LED Lighting Product Certification

Product Certification Scheme for LED Lighting Products

Issue V Rev. 0

06th March, 2025

PRODUCT CERTIFICATION SCHEME FOR LED LIGHTING PRODUCTS

FOREWORD

The Independent LED (**L**ight **E**mitting **D**iode) Lighting Advisory Committee (hereinafter referred as "the Committee") was established in March 2012 by the invitation of Scheme Owner, The Hong Kong Electronic Industries Association (HKEIA) (hereinafter referred as "the Scheme Owner) to oversee and provide directions on the development of Product Certification Scheme for LED Lighting Products (hereinafter referred as "the Scheme"). The Scheme can be adopted by LED lighting manufacturers to show conformity with necessary technical requirements of the Scheme. In addition, manufacturers shall comply with the quality management system (QMS) requirements as laid down in the ISO 9001 Standard.

The Scheme is the effort of the Committee through co-operation among representatives from local academics, engineers, LED lighting manufacturers, contractors, government bodies and users to develop the Scheme in accordance with ISO/IEC 17067 and ISO/IEC TR 17026.

This Product Certification Scheme supersedes the Issue IV Rev.1 28th May, 2019 of the Product Certification Scheme for LED Lighting Products.

The details of the changes are given in Annex D.

The following dates were fixed:

- This Product Certification Scheme for LED Lighting Product Issue V Rev. 0 is to be implemented starting on 06th March, 2025.

- The latest date by which the Product Certification Scheme for LED Lighting Product Issue IV Rev. 1 28th May, 2019 have to be withdrawn on 15th May, 2026.

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1. INTRODUCTION

1.1 The purpose of the Scheme is to ensure all **LED Lighting Products** produced by LED Lighting Manufacturers of the Supplier meet the requirements specified in this Scheme, in the area of safety, ElectroMagnetic Compatibility (EMC) and performance[#]. This is a product certification scheme that requires LED Lighting Manufacturers of the Supplier to operate a quality system which complies with ISO 9001 and the requirements of this Scheme.

1.2 This third party product certification system is a System 5 product certification system in accordance with ISO/IEC 17067, for determining the conformity of a product with specified requirements through initial testing of samples of the product, assessment and surveillance of the involved quality system, and surveillance by testing of product samples taken from the open market or the purchasers.

1.3 A Certification Body who uses this Scheme for certification of LED lighting products manufacturing plants shall be accredited by Hong Kong Accreditation Service (HKAS) or its **M**ulti**L**ateral Recognition **A**rrangement (MLA) partners in accordance with this Scheme, ISO/IEC 17065, and the corresponding IAF Guidance.

[#]**Note:** Performance parameters considered in this document include “Lumen”, “Luminance efficacy”, “Power factor”, “Total Harmonic Distortion”, “Color rendering index”, “Correlated color temperature” and “Chromaticity of LEDs”.

2. ABBREVIATIONS

CB	Certification Body(ies)
CBTLs	CB Testing Laboratories
EPA	Environmental Protection Agency of the United States
HKAS	Hong Kong Accreditation Service
HKEIA	The Hong Kong Electronic Industries Association
HOKLAS	Hong Kong Laboratory Accreditation Scheme
IEC	International Electrotechnical Commission
LED	Light Emitting Diode
MLA	MultiLateral Recognition Arrangement
MRA	Mutual Recognition Arrangement
PCB	Printed Circuit Board
PCBA	Printed Circuit Board Assembly
RMS	Root Mean Square
SDCM	Standard Deviation of Color Matching
THD	Total Harmonic Distortion
QMS	Quality Management System

3. TERMS and DEFINITIONS

For the purposes of this document, the terms and definitions given in ISO/IEC 17000 apply, together with the following definitions.

3.1 Areas for Improvement

Areas for Improvement (AFI) are not nonconformities and corrective actions are not mandatory. However, the Certification Body judges by their experience that these are potential problem areas which may deserve attention.

3.2 Audit

Systematic, independent, documented process of obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which **Specified Requirement** (3.27) are fulfilled.

NOTE Whilst "**Audit**" applies to management systems, "**Assessment**" applies to conformity assessment bodies as well as more generally. (ISO/IEC 17000)

3.3 Audit Testing

Sampling and testing of LED lighting products which are ordered by an Certification Body during an Assessment. In Certification and Surveillance Assessments, LED lighting products shall be sampled and tested through audit testing. The testing and compliance Standards shall be confirmed by the Certification Body in considering the requirements of this Scheme.

3.4 Bulkhead Type LED Light Fittings

A surface mounted LED luminaire with irreplaceable light sources, robust construction of die cast aluminum casing and vandal resistant diffuser, which is suitable for indoor and/or outdoor applications.

3.5 Case Temperature (Ts)

The temperature of the thermocouple attachment point on the LED light source package as defined by the manufacturer package

3.6 Certificate of Conformity

The certificate issued by the Certification Body to confirm certification of the Supplier in respect of a particular LED lighting product.

3.7 Certification

Acceptance by the Certification Body, on the basis of Assessments, that the Supplier meets the requirements of this Scheme for a particular LED Lighting product.

3.8 Certification Body

An organization who is accredited by HKAS under the Hong Kong Certification Body Scheme (HKCAS) in the field of "Product Certification" to process application from the Supplier.

3.9 Certification Body(ies) Testing Laboratories

CB Testing laboratories who are recognized in the CB Scheme of the IEC System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE) to perform conformity assessment against the specific IEC Standards

3.10 Certification System

Rules, procedures and management for carrying out certification (ISO/IEC 17000)

3.11 Critical Non-conformity

Significant deviation of products from specified requirements in the Scheme, or the absence of, or failure to implement and maintain, a series of required quality management system elements, or a situation which would, on the basis of available objective evidence raise highest degree of doubts to the conformity of the product that the LED Lighting Manufacturer produce.

3.12 LED Downlight

A LED luminaire, with irreplaceable light sources, that directs the light downward and can be recessed, surface mounted or suspended.

3.13 LED Floodlight

A LED luminaire, with irreplaceable light sources, that provides even illumination across a wide area.

3.14 LED Lighting Manufacturer

A LED lighting product manufacturer in a contract with the Supplier for this Scheme.

3.15 LED Lighting Products

Any Bulkhead Type LED Light Fittings, LED Downlight or LED Floodlight with voltage supply as 220 Vac, 50Hz, and any Road Light with voltage supply not exceeding 1,000 Vac, 50Hz, as defined in this document.

3.16 LED Road Light

A LED luminaires for road, street and tunnel lighting, with voltage supply not exceeding 1,000 Vac, 50Hz.

3.17 LED Temperature Measurement Point (TMP_{LED})

A location on an LED package/module/array, designated by its manufacturer, which provides a surrogate temperature measurement location for the actual LED junction and may be a solder joint at the board attachment site, a point on the LED package case, or a location on the board of an LED module or array.

3.18 Major Non-conformity

Deviation of products from specified requirements in this Scheme, or the absence of, or failure to implement and maintain, one or more required quality management system elements, or a situation which would, on the basis of available objective evidence raise serious doubts to the conformity of the products that the LED Lighting Manufacturer produce.

3.19 Minor Non-conformity

Failure to meet one requirement of a clause of ISO 9001 and/or this Scheme or other necessary reference documents, and which is considered to have serious adverse effect on the competence of the LED Lighting Manufacturer and the quality of lighting products that the LED Lighting Manufacturer produces

3.20 Plant

The Plant for the production of certified LED lighting products.

3.21 Purchaser

An individual, firm or company who entered into a contract with the Supplier to purchase certified LED lighting products.

3.22 Quality Manual

The document describing the LED Lighting Manufacturer's company structure, resources, procedures and methods which together ensure that LED Lighting Manufacturer can meet the requirements of the Scheme.

3.23 Quality Records

The records required by the LED Lighting Manufacturer's Quality Manual to meet the requirements stated in the Scheme.

3.24 Quality System Management Office

A location at which the LED Lighting Manufacturer's quality and production records are maintained.

3.25 Rated Lumen Maintenance Life (Lp)

The elapsed operating time over which the LED light source will maintain the ercentae, p, of its initial light output, such as, L70(hours) implies Time to 70% lumen maintenance.

3.26 Scheme

Certification System related to LED lighting products, to which the same specified requirements, specific rules and procedures apply. The Scheme is owned and administrated by HKEIA. HKEIA will at least annually review and continuously maintain to ensure the Scheme operate to the highest standards.

3.27 Specified Requirement

Need or expectation that is stated

NOTE Specified requirements may be stated in normative documents such as regulations, standards and technical specifications. (ISO/IEC 17000)

3.28 Standard(s)

Normative document(s), established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. (ISO/IEC Guide 2)

3.29 Supplier(s)

The party that is responsible for ensuring that products meet and, if applicable continue to meet, the requirements on which the certification is based. (ISO/IEC 17065)

NOTE Client(s), as defined in ISO/IEC 17065, in lieu of Supplier(s) shall be applied in the document when the Certification Body is accredited according to ISO/IEC 17065.

