

JIS

JAPANESE INDUSTRIAL STANDARD

Retroreflectors — Optical properties — Measuring method

JIS Z 8714—1995

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**Business Department,
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4-1-24, Akasaka, Minato-ku,
Tokyo, JAPAN 107
TEL. 03-3583-8002
FAX. 03-3583-0462

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Retroreflectors — Optical properties
— Measuring method

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1. Scope This Japanese Industrial Standard specifies the method for measuring the optical properties of the retroreflectors.

Remarks: The standards cited in this Standard are given in the following:

- JIS Z 8105 Glossary of colour terms
- JIS Z 8113 Glossary of lighting terms
- JIS Z 8701 Colour specification — The CIE 1931 standard colorimetric system and the CIE 1964 supplementary standard colorimetric system
- JIS Z 8713 Retroreflectors — Optical properties — Vocabulary
- JIS Z 8717 Methods of measurement for colour of fluorescent objects
- JIS Z 8720 Standard illuminants and sources for colorimetry
- JIS Z 8722 Methods of colour measurement — Reflecting or transmitting objects
- JIS Z 8724 Methods of measurement for light source colour
- JIS Z 8726 Method of specifying colour rendering properties of light sources

2. Definitions For the purpose of this Standard, the definitions specified in JIS Z 8105, JIS Z 8113 and JIS Z 8713 apply.

3. Classification of methods for measuring optical properties of retroreflectors

(1) Measuring method of retroreflective properties

- (a) Spectral measuring method
- (b) Photometric measuring method
- (c) Simplified measuring method

(2) Measuring method of colour in daytime

- (a) Spectrophotometric colorimetry
- (b) Photoelectric tristimulus colorimetry

(3) Measuring method of colour in nighttime

- (a) Spectrophotometric colorimetry
- (b) Photoelectric tristimulus colorimetry

4. Measuring method of retroreflective properties of retroreflectors

4.1 General Measurement of the retroreflective properties of the retroreflectors is mainly to obtain the luminous quantities corresponding to the brightness felt by the vehicle driver receiving the reflected light when headlight of automobile illuminates the retroreflectors in nighttime. Therefore, the spectral condition for measuring the retroreflective properties shall be the combination of relative spectral distribution ⁽¹⁾ of standard illuminant A and spectral luminous efficiency $V(\lambda)$ ⁽²⁾, and the geometric condition of illumination and observation shall be specified by relative positional relation between the headlight and retroreflector and the observer.

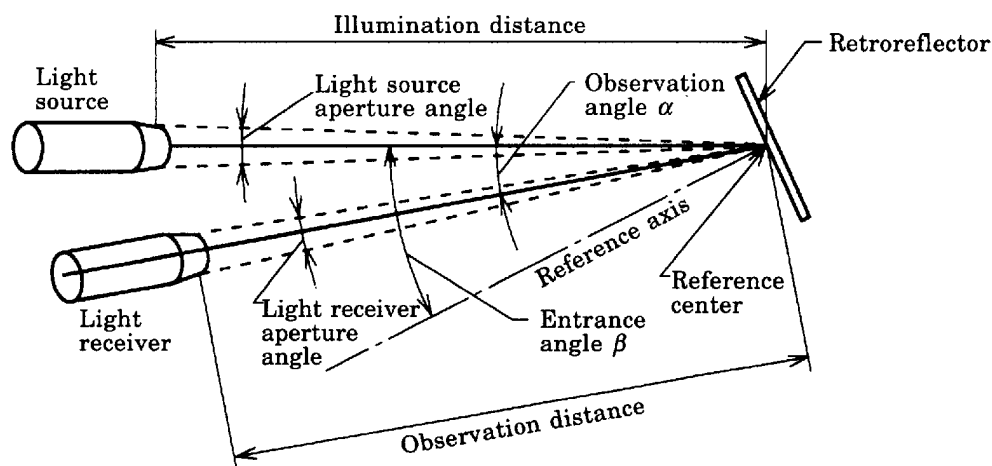
Notes ⁽¹⁾ See Attached Table 1 in JIS Z 8720.

⁽²⁾ It is the same as colour matching function $\bar{y}(\lambda)$ in Attached Table 1 in JIS Z 8701.

4.2 Geometric condition of illumination and observation The outline of geometric condition of illumination and observation at the time of measuring the retroreflective properties of retroreflector is shown in Fig. 1. In general, the observation angle α shall be 12', 20' or 2° and the entrance angle β_1 be 5°, 30° or 40°. The illumination distance and the observation distance shall be 10 m or more. The sum of light source aperture angle and light receiver aperture angle should preferably be 12' $\pm$ 2'.

Remarks: Retroreflective properties of road surface materials such as traffic paint shall be measured making the entrance angle β 85° to 89°.

Fig. 1. Geometric condition at the time of measuring retroreflective properties



- Remarks
1. The directions of observation angle and entrance angle shall be considered that anticlockwise direction is positive.
 2. The figure is in the case of second component of entrance angle $\beta_2 = 0$.