

**Standard of Japan Electronics and Information Technology Industries
Association**

**Digital Color Photo Print Stability Evaluation
JEITA CP-3901**

1. Overview

The improvements of the image quality and the image permanence have the remarkable ones after consumer printers are put on the market, and each company had started announcement their performances as product's merit. On the other hand, ISO has been discussing the method of evaluating the permanence of the digital image photos continuously, but the publication time is not predictable. Under the circumstances, it was judged that JEITA should make its standard of the method of evaluating the permanence of the digital image photos in order to contribute the evolution of the technology and for the users who want to compare the permanence. JEITA had composed PG of the persons related to the industry to discuss it repeatedly, and came to publish the CP-3901 " Digital Color Photo Print Stability Evaluation" CP-3901.

2. Items specified in this standard

Following contents are described,

- 1. Scope**
- 2. Normative references and bibliographies**
- 3. Terms and definitions**
- 4. Sample preparation**
 - 4.1 Life prediction target
 - 4.2 Image target
- 5. Density measurements**
 - 5.1 Definition of density terms
 - 5.2 Density values to be measured
 - 5.3 Colorimetry
- 6. Method for estimating life expectancy**
 - 6.1 Test conditions when calculating life expectancy
 - 6.2 Endpoint
- 7. Test methods - Light Stability**

- 7.1 Scope
- 7.2 Equipment and test conditions
 - 7.2.1 Light source
 - 7.2.2 Illuminance
 - 7.2.3 Optical filter
 - 7.2.4 Temperature and humidity
 - 7.2.5 Other precautions
- 7.3 Measurement
- 7.4 Calculation of life expectancy
 - 7.4.1 Provision for endpoint
 - 7.4.2 Standard Illuminance for calculating life expectancy
- 7.5 Test reporting

8. Test methods - Ozone Stability

- 8.1 Scope
- 8.2 Equipment and test conditions
 - 8.2.1 Test chamber
 - 8.2.2 Gas supply method
 - 8.2.3 Gas concentration control method
 - 8.2.4 Gas concentration measurement method
 - 8.2.5 Gas flow rate control method
 - 8.2.6 Sample setup method
 - 8.2.7 Temperature and humidity
 - 8.2.8 Gas concentration
- 8.3 Test procedure
- 8.4 Measurement
- 8.5 Calculation of life expectancy
 - 8.5.1 Provision for endpoint
 - 8.5.2 Standard concentration for calculating life expectancy
- 8.6 Test reporting
- 8.7 Safety precautions when performing tests

9. Test methods - Thermal stability

- 9.1 Scope
- 9.2 Sample characteristics and test conditions

9.3 Standard conditions (I), ISO-compliant conditions (ISO 18909 compliant, where test temperature is $\geq 20^{\circ}\text{C}$ and endpoint is as provided)

9.3.1 Test chamber

9.3.2 Test humidity

9.3.3 Test temperature

9.3.4 Test method

9.3.5 Method of storing samples after testing

9.3.6 Measurement

9.3.7 Calculation of life expectancy

9.3.7.1 Provision for endpoint

9.3.7.2 Calculating life expectancy using Arrhenius equation

9.4 Standard conditions (II), JEITA-compliant conditions (test temperature is $\geq 20^{\circ}\text{C}$ and endpoint is as provided, or when a half or one-third endpoint is used)

9.4.1 Test chamber

9.4.2 Test humidity

9.4.3 Test temperature

9.4.4 Test method

9.4.5 Method of storing samples after testing

9.4.6 Measurement

9.4.7 Calculation of life expectancy

9.4.7.1 Provision for endpoint

9.4.7.2 Calculating life expectancy using Arrhenius equation

9.4.7.2.1 Basic method using the endpoint of 6.2

9.4.7.2.2 Method for shortening the time when a long time is required to reach the specified endpoint (the 1/2 endpoint method)

9.4.7.2.3 Method for shortening the time when a long time is required to reach the specified endpoint (the one-third endpoint method)

9.5 Test reporting

10. Test reporting

10.1 Reporting of sample preparation

10.2 Light stability test

10.2.1 Test reporting of standard condition

10.2.2 Test reporting of other conditions

- 10.3 Ozone stability test
 - 10.3.1 Test reporting of standard condition
 - 10.3.2 Test reporting of other conditions
- 10.4 Thermal stability test
 - 10.4.1 Test reporting of standard condition (I)
 - 10.4.2 Test reporting of standard condition (II)
 - 10.4.3 Test reporting of other conditions

Annex 1 (Informative)	References
Annex 2 (Normative)	Test Chart
Annex 3 (Informative)	Filters Used in Light Stability Tests
Annex 4 (Informative)	Digital Photo Print Durability Tests
Explanation	

3. Remarks

- 3.1 This standard is described only in Japanese.

Table: Summary of differences in content between the ISO standard being drafted and the JEITA standard

Item	JEITA	ISO (as of the Washington meeting of May 17, 2007)
Endpoint judgment criterion (color portions)	30% OD loss	40% OD loss
Endpoint judgment criterion (imbalance)	Difference in OD loss of 15%	Difference in OD loss of 20%
Portions used for endpoint judgments	YMCK	YMCKRGB
Calculation of years of light stability	One level: 250 lux × 12 hours.	Two levels: 125 lux × 12 hours & 500 lux × 12 hours
Ozone life calculation	40 ppm•hr/year	50 ppm•hr/year
Light stability test method	UV-cut filter required	UV-cut filter optional
	IR-cut filter optional	In reality the majority opinion is that an IR-cut filter is required
	Chamber temperature: 20 ±5°C	Chamber temperature: 23±2°C
	BPT ≤ 40°C	BPT 23 ±2°C
Ozone stability test method	Gas concentration: 1-5 ppm ±10%	Gas concentration: 1-5 ppm ±0.1ppm (However, ±5% is under consideration for a concentration of 5 ppm)
	Chamber temperature: 23 ±2°C	Chamber temperature setting: 23-27°C ±2°C
Thermal stability test method	Can calculate provisional life expectancy using 1/2 or 1/3 endpoint judgment criterion for Dmin	JEITA criteria are under study
	Minimum test temperature range: 15°C acceptable	Minimum test temperature range: ≥ 20°C
Test humidity	50%RH	Tentatively 50%RH (Some are proposing 65%RH, but 50%RH is favored by the majority)
Target	Format: BMP Number of steps: 16 Tolerance for change from initial density: 10% Profile: Not used Driver: Manufacturer's recommended conditions	Format: Tiff s-RGB Number of steps: TBD Tolerance for change from initial density: Gray: 0.05, YMCKRGB: 0.10 Profile: Use Driver: One that reproduces close to original file