3.30 Surveillance

Systematic iteration of conformity assessment activities as a basis for maintaining the validity of the Certificate of Conformity. (ISO/IEC 17000)

4. PROCEDURES FOR APPLICATION AND CERTIFICATION

4.1 Application

4.1.1 The application from the Supplier should include:

1. an application form completed as prescribed by the Certification Body, an example could be reference to ISO/IEC TR 17026;

2. payment of appropriate fees;

3. provision of the Quality Manual and related documentations for Assessment;

4. nomination of a person to be the management representative and the Supplier's formal contact with the Certification Body.

4.1.2 On acceptance of a completed application form and receipt of the payment, if required, the Certification Body provides the Supplier with an estimate of the time required for conduct of the initial evaluation, and information necessary for the processing of the application.

4.2 Certification Evaluation

4.2.1 Certification Evaluation shall comprise the following:

1. Overall assessment of the quality management and production systems of the LED Lighting Manufacturer.

2. Initial type test. The Supplier shall submit representative samples of LED Lighting Products to the Certification Body for initial type tests. The relevant requirements and the evaluation methods specified in this Scheme, as stated in Annex A, shall be checked for compliance.

3. Report check. The Certification Body may accept and review test reports produced by others, as specified in Annex A, and the Certification Body should ensure that suitability and competence of the party conducting testing, as specified in ISO/IEC 17025, are met.

4. Plant production assessment. The Certification Body will assess the plant and equipment including the calibration of equipment and the operation of the relevant sections of the LED Lighting Manufacturer's quality and technical systems conforming to the Scheme. The relevant requirements and the evaluation methods specified in Annex A of the Scheme shall be checked for compliance.

4.2.2 On completion of the plant control assessment, the Certification Body will notify the Supplier in writing the nonconformities found, followed by the Supplier's acknowledgement of these nonconformities.

Notes: If there is production of the model under the certification process, a random sample needs to be drawn and sent to the certification body for photometric and electrical parameters measurements (this includes Input Power, Ontput Power Factor, Input THD-I, Lumen, Lumen Efficacy, Light Distribution (Road Light only), Correlated Color Temperature, Color Rendering Index and Color coordinates.) The above tests should be performed first by the manufacturer (by itself or by external accredited testing organization) and then by the Certification Body. This is to verify the produced product meets the production specifications.

If there is no production of the model under the certification process, the manufacturer should notify the Certification Body once the date for the production of the model is available. The Certification Body will determine if additional production process assessment is required. A random sample should also be drawn for the testing as specified above.

4.2.3 There are four possible recommendations:

1. **No nonconformity**. Certification will be recommended to the Certification Body for the decision making. Some Area of Improvements may be given for the improvement of the quality and technical systems.

2. **A number of Minor Non-conformity** which do not cumulatively indicate a major failure of the quality management system and product quality. Certification will be recommended after receipt of a letter giving satisfactory details of corrections and corrective action plan which will remove the nonconformities from the system after successful implementation. The time limit for the receipt of the letter will be two weeks.

   Note that corrections and corrective actions do not have to be implemented before the receipt of the letter by the Certification Body. Corrections and corrective actions shall be implemented within an acceptable time which will be a maximum of four weeks or such lesser time as the Certification Body may decide. Minor Non-conformity shall be audited on the first subsequent surveillance assessment.

3. **A major Non-conformity** or **a number of systematic Minor Non-conformity** which accumulate to indicate a major failure of the quality management system and product quality. The Supplier will be required to respond giving satisfactory details of corrections and corrective actions in rectifying the nonconformities in the system after successful implementation. The time limit for the written response will be two weeks.

   Corrections and corrective actions shall be implemented within an acceptable time which will usually be between one to three months.

   Certification will not be recommended until the nonconformities have been rectified from the system and a satisfactory follow up assessment has been carried out.

4. **A Critical Non-conformity** indicating that the extent of the system failure requires more than six months for corrections as considered by the Certification Body. The Supplier will be required to re-apply for certification after a period of at least six months following the date of Certification Assessment. However, when under special cases (e.g. change of LED driver) a reasonable suspension period (e.g. 9 or 12 months) may be agreed with CB for reinstatment.

4.3 Certification

4.3.1 After the Certification Evaluation, the Supplier shall be notified of the Certification decision in writing and additionally be submitted a certification agreement for signature in case of a positive result. The agreement should address conditions under which the certificate is to be used, and should establish rules in the case of misuse. An example of such agreement could be referenced to ISO/IEC TR 17026 and ISO/IEC 17065.

4.3.2 When the certification agreement has been signed, the Certification Body shall issue the Certificate of Conformity to the Supplier.

4.3.3 Supplier shall inform Certification Body about the production schedule for each production run.

4.4 Extension of the scope of Certification

4.4.1. The Supplier wishing to extend the scope of Certification to additional types or models of products, to the same specified requirements as the product(s) for which a Certificate of Conformity is already granted, should apply to the Certification Body using the application form, an example could be referenced to ISO/IEC TR 17026.

4.4.2 The Certification Body may decide not to carry out an assessment of production process or quality system, but to require test samples of the additional types of products to determine that they comply with the specified requirements. The decision should be based on the structure of the new models and the internal circuit design. This includes, but not limited to, the change in housing shape design, internal wirings, etc.

4.5 Certificate of Conformity

4.5.1 Upon Certification, LED lighting products conforming to the Scheme shall be indicated by a Certificate of Conformity issued by the Certification Body. An example of such certificate could be referenced to ISO/IEC TR 17026.

4.5.2 Certificate of Conformity shall include, in particular:

1. name and address of the Certification Body;
2. name and address of the Supplier;
3. name and address of the LED Lighting Manufacturer and the Plant;
4. the name of the Certified LED Lighting Product(s);
5. the model number(s) of the Certified LED Lighting Product(s);
6. statement to indicate the Certified LED Lighting Product(s) conform to the requirements of the relevant product Standard and the conformity is established according to the Scheme,
7. date of issue of the Certificate;
8. the certificate number assigned by the Certification Body;
9. signature and title of authorized officer of the Certification Body.

4.5.3 The Certificate of Conformity shall come into force once being issued, and remain in force unless the Certification is withdrawn for justified reasons or cancelled by either party upon due written notice given to the other party.

4.6 Records Retention

4.6.1. The Certification Body shall keep all certification records, including original records of evaluations and certification documents, when the certificate issued remains valid and for an additional period of at least 10 years from the date the certificate is withdrawn for whatever reason.

5. PUBLICITY BY SUPPLIER

5.1 The Supplier shall have the right to publish the fact that a Certificate of Conformity is issued for its LED lighting product(s) to which the Certificate applies.

5.2 In every case, the Supplier shall take sufficient care of its publications and advertising that no confusion arises between certified and non-certified products.

5.3 The Supplier shall not specify or make any claim in user information that could lead Purchasers to believe performance or usage of the product(s) not covered by the Certification.

6. MISUSE OF A CERTIFICATE OF CONFORMITY

6.1 The Certification Body should take action when unauthorized, incorrect, or misleading use of the Certificates of Conformity is found.

6.2 Incorrect references to the certification system or misleading use of certificates found in advertisements, catalogues, etc., shall be dealt with by suitable actions, which could include legal or correction action or publication of the transgression.

7. OBLIGATIONS OF SUPPLIER

7.1 The Supplier shall ensure that its LED Lighting Manufacturers operate a quality management system in accordance with ISO 9001 and requirements of the Scheme.

7.2 The Supplier shall ensure that its LED Lighting Manufacturers' quality and technical documentations are applied to its Plant producing and supplying products within the Scheme.

7.3 The Supplier shall pay an annual fee to the Certification Body for each Certification. It shall also pay an initial assessment fee and all subsequent fees to the Certification Body for assessment, surveillance and re-assessment and any Audit Testing as may be directed. The amount of all fees will be determined by the Certification Body.

7.4 The Supplier shall ensure that its LED Lighting Manufacturers afford the Certification Body full assistance and cooperation during any assessments, producing documentation and Quality Records when requested, allowing the Certification Body to have free access to the Plant and quality records centre and assisting with Audit Testing as necessary.

7.5 The Supplier shall ensure that its LED Lighting Manufacturers do not sub-contract the production and supply of certified LED lighting products unless specific prior approval has been obtained from the Certification Body. Such approval will only be given if the proposed sub-contractor is also a LED Lighting Manufacturer of a Supplier and the Purchaser has been informed of and agreed with the sub-contract arrangement.

7.6 The Supplier shall keep the Certification Body informed in writing of changes in its circumstances which may affect Certification. Such changes include:

1. Changes in ownership or name.
2. The resignation of management representative or company directors.
3. Changes in the Quality Manual of its LED Lighting Manufacturers or significant items in its Plant.
4. Changes of the location of the Plant and/or its LED Lighting Manufacturers.
5. Closure of the Plant.

7.7 The Supplier shall inform the Certification Body any significant changes to the product, components, manufacturing process or quality management system, which may affect the conformity of the product. In such case, the Certification Body shall evaluate the degree of such changes to the product quality and may demand an assessment for such changes and the Supplier may be asked not to release the product before the performance of an on-site assessment.

