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**Test methods for colour fastness to
washing and laundering**

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Foreword

This translation has been made based on the original Japanese Industrial Standard 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 the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS L 0844:2005** is replaced with this Standard.

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Test methods for colour fastness to washing and laundering

Introduction

This Japanese Industrial Standard has been prepared based on the fourth edition of **ISO 105-C06** published in 2010, the second edition of **ISO 105-C08** published in 2010, the first edition of **ISO 105-C09** published in 2001, the first edition of **ISO 105-C10** published in 2006 and the first edition of **ISO 105-C12** published in 2004 with some modifications of the technical contents.

The portions given dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JB. Annex JA contains matters not given in the corresponding International Standard.

1 Scope

This Standard specifies the test methods for colour fastness of dyed textile goods to washing and laundering.

For tests performed in accordance with method C (**ISO 105-C08**), method D (**ISO 105-C09**) and method E (**ISO 105-C12**), the requirements in Annex A to Annex C shall apply in place of those in clause 5 to clause 9.

NOTE : The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 105-C06:2010 *Textiles—Tests for colour fastness—Part C06: Colour fastness to domestic and commercial laundering*

ISO 105-C08:2010 *Textiles—Tests for colour fastness—Part C08: Colour fastness to domestic and commercial laundering using a non-phosphate reference detergent incorporating a low-temperature bleach activator*

ISO 105-C09:2001 *Textiles—Tests for colour fastness—Part C09: Colour fastness to domestic and commercial laundering—Oxidative bleach response using a non-phosphate reference detergent incorporating a low temperature bleach activator*

ISO 105-C10:2006 *Textiles—Tests for colour fastness—Part C10: Colour fastness to washing with soap or soap and soda*

ISO 105-C12:2004 *Textiles—Tests for colour fastness—Part C12: Colour fastness to industrial laundering* (Overall evaluation: MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, 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 G 4303 *Stainless steel bars*

JIS K 0557 *Water used for industrial water and wastewater analysis*

JIS K 3302 *Laundry bar soaps*

JIS K 3371 *Synthetic detergents for home laundering*

JIS K 8355 *Acetic acid (Reagent)*

JIS K 8625 *Sodium carbonate (Reagent)*

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

NOTE : Corresponding International Standard: ISO 105-A01 *Textiles—Tests for colour fastness—Part A01: General principles of testing* (MOD)

JIS L 0803 *Standard adjacent fabrics for staining of colour fastness test*

NOTE : Corresponding International Standards: ISO 105-F01 *Textiles—Tests for colour fastness—Part F01: Specification for wool adjacent fabric*, ISO 105-F02 *Textiles—Tests for colour fastness—Part F02: Specification for cotton and viscose adjacent fabrics*, ISO 105-F03 *Textiles—Tests for colour fastness—Part F03: Specification for polyamide adjacent fabric*, ISO 105-F04 *Textiles—Tests for colour fastness—Part F04: Specification for polyester adjacent fabric*, ISO 105-F05 *Textiles—Tests for colour fastness—Part F05: Specification for acrylic adjacent fabric*, ISO 105-F06 *Textiles—Tests for colour fastness—Part F06: Specification for silk adjacent fabric*, ISO 105-F07 *Textiles—Tests for colour fastness—Part F07: Specification for secondary acetate adjacent fabric*, and ISO 105-F10 *Textiles—Tests for colour fastness—Part F10: Specification for adjacent fabric: Multifibre* (Overall evaluation: MOD)

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

NOTE : Corresponding International Standard: ISO 105-A02 *Textiles—Tests for colour fastness—Part A02: Grey scale for assessing change in colour* (MOD)

JIS L 0805 *Grey scale for assessing staining*

NOTE : Corresponding International Standard: ISO 105-A03 *Textiles—Tests for colour fastness—Part A03: Grey scale for assessing staining* (MOD)

3 Summery

A composite specimen is treated by soaking it in test solution based on the specified method, rinsed with water and dried. Then the grade of change in colour and the grade of staining are obtained by comparing the degrees of the change in colour on the specimen and the staining on the standard adjacent fabrics with the grey scale for assessing change in colour and grey scale for assessing staining, respectively, or by instrumental method, and the colour fastness of the specimen is determined.

4 Classification of tests

Classification of tests is as shown in table 1.

