

JIS

JAPANESE INDUSTRIAL STANDARD

Mirrors for automobiles

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Mirrors for automobiles

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1. Scope This Japanese Industrial Standard specifies the mirrors, which are attached to automobiles and are used by the driver for viewing and perceiving the back field or the surroundings of the car.

Remarks 1. The following standards are cited in this Standard:

JIS B 7503 Dial gauges

JIS C 1609 Illuminance meters

JIS D 0201 General rules of electroplating for automobile parts

JIS D 0202 General rules of coating films for automobile parts

JIS D 0203 Method of moisture, rain and spray test for automobile parts

JIS D 0205 Test method of weatherability for automotive parts

JIS D 1601 Vibration testing methods for automobile parts

JIS R 3201 Sheet glasses

JIS R 3202 Float and polished plate glasses

JIS Z 8703 Standard atmospheric conditions for testing

JIS Z 8720 Standard illuminants and sources for colorimetry

JIS Z 8741 Method of measurement for specular glossiness

2. The following International standard corresponds to this Standard:

ISO 5740 Road vehicles — Rear view mirrors — Test method for determining reflectance

3. The units and the numerical values given in { } in this Standard are based on the traditional system of units and are appended for informative reference.

2. Definitions The definitions of principal terms used in this Standard shall be as follows:

- (1) mirrors A device consisting of a mirror, holder, adjusting part, support (including a shock relaxation mechanism), etc. (refer to Attached Figs. 1 to 3).
- (2) holder A part holding a mirror.
- (3) adjusting part A part adjusting the angle of a mirror.
- (4) support A part existing between a mirror, a holder and a car body, and supporting the mirror at a specific position.

- (5) shock relaxation mechanism A mechanism preventing or lightening hindering a crew-member and a walker by dislocation, falling down, etc. of a mirror in cases of the collision, contact, etc. of a human body with the mirror.
- (6) inside mirror A mirror installed in the car room and used for viewing and perceiving the back field of the car (refer to Attached Fig. 1).
- (7) outside mirror A mirror installed outside the car room, or otherwise to the handle or the like of the motorcycle (including a moped) and used for viewing and perceiving the side and the back field of the car (refer to Attached Fig. 2).
- (8) outside under mirror A mirror installed outside the car room and used for viewing and perceiving the lower part and the circumference of the car.
Furthermore, it includes the side under mirror to be attached to large trucks and the like (refer to Attached Fig. 3).
- (9) flat mirror A mirror having a flat surface.
- (10) convex mirror A mirror having a convex surface with a definite radius of curvature.
- (11) reflectance variable mirror A mirror having the anti-glare property capable of decreasing the reflectance when the light of the head lamp of a following car is bright at night.

Furthermore, prism mirrors are included therein.

3. Classification Mirrors shall be classified into an inside mirror, an outside mirror, and an outside under mirror.

Further, the fitting position of a car body, the field of view, etc. corresponding to the classification of mirrors are given in Table 1 for informative reference.

Table 1. Classification of mirrors

Class	Example for reference		
	Fitting position of a mirror	Field of view	Mirror surface
Inside mirror	Front in car room	Back field	Flat
Outside mirror	Front side part of car body	Back side field	Convex
	Door part		
	Front pillar part of car body		
	Fair ring and handle part of motorcycle		
Outside under mirror	Front surface part of car body	Under part just front	Convex
	Front side part of car body	Under part outside	
	Rear surface and rear side part of car body	Under part just rear	

4. Performance

4.1 Reflectance When the test specified in 10.2 is carried out, the reflectance of the mirror surface shall be not less than 35 %. However, for a reflectance variable mirror, the reflectance on the low reflectance side shall be not less than 4 %.

4.2 Distortion factor When the test specified in 10.3 is carried out, the distortion factor of the mirror surface shall be not more than 2 % for a flat surface mirror and not more than 5 % for a convex surface mirror. However, the distortion factor of convex surface mirror of an outside under mirror may be not more than 8 %.

4.3 Radius of curvature of convex surface mirror When the test specified in 10.4 is carried out, the radius of the curvature of a convex surface mirror shall basically be not less than 600 mm (not less than 800 mm for motorcycles). However, the radius of the curvature of the mirror surface of an out-side under mirror shall be not less than 100 mm.

