

Emergency lighting Approved products versus non-approved Luminaires

Considering their performance.

Features, benefits and downfalls

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on behalf of

Chris Watts –Cooper Lighting & Safety Ltd

The need for customer confidence –



❖ Previous fire certificates now removed

❖ The government guides state:-

Third-party quality assurance can offer comfort both as a means of satisfying you that goods and services you have purchased are fit for purpose, and as a means of demonstrating that you have complied with the law.

If the customer uses a non approved product they may have to prove it is 'fit for purpose' to a court if challenged.

The need for customer confidence –



- ❖ **The ‘responsible person’ is normally the employer but it may be the building owner**
- ❖ The ‘responsible person’ has the duty to ensure his premises are safe and that he uses suitable people to ensure this is done.
- ❖ The responsible person must ensure that the product quality, system design, installation and maintenance is fit for purpose
- ❖ They should ensure that all working on the design, installation or servicing of safety systems are adequately competent to do so.

System design considerations



- ❖ **To comply with the Fire Safety Order there are other factors**

- ❖ The 'responsible person' has to keep the system working correctly at all times and demonstrate its compliance by:
 - ❖ Confidence in compliance – from approved products
 - ❖ Optimum design – from proven data
 - ❖ Maximum life before replacement – from quality products
 - ❖ Minimum service and running costs
 - ❖ Maximum battery life – good battery properly charged
 - ❖ Maximum Lamp life – good lamps properly controlled

BS EN 60598-2-22. Product Standard

Shows a proven acceptability

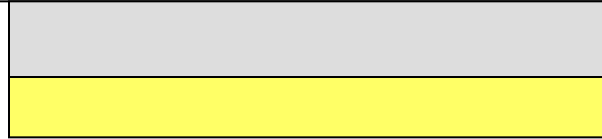


- ❖ The luminaire standard has been developed to ensure that compliant luminaires are made to high standards

- ❖ Product tests check and can be used to demonstrate -
 - ❖ Luminaires will perform correctly when required.
 - ❖ They will provide a good operational life.
 - ❖ That the components are adequate and compatible.
 - ❖ That published performance data will be achieved
 - ❖ That the production will match the quality of the tested luminaire.

- ❖ If the engineer designing the system does not use certified luminaires then they are responsible for the performance of those luminaires

BS EN 60598-2-22.Product Standard Covers all emergency luminaires



- ❖ The enclosure has to be appropriate for the duty i.e. appropriate IP rating and vandal resistance
- ❖ The standard checks that seals and fixing clips of the luminaire will give the claimed degree of protection
- ❖ The Luminaires can either be –
 - ❖ Self contained with internal rechargeable batteries or-
 - ❖ Supplied by remote centrally powered batteries or generators

BS EN 60598-2-22.

