theLIA

SPECIFICATION & TENDER GUIDANCE

Introduction

An invitation to tender provides prospective suppliers with tender documentation setting out the information they need to prepare their offer. Tender documentation will typically include performance requirements, compliance requirements, and other requirements specific to the project.

When suppliers submit their tender, they will be expected to provide documented evidence to support their clams of compliance to the tender requirements.

It is of the upmost importance that submitted tenders are comprehensive, accurate and not embellished.

The tendering process is designed to be fair and transparent. When projects are publicly funded, or there are large sums at stake, organisations need to get the best value-for-money for taxpayers or stakeholders and demonstrate they have not awarded contracts unfairly.

Purpose

This document is intended to provide guidance on the different types, and levels, of documentation specifiers should request for lighting and lighting related products, and how to read and interpret them for acceptance for tenders.

This LIA tender guidance document is intended to provide sufficient information to be able to review tender documentation with confidence. Should more help or guidance be required, the LIA and LIA Laboratory are here to help, you can contact us at https://www.thelia.org.uk/general/?type=CONTACT.

Contents

1 Definitions

CE Mark – A mark placed on a product prior to placing it on the EU market once the product complies with the requirements of applicable Directives and associated Regulations.

UKCA – A Mark placed on a product prior to placing it on the UK market once the product complies with the requirements of applicable Regulations.

Declaration of Conformity (DoC) – A document signed by a responsible person supporting their claims of conformity to CE/UKCA requirements before a product is placed on the UK or EU market.

Directive – A top level document with legal requirements.

Regulation – A top level document with legal requirements.

EMCD – Electro-Magnetic Compatibility Directive, top level EU Directive for compliance of EMC.

GPSD – General Product Safety Directive, top level EU Directive for safety compliance of general products.

LVD – Low Voltage Directive, top level EU Directive for safety compliance for products with an operating voltage of 50-1000V.

ERPD – A top level EU Directive establishing a framework for the setting of eco-design requirements for energy-related products.

REACH - Registration, Evaluation, Authorization and Restriction of Chemicals, top level regulation for controlling hazardous chemicals within a product.

RED – Radio Equipment Directive, top level EU Directive used for compliance of products which use radio waves to control them.

EE(S)R – Electrical Equipment (Safety) Regulations, a top-level regulation for compliance of safety for products which fall under UKCA, UK SI 2016 No. 1101.

EMCR – Electro Magnetic Compatibility Regulations, a top-level regulation for compliance of EMC for products which fall under UKCA, UK SI 2016 No. 1091.

EcoDesign– ENERGY CONSERVATION The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021, a top-level UK regulation for energy performance requirements for products which fall under UKCA, UK SI 2021 No. 1095.

RoHSD – Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations, a top-level regulation for compliance to hazardous chemicals for products which fall under UKCA, UK SI 2012 No. 3032

WEEE - Waste Electrical and Electronic Equipment recycling Regulation, a UK and EU Regulation for the safe removal and disposal of wate electrical products.

Report – A document which identifies a test specification and a pass/fail criteria.

Certification – A product certified by an ISO/IEC 17065 accredited body. Documents called certificates that are not issued by a ISO/IEC 17065 accredited body are not classed as true certificates, only certification bodies can issue product certification certificates.

Issuing Body – The certification body or laboratory that has issued the report or certificate.

3rd Party – An Independent and impartial body.

Accredited – A recognition awarded by a national level accreditation body such as UKAS (United Kingdom Accreditation Service) to perform assessments to set standards identified through a report or certificate

2 Why review documents?

Without reviewing a product's supporting documents there is no way to verify product claims are correct. Unfortunately, many manufacturers make claims about their products which have never been verified. Reviewing supporting documents and not just product specification/data sheets is the only way to ensure claims made are correct and that the product being purchased meets the required specification.

3 Minimum legal requirements

To place most lighting products on the UK/EU market the minimum legal requirements are that there is a signed Declaration of Conformity (DoC) and a Risk Assessment, along with supporting evidence for the DoC. Typically, there are no legal requirements for 3rd party testing to be performed or for manufacturers to verify their performance claims through a 3rd party. For certain products such as ATEX products placed into potentially explosive areas, there are specific legal requirements to have these assessed by a 3rd party.

As such many manufacturers/distributors have legally placed products on the market without potentially verifying the product claims. It is the specifier/purchaser's responsibility to review all available documentation to ensure the products they select meet their requirements.

4 What Directives/Regulations are applicable?

The Directives and Regulations that are applicable for luminaires varies depending on the specification and intended use of the luminaire or lighting product. Typically, the below will be applicable:

LVD – The European Low Voltage Directive covers the safety requirements for luminaires with a voltage above 50V. This ensures safety and protection from electric shock and excessive temperature. UKCA equivalent Regulation: UK SI 2016 No. 1101, The Electrical Equipment (Safety) Regulations 2016.