7.8 The Supplier shall ensure its LED Lighting Manufacturers keep a list of its Purchasers who purchased the certified LED lighting products for the purpose of recall in case necessary. This record should be checked during surveillance audit.

7.9 The Supplier shall ensure its LED Lighting Manufacturers keep a list of all its suppliers, including alternative ones, who supplied the LED Lighting Manufacturer with their components for the purpose of audits from the Certification Body in its Certification or Surveillance.

8. SURVEILLANCE

8.1 After Certification, the Certification body shall conduct periodic Surveillance of the products and the production process/quality management system on the basis of the requirements of the relevant Standard and on the basis of the elements or requirements of the current document.

8.2 Frequency and Purpose of Surveillance Assessment

8.2.1 The frequency of routine Surveillance assessments shall be at least once for every 12 months from the date of issuing certificate.

Surveillance assessments shall comprise the followings:

1. Surveillance by testing. The Certification Body shall take random representative samples of the Certified LED Lighting Products from the market or from Supplier's stock or from a combination of both. The samples of Certified LED lighting products are used for evaluation testing. The relevant properties specified in Table 3.1.3 of this Scheme shall be determined for checking compliance.

2. Plant production surveillance. The Certification Body will assess the Plant and equipment including the calibration of the equipment and the operation of relevant sections of the LED Lighting Manufacturer's quality and technical documentations conforming to the requirements of the Scheme.

3. If there is no production line operation within 3 months before or after the surveillance date (i.e. the year after certificate issue date), the plant production surveillance assessment can be deferred to next year or when there is production. If there is no product in 2 consecutive years, the factory has to prepare either a "demo" production or the actual production of similar products that are with similar mechanical structures.

8.2.2 Other Surveillance Assessments will be made for follow up assessment purposes following a report of critical nonconformities. Such assessments may require either:

1. A partial assessment to confirm that nonconformities have been corrected; or

2. A full assessment to confirm compliance with the requirements of the Scheme.

8.3 Conclusions from Surveillance Assessment

8.3.1 On completion of each Surveillance Assessment, the Supplier shall be notified of the Surveillance conclusion in writing.

8.3.2 There are four possible conclusions:

1. **No nonconformity.** Certification should be confirmed. Area of Improvements may be given for the improvement of the quality and technical systems.

2. **A number of Minor Non-conformity** which do not cumulatively indicate a major failure of the quality management system and product quality. Certification should be conditionally confirmed. Certification will be confirmed after the Certification Body received a written response from the Supplier stating details of the proposed corrections and corrective actions and with the Certification Body's consent to implement. The time limit for the receipt of the written reply will be two weeks. Corrections and corrective actions shall be implemented within an acceptable time limit which will be a maximum of four weeks or such lesser time as the Certification Body may decide.

3. **A Major Non-conformity** or **a number of systematic Minor Non-conformity** which accumulate to indicate a major failure of the quality management system and product quality. Suspension of Certification should be recommended. The Supplier will be required to submit a written reply stating details of the proposed corrections and corrective actions for rectifying the nonconformities in the system of its LED Lighting Manufacturer. The time limit for the receipt of the written response will be two weeks. The Certification Body shall assess the corrections and corrective actions to ensure proposed actions are effectively implemented before reinstatement of the Certification.

   A partial or full re-assessment, as directed by the Certification Body, will be required within three months before reinstatement of Certification can be confirmed.

4. Certification shall be suspended in case of critical nonconformity, major nonconformity or a number of systematic minor nonconformities that have not been rectified in the system in accordance with the relevant procedures stated in the requirements of the Scheme or if the Supplier is persistently failing to comply with its obligation under the Scheme.

9. SUSPENSION OF CERTIFICATION

9.1 The applicability of the Certification to a specific product may be suspended for a limited period, typically no more than 6 months, in the following cases:

- if the surveillance shows Major Nonconformity with the requirements of such a nature that immediate withdrawal is not necessary;

- if a case of improper use of the certificate (e.g. misleading publications or advertisement) is not solved by suitable retractions and appropriate corrective actions by the Supplier;

- if there has been any other contravention of the Scheme or the procedures of the Certification Body.

Note: Due to specific conditions, such as relocation of factories, the suspension period may be further extended by a maximum of 3 months, i..e a maximum total suspension period of 9 months.

9.2 The Supplier shall make sure that any product that has been produced in the period of the suspension of the Certification shall be prohibited to be identified as certified products.

9.3 Upon suspension of the Certification of Conformity, the Supplier shall notify its Purchasers and shall call back all products which fail to comply with the Scheme.

9.4 The Certification Body shall confirm an official suspension of the Certificate of Conformity via a registered letter to the Supplier.

9.5 The Certification body shall indicate under which conditions the suspension shall be removed.

9.6 At the end of the suspension period, the Certification body shall investigate whether the indicated conditions for re-instituting the Certificate of Conformity have been fulfilled.

9.7 On fulfillment of conditions in accordance with Clause 9.5, the Certification Body shall notify the Supplier that the suspension shall be removed.

10. WITHDRAWAL OF CERTIFICATION

10.1 The Certification Body shall have the right to withdraw the Certificate of Conformity by informing the Supplier in writing in the following cases:

- if the surveillance shows that the nonconformity is of a serious nature;
- if the Supplier or its LED Lighting Manufacturer fails to fulfill its financial obligations;
- if there is any other contravention of the certification agreement;
- if inadequate measures are taken by the Supplier or its LED Lighting Manufacturer in the case of suspension.

10.2 The Supplier shall have the right to give notice of appeal, and the Certification Body when considering the appeal may or may not (depending on the nature of the case) decide to proceed with its decision to withdraw the Certificate of Conformity.

10.3 Further, the Certificate of Conformity may be withdrawn in the following cases:

- if the Supplier does not wish to prolong the certification;
- if the Standards or rules are changed and the Supplier or its LED Lighting Manufacturer either will not or cannot ensure conformity with the new requirements within the time limit;
- if the product is no longer made or the Supplier or its LED Lighting Manufacturer goes out of business;
- on the grounds of other provisions certified in the Certification agreement.

11. INFORMATION ON SUPPLIER

11.1 Upon the request of any purchasers, end users or any concerned parties of the certified LED Lighting Products, the Certification Body will provide verbal and, if requested, written confirmation of the status of any LED Lighting Manufacturers or Plants under its register of a Supplier.

11.2 Any announcement or confirmation of the suspension or withdrawal of Certification will accompany with reasons for such suspension or withdrawal.

12. APPEALS AGAINST DECISIONS

12.1 The Supplier shall have the right of appeal against any decisions of the Certification Body or equivalent to an appeal committee set up under the Certification Body. Details of the appeal procedure shall be given by the Certification Body.

12.2 A meeting of the appeal committee shall be held within 30 calendar days of receipt of the appeal notice from the Supplier, and the Supplier shall be given at least 7 calendar days' notice of the time and place of the meeting. The decision of the majority of the appeal committee as declared by its chairman shall be final and shall be released within 7 calendar days after the appeal committee meeting.

13. CHANGES TO THE REQUIREMENTS

13.1 The Certification Body shall inform Suppliers no later than a three-month written notice of any intended changes to the Certification Body's requirements to allow for clarification between the Supplier and the Certification Body.

13.2 The requirements for the accreditation stated in this document and other accreditation criteria may be amended from time to time as deem fit. Supplier and Certification Body shall conform to the amended requirements and criteria within the period of time specified in the revisions. The accreditation of Certification Body may be suspended, terminated or the grant of accreditation may be refused to it if the organization fails to conform to the amended requirements and criteria within the specified period of time.

14. COMPLAINTS RECEIVED BY SUPPLIER

14.1 Supplier shall keep a record of all written complaints received from any concerned parties. These records shall be made available to the Certification Body at the time of any Assessments.

14.2 The Supplier shall take appropriate actions with respect to the Certification Body's decision and make good any deficiencies found in the products to comply with the requirements of the Scheme.

15. COMPLAINTS RECEIVED BY THE CERTIFICATION BODY

15.1 The Certification Body shall keep a record of all written complaints received from any concerned parties, in relation to a Supplier. Such complaints will be investigated and the actions taken shall be documented with their effectiveness.

15.2 The Certification Body shall respond to complainants with a report which is confined to a statement upon the Certification status of the LED Lighting Manufacturer and its Plant(s) of the Supplier.

16. CONFIDENTIALITY

16.1 Supplier shall disclose to the Certification Body for the purposes of Assessments of all information or records obtained from or pertaining to Purchasers in connection with the Scheme.

16.2 The Certification body shall be responsible for ensuring that confidentiality of information is maintained by its employees and those of its subcontractors concerning all information obtained as a result of their contacts with the Supplier.

17. OBLIGATION OF CERTITIFICATION BODY

17.1 The Certification Body shall ensure all types of testing services, as listed in Table A.3.1.3: Surveillance Assessment for LED Lighting products of this Scheme, complying with ISO/IEC 17025, without any reduction in scope.

17.2 Where any part of the testing services is contracted to any third party, the Certification Body shall remain fully liable for any act or omission of such third party as if such act or omission were its own.