Table 1 Classification of tests

Type of test	Subclassification of test methods (No.)	Type of test of International Standard	Corresponding International Standard (informative)
Method A	A-1	Test 1 A (1)	ISO 105-C10
	A-2	Test 2 B (2)	
	A-3	Test 3 C (3)	
	A-4	—	
	A-5	—	
	A-6	Test 4 D (4)	
	A-7	Test 5 E (5)	
Method B	B-1	A1S	ISO 105-C06
	B-2	A1M	
	B-3	A2S	
	B-4	B1S	
	B-5	B1M	
	B-6	B2S	
	B-7	C1S	
	B-8	C1M	
	B-9	C2S	
	B-10	D1S	
	B-11	D1M	
	B-12	D2S	
	B-13	D3S	
	B-14	D3M	
	B-15	E1S	
	B-16	E2S	
Method C	C-1	—	ISO 105-C08
	C-2		
	C-3		
	C-4		
Method D	—	—	ISO 105-C09
Method E	—	—	ISO 105-C12
NOTE : The horizontal bar “—” in the table means no applicable method.			

5 Apparatus and materials

The apparatus and materials shall be as follows.

- a) **Washing tester** The washing tester is composed of the test bottle, the device for rotating the test bottle and the thermostatic water bath or thermostatic chamber for keeping the test solution in the test bottle at constant temperature required. Each of them shall be in conformity with the following respective requirements.

An example of the apparatus is shown in figure 1 and figure 2.

- 1) **Test bottle** The cylindrical bottle for containing composite specimen or specimen, test solution and stainless steel balls, made of glass or stainless steel, with $550 \text{ ml} \pm 50 \text{ ml}$ capacity ($75 \text{ mm} \pm 5 \text{ mm}$ in inside diameter), which can bear the rotation and be sealed closely.
- 2) **Rotating device** The rotating device shall be composed of an electric motor, rotating shaft and a test-bottle holder that is radially attached to the rotating shaft, shall allow a test bottle to be attached so that the centre line of the holding axis of the test-bottle holder is aligned with the centre line of the test bottle, and shall be capable of rotating in a thermostatic water bath or thermostatic chamber at the rate of $40 \text{ r.p.m.} \pm 2 \text{ r.p.m.}$

The distance from the centre of the rotating shaft to the bottom of the test bottle shall be $45 \text{ mm} \pm 10 \text{ mm}$.

- 3) **Thermostatic water bath or thermostatic chamber** That having a heating device and capable of keeping the test solution in the rotating test bottle at a prescribed temperature $\pm 2^\circ\text{C}$.
- 4) **Stainless steel balls** Stainless steel balls which are approximately 6 mm in diameter, and are made of SUS304 specified in **JIS G 4303**.

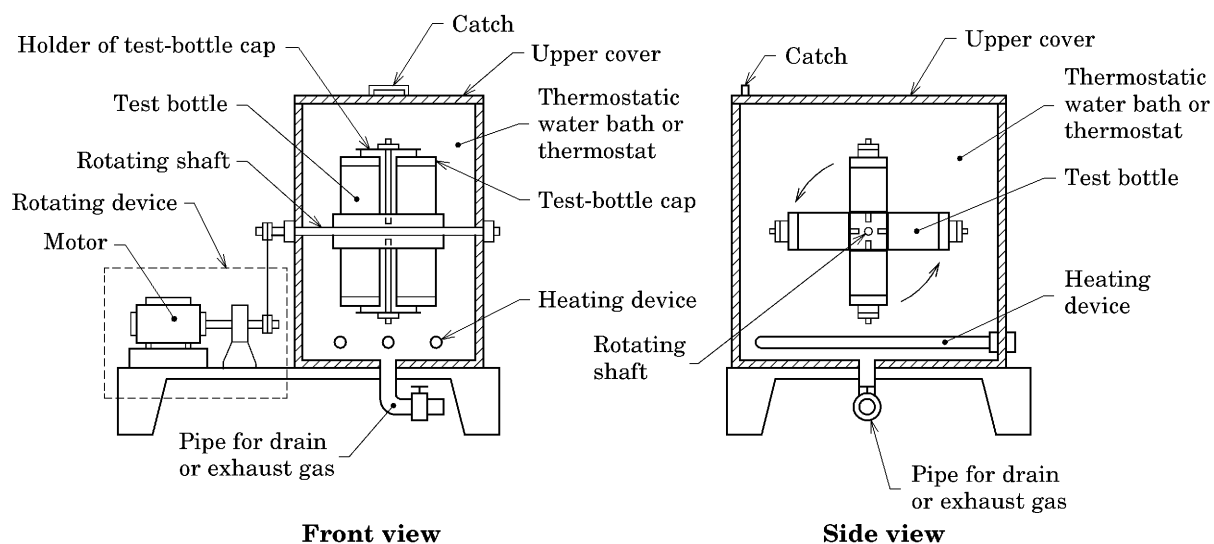


Figure 1 Example of washing tester (comprising a thermostatic water bath)