GPSD – The European General Product Safety Directive covers the safety requirements for products which do not fall under the LVD scope. UKCA equivalent Regulation: UK SI 2016 No. 1101, The Electrical Equipment (Safety) Regulations 2016.

EMCD – The European Electro Magnetic Compatibility Directive covers the electro-magnetic compatibility of the luminaire or lighting product. This is to ensure the product does not produce electro-magnetic output which could interfere with the wireless systems in a building or other electrical products. UKCA equivalent Regulation: UK SI 2016 No. 1091, Electro Magnetic Compatibility Regulations.

ERPD – The European Energy Related Product Directive covers the energy usage of the product to ensure it is efficient and has a suitable working life. UKCA equivalent Regulation: UK SI 2021 No. 1095, ENERGY CONSERVATION The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021.

RoHSD – The European Restriction of Hazardous Substances Directive is to ensure that the product is not made of substances which could be hazardous to health or the environment. UKCA equivalent Regulation: UK SI 2012 No. 3032, Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.

REACH – The European Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation is to ensure the parts of a lighting product or luminaire comply with chemical regulations, particularly those known as Substances of Very High Concern (SVHC). UKCA equivalent Regulation: UK SI 2008 No. 2852, The REACH Enforcement Regulations 2008.

RED – The European Radio Equipment Directive covers the requirements of products which use radio waves to control them. UKCA equivalent Regulation: UK SI 2017 No. 1206, The Radio Equipment Regulations 2017.

For a full list and description of UK/EU Directives relating to lighting refer to LIA Information Sheet IS01 here.

5 Types of Safety Claims

Manufacturers/distributors may make claims of compliance in different ways. Understanding what those claims mean is essential to ensuring that a suitable product is selected during tender.

UKCA/CE Compliant: The manufacturer/distributor claims their product meets all the requirements of the relevant Directives/Regulations required to place the product on the UK/EU market.

Note: Not all legal requirements fall under CE/UKCA. Other regulations such as WEEE and REACH fall outside of UKCA and CE.

LVD Compliant: The manufacturer/distributor claims their product meets the requirements of the LVD (or other directives) specifically.

Harmonised standard compliant: The manufacturer/distributor claims their product meets the requirements of a specific harmonised standard, for example ‘BS EN 60598 compliant’. See Section 10 of this document for a non-exhaustive list of luminaire safety standards.

5.1 What to request

- Declaration of Conformity – See Annex A and B for EU and GB example DoCs.
- Safety assessment reports/ certificates – See document IS-8 for guidance on how to read reports and certificates.
- Compliance risk assessment.

6 Types of Performance Claims

CE/UKCA Compliant: The manufacturer/distributor claims their product meets all the requirements of the relevant Directives/Regulations required to place the product on the UK/EU market.

ERPD Compliant: The manufacturer/distributor claims their product meets the requirements of the ERPD (or other directives) specifically.

Harmonised standard compliant: The manufacturer/distributor claims their product meets the requirements of a specific harmonised standard, for example 'BS EN 62722'. See Section 11 of this document for a non-exhaustive list of luminaire performance standards.

6.1 What to request

- Declaration of Conformity
- Product information Sheet (this is a legal requirement under ERPD/ UK SI 2021 No. 1095 and should be on a publicly available webpage), it holds detailed performance information regarding lightsources and the lightsource(s) within a product. An example of what is required is shown in Annex E.
- Performance test reports/ test certificates – Performance reports should contain evidence of the performance claims in the product information sheet. Performance reports will, where required show:
  - The total amount of light being emitted from the product.
  - The quality of the emitted light (how well you can perceive colours under the light).
  - The angular distribution of light (where the light goes) and the quantity in each direction.
  - The colour of the light.
  - Energy efficacy of the product.
  - Expected lifetime of the product.

An example photometric performance report is shown in Annex C.

An example product lifetime calculation report is shown in Annex D.

It is recommended to request a specification/data sheet as well as the documents supporting the claims, this will allow you to compare what is being claimed against any evidence provided.

For example, where a luminaire specifies a certain lumens per Watt (lm/W), it is recommended to review the supporting documents to confirm the lm/W claim has been verified. It should also be noted that the LED module lm/W is not the same as the luminaire lm/W and care should be taken to ensure the luminaire and not just the LED module has been assessed.

Care should also be taken when validating performance data as there is a difference between performance testing of an LED module or light source within a containing product, and actual performance testing of the finished luminaire.