17.3 For each certified model, the Certification Body shall maintain a record of directory with the following information –

1. contact information of the Supplier (company name, contact person, address, email address and phone number);
2. contact information of the LED Lighting Manufacturer and the Plant (company name, contact person, address, email address and phone number);
3. LED lighting product type;
4. the model number(s) of the Certified LED Lighting Product(s);
5. date of issue of the Certificate;
6. the certificate number;
7. the rated maximum ambient temperature, t_a;
8. measured LED driver case temperature in safety evaluation with t_a;
9. measured in situ TMP_{LED} temperature in Annex B.1.

17.4. The Certification Body shall notify HKEIA by electronic means (e.g. by e-mail or other means as specified by HKEIA) about the issue of a certificate within 5 working days from the date when it issues the certificate with the following information –

1. certificate number;
2. name of the Supplier;
3. LED lighting product type;
4. model number(s);
5. certificate issue date;
6. t_a;
7. measured LED driver case temperature in safety evaluation with t_a;
8. measured in situ TMP_{LED} temperature in Annex B.1;

17.5 The Certification Body shall seek consent from the Supplier for transferring all information specified in section 17.3 to HKEIA and allowing HKEIA to publish the information on its website.

17.6 Each model of certified equipment (including the information of the equipment as provided by the Certification Body) will be posted on HKEIA's website at "http://www.hkeia.org/ledlpc_c.html".

Note: The terminated and suspended model should also be listed in the HKEIA web site with the date of termination/suspension. The terminated model should be shown for at least 2 years from the date of termination.

18. LIABILITY

18.1 The Supplier and Certification Body may only make representations or statements concerning the Certification of Conformity which are contained and/or supplied by the Committee. The Committee is not liable for any loss or damages caused by unauthorized representations or statements regarding the Certification of Conformity made by or on behalves of the Supplier and/or Certification Body.

18.2 The Committee and Scheme Owner are not liable to the Supplier and/or Certification Body for any loss, damage, costs, legal costs, professional and other expenses of any nature whatsoever incurred or suffered by the Supplier or Certification Body, or by a purchaser of the products from the Supplier, or by any other third party, whether direct or consequential (including but without limitation to any economic loss or other loss of turnover, profits, business or goodwill) arising out of any dispute or contractual tortious or other claims or proceedings made by or brought against the Supplier and/or Certification Body in relation to the any products.

18.3 The Committee and Scheme Owner are not responsible in any way whatsoever for dealing with any disputes or contractual, tortious or other claims or proceedings of the type referred to in clause 18.2

18.4 The Supplier and/or Certification Body agrees to pay, discharge and indemnify the Committee and the Scheme Owner, their officers, servants and agents at all times against all and any loss, damages, costs, legal costs, professional and other expenses referred to in clause 18.2 and 18.3.

19. GOVERNING LAW AND JURISDICTION

19.1 The validity, construction and performance of this Scheme are governed by Hong Kong laws.

19.2 All disputes, claims or proceedings between the parties relating to the validity, construction or performance of this Scheme are subject to the exclusive of the jurisdiction of the Hong Kong Courts to which the parties irrevocably submit. Each of the Supplier and Certification Body irrevocably consent to the award or grant of any relief in any such proceedings before the Hong Kong Courts.

Annex A (Normative): Requirements of LED Lighting Products & Evaluation Methods of Conformity

A.1. GENERAL REQUIREMENTS OF LED LIGHTING PRODUCTS

Table A.1 GENERAL REQUIREMENTS – EVALUATION METHODS

Evaluation Category	Standards / Requirements	Initial Assessment
		Type Test/ Evaluation
Safety	IEC 60598-1 with particular requirement in Annex A.2	Yes[1]
	IEC 62471	Yes[1]
EMC	CISPR 15 / EN 55015, IEC 61000-3-2 / EN 61000-3-2, IEC 61000-3-3 / EN61000-3-3, and Surge immunity test according to IEC 61547 / EN 61547	Yes[2]
Performance	See Annex B.1	Yes[3]

NOTE:

Note 1 Report Check: The tests shall be conducted by a CBTL. The test report shall be issued by the CBTL and evaluated with the associated certificate issued by the relevant National Certification Body of the IECEE CB Scheme.

Note 2 Report Check: The tests shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent.

Note 3 Initial Type Test is required. (See Annex A.3.1.1)

A.2 SPECIFIC REQUIREMENT OF LED LIGHTINGS PRODUCTS

Table A.2.1 SPECIFIC REQUIREMENTS FOR BULKHEAD TYPE LED LIGHT FITTINGS – EVALUATION METHODS

Evaluation Category	Standards / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	IEC 60598-2-1 associated with IEC 60598-1, where the unit shall be tested with its rated maximum ambient temperature as t_a	Yes[1]
Performance	IES LM-79 Photometric measurement	Yes[2]
Supplementary requirements	See Note 4	Yes[3]

NOTE:

Note 1 Report Check: The tests shall be conducted by a CBTL. The test report shall be issued by the CBTL and evaluated with the associated certificate issued by the relevant National Certification Body of the IECEE CB Scheme.

Note 2 Report Check: The tests shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent.

The following photometric performance shall be complied with:
(a) Color rendering index (CRI): not less than 75;
(b) Correlated color temperature (CCT): 4,000K (nominal) [3,985K (target) +/-275K tolerance];
(c) Correlated color temperature (CCT): within the corresponding 7-step chromaticity quadrangles as defined in ANSI/NEMA/ANSLG C78.377.

Note 3 Initial Type Test is required. (See Annex A.3.1.1)

Note 4 The following supplementary requirements shall be complied with:

(a) Light diffuser test:
  i) Impact test according to Section 4.13 of IEC 60598-1 for rough service luminaires with impact energy of 6.5Nm, at 25degC, without visible damage; and
  ii) Glow wire test according to Section 13.3 of IEC 60598-1 with temperature set at 850degC.

(b) i) For light fittings with internal dimming function/selector, the lumen output, efficiency, power factor and total harmonic distortion for current (THD-I) at each dimming setting shall be verified against the values/tolerance as quoted by the LED lighting manufacturer. The measuring method shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79;
  ii) For light fittings intended to be connected to an external dimmer, please refer to Annex B.2 as the requirements.

(c) The light fittings shall also comply with the following performance requirements, where the measurements shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79:

  i) Luminance efficacy: Minimum 70 lumen/watt at 100% full lumen output;
  ii) Overall operating power factor of the luminaries ≥ 0.85 at all internal dimmer settings (note: if continuous dimming is used, the power factor should be measured at max, medium and min. power settings);
  iii) Total Harmonic Distortion (Current), THD-I: ≤15% at the maximum (100%) dimmer setting.

Table A.2.2 SPECIFIC REQUIREMENTS FOR LED DOWNLIGHT – EVALUATION METHODS

Evaluation Category	Performance Standard / requirements	Initial Assessment Type Test/ Evaluation
Safety	- IEC 60598-2-1 associated with IEC 60598-1 for surface mounted application, where the unit shall be tested with its rated maximum ambient temperature as t_a - IEC 60598-2-2 associated with IEC 60598-1 for recessed mounted application, where the unit shall be tested with its rated maximum ambient temperature as t_a	Yes[1]
Performance	IES LM-79 Photometric measurement	Yes[2]
Supplementary requirements	See Note 4	Yes[3]

NOTE:

Note 1 Report Check: The tests shall be conducted by a CBTL. The test report shall be issued by the CBTL and evaluated with the associated certificate issued by the relevant National Certification Body of the IECEE CB Scheme.

Note 2 Report Check: The tests shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent.

The following photometric performance shall be complied with:

(a) Color rendering index (CRI): not less than 80;

(b) Correlated color temperature (CCT): shall have one of the following nominal value: 2,700K, 3,000K, 3,500K, 4,000K or 5,000K [The LED downlight shall also fall within the corresponding 7-step chromaticity quadrangles as defined in ANSI C78.377.];

(c) Minimum 345lumens for aperture <=4.5inches or 575 lumens for aperture >4.5inches. The luminaries shall deliver a minimum of 75% of total lumens (initial) within the 0-60deg zone (axially symmetric about the nadir).

Note 3 Initial Type Test is required. (See Annex A.3.1.1)

Note 4 The following supplementary requirements shall be complied with:

(a) For light fittings intended to be connected to an external dimmer, please refer to Annex B.2 as the requirements.

(b) The light fitting shall also comply with the following performance requirements, where the measurements shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79:

i) Luminance efficacy: Minimum 60 lumen/watt at 100% full lumen output;

ii) Overall operating power factor of the luminaries $\geq$ 0.85 at all internal stepwise dimmer settings (note: if continuous dimming is used, the power factor should be measured at max, medium and min. power settings);

Table A.2.3. SPECIFIC REQUIREMENTS FOR LED FLOODLIGHT – EVALUATION METHODS

Evaluation Category	Performance Standard / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	IEC 60598-2-5 associated with IEC 60598-1, where the unit shall be tested with its rated maximum ambient temperature as t_a	Yes[1]
Performance	IES LM-79 Photometric measurement	Yes[2]
Supplementary requirements	See Note 4	Yes[3]

NOTE:

Note 1 Report Check: The tests shall be conducted by a CBTL. The test report shall be issued by the CBTL and evaluated with the associated certificate issued by the relevant National Certification Body of the IECEE CB Scheme.

