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# HOKLAS Supplementary Criteria No. 54

## ‘Physical and Mechanical Testing’ Test Category - Gemstone Testing to Standard Methods for Testing Fei Cui for Hong Kong (HKSM/FCT-2016)

### 0 Introduction

- (a) This document serves to clarify and supplement the requirements of ISO/IEC 17025: 2017 and HKAS Policy Document No. 1 for accreditation of laboratories performing gemstone testing under the test category of ‘Physical and Mechanical Testing’. It should be read in conjunction with the current issue of ISO/IEC 17025: 2017 and other relevant accreditation criteria documents.
- (b) In addition to the requirements stipulated in this document, an accredited laboratory shall comply with specific requirements of Fei Cui test standards.

### 1 Scope

(No additional explanation)

### 2 Normative references

(No additional explanation)

### 3 Terms and definitions

The definition of ‘Fei Cui’ is defined in Trade Descriptions (Definition of Fei Cui and Natural Fei Cui) Regulation (Cap. 362, Section 33) of the Government of the Hong Kong Special Administrative Region. The expression ‘Fei Cui’, when used in the course of any trade or business to describe an article, means the article is a granular to fibrous polycrystalline aggregate which is composed solely or principally of any combination of jadeite, omphacite and kosmochlor.

### 4 General requirements

(No additional explanation)

### 5 Structural requirements

(No additional explanation)

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## 6 Resource requirements

### 6.1 General

(No additional explanation)

### 6.2 Personnel

#### (a) Approved signatories

##### 6.a.1 Nominees of approved signatories for the tests of Fei Cui shall either be

- (a) a Certified Gemmologist (CG) in Fei Cui of the Gemmological Association of Hong Kong (GAHK) plus at least one year relevant testing experience; or
- (b) a person having a relevant professional certificate of a recognised gemmological institution (e.g. Gem-A, GIA etc.) or equivalent plus at least one year relevant testing experience. In addition, the applicant shall have adequate knowledge of ISO/IEC 17025: 2017 and have attended and passed an external training course of Fei Cui testing. The outline of the training course of Fei Cui testing is shown in Appendix A. Training materials shall be kept. The applicant shall also demonstrate that he/she has acquired up-to-date technical knowledge and skills by participation in activities related to the tests for at least 18 hours in the two years preceding his/her application for approved signatory. Records of participation in such activities shall be maintained for at least four years. After approval has been granted, the approved signatory shall continually update his/her technical knowledge and skills in accordance with Note (i) below. In addition, he/she shall also demonstrate to the HKAS Executive in each assessment that he/she is competent in the respective tests.

Notes: (i) The activities of acquiring up-to-date technical knowledge and skills include attending courses/workshops, seminars/conferences, making public presentations, issuing technical papers in journals or other publications, or joining study tour etc. The minimum requirement involved in these activities is nine hours per year. For reaffirmation of signatory status after approval has been granted for two years, the minimum requirement involved in the activities which shall be focused on advanced knowledge related to gemstone testing is three hours per year. The content and the number of hours counted of the activities shall be recorded. HKAS Executive may review the records if necessary.

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(ii) If necessary, HKAS Executive may seek advice from relevant Working Party/Task Force or other relevant professional bodies, such as GAHK, to determine the equivalence of professional qualifications, membership and the activities of acquiring up-to-date technical knowledge and skills.

6.a.2 The applicants shall demonstrate to the assessment team their technical competence in Fei Cui testing before signatory approval is granted.

6.a.3 For existing approved signatories, if the conditions or requirements listed in 2.1.1 cannot be met, the laboratory shall inform HKAS Executive in writing immediately and the person shall not sign any HOKLAS endorsed reports from the date of not meeting the specified requirement. HKAS Executive will take appropriate action (e.g. removal of his/her signatory approval) when notification of change is received.

(b) Operators performing tests of Fei Cui, except weighing and dimensional measurements, shall be a person meeting the requirements of approved signatories, recognised gemmologist of a gemmological institution or equivalently trained. For those who are equivalently trained, the training records shall be kept and HKAS Executive may review the records and assess the operator's competence during assessment.

6.3 Facilities and environmental conditions

(No additional explanation)

6.4 Equipment

General requirements on equipment calibration are given in the HOKLAS Supplementary Criteria No. 2. Specific requirements on equipment calibration/verification for specific instruments are given in Appendix B of this document.

6.5 Metrological traceability

(No additional explanation)

6.6 Externally provided products and services

(No additional explanation)

## 7 Process requirements

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#### 7.1 Review of requests, tenders and contracts

(No additional explanation)

#### 7.2 Selection, verification and validation methods

The classification of the type (A, B, C or B+C) of a Fei Cui test item shall strictly follow the definition of Fei Cui and test procedures stipulated in ‘Standard Methods for Testing Fei Cui for Hong Kong’ (HKSM/FCT-2016) issued by The Gemmological Association of Hong Kong Limited.

#### 7.3 Sampling

As the properties of a test item may not be homogeneous, it is often necessary to test different locations on it to ensure that the results obtained are representative. The laboratory shall have a documented procedure for determining the number of locations to be tested and selecting the locations to be tested and ensure that all operators are well trained for such determination and selection. The laboratory shall also have a procedure for recording and reporting the test results obtained from the tested locations.