When conducting an evaluation of technical data care should be taken to assess how the approximate lifetime of luminaire was calculated or measured (e.g., 50000 hours). Lifetime can be calculated using a TM-21 conversion from LED chip LM80 data and these calculations should be reviewed for validity. The best evidence is any data from endurance/life testing. Many Laboratories offer this testing along with performance validation services.

7 Other EU Directives and UK Regulations

EMC, RoHS, and RED evidence should be demonstrated where applicable.

7.1 What to request

- Declaration of Conformity.
- EMC assessment test report/certificate.
- RoHS assessment test report for the finished product, or RoHS compliance certificates for all constituent components, or outsource supplier/sub-manufacturer declaration of RoHS conformity (if this option is used it is recommended that the outsource supplier is audited to confirm compliance) – See document IS-8 for guidance on how to read reports and certificates.
- RED assessment test report/certificate.
- Suppliers that are placing product on the market must be Waste Electrical and Electronic Equipment (WEEE) registered. This can be validated here: https://www.gov.uk/government/publications/waste-electrical-and-electronic-equipment-weee-public-registers.

Manufacturers/distributors are required to hold a “Technical File” for each product they place onto the EU and/or UK market. This technical file must contain all the supporting evidence that the manufacturer/distributor has used to make their legally required Declaration of Conformity and Risk Assessment. As such manufacturer/distributors should hold and be able to issue the supporting documentation to prove their compliance to the relevant requirements.

Note: There is a legal requirement to hold technical file documentation but there is no legal requirement to provide it to a customer.

8 Types of documents

There are several types of documents that can be used as supporting technical evidence.

8.1 Information Sheet:

An information sheet is a document made by the manufacturer or distributor which outlines the product specification.

Pros	Cons
- All information consolidated into one place	- Not separately approved - No 3rd party verification - No test specification - No on-going review of the products

8.2 In-house Test Report:

A report performed by the manufacturer or distributor which outlines assessments performed including the test specification they were performed to.

Pros	Cons
- Includes test specification	- Not independently assessed - No 3rd party verification - No on-going review of the products

8.3 3rd Party Test Report:

A report produced by an independent 3rd party which outlines assessments performed including the test specification. This report will not have been done by an independently accredited test house.

Pros	Cons
- Testing performed by an independent body - Includes test specification	- Report not from accredited test house - No on-going review of the products

8.4 3rd Party Accredited Test Report:

A 3rd party report performed by an accredited test house. The body writing the report will have been externally accredited to issue reports to the standards identified in the report. This report will have an accreditation mark, such as the UKAS badge.

Pros	Cons
- Testing performed by an accredited test house - Confidence results are accurate and independent	- No on-going review of the products

8.5 Certification:

A certificate of the products assessed by an accredited certification body. The certificate, product and or product packaging will be marked with a certification logo.

Pros	Cons
- Highest level of approval - Regular reviews of product to ensure continued compliance	

9 Types of documents

9.1 What to check for

When reviewing documents, it is important to check the manufacturer's claims and verify the claims have been validated. Claims made in a specification sheet may not have been validated by a 3rd party and purchasers may not be buying a product that performs in the way the specification sheet claims.

Safety Claims: Where the lighting product documentation makes claims of compliance to relevant safety directives/regulations, such as the LVD, UK SI 2016 No. 1101 or the GPSD, there should be supporting evidence.

This evidence may come in multiple forms such as reports, 3rd party reports and certification.

Performance Claims: Where the lighting product documentation makes claims of compliance to relevant performance directives/regulations, such as the Ecodesign requirements, UK SI 2019 No. 539 or they state certain performance characteristics such as a specific lumens per Watt and expected lifetime, there should be supporting evidence.

This evidence may come in multiple forms such as reports, 3rd party reports and certification.

Model Numbers: The model number of a product should match the model number on a test report or certificate. It's possible the model number on a product or in a specification sheet may differ from the report or certificate but there should be some justification from the manufacturer for the difference.

Product Images: Good quality reports will include photos of the product(s) assessed and the components which make up the product. Comparing the product submitted for tender and the photos in the supporting report can give confidence that the submitted product is the same as the tested product.

Issuing Body: All reports or certificates must state who issued the report and who the testing laboratory was. It is important to review that the issuing body is a reputable and approved test house.

Countries Assessed: What countries (or national differences) were assessed. Many countries have specific requirements that are not outlined in the IEC (International) standards. As such national differences shall be assessed for the country that the product is to be sold in.

10 How to review a report/ certificate

When reviewing a product for acceptance, it is important to assess the product submitted against the supporting reports to ensure that the product submitted it the same as the product tested. Care should also be taken to review the standards the product was assessed to and who performed the assessment. Guidance on reading reports and certificates can be found in document IS-8.

Products assessed: Does the report state the model numbers/description of the products assessed and do they match the spec sheet? Are there photos within the report showing the products and do they match the specification sheet?

