



Application/ Requirements for LED Lighting Products Certification Scheme



Present by : Samson Leong

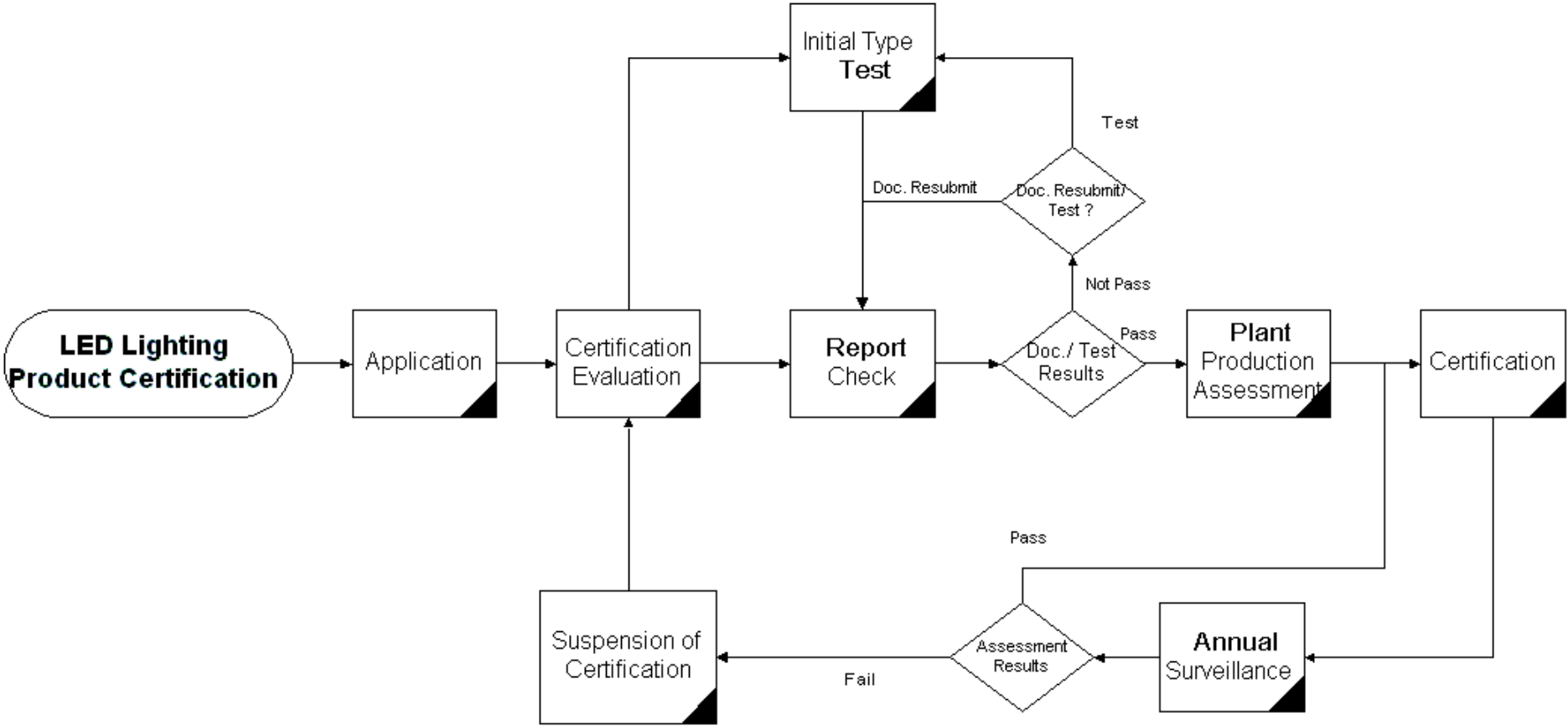
Regional Lighting Business Manager
Consumer & Commercial Electrical, Intertek Testing Services HK Ltd.

- **Flow of Application and Certification**
- **General Requirements for 3 LED products**
- **Specific Requirements for**
 - **Bulkhead Type LED Light Fittings**
 - **LED Downlight**
 - **LED Floodlight**
- **Evaluation Methods of Conformity**
 - **Initial Type Tests**
 - **Plant Production Control**
 - **Surveillance Assessment (*Further explain in next presentation*)**

Flow of Application and Certification



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Flow of Application and Certification



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Application:

- Application Form
- Quality Manual and document for assessment
- Nominate a person as representative and formal contact for this program
- Payment

Certification Evaluation:

- Initial Type Test, Report Check: (Annex A)
 - CBTL under IECEE, and/or,
 - HKAS/ MRA Partner accredited lab.
 - ISO/IEC 17025
- Plant Production Assessment
 - Components
 - Production Processes

e.g. Doc under ISO 9001 system, production equipment, production on-line testing equipment, etc.

