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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 Japan Safety Appliances Association (JSAA)/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 A 5759**:2006 is replaced with this Standard.

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Adhesive films for glazings

Introduction

This Japanese Industrial Standard was established in 1982, and has gone through 4 revisions to this day. Since the last revision in 2006, there has been diversification of usages and improvement of product quality noticed. The revision at this time aims to adapt the contents to such changes.

No corresponding International Standard has been established at this point.

1 Scope

This Standard specifies the adhesive films for glazings, to be used for windows entrances and exits in buildings (hereafter referred to as “films”). Organic glass is not included in the glass as referred to in this Standard.

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 B 7503 *Dial gauges*

JIS B 7721 *Verification and calibration of the force measuring system of the tension/compression testing machines*

JIS B 7753 *Light-exposure and light-and-water-exposure apparatus (Open-flame carbon-arc type)*

JIS K 6253 *Rubber, vulcanized or thermoplastic—Determination of hardness*

JIS R 3106 *Testing method on transmittance, reflectance and emittance of flat glasses and evaluation of solar heat gain coefficient*

JIS R 3108 *Glass in building—Forced-entry security glazing—Test and classification by repetitive ball drop*

JIS R 3202 *Float glass and polished plate glass*

JIS Z 0237 *Testing methods of pressure-sensitive adhesive tapes and sheets*

JIS Z 2245 *Rockwell hardness test—Test method*

JIS Z 8401 *Guide to the rounding of numbers*

JIS Z 8720 *Standard illuminants and sources for colorimetry*

JIS Z 8902 *Xenon standard white light source*

ISO 9050 *Glass in building—Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors*

3 Terms and definitions

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

3.1 solar radiation

the energy emitted from the sun as electromagnetic wave, having the wavelength of 300 nm to 2 500 nm, which reaches the ground

3.2 visible light

radiation which generates a visual sense through visual organ, having a wavelength of 380 nm to 780 nm

NOTE : In general, the shorter wavelength limit and longer wavelength limit in the wavelength band of visible light are 380 nm to 400 nm, and 760 nm to 780 nm, respectively.

3.3 ultraviolet

solar radiation which is the radiation of UVB band (300 nm to 315 nm) and UVA band (315 nm to 380 nm)

3.4 transmittance

ratio (Φ_t/Φ_o) of flux of transmitted light (Φ_t) to flux of incident light (Φ_o), expressed in percentage (%) with the quantity symbol τ

Transmission is a phenomenon in which the light passes through a medium without changing frequency of its monochromatic component.

3.5 reflectance

ratio (Φ_r/Φ_o) of flux of reflecting light (Φ_r) to flux of incident light (Φ_o), expressed in percentage (%) with the quantity symbol ρ

Reflection is a phenomenon in which, when the light enters the boundary surface, its monochromatic component returns.

3.6 shade factor

coefficient that expresses the rate of incident solar radiation through a 3-mm thick plate glass coated with a film, which includes the light re-emitted toward the opposite side to the incident surface after absorbed once (sum of transmitted light and re-emitted light), when the rate of the plate glass without the film stands at 1

3.7 coefficient of heat transfer

the quantity of heat, per area of 1 m², transmitting through a 3-mm thick plate glass coated with a film during a unit time, when the difference of air temperatures between both sides of glass is 1 °C

3.8 plate glass

float plate glass specified in **JIS R 3202**

4 Classification

4.1 Classification by application

The films shall be classified and symbolized according to their application as shown in table 1.

Table 1 Classification by application

Classification	Symbol
Solar control film	SC
Glass shatter resistant film	GS
Glass security film	SF

4.2 Classification by performance

The films classified by application in 4.1 shall be further classified into **a)** to **c)** according to the following performance.

For films of two mixed classification, such as solar control/glass shatter resistance films or solar control/glass security films, the symbols for the two relevant classes shall be given [see clause 8 b)].

- a) **Solar control film** The solar control films shall be classified as given in table 2 according to the shielding performance.

Table 2 Classification by shielding performance

Shade factor	Symbol
Under 0.40	A
0.40 or over to and excl. 0.60	B
0.60 or over up to and incl. 0.85	C

- b) **Glass shatter resistant film** The glass shatter resistant films shall be classified as given in table 3 according to glass shatter resistance.

Table 3 Classification by glass shatter resistance

Glass shatter resistance	Symbol
Passing a shot bag test	A
Passing an interlayer displacement test	B

- c) **Glass security film** The glass security films shall be classified as given in table 4 according to glass security performance.

Table 4 Classification by glass security performance

Glass security performance	Symbol
Passing a steel ball drop test A	A
Passing a steel ball drop test B	B

5 Quality

5.1 General

The films shall, as a rule, be provided with transparency, uniformity, toughness, flexibility and stability of dimensions in the temperature and humidity change, and conform to the following requirements.

- a) When tested in accordance with **6.2**, the film shall be free from strains, bubbles, striae, etc. which may interfere with seeing through the film.
- b) The film applied on a glass shall not damage or corrode the glass.
- c) The film, when applied on a glass, shall adhere uniformly and shall be removable when necessary.
- d) The film shall have a good workability.

5.2 Performance

The performance required for each class of films shall be as given in table 5.

For films of two mixed classification, such as solar control/glass shatter resistance films or solar control/glass security films, all the performances required for both classes shall be tested.

Table 5 Classification and performance of films

Performance	Classification		
	Solar control film	Glass shatter resistant film	Glass control film
Visible light transmittance	○	—	—
Shade factor	○	—	—
Coefficient of heat transfer	○	—	—
Ultraviolet transmittance	○	—	—
Tensile strength	○	○	○
Elongation	○	○	○
Adhesive strength	○	○	○
Weather resistance	○	○	○
Glass shatter resistance	—	○	—
Glass security performance	—	—	○
NOTE : ○ mark indicates the performance required for each class of films.			

5.3 Visible light transmittance

The visible light transmittance of solar control film, when tested in accordance with **6.3**, shall not exceed 87 %.

5.4 Shade factor

The shade factor of solar control film, when tested in accordance with **6.4**, shall satisfy the requirements in table 6.

Table 6 Shade factor of solar control film

Shade factor	Symbol
Under 0.40	A
0.40 or over to and excl. 0.60	B
0.60 or over up to and incl. 0.85	C

5.5 Coefficient of heat transfer

The coefficient of heat transfer of solar control film, when tested in accordance with **6.5**, shall not exceed 5.9 W/m²K.

5.6 Ultraviolet transmittance

The ultraviolet transmittance of solar control film, when tested in accordance with **6.6**, shall not exceed 3 %.

5.7 Tensile strength and elongation

The tensile strength and elongation of films, when tested in accordance with **6.7**, shall satisfy the requirements in table 7.

Table 7 Tensile strength and elongation of films

Performance	Classification		
	Solar control film	Glass shatter resistant film	Glass security film
Tensile strength N/25 mm width	50 min.	100 min.	800 min.
Elongation %	60 min.	60 min.	60 min.

5.8 Adhesive strength

The adhesive strength of films, when tested in accordance with **6.8**, shall satisfy the requirements in table 8.

Table 8 Adhesive strength of films

Performance	Classification		
	Solar control film	Glass shatter resistant film	Glass security film
Adhesive strength N/25 mm width	2 min.	4 min.	8 min.

5.9 Weather resistance

The weather resistance of films, required for each classification, when tested in accordance with **6.9**, shall satisfy the following. The test duration and test items of weather resistance shall be as given in table 9.

- a) The films shall be free from abnormalities such as blister, cracks, peeling on the end, etc.