It is important to review the supporting reports to ensure they are for the same product that has been submitted.

Standards assessed: What harmonised standard was the product assessed to and is it the correct standard for the product? All reports or certificates should outline what standards the product was assessed to and have a statement of compliance or list of test results.

Many products fall directly under a specific harmonised standard, however it's possible some product types do not and a limited assessment to multiple standards should be made.

Where a luminaire is assessed against IEC/EN 60598-1 there should also be a Part 2 test (e.g., IEC/EN 60598-2-1). This part 2 of the standard is what outlines the specific requirements for a product type, such as street lighting or portable lighting.

Assessment body: Who has performed the assessment (BSI, TUV, LIA Laboratory etc.) and are they accredited to perform the test? Accreditation schedules are normally publicly available through the accreditation body website or can be directly requested from the assessment body. If the assessment body is accredited and has performed an accredited assessment, then the report/certificate will have an accreditation logo, such as the UKAS badge.

Accreditation is performed by a national accreditation body; in the UK this is UKAS, and their list of accredited UK bodies can be found here: https://www.ukas.com/find-an-organisation.

Date of assessment: When was the assessment made? Is the reports/certificate still valid?

Over time standards and acceptance documents get updated and change. As such the specific standard listed on the report should identify the issue date and any amendments made to the standard e.g., IEC/EN 60598-1:2015+A1:2018 shows the standard was issued in 2015 and amended in 2018.

The current versions of the IEC standard can be found here: https://webstore.iec.ch/

The current versions of the BS EN standard can be found here: https://shop.bsigroup.com/

Standards are defined as "current", "superseded" or "withdrawn". When a standard is current it is the latest version, when a standard is superseded, the standard is still valid but it not the latest version, when a standard is withdrawn it is no longer a valid harmonised standard.

11 Applicable Safety Standards for Luminaires

This list below is not exhaustive, and specifications may change. This list is intended to be used as a guide only. A more comprehensive list can be found in LIA IS11 here, and LIA IS15 here.

Standard	Title	Product Description
IEC/EN 60598-1	Luminaires -- General Requirements and Tests	General Luminaires
IEC/EN 60598-2-1	Luminaires -- Particular requirements -- Fixed general purpose luminaires	Luminaires fixed to a wall or ceiling but not entering into the void
IEC/EN 60598-2-2	Luminaires -- Particular requirements -- Recessed luminaires	Luminaires fixed to a wall or ceiling and entering into the void
IEC/EN 60598-2-3	Luminaires -- Particular requirements -- Luminaires for road and street lighting	Luminaires for installation on roads/streets or on posts in public areas
IEC/EN 60598-2-4	Luminaires -- Part 2: Particular requirements - Section 4: Portable general purpose luminaires	Portable luminaires fitted with a plug and intended to be moved during lifetime
IEC/EN 60598-2-5	Luminaires -- Particular requirements -- Floodlights	Flood lights to be mounted to a wall or pole
IEC/EN 60589-2-7	Luminaires -- Particular requirements -- Portable luminaires for garden use	Luminaires intended to be installed in the garden and to be moved once installed
IEC/EN 60598-2-10	Luminaires -- Particular requirements -- Portable luminaires for children	Luminaires intended for use by/to appeal to children
IEC/EN 60598-2-13	Luminaires -- Particular requirements -- Ground recessed luminaires	Luminaires intended to be installed recessed into the ground
IEC/EN 60598-2-20	Luminaires -- Particular requirements -- Lighting chains	Luminaires linked together by a permanent chain
IEC/EN 60598-2-22	Luminaires. Particular requirements -- Luminaires for emergency lighting	Emergency lighting luminaires

12 Applicable Performance Standards for Luminaires

This list below is not exhaustive, and specifications may change. This list is intended to be used as a guide only. A more comprehensive list can be found in LIA IS11 here, and LIA IS15 here.

Standard	Title
EN 60969	Self-ballasted lamps for general lighting services. Performance requirements
EN 13032-1	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Measurement and file format
EN 13032-4	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. LED lamps, modules and luminaires
CIE 84	The measurement of Luminous Flux
CIE 13.3	Method of Measuring and Specifying Colour Rendering Properties of Light Sources
IES LM 79	Approved Method: Optical and Electrical Measurements of Solid State Lighting Products
IES LM 80	Approved Method: Measuring Lumen Maintenance of LED Light Sources
IES TM 21	Projecting Long Term Lumen Maintenance of LED Light Sources
IEC 63013	LED Packages - Long-Term Luminous and Radiant Flux Maintenance Projection
EN 62717	LED modules for general lighting – Performance requirements
EN 62722	Luminaire performance. General requirements
EN 62612	Self-ballasted LED-lamps for general lighting services with supply voltages >50 V - Performance requirements

13 Need more advice?

The LIA has a number of resources available to help with tender and product acceptance including training at our lighting academy and product assessment at our National Certification Body and UKAS accredited test laboratory, as well as our extensive list of guidance documents and information sheets and consultation for UKCA and CE technical files.