 - Finished products

Manufacturer should be ISO 9001 certified by HKAS or MRA partner

Flow of Application and Certification



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Certification:

Certificate will be issued after completion of evaluations followed by certification agreement establishment.

Certificate will include following information:

- Included name and address of Certification Body, Supplier, Manufacturer;
- Product information: Name, Model No.,
- Conformed Requirements
- Cert. Information: Cert. No., Issues date, Authorized signature, etc.

Requirements

For

Bulkhead Type LED Light Fittings

LED Downlight

LED Floodlight

Three Major Areas

1. Safety Requirement

- IEC 60598-1 with particular requirements for specific product
- IEC 62471 – Photobiological Safety

2. EMC Requirement

- CISPR 15 / EN 55015
- IEC 61000-3-2, IEC 61000-3-3
- IEC 61547 Surge immunity

3. Performance Requirement

- IES LM-79
- IES LM-80, TM-21
- Thermal Test (*For LM80 Setup*)

Safety Requirements



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End Product Safety

60598-1

60598-2-1, 2, 5

Component Safety

61347-1

61347-2-13

62031

Performance

62471

62471-2

Photo-biological hazard/safety

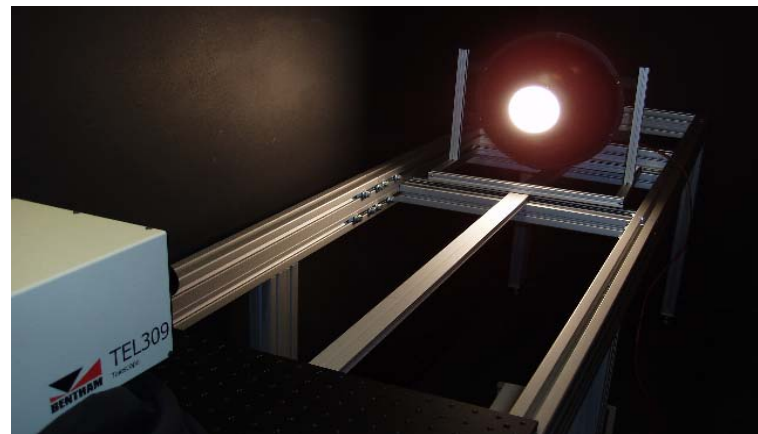
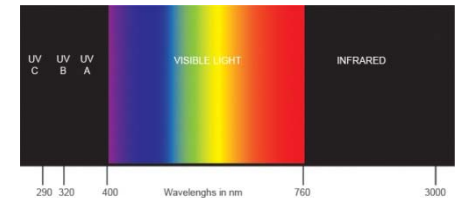


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Photo-biological safety

The Spectroradiometer system were introduced, which can measure a light source with spectral range **200-1700nm. (From UVC to IRB)**, and can be further expanded to **3000nm**.

With the Spectroradiometer system (**Double Monochromator**), we can perform the LED photo-biological safety testing (i.e. **EN 62471**) and Ultra-Violet radiation measurement according to different requirement (e.g. ErPs directvie)



Performance Requirements

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IESNA LM 79: Approved Method: Electrical and Photometric Measurements of Solid State Lighting

- Minimum Luminous Efficacy
- Minimum Light Output
- Power Factor
- CCT
- CRI
- Duv Tolerance (Color)
- Chromaticity coordinates
- Luminous Intensity Distribution
- Min Center Beam Intensity
- Color Spatial Uniformity
- Electrical Measurements



Performance Requirements



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IES LM80: Approved Method: Measuring Lumen Maintenance of LED Light Sources

Focus on LED modules, arrays and devices :

Capable to test for LED component with rated power up to 150W !

1. At Least 6000 Hours Lumen Maintenance with data collection at a minimum of every 1000 hours
2. Electrical and Thermal Management (55°C, 85 °C, and temperature selected by Manufacturer)



Specific Requirements for Bulkhead Type LED Light Fittings



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Evaluation Category	Standards / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	IEC 60598-2-1 associated with IEC 60598-1	Yes ¹
Performance	IES LM-79 Photometric measurement	Yes ²
Supplementary requirements	See Note 4	Yes ³

Specific Requirements for Bulkhead Type LED Light Fittings



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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) Chromaticity of LEDs: variation within 0.007 on the CIE1976 (u', v') diagram.

Supplementary Requirements :

(a) Light diffuser test:

- i) Impact test: 6.5Nm, at 25degC, without visible damage; and
- ii) Glow wire test: 850degC.

(b) Verification of circuit design and configuration of the LEDs:

- i) Single LED fails open or short circuit, a minimum of 80% of the remaining LEDs shall maintain operation, and

For unit less than 5 LEDs, others LEDs are required to be lighted.