4.4 Vibration endurance When the test specified in 10.5 is carried out as to the vibration endurance of a mirror, the deformation, breakage, and falling down of each part, the displacement of the direction of the mirror, and other harmful defects shall not be generated.

4.5 Moisture resistance When the test specified in 10.6 is carried out as to the moisture resistance of a mirror, each part shall be free from abnormalities and the reflectance of the mirror after test shall be not less than 85 % relative to the reflectance before test. However, it is not applied to an inside mirror.

4.6 Temperature resistance When the test specified in 10.7 is carried out as to the temperature resistance of a mirror, deformation, cracks, and other harmful abnormalities shall not be generated in each part.

4.7 Weather resistance When the test specified in 10.8 is carried out as to the weather resistance of a mirror, the cloudiness and deterioration of the mirror surface and the remarkable discoloration, cracks, deformation, etc. of other parts shall not be generated. However, it is not applied to an inside mirror.

4.8 Shock relaxation ability

4.8.1 Necessary conditions As to the shock relaxation ability of a mirror, when the mirror is installed in a normal service state, an inside mirror shall conform to the performance specified in 4.8.2 and an outside mirror shall conform to the performance specified in 4.8.3. However, this provision is not applied to the mirrors for which the exclusion of application is specified by other standards or criteria, and the following mirrors:

- (1) The inside mirror which is outside the head shock range ⁽¹⁾ of a crew-member.

Note (1) The head shock range herein shall be in accordance with other specifications or standards.

- (2) The following outside mirror and outside under mirror.
 - (a) The mirror installed inside the most exterior line of the car body near its fitting part.
 - (b) The mirror installed at a position of over 1.8 m in ground clearance.
 - (c) The mirror for motorcycles.
 - (d) The mirror on the body side of which an impact relaxation mechanism is provided.

4.8.2 Shock relaxation ability of inside mirror The shock relaxation ability of an inside mirror shall conform to either one of the following performances:

- (1) The force applied in the press type test of 10.9.1 (1) shall be not exceeding 441 N {45 kgf} and the mirror shall be displaced outside the head shock range, or otherwise all the keen ends shall fall off or be broken.
- (2) In the shock type test of 10.9.1 (2), a pendulum drops freely from a position of 60° to the vertical line and collides with the mirror in the vertical plane parallel to the centre line of the vehicle. Thereafter, the pendulum shall be swung by 20° or over to the vertical line. When the support or the like is broken, no keen end part shall exist.

4.8.3 Shock relaxation ability of outside mirror The shock relaxation ability of an outside mirror shall conform to either one of the following performances:

- (1) The force applied in the press type test of 10.9.2 (1) shall be not exceeding 245 N {25 kgf} and the mirror shall be displaced into inside the most exterior side line of the car body near the fitting part of the mirror or otherwise to be at a position of higher than 1.8 m in ground clearance, or the mirror shall fall off. However, the angle made by the line connecting the rotation centre of the support and the directional regulating rotation centre of the mirror and the centre line of the vehicle under a state where it is projected on the horizontal plane may be dislocated by 10° or over from that at the time of standard fitting to become not exceeding 40° after displacement.
- (2) A pendulum drops freely from a position of 60° to the vertical line the shock type test of 10.9.2 (2) and collides with the mirror in the vertical plane parallel to the centre line of the vehicle. Thereafter it shall be swung by 20° or over to the vertical line. When the support or the like is broken, no keen end part shall exist.

5. Structure The structure of a mirror shall be as follows:

- (1) The direction of a mirror can smoothly be regulated and held in a fixed direction.
- (2) The holder, support, etc. of an inside mirror shall be applied with anti-glare treatment.

- (3) The support shall be so constructed as to be able to be fitted to the vehicle in a normal service state and if necessary, it shall be equipped with a shock relaxation mechanism.
- (4) The reflectance variable mirror shall be so constructed that the reflectance can be switched to that for day use or night use, etc.