Note 2 Report Check: The tests shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent.

The following photometric performance shall be complied with:

(a) Color rendering index (CRI): not less than 75;

(b) Correlated color temperature (CCT): within the corresponding 7-step chromaticity quadrangles as defined in ANSI/NEMA/ANSLG C78.377.

Note 3 Initial Type Test is required (See Annex A.3.1.1)

Note 4 The following supplementary requirements shall be complied with:

The luminaries shall also comply with the following performance requirements, where the measurements shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79:

i) Luminance efficacy: Minimum 70lumen/watt at 100% full lumen output;

ii) Overall operating power factor of the luminaries $\geq$ 0.85 at all internal stepwise dimmer settings (note: if continuous dimming is used, the power factor should be measured at max, medium and min. power settings);

Table A.2.4 SPECIFIC REQUIREMENTS FOR LED ROAD LIGHT – EVALUATION METHODS

Evaluation Category	Performance Standard / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	- IEC50598-2-3 associated with IEC 60598-1 for road lighting where the unit shall be tested with its rated maximum ambient temperature as ta	Yes[1]
Performance	- IES LM-79 Photometric measurement reports together with the light distribution data in IES data file format	Yes[2]
Supplementary requirements	See Note 4	Yes[3]

NOTE:

Note 1 Report Check: The tests shall be conducted by a CBTL. The test report shall be issued by the CBTL and evaluated with the associated certificate issued by the relevant National Certification Body of the IECEE CB Scheme.

Note 2 Report Check: The tests shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent. The photometric data shall be provided and presented in standard IES data file format.

The following photometric performance shall be complied with:

(a) Color rendering index (CRI): not less than 70; and

(b) Correlated color temperature (CCT): shall have one of the following nominal value: 2,700K, 3,000K, 3,500K, 4,000K and 4,500K [With reference to ANSI C78.377] and within the corresponding 7-step chromaticity quadrangles as defined in ANSI/NEMA/ANSLG C78.377.

(c) The following parameters should be measured and the values should corresponding to the product's specifications with the specific acceptance tolerance:

i) Peak intensity value – The measured sample shall not be less than 75% of the rated intensity.

ii) The beam angle that corresponding to the peak intensity value point as specified in (i) – The measured sample shall not deviate by more than 25%.

ii) The center beam intensity - The measured sample shall not be less than 75% of the rated intensity.

Note 3 Initial Type Test is required. (See Annex A.3.1.1)

Note 4 The following supplementary requirements shall be complied with:

(b) For road light with dimming function/selector, the lumen output, efficiency, power factor and total harmonic distortion at each dimming setting shall be verified against the values/tolerance as quoted by the LED road light manufacturer. The measuring method shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79;

(c) The road light shall also comply with the following performance requirements, where the measurements shall be conducted in accordance with the test conditions as stipulated in the relevant clauses of LM-79:

i) Luminance efficacy: Minimum 100 lumen/watt at 100% full lumen output;

ii) Operating power factor of the luminaries ≥ **0.9** and Total Harmonic Distortion - Current (THD-I) < **20%** at dimmer settings 40% - 100%.

iii) If there is dimmer control, the dimming control should have at least a continuous range 40% - 100%. For demonstrating the continuous dimmer control, the QA test should include at least 3 dimmer settings: 1005, 40% and any intermediate dimmer setting.

iv) Driver's Case Temperature (Tc) rating: up to +**70**degC at a minimum of **95%** Relative Humidity. Luminaires with open drivers are not allowed.

A.3. EVALUATION METHODS OF CONFORMITY

A.3.1 The methods for the evaluation of conformity include the followings (Refer to Table A.1 and Table A.2.1, Table A.2.2 or Table A.2.3 as appropriate):

A.3.1.1 Initial Type Tests

The first evaluation of a LED Lightings Product to fulfill the requirements of the Scheme and appropriate initial type testing in Table A.1 and Table A.2.1, Table A.2.2 or Table A.2.3 as appropriate shall be carried out to confirm the characteristics of the product meet the requirements of the Scheme.

Initial type tests shall also be carried out on existing products after any change in components or manufacturing procedures that can modify the declared values of the characteristics or application properties.

At least one representative sample for initial type test shall be submitted by Supplier.

A.3.1.2 Plant Production Control

The LED Lighting Manufacturer shall have a quality system ISO 9001 certified by an HKAS or its MRA partner accredited body. The inspector shall verify if the production of the certified products is covered by the scope of the certificate and if the relevant procedures cover the requirements of this document.

The Plant Production Control procedures and quality inspection checklists relevant to the declared properties, as confirmed by the initial type tests, of the LED Lighting Products Manufacturer shall be established and implemented in accordance with the requirements in the Scheme.

Any change in components, manufacturing control procedures or quality inspection checklist that can affect the properties of the LED Lighting Products shall be recorded and implemented according to the declared documents control procedures, including but not limited to,

- Engineering change note
- Work instructions
- Quality inspection plan
- ID for date of manufacturing

The quality inspection plans and/or control procedures shall consist of a system for the incoming materials, production quality control, and finished products to ensure that the product complies with the relevant requirements, and with main stages as below

A.3.1.2.1 Components - Incoming Quality Control (IQC)

The manufacturer shall define the acceptance criteria, i.e. Acceptable Quality Limit (AQL), and control procedures for incoming components to ensure that these are not used until it has been verified that they comply with the required specifications. The related documents and materials, not limited to the following items, shall be provided for review.

- Incoming quality inspection plan or checklist
- Component reference samples of specific product type for IQC inspection
- Component specifications
- For each batch of received components listed below, relevant test data (e.g. photometric test) should be provided by IQC or the component supplier:
    - LED drivers;
    - LED modules;
    - Light diffuser; and
    - Lens (for Road Light)
- Incoming components' storage and handling

A.3.1.2.2 Production Processes – Inspection and quality control procedures

The LED Lighting Manufacturer shall identify and define the plant and production processes and ensure that the processes are carried out under controlled conditions clearly described in the procedures. The processes are verified by means of inspections and tests documented in a plan, as frequency and values or criteria are required on both equipment and on operations in the process. The actions to be taken when control values or criteria are not obtained shall be given.

The production line audit shall be conducted with the following checking items.

i. Work Instruction (WI) for assembly products shall be provided for each working or assembly position. The WI shall include the following contents, if applicable.

- Components / parts required for sub-assembly
- Components assembly methods or procedures
- Test instruments used for quality control, if applicable
- Quality check points, if applicable

ii. In production on-line testing, the followings shall be confirmed.

- Location of production plant, identity and settings of production equipment.

- Identity of plant management personnel against factory organization chart.

- The factory burn-in test procedure and requirements for the completed LED lighting products, according to the relevant quality inspection plan / checklist.

- Production on-line tests listed with appropriate calibrated test equipment on each sample.

  - Dielectric Voltage Withstand Test or Insulation Resistance Test with accordance to Annex Q (Conformity Testing during Manufacture) of IEC 60598-1, if applicable.

  - Earthing continuity test for class I product only with accordance to Annex Q (Conformity Testing during Manufacture) of IEC 60598-1, if applicable.

  - Measurements and/or checking on power and power under different dimmer settings (a minimum of 2 checking on the max. dimmer setting (100% power input) and minimum dimmer setting (e.g. 40% power input). The light output should also be observed to determine if there is corresponding light level changes. In view of limited equipment available in production line, measurement of the output light level is not required.

    Note: If the dimmer setting is continuously variable, it is typically to set the dimmer setting according to the power input level.
    THD-I (Total Harmonic Distortion – Current) is preferred during the production process.

iii. Major components, including LED module, light diffuser and critical components inside the LED driver per Bill of Material (BOM) of the specific product, shall be verified during the initial factory audit.

- Identity of component manufacturers;

- Components model number, specifications and certificates.

iv. Any deviation by comparing the PCB layout diagram (both with and without the components) and photos of the finished PCBA of the production units against the PCB layout and photos of the unit which submitted for EMC testing.

A.3.1.2.3 Finished products - Quality inspection and tests

A finished product quality inspection plan/checklist for specific product shall be provided for review. The number and size of samples, frequencies / methods of sampling for inspection and tests (e.g. AQL), defective classification for inspection, tests performed, shall be described in the plan/checklist. All the results of inspection and tests shall be recorded accordingly. Tests shall be conducted to prove performance consistency of relevant product in the batch. There should be product date information for each production batch (this can be date code in each product or production period in each lot, etc.)

The selected samples should be tested with the parameters: Input voltage, input current, input power, input power factor, input THD-I (Total harmonics distortion - Current), lumen, CCT (Correlated Color Temperature), color rendering index, light distribution (for road light), color co-ordinates. For bulk head type of luminaires, all the dimmer settings have to be tested with the above test parameters. For Downlight, Floodlight and Road Light, 3 dimmer settings are to be tested with the above test parameters and this should include the maximum (100% for all type of lighting product) dimmer setting, minimum dimmer setting (40% for road light) and any intermediate dimmer setting.