For more information on how the LIA can assist you with tendering and specification advice please contact enquiries@thelia.org.uk.

Annex A - Example EU Declaration of Conformity

Note: this is an example – Directives and Standards will be specific to the product type

EU DECLARATION of CONFORMITY

PMS Lighting

69 The Avenue
Some Town
AB12 3CD, UK

Declares that under our sole responsibility the product

LED Luminaire model XYZ

is in conformity with the provisions of the following EU directives and regulations, including all amendments, and with national legislation implementing these directives:

LVD	Low Voltage Directive	**2014/35/EU**
EMC	Electro Magnetic Compatibility Directive	**2014/30/EU**
ERP	Energy Related Products Directive	**2009/125/EC**
RoHS	Restriction of Hazardous Substances	**2011/65/EU**

The following harmonised standards have been applied

LVD	
BS EN IEC 60598-1:2021	Luminaires. General requirements and tests
BS EN IEC 60598-2-1:2021	Luminaires. Particular requirements. Specification for fixed general purpose luminaires
BS EN 62493:2015	Assessment of Lighting Equipment Related to Human Exposure to Electromagnetic Fields
RoHS	
BS EN 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EMCD	
BS EN 61547:2009	Equipment for general lighting purposes. EMC immunity requirements
BS EN 55015:2013+A1:2015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
BS EN 61000-3-2:2014	Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions
BS EN 61000-3-3:2013	Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems
ERPD	
BS EN 62717:2017+A2:2019	LED modules for general lighting - Performance requirements

Authorised signatory:

Name: Paul Sargent
Position: Quality Director
Date: 09/11/2021
Place of issue: As above

CE

Annex B – Example GB Declaration of Conformity

Note: this is an example – Directives and Standards will be specific to the product type

DECLARATION of CONFORMITY

PMS Lighting

69 The Avenue
Some Town
AB12 3CD

Declares that under our sole responsibility the product

Wall mounted LED Luminaire

is in conformity with the provisions of the following statutory requirements, including all amendments, and with national legislation implementing these regulations:

UK SI 2016 No. 1101	The Electrical Equipment (Safety) Regulations 2016
UK SI 2016 No. 1091	Electro Magnetic Compatibility Regulations 2016
UK SI 2019 No. 1095	The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021
UK SI 2012 No. 3032	Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The following designated standards have been applied

EE(S) R	
BS EN IEC 60598-1:2015+A1:2018	Luminaires. General requirements and tests
BS EN IEC 60598-2-1:2021	Luminaires. Particular requirements. Specification for fixed general purpose luminaires
BS EN 62493:2015	Assessment of Lighting Equipment Related to Human Exposure to Electromagnetic Fields
RoHS R	
BS EN 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EMC R	
BS EN 61547:2009	Equipment for general lighting purposes. EMC immunity requirements
BS EN 55015:2013+A1:2015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
BS EN 61000-3-2:2014	Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions
BS EN 61000-3-3:2013	Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems
ERP R	
BS EN 62717:2017+A2:2019	LED modules for general lighting - Performance requirements

