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**Reflectance test method of reflective glass
mirror for concentrated solar power system**

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Table of Contents

Foreword.....	3
1 Scope	4
2 Normative References.....	4
3 Terms and Definitions.....	4
4 Apparatus.....	5
5 Test sample and standard sample.....	6
6 Test Conditions.....	7
7 Test procedures and test results.....	7
8 Test report	10
Annex A (Normative) Data sheet of solar direct spectral irradiance AM1.5D	11

Reflectance test method of reflective glass mirror for concentrated solar power system

1 Scope

This Standard specifies the terms and definitions, apparatus, test sample and standard sample, test conditions, test procedures, test results and test report of reflectance test method of reflective glass mirror for concentrated solar power system.

This Standard applies to the test and calculation of solar hemispherical reflectance and specular reflectance of reflective glass mirror for concentrated solar power system. This Standard can be referred to for reflective glass mirror for concentrating photovoltaic and other types of reflective glass mirrors.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to This Standard.

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 purposes of this document, the following terms and definitions apply.

3.1

solar hemispherical reflectance

The ratio of solar radiation flux to incident solar radiation flux reflected by sample within a 2π solid angle, within the solar spectrum (300 nm ~ 2 500 nm) band, whose value is usually expressed in percentage.

3.2

specular reflectance

- b) the intersection angle between ray axis of lighting beam and normal of sample shall not be greater than 15° ;
- c) use integrating sphere equipped with photoelectric detector and incidence hole. It is preferable to use integrating sphere of diameter not less than 150 mm. When integrating sphere of other dimensions is selected, the area sum of all integrating sphere openings shall be less than 4% of internal surface area of integrating sphere;
- d) the accuracy of wavelength of instrument shall be within ± 1 nm;
- e) the accuracy of photometric measurement of instrument shall be within $\pm 1\%$ and the measuring repeatability shall be within $\pm 0.5\%$;
- f) instrument shall not be influenced by extraneous light during measurement.

4.2 Specular reflectance test instrument

Test instrument shall meet the requirements as follows:

- a) it is capable of measuring the specular reflectance under a certain wavelength of 660 nm of solar spectrum;
- b) If receiving diaphragm is installed, receiving angle φ is controlled within 0 mrad ~ 20 mrad;
- c) the intersection angle between ray axis of lighting beam and normal of sample shall not be greater than 15° ;
- d) optical alignment can be conducted in accordance with the thickness and surface curvature of reflective glass mirror, in order to make reflected light beam be fully received by receiving diaphragm;
- e) the measuring accuracy of instrument shall be within $\pm 1\%$ and the measuring repeatability shall be within $\pm 0.5\%$;
- f) instrument shall not be influenced by extraneous light during measurement.

NOTE: Specular reflectance test instruments of other wavelengths can be as agreed on by supplier and purchaser.

5 Test sample and standard sample

5.1 Test sample

Test sample shall meet the requirements as follows:

- a) reflective glass mirror is used as test sample whose dimensions are preferably prepared as required by instrument;
- b) test sample shall be clean without dust, oil stain or other contaminants;
- c) test sample press shall be close to the test opening of instrument without any gap at the center;
- d) the dimensions of test sample shall meet the requirements for tests at three different positions at least, or at least 3 pieces of test sample are cut from different positions of the same product.

5.2 Standard sample

Standard sample is preferably used for test, which have the reflective characteristics similar to reflective glass mirror sample. Standard sample can be traceable to national or international reference-standards.

6 Test Conditions

Test shall be conducted in the environment of $(23 \pm 2)^{\circ}\text{C}$ and relative humidity $(40 \pm 15)\%$. Test sample is preferably stored under the environmental conditions for 3 h at least before test.

7 Test procedures and test results

7.1 General rules

7.1.1 The reflectance test process specified in ISO 9050 can be referred to for solar hemispherical reflectance test.

7.1.2 For solar hemispherical reflectance test, the spectral range shall be at least 300 nm ~ 2 500 nm and the wavelength interval shall be not greater than 5 nm.

7.1.3 The certain wavelength for specular reflectance test shall include 660 nm and it is not limited to this wavelength.

7.1.4 Beam correction can be conducted by specular reflectance test instrument in accordance with the glass thickness and surface curvature.

7.1.5 Instrument shall be preheated for 5 min ~ 30 min before each test, in accordance with instrument instructions.

7.2 Solar spherical reflectance test

7.2.1 Test procedures

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