- ii) Assess circuit/connection diagram as per above requirement

(c) Determine lumen, efficiency, PF and harmonic distortion for product with integrated/ separate dimmer v.s. the quoted values at each dimming setting.

(d) The light fittings comply with the following performance requirements:

- i) Luminance efficacy: Minimum 70lumen/watt at 100% full lumen output;
- ii) Overall operating power factor of the luminaries ≥ 0.85 ;
- iii) Total Harmonic Distortion (THD): Maximum 15%.

Specific Requirements for LED Downlight



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Evaluation Category	Performance Standard / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	<ul style="list-style-type: none"> - IEC 60598-2-1 associated with IEC 60598-1 for surface mounted application - IEC 60598-2-2 associated with IEC 60598-1 for recessed mounted application 	Yes ¹
Performance	IES LM-79 Photometric measurement	Yes ²
Supplementary requirements	See Note 4	Yes ³

Specific Requirements for LED Downlight



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Performance shall be complied with:

- (a) Color rendering index (CRI): not less than 80;
- (b) Correlated color temperature (CCT): 2,700K, 3,000K, 3,500K, 4,000K or 5,000K [7-step chromaticity quadrangles];
- (c) Chromaticity of LEDs: variation within 0.007 on the CIE1976 (u' , v') diagram;
- (d) Min. 345 lu for aperture ≤ 4.5 inches or 575 lu for aperture > 4.5 inches. (Min 75% of total lumens in 0-60deg zone).

Supplementary Requirements :

- (a) Determine lumen, efficiency, PF and harmonic distortion for product with integrated/ separate dimmer v.s. the quoted values at each dimming setting.
- (b) The light fittings comply with the following performance requirements:
 - i) Luminance efficacy: Minimum 60 lumen/watt at 100% full lumen output;
 - ii) Power Factor ≥ 0.85 ;
 - iii) Total Harmonic Distortion (THD): Maximum 15%.

Specific Requirements for LED Floodlight



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Evaluation Category	Performance Standard / requirements	Initial Assessment
		Type Test/ Evaluation
Safety	IEC 60598-2-5 associated with IEC 60598-1	Yes ¹
Performance	IES LM-79 Photometric	Yes ²
Supplementary requirements	See Note 4	Yes ³

Specific Requirements for LED Floodlight



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Performance shall be complied with:

- (a) Color rendering index (CRI): not less than 75;
- (c) Chromaticity of LEDs: variation within 0.007 on the CIE1976 (u', v') diagram.

Supplementary Requirements :

(a) Verification of circuit design and configuration of the LEDs:

- i) Single LED fails open or short circuit, a minimum of 80% of the remaining LEDs shall maintain operation, and

For unit less than 5 LEDs, others LEDs are required to be lighted.

- ii) Assess circuit/connection diagram as per above requirement

(b) The light fittings comply with the following performance requirements:

- i) Luminance efficacy: Minimum 70 lumen/watt at 100% full lumen output;
- ii) Power Factor ≥ 0.85 ;
- iii) Total Harmonic Distortion (THD): Maximum 15%.

Local Support



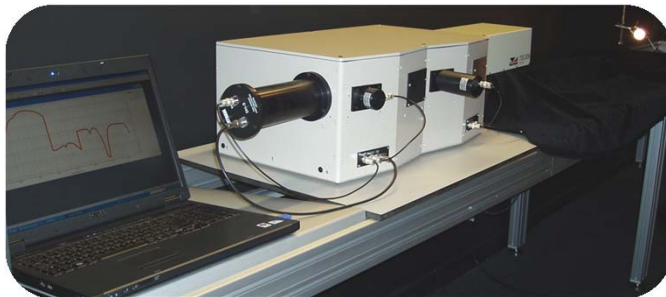
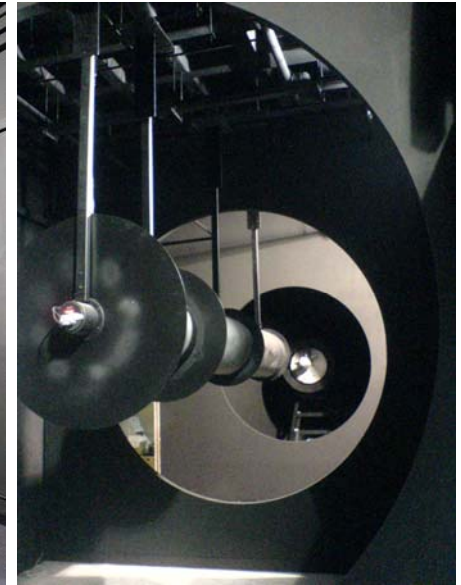
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Qualified LED lighting products:

- Testing;
- Certification;
- Surveillance

This requires

- Certification Bodies
- Accredited Laboratories
- Long history with excelled experiences



Contact



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