#### 7.4 Handling of test or calibration items

- (a) Test application forms, test records and test reports shall contain sufficient information to allow unique identification of the test items. The laboratory shall take high quality photographs of the test item and keep them as part of the test records and include them on the test report. The size and quality of the photograph shall be such that the distinguishing features and characteristics of the gemstone tested are clearly shown.
- (b) Care should be exercised in handling gemstone to prevent damages to them or contamination of their surface. Wearing clean white cotton gloves is a good practice.

#### 7.5 Technical records

All observations and conditions under which such observations are made shall be clearly recorded. Operators shall strictly follow the requirements of the test standard (as given in clause 7.2) in recording data and reporting results. Where measurement instruments are used, their readings shall be recorded or their printouts shall be signed and kept. Where the observations are made by an operator, they shall be recorded unambiguously with the help of a sketch, a graph or annotation where appropriate. Where appropriate, it may be convenient to use digital photography to record and present the observations.

#### 7.6 Evaluation of measurement uncertainty

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(No additional explanation)

#### 7.7 Ensuring the validity of results

- (a) The laboratory shall perform a regular inter-operator comparison for the accredited test area of 'Fei Cui' every six months. All operators of the laboratory shall participate in this comparison using the same test item. The records of such comparisons shall be kept. For laboratories where a single operator performs the test, checks the results and signs the report, such single-operator laboratories shall document and demonstrate an effective quality assurance mechanism to ensure the integrity of the test results, and also participate more frequently in inter-laboratory comparison tests. A frequency of at least once every six months for each accredited test depending on the volume of work and other pertinent factors may be suitable. When assessing the adequacy of participation in inter-laboratory comparisons, other quality assurance measures implemented by the laboratory will be taken into consideration.
- (b) An approved signatory, where manpower resources of his/her laboratory are available, should not sign a test report containing test results obtained by himself/herself.
- (c) HKAS requires accredited laboratories to participate in proficiency testing programmes or inter-laboratory comparison tests as an integral part of their quality assurance requirements. Accredited laboratories shall refer to HOKLAS SC-33 in respect of the HOKLAS proficiency testing requirement.

#### 7.8 Reporting of results

- (a) The description of the test item shall be clearly stated in a test report.
- (b) Opinions or interpretations for the gemstone testing that a laboratory has not accredited for providing is not permitted to be included in a HOKLAS endorsed report. If this is required, approval from HKAS Executive in writing is necessary. An endorsed report containing such opinions or interpretations shall in all cases clearly state that the laboratory is not accredited for providing them.
- (c) If any one of the testing methods mentioned in the test standard (as given in clause 7.2) is not performed, a clear indication of such shall be shown in an HOKLAS endorsed test report and the classification on the type of a Fei Cui test item shall not be made.

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7.9 Complaints

(No additional explanation)

7.10 Nonconforming work

(No additional explanation)

7.11 Control of data and information management

(No additional explanation)

**8 Management system requirements**

(No additional explanation)

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## **APPENDIX A**

The outline of a typical training course on Fei Cui testing shall include, but not limited to, the following:

### **A. Lecture section**

- Fundamental theory of Fei Cui, definition and nomenclature of Fei Cui and its three members of Jadeite Jade, Kosmochlor Jade and Omphacite Jade
- Set of visual examination skills and tactile discrimination techniques that enable the learner to recognise the features related to the visual stimulus of Fei Cui test items
- Classification of natural and treated Fei Cui (Type A, Type B, Type C, Type B+C)
- The comprehensive testing methodology and testing procedures for item of Fei Cui
- Basic principles of testing equipment including Fourier Transform Infrared Spectrometer and Infrared Spectrum Fingerprint Identification method
- The analysis of testing results, data and technical specifications when issuing Fei Cui test reports
- The formats and contents of Fei Cui test reports

### **B. Hands-on practical section**

- Practice the comprehensive testing methods of test items of Fei Cui including visual examination skills and tactile discrimination techniques
- Use the basic hand-held testing tools and instruments to examine and identify the test item of Fei Cu, treatment types of Fei Cui and visual stimulus of Fei Cui
- Understanding the operation principles of testing equipment including Fourier Transform Infrared Spectrometer
- Production procedures of Fei Cui test reports
- Practical sessions (in a gemstone testing laboratory, if achievable)

### **C. Assessments and examination**

- Coursework & assignment
- Practical assessment
- Written assessment

Note: Course duration – at least 75 hours including lecture and hands-on practical sections in a gemstone testing laboratory, practical assessment and assessment by written examination.

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## APPENDIX B

### SPECIFIC CALIBRATION REQUIREMENT

This Appendix lists the specific calibration requirements for equipment of Fei Cui tests.

Type of equipment	Maximum period between successive calibration/verification	Calibration/verification procedure or guidance documents and equipment requirements
<b>Fei Cui Tests</b>		
<b>REFRACTOMETER</b>	6 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .
<b>POLARISCOPE</b>	6 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .
<b>FLUORESCENCE</b>	6 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .
<b>COLOUR FILTER</b>	6 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .
<b>SPECTROSCOPE</b>	6 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .
<b>INFRARED SPECTROMETER</b>	3 months	Check against reference standard with proper metrological traceability to an acceptable source <sup>#</sup> .

Note of #: The laboratory shall demonstrate the metrological traceability of the reference standard and acceptability of the source to the satisfaction of HKAS Executive. If necessary, HKAS may seek advice from GAHK or other appropriate professional bodies.