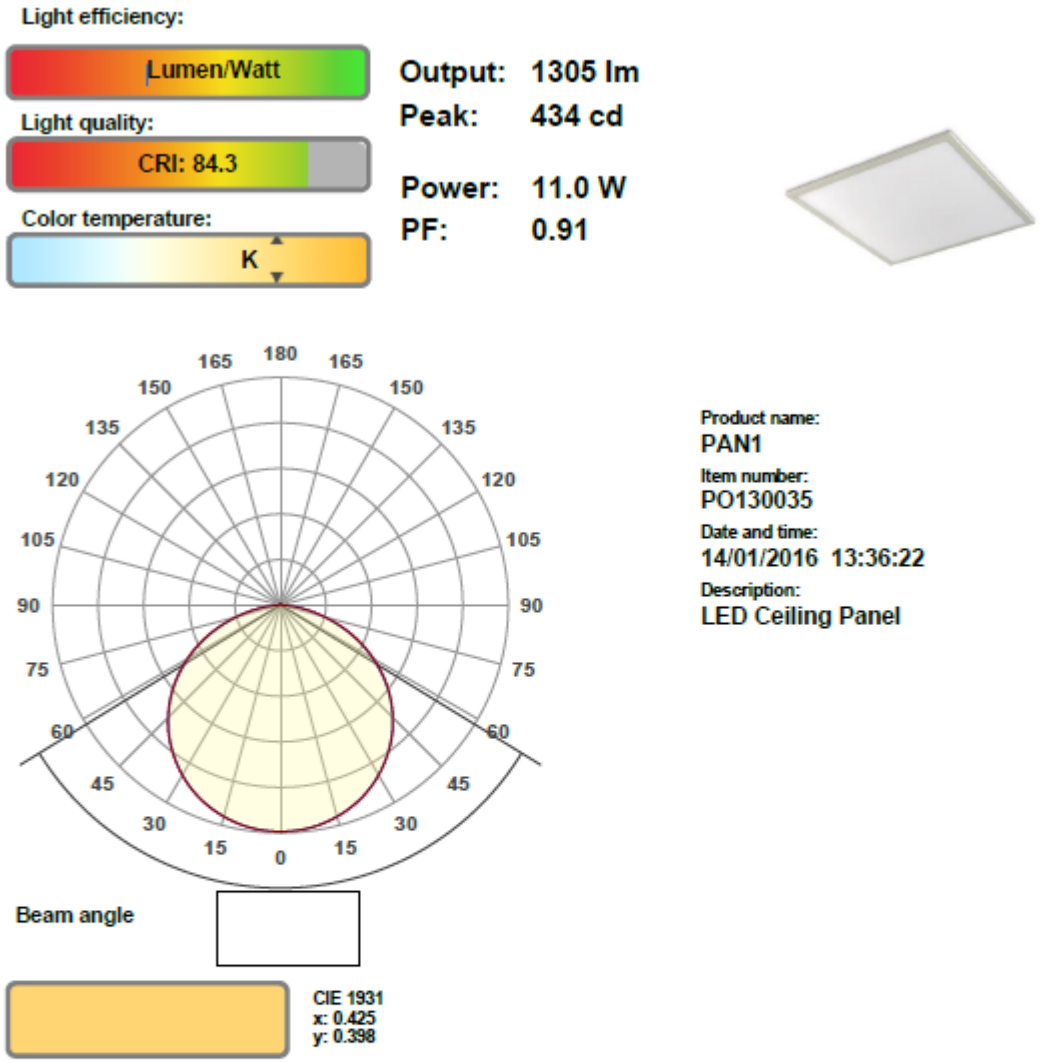
Authorised signatory:

Name: Paul Sargent
Position: Quality Director
Date: 09/11/2021
Place of issue: As above

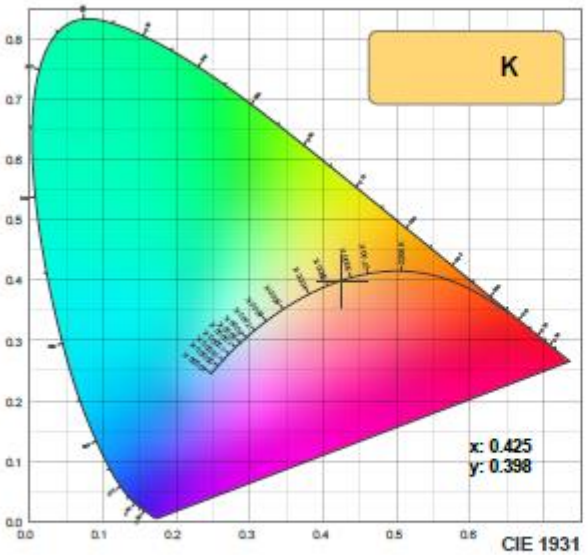
UK CA

Annex C – Example Photometric (performance) report

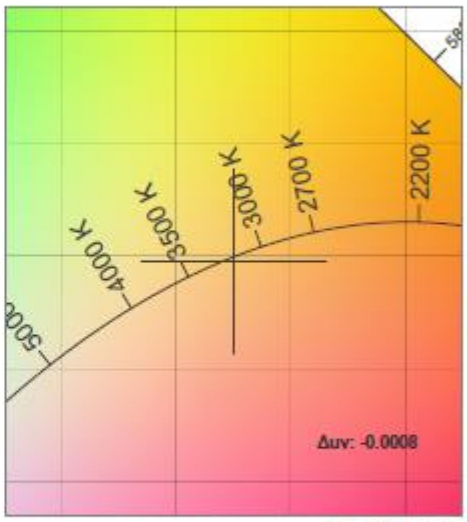
Note this example is for a luminaire (containing product) and is intended to demonstrate the level of detail expected.