A.3.1.2.4 Criteria of quality inspection for components and finished products

Where and when possible and applicable, the results of inspections and tests shall be interpreted, according to the Acceptable Quality Limit (AQL) which are described in the relevant quality inspection plans/checklists for the incoming components/materials and finished products.

A.3.1.3 Surveillance Assessment

The surveillance assessment for the LED lighting products should be performed at least once for 12 months. The surveillance consists of the assessment of the production process and testing of samples from the factory or the open market, or both.

The surveillance of the production process is identical to the initial assessment and refers to annex 3.1.2.

In the surveillance by testing of samples from the factory or the open market, the Certification Body shall take random representative samples of the Certified LED Lighting Products from the market or from Supplier's stock or from a combination of both. As stated in table A.3.1.3, the specified number of samples shall be evaluated for the relevant standards or requirements. No non-compliance shall be found in the evaluation.

Table A.3.1.3 – Surveillance Assessment for LED lighting products

Evaluation Category	Standard/requirements	Assessment items	Number of samples
Safety	IEC 60598-1 associated with corresponding safety standard in Annex A.2[1]	LED driver case temperature verification	1
	Supplementary test – Light diffuser test[2]	Light diffuser	1
EMC	CISPR 15 / EN 55015	Radio disturbance	1
Performance	IES LM-79 Photometric measurement[3]	Photometric performance	Normally 3, but not less than 1
	Annex B.1	LED in situ TMP_{LED} temperature verification	1

Note 1 The requirement is that the LED driver case temperature measured shall not be higher than 110% of the LED driver case temperature as listed on the directory of the HKEIA website for the corresponding certified model.

Note 2 If applicable, the specific requirements of the test shall be followed as stated in the corresponding tables in Annex A.2 for the defined type of LED lighting product.

Note 3 The specific requirements of the measurements shall be followed as stated in the corresponding tables in Annex A.2 for the defined type of LED lighting product.

Annex B (Normative): Supplementary Requirements

B.1 LED in situ TMP_{LED} temperature measurement and requirement

B.1.1 Lumen Maintenance Requirement: Directional and Non-Directional Luminaires

B.1.1.1 Requirements:

The LED package(s) / module(s) / array(s) used shall meet the following L_{70}(9k) rated lumen maintenance life values, *in situ*: L_{70}(9k) ≥ 50,000 hours

Compliance with the above shall be documented with a TM-21 lumen maintenance life projection report as detailed in TM-21, section 7. The report shall be generated using data from the LM-80 test report(*) for the employed LED package/module/array model ("device"), the forward drive current applied to each device, and the *in situ* TMP_{LED} temperature of the hottest device in the luminaire. In addition to LM-80 reporting requirements, the following information shall be reported:

- sampling method and sample size (per LM-80 section 4.3)
- test results for each Ts and drive current combination
- description of device including model
- ANSI target, and calculated CCT value(s) for each device in sample set
- Δu'v' chromaticity shift value on the CIE 1976 diagram for each device in sample set

Access to the TMP_{LED} for the hottest LED may be accomplished via a minimally sized hole in the luminaire housing, tightly resealed with a suitable sealant if created for purposes of testing. All thermocouple attachments and intrusions to luminaire housing shall be photographed.

(*)Note:
1. The LM-80 measurements shall be conducted by a HKAS or its MRA partners accredited test laboratory. The results shall be reported in HKAS endorsed test report or equivalent.

2. The LM-80 report is applicable to the light sources with allowed variations as below, which can be referred to the "Light Source" and "Correlated Color Temperature(CCT)" sections as extracted from Energy Star Program Requirement Product Specifications for Luminaires (Light Fixtures) version 2.0, Page 9, "Allowable Variations Within Product Families" table.

- Light Source (refers to the make and/or model of the source; also review CCT below):

  Allowed so long as variations will not negatively impact luminaire's compliance with any performance criteria in this specification.

- Correlated Color Temperature (CCT) (also review Light Source above):

  Allowed so long as the lamp series or LED package/module/array series (and associated drive current), ballast or driver, and thermal management components are identical, and so long as variations will not negatively impact luminaire's compliance with any performance criteria in this specification. The representative model shall be the version within the product family with the lowest CCT for SSL products.

B.1.1.2 Method of measurement:

Lumen maintenance: IES LM-80-08
Lumen maintenance projection method: IES TM-21-11
CCT calculation: CIE 15.2004
ANSI/UL 1598:2008 (Sections 19.7, 19.10-16)
Reference documents: chromaticity specifications: ANSI/NEMA/ANSLG C78.377-2011
Lumen Maintenance: Energy Star TM-21 Calculator

B.1.1.3 Supplemental testing guidance:

Luminaire sample size: 1 complete luminaire.

LM-80 sample size: minimum sample size of 20 units for LED packages, or 10 units for LED arrays or LED modules, for each Ts and drive current combination (refer to IES TM-21-11, section 4.2). Each sample set may be composed entirely of one nominal CCT, or may be split between no more than two adjacent nominal CCT values as outlined in ANSI C78.377 (e.g. 2700 and 3000K, or 3000K and 3500K).

Passing Test: All of the conditions below shall be met.

1. In the sample luminaire, the in situ TMP_{LED} temperature is less than or equal to the temperature specified in the LM-80 test report for the corresponding or higher drive current, within the manufacturer's specified operating current range.

2. The drive current measured in the luminaire is less than or equal to the drive current specified in the LM-80 test report at the corresponding temperature or higher.

3. The TM-21 lumen maintenance life projection report projects an L_{70} meeting or exceeding requirements.

Remark:

Apart from the required *in situ* rated lumen maintenance life value, the above is solely extracted from Energy Star Program Requirement Product Specifications for Luminaires (Light Fixtures) version 2.0, Page 17, Table "Lumen Maintenance: All Luminaires", and Source Type section : "Solide State Option 1 : Luminaire, Retrofit kit, LED Light Engine LED Package, Module or Array".

B.1.2 Color Maintenance Requirements: Solid State Indoor Luminaires Only (Exemption: Outdoor Luminaires)

B.1.2.1 Requirements:

Luminaire change in chromaticity coordinates from 0-hour measurement, at any measurement point during operation, shall be ≤ a total linear distance of 0.007 on the CIE 1976 u'v' diagram. All units must meet.
The change of chromaticity at each measurement point over the tested hours of operation shall be ≤ 0.007 on the CIE 1976 (u',v') diagram,, as demonstrated by the IES LM-80 test report for the employed LED package/array/module model.

B.1.2.2 Method of measurement and/or Reference Documents:

Methods of Measurement: IES LM-80-08
Reference documents: ANSI/UL 1598 :2008

B.1.2.3 Supplemental testing guidance:

Laboratory test results shall be produced using the specific models of lamp or LED package, LED module or LED array and LED driver that will be used in production.

Sample Size (LM-80 option): same as Lumen Maintenance, Option 1 (i.e. Annex B.1.1).

Passing Test (LM-80 option): for all LM-80 samples, at any measurement point, the distance of the chromaticity coordinates from the initial (zero-hour) chromaticity coordinates shall not exceed 0.007 at the temperature(s) adjacent to the measured in situ TMP_{LED} temperature, and at the corresponding drive current.

Example 1: an LM-80 test report provides data at T_S= 55°C, 85°C and 105°C, and the measured in situ TMP_{LED} temperature value is 89°C. Neither the 85°C nor the 105°C LM-80 data may show chromaticity shift exceeding 0.007 at any measurement point from zero through 6,000 hours, for the corresponding drive current. The LM-80 chromaticity data at 55°C is disregarded.

Example 2: an LM-80 test report provides data at T_S= 58°C, 87°C and 106°C, and the measured in situ TMP_{LED} temperature value is 53°C. The LM-80 data at 58°C may not show chromaticity shift exceeding 0.007 at any measurement point from zero through 6,000 hours, for the corresponding drive current. The LM-80 chromaticity data at 87°C and 106°C is disregarded.

Remark:

The above is solely extracted from Energy Star Program Requirement Product Specifications for Luminaires (Light Fixtures) version 2.0, Page 19, Table "Color Maintenance Requirements: Solid State Indoor Luminaires Only (Exemption: Outdoor Luminaires)" for the LM-80 option.

B.2 Dimming requirements: All luminaires marketed as dimmable

B.2.1 Requirements:

The luminaire and its components shall provide continuous dimming from 100% to 20% of total light output.

B.2.2 Method of Measurement:
None referenced.

B.2.3 Supplemental Testing Guidance:
Laboratory test results shall be produced using the specific lamp and ballast models that will be used in production.

Sample Size: 1 sample of the luminaire shall be tested.

Passing Test: The sample shall pass.

Remark

1. This section is solely extracted from Energy Star Program Requirement Product Specifications for Luminaires (Light Fixtures) version 2.0, Page 25, Table 15.1 “Dimming: All Luminaires Marketed as Dimmable, and Source Type section : “Solid State“.