6. Shape and dimensions The shape and dimensions of a mirror shall be as follows:

- (1) The dimensions of the effective reflecting surface of a mirror shall be the size capable of viewing and perceiving the back field, the side field and the surroundings of a vehicle according to the class of the mirror and the outside mirror for motorcycles shall be, as a rule, of 85 mm or over in diameter for a circular one and of 50 cm² or over in area for another shaped one.
- (2) When glass is used for the mirror, its thickness shall be, as a rule, as specified in JIS R 3201 or JIS R 3202.
- (3) When a mirror is installed in a normal service state, it shall be free from keen angle, projection, etc. in each part.

7. Appearance The appearance of a mirror shall be as follows:

- (1) When a mirror is given an illuminance of 500 lx and observed from the direction of 45° with the naked eyes at a distance of approx. 50 cm, the mirror shall be free from bend, cloudiness, streak, bubble, flaw, crack, mixture of foreign matters and other defects harmful to the mirror surface.
- (2) As to the significant surface of the plated metallic part, the test specified in 7.1 (Appearance test method) of JIS D 0201 shall be carried out and the test results shall conform to Grade 2 and upwards specified in 8.1 (Appearance criteria) thereof.
- (3) When the test specified in 4.3 (Test method for appearance) of JIS D 0202 is carried out, the significant surface of the coated metallic part shall conform to specification in 3.2 (Appearance) thereof.
- (4) The rubber part shall be free from fissure, crack, and other harmful defects.
- (5) The synthetic resin part shall be free from remarkable colour unevenness, fissure, harmful flaws, distortion and other defects.

8. Plating and coating The plating and coating of a mirror shall be as follows. However, this provision does not apply to the inside mirror.

- (1) When the test specified in 7.3 (Corrosion resistance test method) of JIS D 0201 is carried out, the significant surface of the plated mirror shall conform to the requirements specified in 8.3 (Corrosion resistance criteria) thereof.

6
D 5705-1993

- (2) When the test specified in 4.6 (Testing method for corrosion resistance) of JIS D 0202 is carried out for 48 h, the significant surface of the coated mirror shall conform to the requirements specified in 3.5 (Corrosion resistance) thereof.
- (3) When the reflecting coating film and the backing of mirror are dipped in warm water at 90°C for 1 h and then left standing in air for 10 min, cloudiness or spots on the mirror surface, or softening or peeling of the backing shall not occur.

9. Anti-glare treatment As to the anti-glare treated surface of a mirror, the glossiness shall be examined by optical conditions specified in the method 5 in 4.2 (Measuring conditions) of JIS Z 8741 and its glossiness [Gs (20°)] shall be not exceeding 40 %.

10. Test methods

10.1 Standard state of test place The state of a test room shall be at temperature of 20°C Grade 15 and humidity of 65 % Grade 20 specified in JIS Z 8703.

10.2 Reflectance test The reflectance test of a mirror shall be carried out by the apparatus and the method given as follows and the reflectance shall be obtained by measurement or calculation.

- (1) Apparatus The apparatus consists of the light source, holder of a mirror, light receptor, and indicator as given in Fig. 1 for direct measuring method and of the light source, holder of mirror, light receptor, integrating sphere and indicator as given in Fig. 2 for indirect measuring method.
- (2) Arrangement and conditions of apparatus The apparatus is arranged as given in Fig. 1 or Fig. 2.

The incident light on a mirror from the projector as the light source of which standard light A specified in JIS Z 8720 is used, shall be almost parallel and of 19 mm or over in diameter. The angle of incident light and that of reflected light to the normal of the mirror shall be within $25 \pm 5^\circ$. The reflected light from the mirror surface should preferably be less than that of the photometric plane of a receptor and 50 % or over. However, in the case of measurement by using an integrating sphere, it is preferable that the angle of incident light is $25 \pm 5^\circ$.

- (3) Indicator The accuracy including the receptor shall be not more than $\pm 2 \%$ of the maximum scale value or not more than $\pm 10 \%$ of the magnitude of reading, whichever is smaller. However, the reflectance may be obtained by calculation after the measurement with the illuminance meter having an accuracy of not less than general class A specified in JIS C 1609 or the instrument having the performance equal or superior thereto.