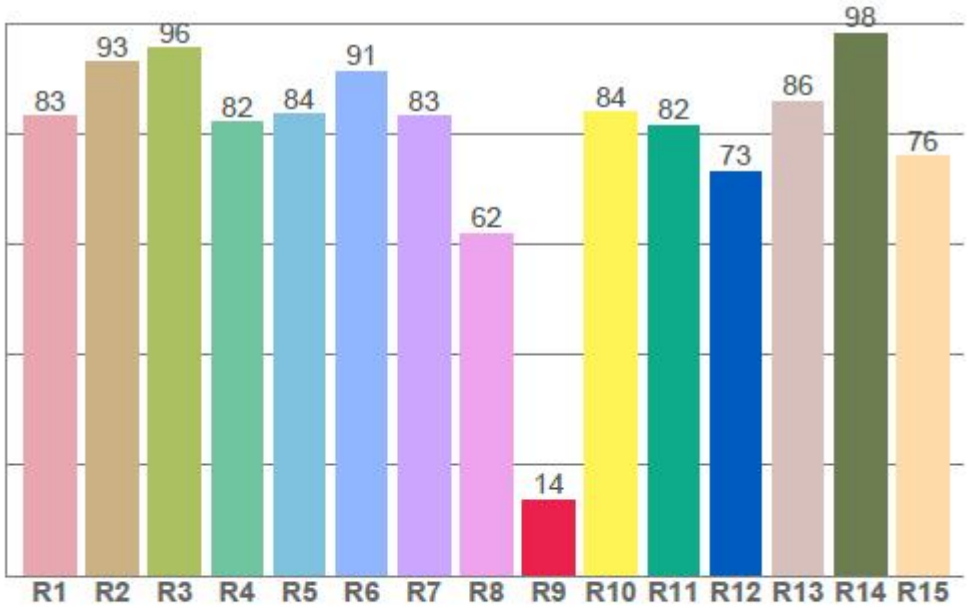
Colour details



CIE 1931



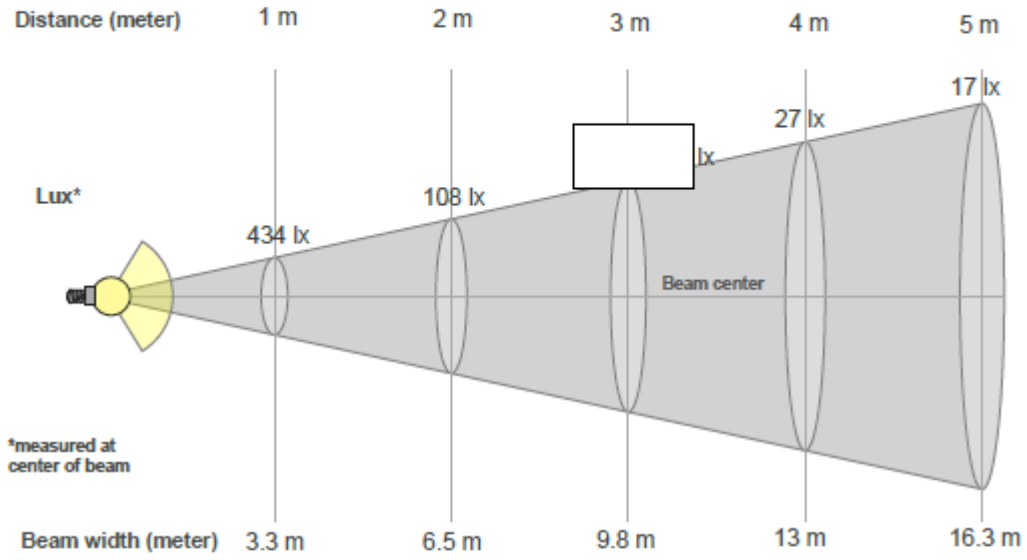
CIE 1931 ZOOM



Colour parameters

Color temperature	Color rendering index	Red component	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
CCT	CRI	CRI R9	x	y	u	v
K	84.3		0.425	0.398	0.248	0.345

Beam details



Intensities in 0° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
434	433	428	420	408	394	376	355	332	305	275	242	207	169	129	88	50	19	3	1
100%	100%	99%	97%	94%	91%	87%	82%	76%	70%	63%	56%	48%	39%	30%	20%	12%	4%	1%	0%

Beam angle 50%	Field angle 10%

Annex D – Example TM21-11 Lifetime Report

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Test Report

Report No	:	LXXXX
Client:	:	X
Description	:	
Manufacturer	:	
Type/Models	:	
Test Specification	:	Thermal test in accordance with EN 60598-1:2015+A1:2018 - Clause 12.4 with IES TM-21-19 data analysis
Dates of Testing	:	XX/XX/XXXX – XX/XX/XXXX
Conclusion	:	Refer to body of report
Date of Issue	:	
Date of Expiry	:	

Analysis by:
Position:

Approved by:
Position:

INTRODUCTION

Joe Bloggs Lighting have supplied the product identified in Table 1. for thermal measurements in accordance with the specification detailed on page one of this report.

