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enclosed carbon arc lamp light**

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Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Suga Weathering Technology Foundation (SWTF)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS L 0842** : 2004), which has been technically revised.

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Test methods for colour fastness to enclosed carbon arc lamp light

Introduction

The test methods in this Standard, for which no corresponding International Standard exists at this point, have been well established in Japan for their effectiveness in controlling the quality of textile products. This revision has been initiated to make necessary changes in the provisions regarding the apparatus and materials, preparation of specimens, test procedure, assessment method and test report, as well as to conform the layout of this document to the rules laid down in **JIS Z 8301**.

1 Scope

This Standard specifies the test methods for assessing the colour fastness of dyed textiles to enclosed carbon arc lamp light.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 7751 *Light-exposure and light-and-water-exposure apparatus (Enclosed carbon-arc type)*

JIS L 0801 *General principles of testing methods for colour fastness*

JIS L 0804 *Grey scale for assessing change in colour*

JIS L 0841 *Test methods for colour fastness to daylight*

ISO 105-B05 *Textiles — Tests for colour fastness — Part B05 : Detection and assessment of photochromism*

NOTE **JIS L 0886**, which corresponds to the above **ISO** Standard, is not cited for reasons of technical deviation.

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in **JIS L 0801** apply.

3.1

standard fading

change in colour where the colour contrast between the exposed and unexposed portions is approximately equal to the colour contrast of Grey scale No. 4 for assessing change in colour

3.2

photochromism

phenomenon where a dyed textile that changes in colour when exposed to irradiation of light reverts to the original colour when stored away from light for a definite period of time

4 Summary

A specimen is exposed to enclosed carbon arc lamp light by the specified method, and either by comparing the change in colour of the specimen with that of the blue scales or reference sample exposed along with the specimen, or by comparing the change in colour of the specimen before and after the test, the colour fastness of the specimen to enclosed carbon arc lamp light (hereafter referred to as the colour fastness) is determined.

5 Test methods

The test is carried out by one of the following five methods selected according to the specific purpose of the test.

- a) **Exposure method 1** A single specimen is exposed to light along with a set of blue scales and the colour fastness of the specimen determined.
- b) **Exposure method 2** Multiple specimens are exposed to light along with a set of blue scales and the colour fastness of each specimen determined.
- c) **Exposure method 3** A single or multiple specimen(s) is exposed to light along with the target blue scale to see if the specimen(s) exhibits an equal colour fastness to the target blue scale.
- d) **Exposure method 4** A single or multiple specimen(s) is exposed to light along with the target blue scale or reference sample with known colour fastness to see if the specimen(s) exhibits an equal colour fastness to the target blue scale or the reference sample.
- e) **Exposure method 5** Specimens are exposed to light until the specified amount of radiant energy is reached and the colour fastness of the specimens determined.

6 Apparatus and materials

The apparatus and materials shall be as follows.

- a) **Blue scales**, specified in **6 a)** of **JIS L 0841**.
- b) **Grey scales for assessing change in colour**, specified in **JIS L 0804**.
- c) **Light-exposure apparatus**, in accordance with **1) to 5)** below, also meeting the requirements for the enclosed carbon-arc type light-exposure apparatus (Type F) (hereafter referred to as the test apparatus) provided in **4 a)** of **JIS B 7751**.

The general outlines of different types of the test apparatus are shown in Figures A.1 to A.3 for reference.

- 1) The specification of the test apparatus and test conditions shall be as given in Table 1.

The spectral distribution of enclosed carbon arc is shown in Figure A.4 for reference.

Table 1 Specification of test apparatus and test conditions

Item		Condition
Power source		180 V to 220 V, single phase or three phase
Light-emitting part	Light source	Enclosed carbon arc lamp light
	Number of lights	1
	Discharge voltage and current	125 V to 145 V, 15 A to 17 A [average 135 V (± 2 %), 16 A (± 2 %)]
	Spectral transmittance of unused glass globe	2 % max. at 275 nm or lower wavelength, 90 % min. at 400 nm to 700 nm wavelength
Black panel temperature		63 °C $\pm$ 3 °C or 83 °C $\pm$ 3 °C
Relative humidity		(50 $\pm$ 5) % for automatic humidity control type apparatus and black panel temperature of 63 °C $\pm$ 3 °C 50 % max. for wick type (uncontrolled type) apparatus or black panel temperature of 83 °C $\pm$ 3 °C

- 2) The specimen holding device shall have a specimen rotating rack that is about 508 mm in outside diameter and capable of rotating the specimen at a speed of 2 rpm $\pm$ 1 rpm.
 - 3) The specimen holder shall be either of inclined or vertical type and made of aluminium or stainless steel (see Figures A.5 and A.6).
 - 4) The temperature controller shall be capable of maintaining the temperature inside the apparatus constant so that the reading on the black panel thermometer is 63 °C $\pm$ 3 °C or 83 °C $\pm$ 3 °C.
 - 5) The black panel thermometer (see Figure A.7) shall consist of a metal plate and a stem coated with two sprayed and then baked layers of light-resistant black enamel, and have reflectance of not more than 10 % (see Figure A.8). Normally two such black panel thermometers shall be used, one for measurement and the other for calibration of the measuring black panel thermometer. The calibration of the measuring black panel thermometer shall be performed by mounting both black thermometers at the same mounting position as the specimen and using the same irradiation condition.
- d) **Opaque covering** (hereafter referred to as the cover) A white cardboard perfectly opaque to light, or other thin opaque material, for example, a thin sheet aluminium