2. With reference to the “Product Labeling & Packaging Requirements” of the Energy Star Program Requirement Product Specifications for Luminaires (Light Fixtures) version 2.0 that a list of compatible dimmers shall be printed on the external packaging, the applicable dimmers for the test stated here shall be the one as specified by the Supplier.

Annex C: Additional Activities of Scheme Owner (HKEIA) and Certification Bodies

The following activities should be carried out by both the Scheme Owner and Certification Bodies:

1. Scheme Owner should set up a committee with at least 1 member from all the related industrial sectors: HKEIA (the Scheme owner), Retailer, Manufacturer, User/Purchaser, and all the Certification Bodies. New members can be nominated/proposed by the committee members/Scheme Owner. Due to the limited possible membership candidates, there is no limit on the membership duration. The membership can be terminated either by the member's own decision or with the confirmation of all the other committee members. Scheme Owner should provide the arrangement of the meeting. The meeting should be held at least once a year and/or initiated by the committee members/Scheme Owner for special occasions such as scheme update. For any proposed updates/decisions in the Scheme, the issues will be discussed either in meetings and/or through emails and must be without any objections before putting into effect.

2. The committee should hold regular meetings (e.g. once every year) for periodic review of the scheme. This includes: the review of latest update of the test standards that are related to the Scheme; feedback from the LED lighting product industries; observations by Certification Bodies during factory audit; and any issues/experience/observations related to the Scheme.

3. The committee members should advise for the improvements/corrections of the Scheme.

4. When there is any update to the scheme, the committee members are required to review the changes for a) meeting the requirement of ISO/IEC 17065 and HKCAS SC-11; and b) any changes to the output of the scheme (e.g. the validity of current certificates, is the manufacturers be able to produce lighting product of the required efficacy.)

5. With complaint to the Certification Body, the Certification Body required to handle and clear the complaint as noted in the agreement signed between the Scheme Owner (HKEIA) and the Certification Body. If the complaint is related to the scheme itself, a special committee member meeting should be held within 1 month for handling of the complaint. The issues will be discussed either in meetings and/or through emails and must be without any objections before putting into effect. The resolution for the complaint should be completed within 3 months after receiving the complaint. The Scheme Owner (HKEIA) should provide the means (e.g. web link) publicly available for receiving the complaint/advice related to the Scheme. Investigation and decision on complaints shall not result in any discriminatory actions.

6. Summarized resolutions or useful background information related to accreditation of CBs should be provided to HKAS for reference. Any reply (if received) from HKAS will also be forwarded to the committee members for review and meetings will be held if required.

7. When there is any update to the test standards, the committee members (mainly the Certification Bodies and the Manufacturers) should inform all the committee members and advise if any update to the Scheme is required. Changes to the scheme that affect the output of the scheme, should be validated.

Annex D: The mandated versions of the referred test standards and documents

The following referred documents are indispensable for the application of this document. For dated references, only the edition cited applies.

Notes: For undated references, the latest edition of the referenced document (including any amendments) applies.
The Scheme Owner's (HKEIA) web site should be referenced for any updated standard versions and/or newly added standards. The versions listed in the Scheme Owner's web site supersede the standard versions listed in this Annex.
The standards listed in the Scheme Owner's web site will be reviewed during the Scheme's committee meeting and, if applicable, incorporated into this Scheme document.

1. ISO/IEC 17000: 2020, Conformity assessment – Vocabulary and general principles
2. ISO/IEC Guide 2: 2004, Standardization and related activities – General vocabulary
3. ISO/IEC 17065: 2012, Conformity assessment – Requirements for bodies certifying products, processes and services
4. ISO/IEC TR 17026: 2015, Conformity assessment – Example of a certification scheme for tangible products.
5. ISO/IEC 17067: 2013, Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes
6. ISO/IEC 17025: 2017, General Requirements for the competence of testing and calibration laboratories
7. ISO 9001: 2015, Quality management systems – requirements
8. ANSI/ASQC Z1.4: 2013, Sample Procedure and tables for Inspection by Attributes, OR MIL-STD-105E: 1989 – Sampling Procedures & Tables for Inspection by Attributes, OR
9. GB/T 2828.1-2003 / ISO 2859-1:1999, Sampling procedures for inspection by attributes – Part 1 : Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
10. IEC 60598-1: 2024, Luminaries – Part 1: General requirements and tests
11. IEC 60598-1: 2020, Luminaries – Part 1: General requirements and tests
    *(Remark: The transition period migrating to using IEC 60598-1: 2024 will end on **15 May 2026**)*
12. IEC 60598-1: 2014, Luminaries – Part 1: General requirements and tests
    *(Remark: The transition period migrating to using IEC 60598-1: 2024 will end on **15 May 2026**)*

13. IEC 60598-2-1: 2020, Luminaires – Part 2: Particular requirements. Section One: Fixed

14. IEC 60598-2-1: 1979 + A1 : 1987, Luminaires – Part 2: Particular requirements. Section One: Fixed general purpose luminarie
    *(Remark: The transition period migrating to using IEC 60598-2-1: 2020 will end on **15 May 2026**)*

15. IEC 60598-2-2:2023, Luminaires - Particular requirements - Recessed luminaires

16. IEC 60598-2-2:2011, Luminaires - Particular requirements - Recessed luminaires
    *(Remark: The transition period migrating to using IEC 60598-2-2: 2023 will end on **15 May 2026**)*

17. IEC 60598-2-3:2002+AMD1:2011, Luminaires - Particular requirements - Luminaires for road and road lighting)

18. IEC 60598-2-5-2015, Luminaires - Particular requirements – Floodlights

19. IEC 62471: 2006, Photobiological safety of lamps and lamp systems

20. ANSI/UL 1598:2018, Standard for Safety of Luminaires

21. ANSI/UL 1598:2008, Standard for Safety of Luminaires
    *(Remark: The transition period migrating to using ANSI/UL 1598:2008 will end on **15 May 2026**)*

22. CISPR 15:2018, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

23. CISPR 15:2013+IS1:2013+IS2:2013, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
    (Remark: The transition period migrating to using CISPR 15:2018 *will end on **15 May 2026**)*

24. EN IEC 55015:2019, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

25. EN 55015:2013, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
    *(Remark: The transition period migrating to using EN IEC 55015:2019 will end on **15 May 2026**)*

26. IEC 61000-3-2: 2018, Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16A per phase)

27. EN IEC 61000-3-2: 2010/A1:2021, Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16A per phase)

28. IEC 61000-3-3: 2013+AMD1:2017+AMD2:2021, Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current greater than equal to 16A per phase and not subject to conditional connection

29. EN 61000-3-3: 2013/A1: 2019, Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply

systems, for equipment with rated current greater than equal to 16A per phase and not subject to conditional connection

30. IEC 61547: 2020, Equipment for general lighting purposes – EMC immunity requirements

31. EN IEC 61547: 2023, Equipment for general lighting purposes – EMC immunity requirements

32. IES LM-79: 2019, Electrical and Photometric Measurements of Solid-State Lighting Products

33. IES LM-79: 2008, Electrical and Photometric Measurements of Solid-State Lighting Products
    *(Remark: The transition period migrating to using IES LM-79: 2019 will end on **15 May 2026**)*

34. LED LM-80: 2021, Measuring Lumen Maintenance of LED Light Sources

35. LED LM-80: 2018, Measuring Lumen Maintenance of LED Light Sources
    *(Remark: The transition period migrating to using IES LM-80: 2021 will end on **15 May 2026**)*

36. LED LM-80: 2015, Measuring Lumen Maintenance of LED Light Sources
    *(Remark: The transition period migrating to using IES LM-80: 2021 will end on **15 May 2026**)*

37. IES TM-21: 2021, Projecting Long Term Lumen Maintenance of LED Light Sources

38. IES TM-21: 2019, Projecting Long Term Lumen Maintenance of LED Light Sources
    *(Remark: The transition period migrating to using IES TM-21: 2021 will end on **15 May 2026**)*

39. IES TM-21: 2011, Projecting Long Term Lumen Maintenance of LED Light Sources
    *(Remark: The transition period migrating to using IES TM-21: 2021 will end on **15 May 2026**)*

40. ANSI/NEMA/ANSLG C78.377-2017, Specifications for the Chromaticity of Solid State Lighting Products

41. ANSI/NEMA/ANSLG C78.377-2015, Specifications for the Chromaticity of Solid State Lighting Products
    *(Remark: The transition period migrating to using ANSI/NEMA/ANSLG C78.377-2017 will end on **15 May 2026**)*

42. CIE 15:2018, Colorimetry

43. CIE 15:2004, Colorimetry
    *(Remark: The transition period migrating to using CIE-15:2018 will end on **15 May 2026**)*

Annex E (Informative): Revision History

11th February 2014 (Issue II)

- Amended the definition of Audit Testing in clause 3.3.
- Amended the description of Initial type test in clause 4.2.1 item 2.
- Amended the description of Surveillance by testing in clause 8.2.1 item 1.
- Amended the evaluation method of performance requirement as IES TM-21 in Table A.1.
- Specified the descriptions of the Thermal Test.
- Specified the Total Harmonic Distortion requirement in Table A.2.1 as note 5.d.3.
- Deleted the Total Harmonic Distortion requirement in Table A.2.2 and Table A.2.3.
- Erased the requirements of test house and that of reports for Initial Type Tests in Annex A.3.1.1.
- Amended the evaluation method of conformity for Plant Production Control in Annex A.3.1.2.
- Added standards ANSI/ASQC Z1.4:2013, GB/T 2828.1-2003/ISO 2859-1:1999 as referenced documents in Annex B.