Tests confirm component Quality

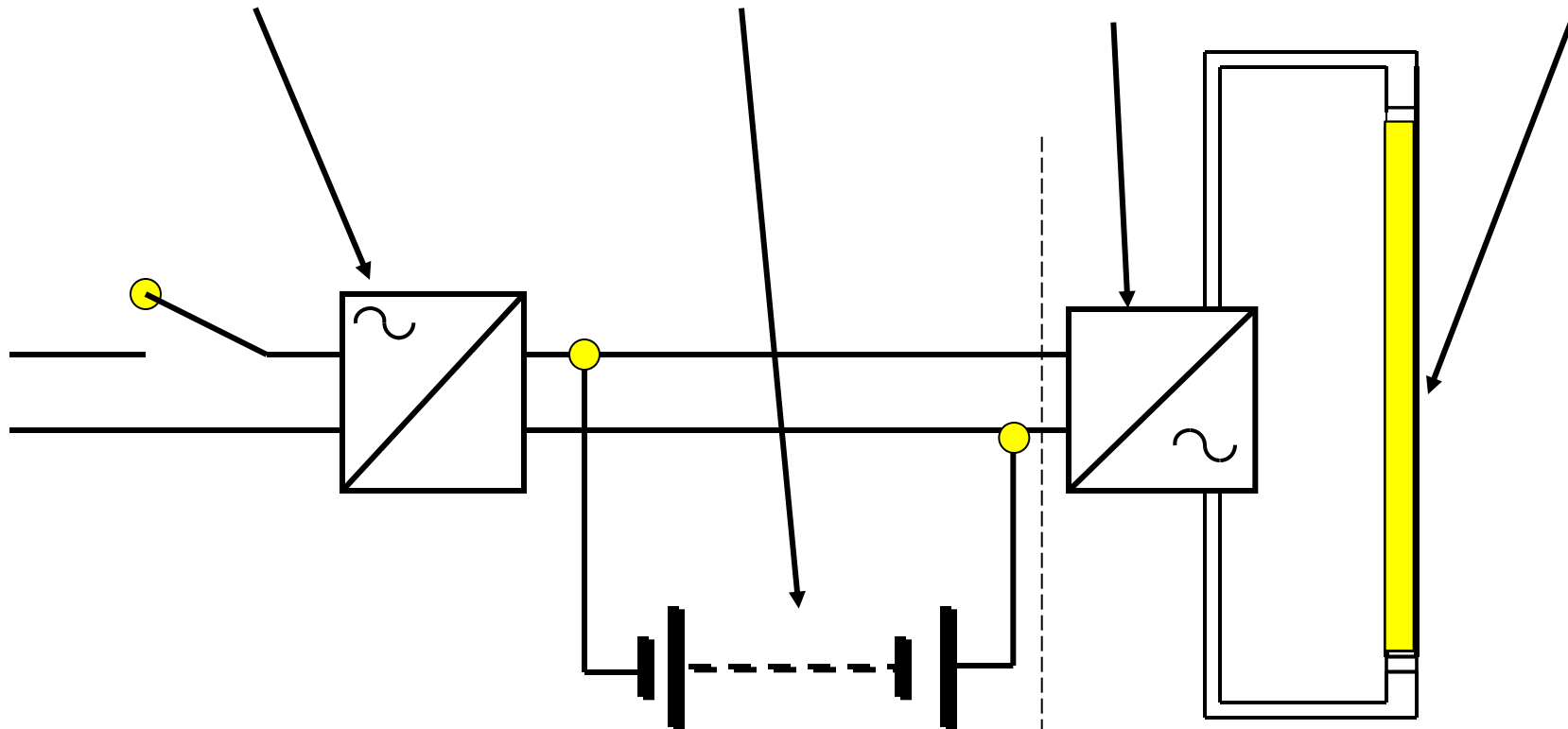


Charger

Battery

Control Gear

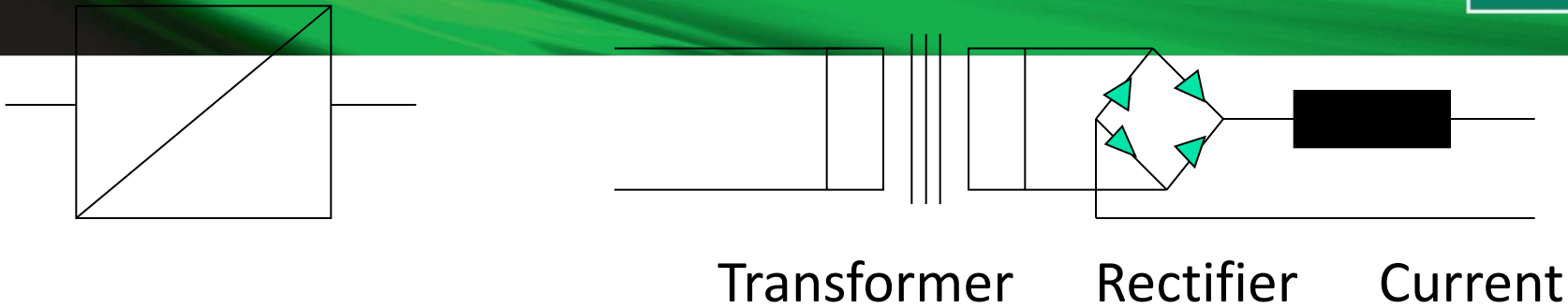
Lamp



Self contained only

All luminaires

BS EN 60598-2-22. Chargers



❖ Chargers must comply with IEC 60924 and

❖ 22.19.1 They must provide the rated charge performance specified by the battery manufacturer to charge batteries within 24 hours over the rated ambient temp. and operating within the range of rated supply voltage $\times 0.9$ to $\times 1.1$