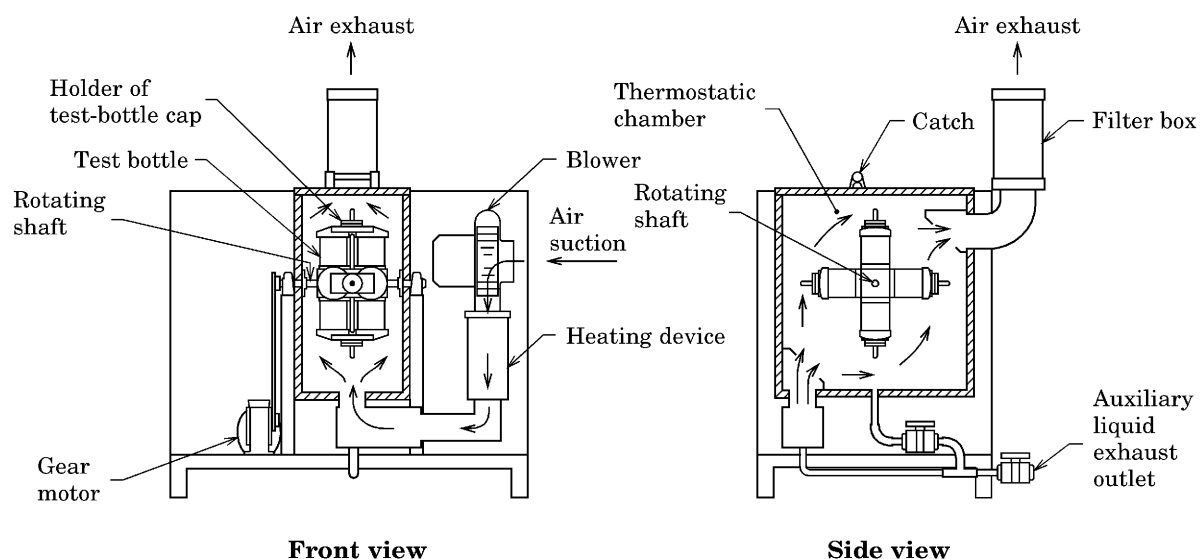


Figure 2 Example of washing tester (comprising a thermostatic chamber)

- b) **Soap** (used for method A) The soap specified in **JIS K 3302**, with no additives (or Type 1), or any other soap with no additives.
- c) **Sodium carbonate** (used for No. A-3 to No. A7 and No. B-7 to No. B-16) Guaranteed reagent specified in **JIS K 8625**.
- d) **Synthetic detergent** (used for method B) Synthetic detergent of either No. 1 specified in table 2 or No. 2 specified in table 3, among which the suitable one for the purpose of use shall be selected. According to table 2 and table 3, weigh out each component accurately, mix and grind them well using a mortar and pestle, dry it, if necessary, and make it uniform powder. As necessary, the detergent on the market which conforms to **JIS K 3371** may be used, in which case, the name of the employed synthetic detergent shall be additionally mentioned in the record.

Table 2 Components of synthetic detergent No. 1

Unit: %

Components	Mass ratio
Linear sodium alkylbenzenesulfonate (LAS)	18.0
Sodium aluminosilicate	25.0
Sodium carbonate	18.0
Sodium silicate ($\text{SiO}_2/\text{Na}_2\text{O}=2/1$)	0.50
Sodium sulfate	22.13
Polyethyleneglycol	2.76
Sodium polyacrylate	3.50
Silicone (soap foam depressor)	0.04
Water content	10.0
Other surfactant	0.07
NOTE : Synthetic detergent No. 1 is equivalent to the detergent specified in 4.4.2 of ISO 105-C06 .	

