

STANDARD TEST METHOD 7

DETERMINATION OF REFRACTIVE INDEX OF FEI CUI (JADEITE JADE)

1.1 SCOPE

This Standard describes the method of determining the refractive index of Fei Cui (Jadeite Jade).

1.2 APPLICATION

The determination of refractive index applies to items made from Fei Cui (Jadeite Jade) as received by the laboratory for testing.

The refractive index may be used for the identification of Fei Cui (Jadeite Jade) on its authenticity.

1.3 DEFINITIONS

Refractive Index (RI): It is the ratio of the velocity of propagation of an electromagnetic wave in vacuum to its velocity in the medium.

The absolute index of refraction for a given medium is defined as: $n = c/v$

where c is the speed of light in a vacuum and v is the speed of light in the medium.

1.4 APPARATUS

The following apparatuses are required:

1. Refractometer: A total internal reflection refractometer with internal or external scale graduated as RI values (ranging from 1.40 to 1.80)
2. Contact liquid: Contact liquid with RI between 1.79 and 1.81. Its composition shall be methy-lene iodine saturated with sulphur and carbon di-iodide (or name as di-iodomethane)

1.5 TEST ITEM

The determination of refractive index is a single unit test for a whole piece of test item in its entirety. Sampling of a number of test items to represent a batch of Fei Cui (Jadeite Jade) products shall not be permitted.

1.6 PROCEDURES

1. The test Fei Cui (Jadeite Jade) shall be cleaned scrupulously with a lint-free cloth.
2. The best-polished side of the Fei Cui (Jadeite Jade) item shall be used.
3. A very small drop of contact liquid shall be dipped between the test item and the top surface of the hemicylinder. The test item shall be in optical contact with the contact liquid.
4. The long direction with the length of the hemicylinder shall be aligned if the spot is elongated.
5. If the image of the test Fei Cui (Jadeite Jade) extends more than three to four scale divisions:
 - i. The Fei Cui (Jadeite Jade) should be lifted straight up and the hemicylinder should be wiped off;
 - ii. The amount of liquid on the test Fei Cui (Jadeite Jade) could be reduced by touching it to the metal stage;
 - iii. The test Fei Cui (Jadeite Jade) shall be returned gently to the hemicylinder; and
 - iv. These steps shall be repeated until the spot covers only three to four scale divisions.

1.7 EXPRESSION OF RESULTS

One of the readings shall be observed:

- 50/50 Reading – This most accurate spot reading is generally found on well polished surfaces. The reading at the point where the spot is exactly half light and half dark shall

be taken.

- Blink Reading – This is the second most accurate spot reading. The reading at the point where the spot blinks abruptly from light to dark shall be taken.
- Average Reading – This least accurate spot reading is usually the result of poor polish, a slightly irregular surface, or too much contact liquid used. The spot lightens gradually over a wide range of the refractometer scale. The average reading of the last completely dark spot and the first completely light spot shall be taken.

1.8 TEST REPORT

The report shall affirm that the test was carried out in accordance with this Standard. The determination of refractive index should be reported as far as possible with other Fei Cui (Jadeite Jade) test results such as polariscope examination, shape and cut identification, measurement of dimensions and weight, identification of transparency, examination of fluorescence, Chelsea colour filter examination, determination of specific gravity, infrared spectrum examination, magnification examination and spectroscopic examination. In general, the test report shall include but not be limited to the following:

- (a) Identification number of the Fei Cui (Jadeite Jade) item.
- (b) Date of test.
- (c) Standard method of determination of refractive index.
- (d) Name of person carrying out the test.
- (e) Name and signature of person responsible for testing