Specification

T0059 Lamp – Linear Lighting

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1 Purpose

The purpose of this document is to outline the mini mum performance specification for column head luminaires for use on the London Underground.

For simplicity, this document makes reference to Light Emitting Diode (LED) technology, however other lighting technologies will also be considered.

2 Scope

This Specification applies to Transport for London (TfL)

Transport for London is in the process of establishing Supplier framework contracts with lighting manufactures to procure products that will demonstrate the most superior whole life costs and performance for its given use.

3 Requirements

3.1 General

3.1.1 The Supplier shall comply with all requirements contained within this document.

3.1.2 The lamp shall be CE marked.

3.1.3 The Supplier shall demonstrate full compliance with the CE Declaration of Conformity in the form of a certificate.

3.1.4 The CE Declaration of Conformity shall be backed up with test results demonstrating full compliance to all standards and criteria. These test results shall form part of the Suppliers submission.

3.1.5 The Supplier shall complete the Lighting Product Specification Criteria for each submission.

3.2 Standards

The lamp shall comply with all relevant London Underground, British and International standards. These include but are not limited to those listed in the following.

3.2.1 London Underground standards

S1066	Lighting of London Underground Assets
S1069	Low voltage electrical installations
S1085	Fire safety performance of materials
S1123	Requirements for matching electrical loads to supplies when making changes to low voltage infrastructure
S1212	Production of a Reliability Case
S1222	Electromagnetic Compatibility

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3.2.2 British and European standards and guidance

BS 6853	Code of practice for fire precautions in the design and construction of passenger carrying trains
BS EN 12600:2002	Glass in building. Pendulum test. Impact test method and classification for flat glass
BS EN 13032	Light and lighting
BS EN 50126	Railway applications (RAMS)
BS EN 55015:2013	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
BS EN 60529:2013	Degrees of protection provided by enclosures (IP code)
BS EN 60598	Luminaires
BS EN 61347-2-13:2006	Lamp control gear. Particular requirements for dc. or ac supplied electronic control gear for LED modules
BS EN 61547:2009	Equipment for general lighting purposes. EMC immunity requirements
BS EN 62031:2015	LED modules for general lighting – Safety specifications
BS EN 62262:2002	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
BS EN 62384:2006	DC or AC supplied electronic control gear for LED modules. Performance requirements
BS EN 62471:2008	Photobiological safety of lamp & lamp systems
BS EN 62504:2014	General lighting / Light emitting diode (LED) products and related equipment. Terms and definitions
BS EN 62612:2013	Self-ballasted LED lamps for general lighting services with supply voltages > 50 V – Performance requirements
BS EN ISO 4589	Plastics. Determination of burning behaviour by oxygen index
Directive 2004/108/EC	Electromagnetic compatability (EMC)
HSG 38 – 1997	Lighting at Work
PD IEC/TR 62696:2011	Luminaires. Application of the IK code IEC 62262

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3.2.3 International standards and guidance

ASSIST Publication Volume 1, Issue 1 May 2012	Flicker Parameters for Reducing Stroboscopic Effects from Solid-state Lighting Systems
IEC/PAS 62717	LED modules for general lighting – Performance requirements
IEC/PAS 62722	Luminaire Performance
IES-LM-79-08	Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products
IES-LM-80-08	Approved Method: Measuring Lumen Maintenance of LED Light Sources
ISO 16933:2007	Glass in building - Explosion-resistant security glazing - Test and classification for arena air-blast loading

3.3 Physical Construction of Lamp

3.3.1 Lamps shall be designed to maintain their International Protection (IP) rating throughout its lifecycle and not degrade due to maintenance and periodic testing.

3.3.2 Lamps shall be rated at IP65.

3.3.3 Lamps shall be able to withstand the compression force from a push fit end cap for the duration of its rated life.

3.3.4 The diameter of the lamp shall be no less than one inch (i.e. T8) and no greater than 1 ½ inch (i.e. T12).

3.3.5 Lamps shall have the option to be coated with polymeric resin or equivalent technology to reduce the accumulation of dirt and grime.

3.4 Operation and Maintenance

3.4.1 The Supplier shall submit a manufactures installation instruction specifying how the lamp should be installed.

3.4.2 The Supplier shall submit an Operation and Maintenance (O&M) manual specifying how the lamp should be maintained.

3.4.3 The O&M manual shall include wiring diagrams for the lamp.

3.4.4 The Supplier shall demonstrate how cleaning can be executed through the provision of photographs

3.4.5 Maintenance of the IP rating must take into account the environmental conditions of London Underground.

3.4.6 The O&M manual shall specify the limits of the maintenance tasks that can be undertaken without voiding the warranty.

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3.5 Electrical

3.5.1 The primary nominal supply voltage (U_0) shall be 230V AC.

3.5.2 The Supplier shall state the range in supply voltage that the lamp can operate under.

3.5.3 Leakage currents must comply with BS EN60598-1 Section 10 and be declared.

3.5.4 Third order harmonic and total harmonic distortion current values shall be declared.

3.5.5 Starting current values and the associated time duration of those starting currents shall be declared.

3.5.6 The power factor shall be greater than or equal to 0.9.

3.5.7 The Supplier shall state the total power consumption in Watts.

3.6 Drivers and Controls

3.6.1 The driver and all components shall be integral to the lamp.

3.6.2 Lamps which automatically increase the drive current in order to compensate for lumen depreciation shall not be used.

3.6.3 Lamps with integral drivers shall use constant current drivers.

3.6.4 Driver current shall not exceed 750mA throughout the life of the lamp.

3.6.5 Lamps with integral drivers shall have a standby power not exceeding 0.5 Watts.

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