❖ 22.19.2 Transformers must comply to IEC 60742 -4.12 &.13 22.6.5 They must have isolated windings (so there is no chance of the mains supply reaching the battery) and insulation and temperature limits must be satisfactory for a minimum 10yr design life

- ❖ The Control gear for fluorescent lamps must comply with IEC60924 and LEDs with IEC 61347-2-13
- ❖ The circuit must operate the lamp correctly providing any preheating required and a suitable output to meet the lamp supply conditions to meet rated output claims and to enable the lamp to meet the switching cycle tests in the standard
- ❖ 22.17 The changeover circuit must operate between 0.6 and 0.85 times the rated supply voltage to ensure the luminaire does not activate under normal voltage dips but that it will be fully operative at the level that most normal luminaires will be ceasing to work correctly

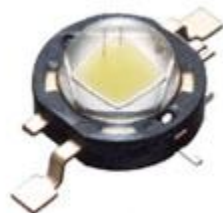
- ❖ Appendix A defines the Maximum ambient temperature, charge range and maximum discharge currents
- ❖ 22.6.8 Batteries must be designed for a minimum life of 4 years and applied correctly
- ❖ 22.6.12 Self contained emergency luminaires utilising a battery of one or more lead acid cells, or a battery of three or more nickel cadmium cells in series, or a battery of one or more NiMH cells shall comply with the requirements of IEC 61347-2-7, subclause 23
- ❖ Note - Batteries must be labelled with the correct battery disposal method and date of manufacture



❖ 22.5.3 luminaires must be clearly marked with details of replacement lamps which must be visible during lamp renewal. Use of the appropriate lamp is necessary to ensure that the rated luminaire performance and design lamp life is achieved

❖ 22.5.9 Lamp holders for luminaires which combine normal and emergency lighting must distinguish the lamp holder by a 5mm green dot visible during re-lamping.

❖ 22.16.4 In order to identify safety colours the minimum value of colour rendering index is $RA > 40$

