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**Test methods for fastness to artificial
accelerated weathering with xenon arc
lamp light or sunshine carbon arc lamp
light**

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Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Test	2
4.1 Principle	2
4.2 Kinds of test method	2
5 Apparatus and materials	3
5.1 Weathering apparatus	3
5.2 Weather fastness reference	11
5.3 Grey scale for assessing change in colour	11
5.4 Stainless steel plate	11
5.5 Grey underlay and mask	11
5.6 Standard light source for using in assessment procedure	11
6 Test specimens	11
7 Procedure	11
7.1 Operation of weather meter	11
7.2 Exposure method for determining weather fastness	12
7.3 Exposure method for determining tensile strength, etc	16
8 Assessment method	17
9 Test report	17

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Suga Weathering Technology Foundation (SWTF)/Japanese Standards Association (JSA), with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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Test methods for fastness to artificial accelerated weathering with xenon arc lamp light or sunshine carbon arc lamp light

Introduction

This Japanese Industrial Standard is intended to specify the test method of determining the fastness to artificial accelerated weathering under water spray cycle condition for textiles. This has been recognized as a test method effective in quality control of textile products in Japan.

1 Scope

This Standard Specifies the test method for fastness to artificial accelerated weathering (hereafter referred to as "weather fastness") by exposure to a xenon arc lamp light or a sunshine carbon arc lamp light under water spray cycle condition of textiles.

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 4305 *Cold-rolled stainless steel plate, sheet and strip*

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

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

JIS L 0809 *Instrumental determination of colour fastness—Change in colour and staining*

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

JIS L 0886 *Test methods for the detection and assessment of photochromism*

JIS L 1096 *Testing methods for woven fabrics*

JIS Z 8701 *Colour specification—The CIE 1931 standard colorimetric system and the CIE 1964 supplementary standard colorimetric system*

JIS Z 8730 *Colour specification—Colour differences of object colours*

CIE Pub. No. 85:1989 *Solar Spectral irradiance*

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 fastness to artificial accelerated weathering

weather fastness of materials exposed to the artificial light source under a water

spray cycle

3.2 standard fading

the change in colour of the same degree contrast with the contrast of step 4 of grey scale for change in colour between exposed and unexposed surfaces

4 Test

4.1 Principle

A test specimen of textiles and weather fastness reference material(s) are exposed to xenon arc lamp light or sunshine carbon arc lamp light under a water spray cycle, and after the exposure the change in colour of them is assessed to determine weather fastness of materials to be tested.

If required, the change in tensile strength before and after exposure, colour change, etc. may be assessed.

4.2 Kinds of test method

Either of two kinds, Method A (xenon arc lamp exposure) or Method B (sunshine carbon arc lamp exposure) designated in table 1 shall be used.

Table 1 Test condition

Kind of test method		Method A	Method B
Light source		Xenon arc lamp	Sunshine carbon arc lamp
Radiation cycle		Continuous	
Optical filter conditions		Inner filter : quartz or borosilicate glass Outer filter : borosilicate glass	Type A filter or Type B filter (see table 2)
Radiation	Setting of arc conditions	Automatic irradiance control	Arc voltage : 50V ± 1 V Arc current : 60A ± 1.2 A at constant line voltage
	Irradiance at sample plane, W/m ² (Wavelength range)	60 ± 2 or 180 ± 5 (300 nm to 400 nm)	255 ± 26 (300 nm to 700 nm)
Temperature °C (at light-on period)	Black panel temperature	63 ± 3 ^{a)}	
	Black standard temperature	65 ± 3 ^{a)}	
Relative humidity, % (at light-on period)		50 ± 5 ^{b)}	
Water spray cycle		12 min spray during 60 min light-on period or 18 min spray during 120 min light-on period	
Quality of water for spray		Distilled water or deionized water with the electric conductivity of 5 µS/cm or less, containing 1 ppm or less silica ^{c)}	
Notes ^{a)} Temperature at water spray off, i.e., during only light-on period. If other temperature, for example, 83°C, is used, record it. ^{b)} If other relative humidity, for example, 65 % RH, is used, record it. ^{c)} It is appropriate to use the water through an ion exchange resin layer (based on an anion/cation.), a reverse osmosis membrane, or the equipment that is combined of these.			

5 Apparatus and materials

The apparatus and materials shall be as follows.

5.1 Weathering apparatus

The weathering apparatus is a xenon-arc-lamp type weathering apparatus (hereafter referred to as "xenon arc lamp weather meter") or a sunshine-carbon-arc-lamp type weathering apparatus (hereafter referred to as "sunshine carbon arc weather meter").

