially the stability that often varies with the for museums, archives and other institutions responsible for preserving color photographic materials, if you want to keep the images Long-term stability requires an understanding of the various storage and display conditions of color photographs.

Most modern color photographs are made by dispersing yellow, magenta, and cyan organic dyes in a transparent binder layer, which is then coated on a transparent or Photographic color dye images will fade during storage and display due to the fading of the three color dyes.

In addition, yellowing (or occasionally other colors) stains (called staining) may form and Physical degradation such as embrittlement and cracking of the support and image layer may occur. The rate of image fading and staining can vary widely, depending primarily on the the quality of chemical processing is another important factor, depending on the inherent stability of photographic color materials and their storage and display conditions.

In addition, post-processing such as applying varnish, laminating plastic film and retouching coloring will also affect the stability of colored materials.

The two main factors that influence the storage behavior (i.e. dark stability) are the temperature and relative humidity of the air that comes into contact with the photograph.

Especially when combined with high relative humidity, chemical reactions will be accelerated, leading to the degradation of one or more image dyes.

Other potential causes of image degradation include atmospheric pollutants (such as oxidizing and reducing gases), microorganisms and insects.

The main factors affecting the stability of color photos when displayed indoors or outdoors are lighting intensity, lighting time, lighting spectrum distribution and surrounding Environmental conditions (however, slower dark fading and staining reactions still occur normally during display and need to be included in the total change in image quality).

Ultraviolet (UV) radiation is particularly harmful to certain types of color photographs, causing rapid fading and degradation of plastic layers such as coatings.

Polyethylene pigment layer on plastic (RC) paper base.

In actual applications, the temperature, relative humidity, lighting intensity, and duration of storage and display of color photos are different.

It is impossible to accurately predict the useful life of a type of photographic material unless the specific storage and display conditions are known in advance. In addition, acceptable