A calculation has also been performed in accordance with IES TM-21-19 based on the thermal test results.

PRODUCT DETAILS

Table 1. ***Test Sample Details***

Product Description	
Model No.	
Number of Samples	
Date of Receipt	
Condition on Receipt	
Product Supply Requirement	
Lamp Type and Power	
Sampling Method: Test samples selected and supplied by client, no sampling method specified by client.	

RESULTS

Table 2. ***Thermal results***

Thermocouple Position	Measured Value	Standard Limit
Ambient (Actual)	20.3°C	Ref.
LED module T_c	49.1°C	Ref.

THERMAL TEST

All temperatures are referenced to 25°C ambient.

All analysis is based on tested case temperatures and manufacturer supplied LM-80-80 test report designation EWARWOOWAR.

Based On THINGUMMYDOODAH LM-80-08 data for a case temperature of 55°C.

Table 2. ***Calculated TM21 measurements at 25°C ambient***

Aspect	Value*
LM 80-08 Sample size	20
Number of failures	0
DUT drive current used in the LM 80 test (mA)	150
LM80 Test duration (hours)	6,000
Test duration used for projection (hour to hour)	1,000 - 6,000
Tested case temperature (ºC)	55
α	5.638E-06
B	1.010
Reported L70(6k) (hours)	>36000
****Note: Calculated values for IES TM-21-11 are not UKAS accredited.***	

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Luminaire at 50°C Ambient, LED solder point 97.9°C

Based On THINGUMMYDOODAH LM-80-08 data for a case temperature of 85°C.

Table 3. ***Calculated TM21 measurements at 25°C ambient***

Sample size	20
Number of failures	0
DUT drive current used in the test (mA)	150
Test duration (hours)	6,000
Test duration used for projection (hour to hour)	1,000 - 6,000
Tested case temperature (ºC)	85
α	7.208E-06
B	1.011
Reported L70(6k) (hours)	>36000

DISCLAIMER

The calculated data is this report was created using the Energy Star TM21 calculator of egular test intervals. The TM21-11 calculation method derives an estimated time for the point at which the lumen output of an LED board reaches 70% of peak luminous flux (L_{70}.) This is not a measurement of luminaire lifetime and should not be used as such.

DEVIATION(S) FROM TEST STANDARD

No reported deviations from test standard.

End

Annex E – ERP (Eco-design) product information

Supplier's name or trademark:					
Supplier's address:					
Model identifier:					
Type of light source:					
Lighting technology used:	LED		Non directional or directional:	☐NDLS ☐DLS	
Light source cap-type (or other electric interface)					
Mains or non-mains:	☐MLS ☐NMLS		Connected lightsource (CLS):	☐NO ☐YES	
Colour-tuneable light source:	☐NO ☐YES		Envelope:		
High luminance light source:	☐NO ☐YES				
Anti-glare shield:	☐NO ☐YES		Dimmable:	☐NO ☐YES	
Product parameters					
Parameter	**Value**		**Parameter**	**Value**	
General product parameters					
Energy consumption in on-mode (kWh/1,000 h) rounded up to the nearest integer	x		Energy efficiency class	A, B, C, D, E, F, G	
Useful luminous flu (use), indicating if it refers to the flu in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	x in [sphere/wide cone/narrow cone]		Correlated colour temperature, Rounded to the nearest 100K, or the range of correlated colour temperatures, rounded to the nearest 100k that can be set.	[x/x...x/x or x(or x...)]	
On-mode power (P_{on}), expressed in W	x.x		Standby power (P_{sb}), expressed in W and rounded to the second decimal point	x.xx	
Networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal point	x.xx		Colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set	[x/x...x]	
Outer dimensions without separate control gear, lighting control parts and non-lighting control parts, if any (millimetre)	Height		Spectral power distribution in the range 250 nm to 800 nm, at full-load	graphic	
	Width				
	Depth				
Claim of equivalent power	☐N/A ☐YES		If yes, equivalent power (W)	x	
			Chromaticity coordinates (x and y)	0.xxx 0.xxx	
Parameters for directional light sources:					
Peak luminous intensity (cd)	x		Beam angle in degrees, or the range of beam angles that can be set	[x/x...x]	
Parameters for LED and OLED light sources:					
R9 colour rendering index value	x		Survival factor	x.xx	
The lumen maintenance factor	x.xx				
Parameters for LED and OLED mains light sources:					
Displacement factor (cos cp1)	x.xx		Colour consistency in McAdam ellipses	x	
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage	☐N/A ☐YES		If yes, then replacement claim (W)	x	
Flicker metric (Pst LM)	x.x		Stroboscopic effect metric (SVM)	x.x	