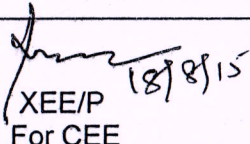


Specification for LED Luminaire:

I. Technical Requirements of LED's		: 100 Lumens/watt for luminaire wattage up to 45 Watts 120 lumens/watt >45 watt @ 350mA drive current. In respect of LEDs of higher power rating. Drive current greater than 350mA can be accepted if the LED's LM-80/IS:16105 test report support them. LEDs shall be SMD type only.
		: Proof of procurement of LED to be submitted and it should not be more than 6 months old
1.	LED Make	: NICHIA/OSRAM/SEOUL/PHILIPS/LUMILEDS/CREE and LEDNIUM
2.	Life Span	: L-70 reported life span of LEDs used in the luminaire shall be greater than 50,000 hrs at the soldering point temperature of 85°C at the luminaire driving current (TM-21 extra polation of the LED manufacturer shall be submitted in support of life span.)
3.	View angle	: 120 degrees (Data sheet to be supported)
4.	Colour Temperature	: White colour LED shall be 5700K as per ANSI standard C78.377A
5.	Colour Rendering Index	: >=65 (Data sheet to be supported)
6.	Safety norms	: LED shall comply photo biological safety norms as per IEC 62471/EN 62471/ IS: 16108. Test certificate of accredited international / national laboratory shall be submitted
7.	Test report	: LM80/IS:16105 test report of specific LED at the soldering point temperature of 85°C for the drive current at which the LEDs shall be driven shall be submitted.
II. Technical Requirements of Driver		
1	Efficiency	85% minimum for power output <= 100 Watts, and 90% for power output > 100 Watts
2	Total Harmonic distortion	: Less than 20% at full load
3	Power Factor of complete fitting	Greater than 0.9
4	Input Operating Voltage with in-built high & low voltage cut off	: 140V – 277V AC (Cut Off in built – 140v for Low & cutoff inbuilt 277v for High)
5	Protection	: Short Circuit & Over Load Protection.
6	Surge protection standard	: Minimum 3kV maximum 4 kV. The surge protection device (SPD) should be fail safe (ie, without leading to fire hazard) SPD failed status should be clearly visible through a flag/ indication.
7	Potting of LED Driver	Mandatory for driver output > 50 Watts

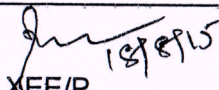
Specification for LED Luminaries	 XEE/P For CEE	SEL/Spec./Power/2-2015 Page 1 of 3
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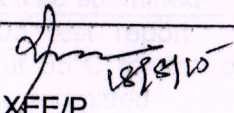
8	EMI/ EMC compliance	Test certificate of NABL accredited laboratory is to be submitted in support of compliance to the following EMI/ EMC standards: (a) CISPR 15/ IS: 6573, (b) IEC: 61547 (reference standards are listed as follows) - IEC 61000-4-2/ IS:14700 Part 3: Sec 2 - IEC 61000-4-3 - IEC 61000-4-4/ IS:14700 Part 3: Sec 4 - IEC 61000-4-5 3 kV (or 4 kV if so offered by the contractor) - IEC 61000-4-6 - IEC 61000-4-11/ IS:14700 Part 3: Sec 11 (c) IEC: 61000-3-2 (Class C)/ IS:1534 Part 1 (d) IEC: 61000-3-3/ IS 14700: Part 3: Sec.2.
9.	Safety requirement	Driver shall comply the safety requirements laid down in IEC: 61347-2-13/ EN: 61347-2-13/ IS: 15885-2-13. Test certificate of NABL accredited laboratory shall be submitted in respect of the offered model/ rating.
10.	Performance requirement	Driver shall also comply the performance requirements as per IEC: 62384/ IS: 16104. Test certificate of NABL accredited laboratory shall be submitted in respect of the offered model/rating.

III. Technical Requirements of Luminaire

1.	Lumen efficacy (min)	80 lumens / watt for <=45W, 90 lumens /watt for > 45 W
2.	Secondary Lens/Optics	The luminaire must have secondary lens /optics. The material of lens. should preferably be PMMA (Poly Methyl Methacrylate)
3.	Cover type	: Toughened Glass or UV stabilized Polycarbonate cover
4.	Life of the LED product as per LM79	: Maintenance of Lumen output – 50,000 hours
5.	Insulation class	: CLASS – 1
6.	Temperature rise test	Soldering point temperature of LED must be <= 85 Deg C. (Test certificate from NABL accredited labs to be supported)
7.	Housing protection	: IP-65. Test certificate of NABL accredited laboratory to be submitted for the luminaire model / rating offered.
8.	Safety requirement	: The luminaire shall comply IEC 60598-1 /IS;10322 Part-1. IEC60598-2-3 /IS;10322 Part-5 Sec.3. Test certificate of NABL accredited laboratory shall be submitted for the luminaire model / rating offered.
9.	Housing of Luminaire	: Pressure die cast LM/ADC12/LM24 housing
10.	Impact resistance	: IK 05
11.	Tests report	: Manufacturer shall submit the LM-79/IS:16106 test report from NABL accredited laboratory. The manufacturer shall submit a declaration that the luminaire submitted for LM79 testing was equipped with the LED driver now being offered.

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IV	Acceptance test	:	Acceptance testing shall be carried out by the purchaser or his representative or by any agency deputed by the purchaser on his behalf. Following will be the list of acceptance tests: as per RDSO Doc. No. RDSO/EM/ LED Norm/ 01 Ver: 1.0 Date: 18.09.2014 Prev. Ver: None. (i) visual check (ii) Checking of luminaire model/ rating from the LM79/IS;16106 test clearance report (iii) 10% of the luminaires should be randomly picked and opened up to check if the LED Driver model/ rating is the same as was cleared during LM-79/ IS;16106 test report. (iv) Checking of documents of purchase of LED; (v) Insulation resistance test of luminaire (vi) Electric strength test of luminaire (vii) Verification of Luminaire nominal system wattage (LED + Driver); (viii) Power factor of drive (ix) Driver Efficiency (x) Driver THD (xi) Low/High voltage cut off of driver (xii) Power supply to the LED PCB is to be through proper connector.
V	Guarantee Warranty	/ :	The Supplier shall guarantee satisfactory performance and manufacturing defects of the LED light fittings for a period of 60 months from the date of commissioning or 72 months from the date of supply whichever is earlier.

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