15th July 2014 (Issue III)

- Specified, in the introduction & Terms and Definition 3.14, the scope of the LED Lighting Products in the Scheme
- Specified, in the introduction, the implication of “performance” with a “Note”
- Added ISO/IEC 17067 in the introduction section 1.2 and as reference standard in Annex C
- Added an abbreviation, RMS as Root Mean Square.
- Corrected “equipments” by “equipment” in the document.
- Amended the Terms and Definitions 3.4, 3.11 and 3.12 to exclude LED luminaire from the Scheme.
- Added the Terms and Definitions for Rated Lumen Maintenance Life (Lp), Case Temperature (Ts) and LED Temperature Measurement Point (TMP_{LED}).
- Amended the Terms and Definitions 3.22 to state the Scheme will be at least annually reviewed and continuously maintained to ensure its operation to the highest standards.
- Amended the item 4 of conclusion from “Certification shall be withdrawn…” to Certification shall be suspended…” in section 8.3.2.
- Amended the testing services listed in Table A.3.1.3 from “accredited” to “comply with” ISO/IEC 17025 in section 17.1
- Added section 17.3 to specify the directory a Certification Body shall maintain.

- Added section 17.4 to 17.6 to specify the requirements of the Certification information notification to HKEIA for the public directory on the HKEIA's website.
- Erased Note 3 & 5 and the requirement of Thermal Test and IES TM-21 in Table A.1.
- Added Annex B.1 requirement as Performance requirements in Table A.1.
- Erased the Note 4(b) and Note 4(a) in the table A.2.1 and table A.2.3 respectively for the requirement of "Verification of circuit design and configuration of the LEDs"
- Amended the "Safety" requirement, Note 2(c), 4(c)&(d) in Table A.2.1.
- Amended the "Safety" requirement & Note 4(a) and erased 2(c) in Table A.2.2.
- Amended the "Safety" requirement and Note 2(b) in Table A.2.3.
- Amended the "Safety" & "Performance" requirements with Note 1 in Table A.3.1.3 for Surveillance Assessment.
- Added Annex B for the Supplementary Requirements as Annex B.1: LED in situ TMP_{LED} temperature measurement and requirement and Annex B.2: Dimming requirements: All luminaires marketed as dimmable.
- Added ANSI/NEMA/ANSLG C78.377-2008, CIE 15:2004 and ANSI/UL 1598:2008 in the reference list.

1st November, 2017 (Issue IV)

- Spelling and grammatical errors corrections.
- Added the definition for Road Light
- Added the effective and of this Issue and the latest withdrawn date of the previous issue.
- Remove the year specifications of the test standard ANSI/NEMA/ANSLG C78.377 in Table A.2.1, A.2.2 and A.2.3.
- Added Table A.2.4 for the Specific Requirements for LED Road Light.
- In Annex C, update the test standards' version. Also added the test standards version for IEC 60598-2-2, IEC 60598-2-3 and IEC 60598-2-5.
- Clause 3.3, Audit Testing: Delete the wordings "purchaser's specifications and".
- Clause 3.16, LED Road Light: Delete the wordings "other public outdoor lighting applications".
- Clause 4.2.1 (2): Delete the word "random".
- Clause 4.3, Certification: Added clause 4.3.3 for the product schedule.
- Clause 8.2.1 (1): Added the wording "Table 3.1.3" to avoid confusion.
- Table A.2.1, EMC: Add the corresponding EN version of the IEC test standards.
- Table A.2.4, Note 2 (b): Change the "SDCM and 7-step MacAdam ellipses" wordings to "7-step chromaticity quadrangles" for matching the ANSI C78.377 wordings and align with the wordings in Tables A.2.1, A.2.2 and A.2.3.

- Clause A.3.1.1: Change “One representative sample” to “At least one representative sample” and delete the wording “each”.

- Clause A.3.1.2 (Plant Production Control): Add the requirement of “ID date of manufacturing” so that each batch of production can be tracked.

- Clause A.3.1.2.1: Added the requirement for IQC checking record for LED module and light diffusion.

- Clause A.3.1.2.1: Add the requirement for incoming components’ storage and handling.

- Clause A.3.1.2.2 (ii): Correct the “5 SDCM” to “7-step chromaticity quadrangles”.

- Clause A.3.1.2.2 (iii): Change “LED source” to “LED module”.

- Table A.3.1.3: For “Photometric performance” Assessment item, the wordings for the number of samples is change to “Normally 3, but not less than 1”. This is due to the fact that there can be no production run between factory assessments.

- Annex B: Updated the wordings in accordance to the updated Energy Star for Luminaires ver. 2.0.

- Annex C: Updated the test standards’ versions.

28th May, 2019 (Issue IV Rev. 1)

- Spelling, punctuation and grammatical errors corrections.
  Removed the “:” in clause 3.25.
  Changed the wordings from “may be suspended and terminated or the grant….” to “may be suspended, terminated or the grant ….” In clause 13.2.
  Removed the extra blank line after Note 4 (a) (ii) of Table A.2.1.
  Removed the comma in Note 4 (b) of Table A.2.2 and Note 4(c) of Table A.2.4
  Removed the extra space and index number in Note 3 and Note 4 of Table A.2.3.

- Annex C: Combine items 28 and 29: It is acceptable to use either the IES LM-80-08 or the IES LM-08-15 report for the LED lumen maintenance test.

- Annex C: item 21: ANSI/NEMA/ANSLG C78.377-2011: Change the transition period ending date to 15 September, 2020. The item number should be 30, not 21.

- Annex C: Correct the last 2 items’ index number. It should be 31 and 32, not 22 and 23.

06th March, 2025 (Issue V)

- Forward and Clause 4.: ISO/IEC Guide 28 is already withdrawn and is replaced by ISO/IEC TR 17026.

- Clause 17.6: Added the requirements of keeping the list for those terminated/suspended models.

- Clause 4.2.2 - On completion of the plant control assessment: Added the process for selecting 1 sample for photometric and electrical parameters measurement. Also specify the handling procedure if there is not production of model during the initial factory audit.

- Clause 4.2.3 (4) – Added the allowance of 9 to 12 months for reinstatement under special condition

- Clause 4.4.2 – Add more specific requirements for accepting similar products.

- Clause 8.2.1 (3) – Add handling approach when there is no production.

- Clause 9.1 – Updated the suspension period to 6 months. Added the allowance of 3 more months

under special conditions such as factory relocation.

- Table A.2.1 SPECIFIC REQUIREMENTS FOR BULKHEAD TYPE LED LIGHT FITTINGS – EVALUATION METHODS, Note 4 (b) i, (c) ii and (c) iii: Modify wordings to better describe the requirements.

- Table A.2.1, A.2.2 and A.2.3 – Add details on power factor requirement for stepwise and continuous dimming function.

- Table A.2.4 SPECIFIC REQUIREMENTS FOR LED ROAD LIGHT – EVALUATION METHODS, Note (4) items (c) ii and (c) iii: Correct the sentence numbering and added details on the dimmer setting required for power factor and THD-I measurement.

- A.3.1.2.1 Production Processes – Added “LED driver”.

- A.3.1.2.2 Production Processes – Inspection and quality control procedures, item (ii): Added the requirement of reducing the dielectric voltage withstand test level to those required for production. This is to avoid damage to the product or reducing the performance of the product.

- A.3.1.2.2 Production Processes – Inspection and quality control procedures, item (ii): Remove the requirement for photometric related measurement during production.

- A.3.1.2.3 Finished products - Quality inspection and tests: Add the production code checking requirement.

- A.3.1.2.3 Finished products - Quality inspection and tests: Add the test requirements details for selected finished product.

- A.3.1.2.1 Components - Incoming Quality Control (IQC): Added the component “lens (for Road Light)”.

- Annex C and D: Change to Annex D and E due to the addition of the new Annex C.

- New Annex C: Additional Activities of Scheme Owner (HKEIA) and Certification Bodies:
  New activities required for the Scheme Owner (HKEIA) and Certification Bodies:
  - Set up of committee;
  - Regular committee meeting;
  - Improvement suggestions;
  - Evaluation of the Scheme’ s update against the HKCAS-11 requirements;
  - How to handle complaint;
  - Should inform HKAS for any update of the Scheme and the committee’ s meeting minutes should also be emailed to HKAS; and
  - Updating of the test standards’ versions.

- Annex D: Updated the heading; add procedures on updating the referred standards; and update the standards’ versions. Transition period of 2 years is provided for updating to the new standard version.