Table 3 Components of synthetic detergent No. 2

Unit: %

Components	Mass ratio	
Linear sodium alkylbenzenesulfonate (average length of paraffin chain: 11.5 by number of carbon atoms)	8.0	±0.02
Ethoxylate tallow alcohol (14EO)	2.9	
Soap C ₁₂ -C ₁₆ : 13 to 26 % C ₁₈ -C ₂₂ : 74 to 87 %	3.5	
Sodium tripolyphosphate	43.7	
Sodium silicate (SiO ₂ /Na ₂ O=3.3/1)	7.5	
Magnesium silicate	1.9	
Carboxymethyl cellulose sodium salt (CMC)	1.2	
Sodium salt of EDTA	0.2	
Sodium sulfate	21.2	
Water	9.9	
NOTE: Synthetic detergent No. 2 is equivalent to the detergent specified in 4.4.3 of ISO 105-C06.		

- e) **Acetic acid** (used for method A) That specified in **JIS K 8355**.
- f) **Sodium hypochlorite solution** (used for No. A-4, No. B-13 and No. B-14) That containing 1 % of available chlorine (see Annex JA for the test method for available chlorine).
- g) **Sodium percarbonate** (used for method A) That containing 12 % or over of available chlorine, being 10 to 11 in pH (3 % solution) (see Annex JA for the test method for available oxygen).
- h) **Water** Water of A1 specified in **JIS K 0557**.
- i) **Grey scale for assessing change in colour** That specified in **JIS L 0804**.
- j) **Grey scale for assessing staining** That specified in **JIS L 0805**.
- k) **Standard adjacent fabrics** Those specified in **JIS L 0803**.

Hydroextractor and dryer to be used shall be in accordance with **JIS L 0801**.

6 Preparation of composite specimens

6.1 Method A (laundering using soap, or soap and sodium carbonate)

The preparation of composite specimens for method A shall be in accordance with 6.2 of **JIS L 0801**. If necessary, however, any one of the methods described in the following a) to c) may be applied. When single-fibre cloth is used for standard adjacent fabrics, one of the two standard adjacent fabrics used for specimen (the first standard adjacent fabric) shall be of the same type as the specimen, and the other adjacent fabric (the second standard adjacent fabric) shall be as given in table 4. When the specimen is composed with mixture, the first standard adjacent fabric shall be a cloth made of fibre having the largest mixture ratio, the second standard adjacent fabric shall be a

cloth as given in table 4 or that made of fibre having the next largest mixture ratio. When multifibre cloth is used, the multifibre test union cloth No. 1 (hereafter referred to as “union cloth No. 1”) and the multifibre test union cloth No. 2 (hereafter referred to as “union cloth No. 2”) are used for the tests No. A-1 to No. A-2, and the multifibre test union cloth No. 3 (hereafter referred to as “union cloth No. 3”) is used only for the tests No. A-3 to No. A-7.

Table 4 Combination of standard adjacent fabrics (method A)

First standard adjacent fabric	Second standard adjacent fabric Test temperature 40 °C and 50 °C	Second standard adjacent fabric Test temperature 60 °C, 70 °C, 80 °C and 95 °C
Cotton	Wool	Rayon or nylon
Wool	Cotton	—
Silk	Cotton	—
Rayon	Wool	Cotton
Acetate	Rayon or cotton	Rayon or cotton
Nylon	Wool or cotton	Cotton
Polyester	Wool or cotton	Cotton
Acrylic	Wool or cotton	Cotton

Other types of fibre may be used upon agreement between the interested parties, in which case, the type used shall be reflected in the test report.

Further, in the case of adding the sodium hypochlorite to the test solution in No. A-4 test, the composite specimen shall be prepared using the standard adjacent fabrics as given in table 5.

- a) In the case of the sample made of cloth, specimens shall be prepared in accordance with either of the following methods.
 - 1) Put two standard adjacent fabrics (single-fibre cloth), each measuring 50 mm × 40 mm, side by side on a specimen measuring 100 mm × 40 mm. Next, either sew four sides of the specimen roughly with white cotton sewing thread, or fold the specimen in half into 50 mm × 40 mm with the adjacent fabric inside, and sew roughly at an approximate centre of the specimen with white cotton sewing thread such that the sewing line is parallel to the folding line.
 - 2) Put a standard adjacent fabric (multifibre cloth) measuring 100 mm × 40 mm on the same sized specimen, and sew its four sides roughly with white cotton sewing thread.
- b) In the case of the sample made of thread, specimens shall be prepared in accordance with either of the following methods.
 - 1) Take the sample, with 100 mm length, weighing about 1/2 of two adjacent fabrics, place it by making it a thin layer between two adjacent fabrics (single-fibre cloth) each measuring 100 mm × 20 mm, and sew its four sides roughly with white cotton sewing thread.