Each xenon arc lamp weather meter or sunshine carbon arc weather meter consists of a light source, a test chamber, temperature control device, a humidity control device, a water spray unit, specimen holders, etc., and details are as follows. Examples of the apparatus are shown in figures 1 and 2.

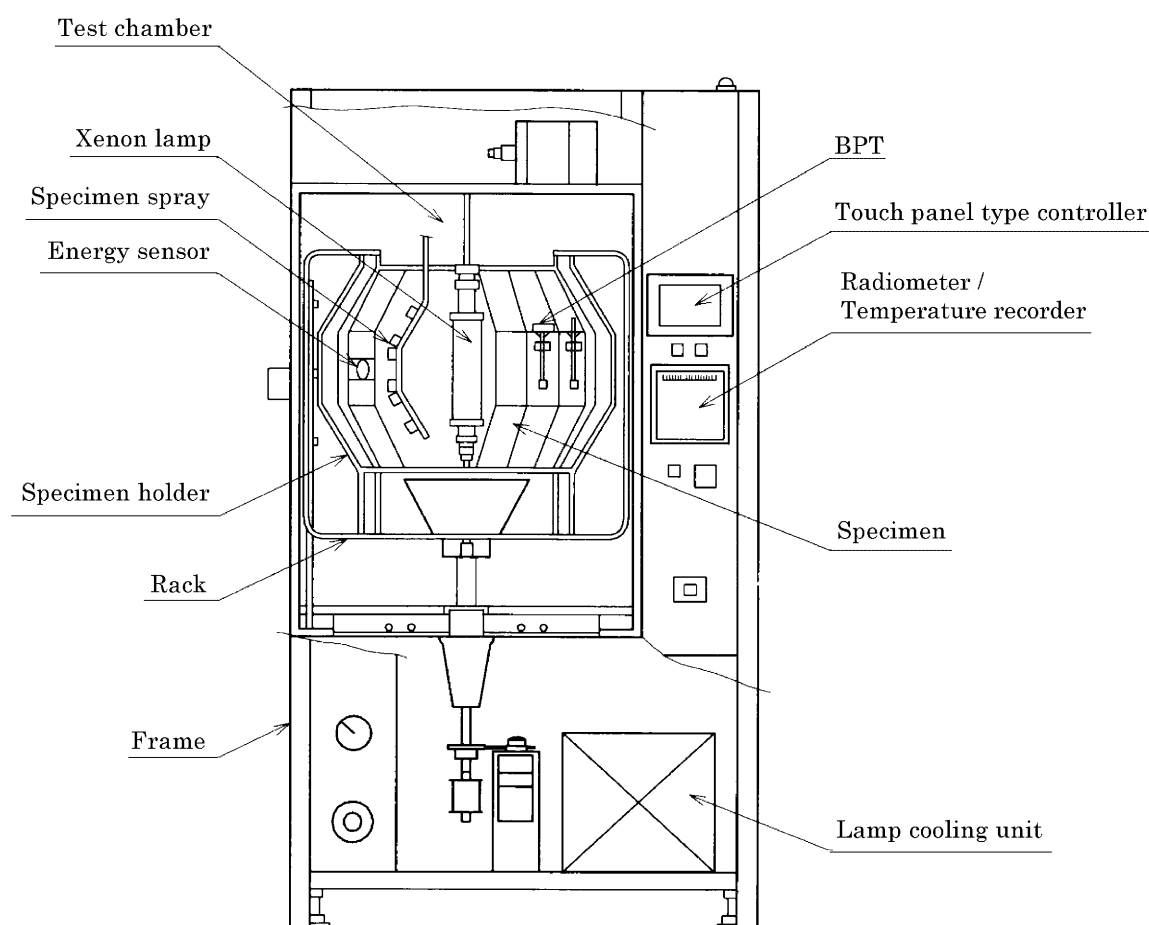
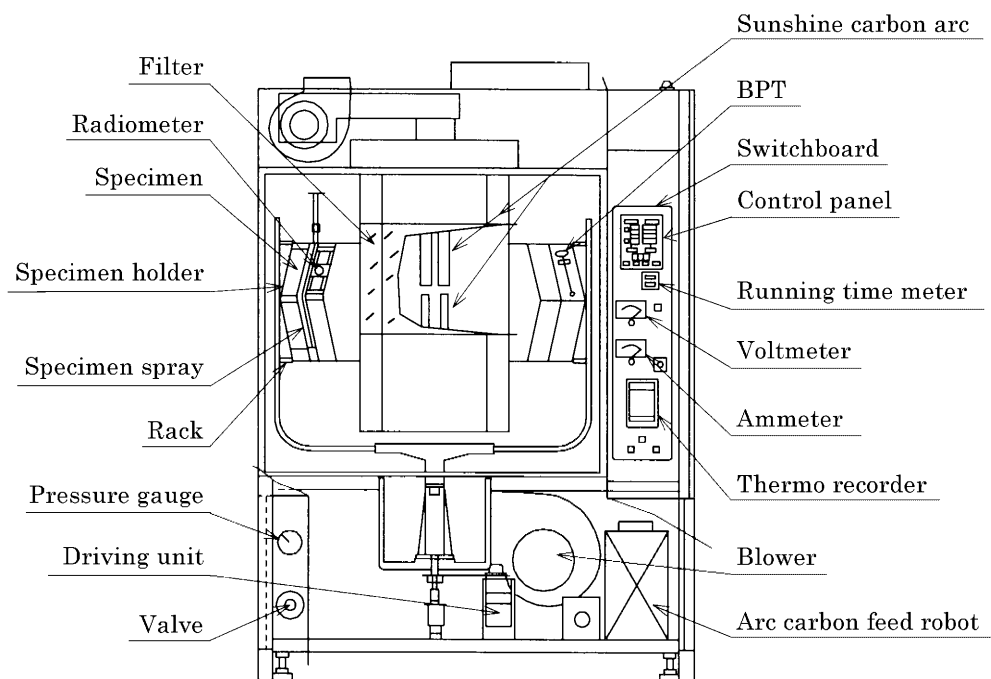
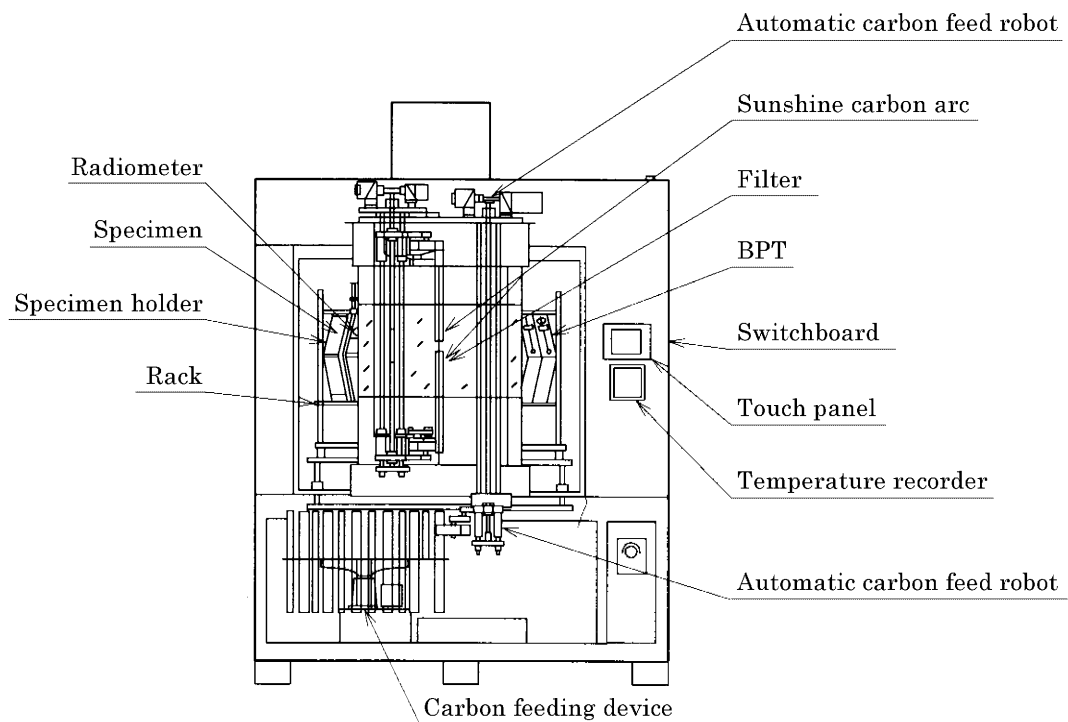


Figure 1 A typical xenon arc lamp weather meter



a) Continuous 70-h lighting type



b) Continuous 300-h lighting type

Figure 2 A typical sunshine carbon arc weather meter