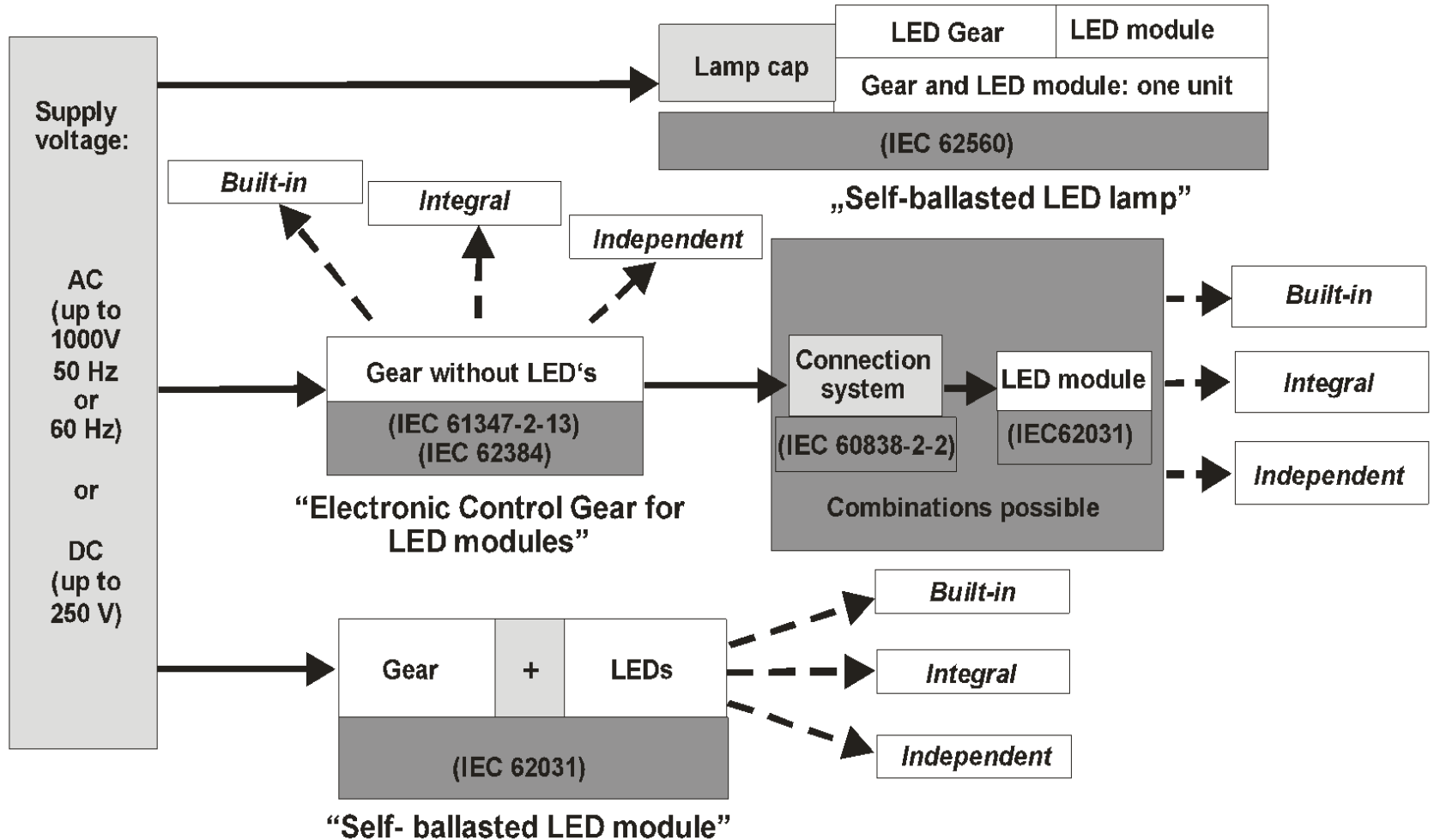




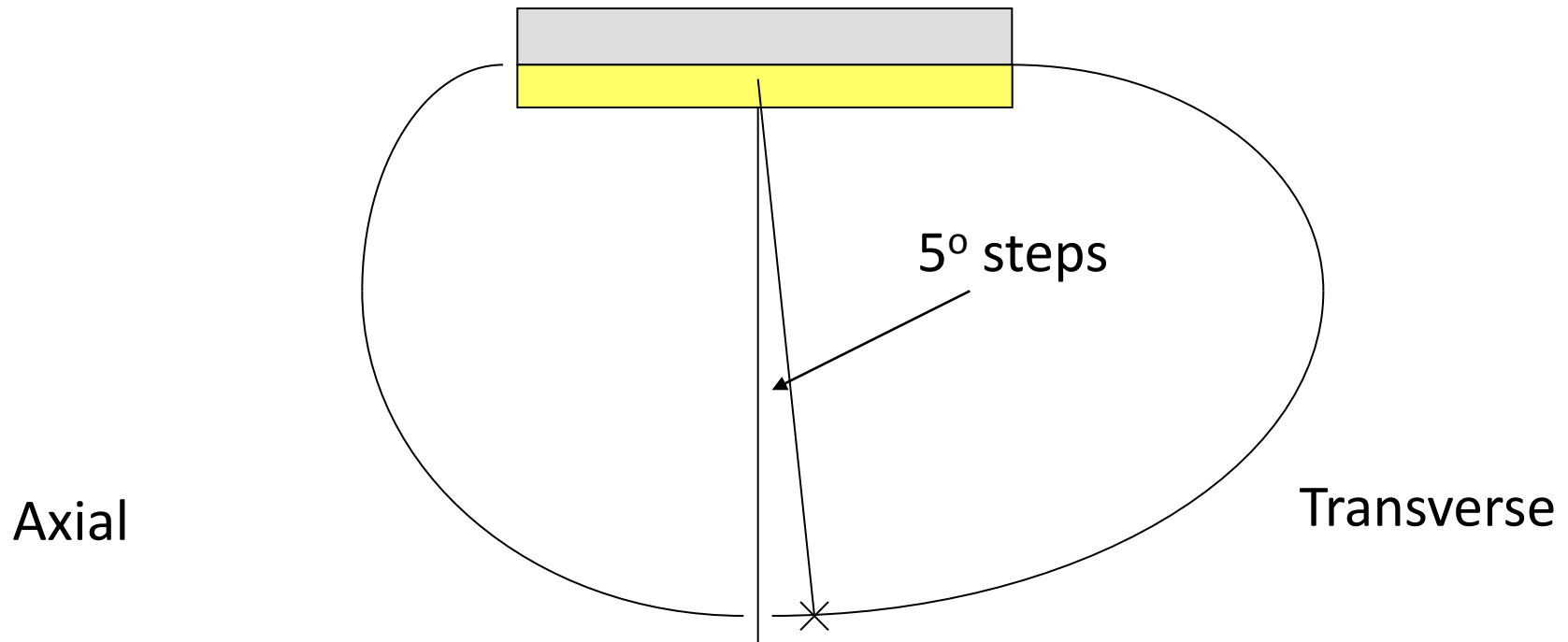
LED PRODUCT STANDARDS

Product type	Safety	Performance
LED Lamp > 50 V (240V)	62560	PAS 62612
LED Lamp < 50 V (12V)	XXXXX	XXXXX
LED Modules	62031	PAS XXXXX
LED Connectors	60838-2-2	-
LED Control Gear (Drivers)	61347-1 61347-2-13	62384
LED Luminaires	60598-1 60598-2-xx	PAS XXXXX

LED PRODUCT STANDARDS FLOW CHART



BS EN 60598-2-22. Performance



The tests check the minimum light output and its distribution in 5° steps of gamma in the C planes C_0 and C_{90}

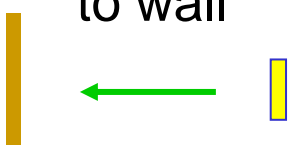



Acceptable formats of Photometric data



- ❖ To decide if extra luminaires are needed in addition to those at the points of emphasis the following can be used
 - ❖ ICEL Authenticated spacing tables
 - ❖ Computer designs using authenticated data
 - ❖ Manual calculations from tested data
 - ❖ Light meter readings but accuracy is difficult.

Acceptable formats of Photometric data



	Escape routes 1 Lux min. along centre line			
Ceiling mounting Height (m)	Transverse to wall 	Transverse spacing 	Axial spacing 	Axial to wall 
2.5	1.8	5.6	4.7	1.5
3	1.4	5.5	4.6	1.1
4	-	-	-	-

Summary of Benefits of approved product



Feature	Approved	Non Approved
Confidence	Proven-	Suspect – User needs to justify its use
Housing suitability	Proven IP performance	May not survive environment
Charger	Tested for recharge time while protecting the battery	May overcharge & damage the battery or not recharge in 24 Hrs.
Transformer	10 year minimum design life safe operation	Unknown life possible unsafe failure mode.
Battery	Assessed minimum 4 year design life for rated duty	Possible early total failure with risks to occupants & costs

Summary of Benefits of approved product



Feature	Approved	Non Approved
Control gear	Proven correct operation of the lamp and consistent performance	Unproven circuits may damage the lamp and give poor performance
Change over	Ensures that luminaires operate when needed and do not 'hunt'	May not operate as required on low supply voltages.
Lamps	Matched to control gear with known performance and life	May give short life and poor or inconsistent performance
Photometric performance	Proven performance enables accurate optimum designs to be demonstrated.	Unproven performance means system designers can only demonstrate compliance by light test.



Thank you for listening

Any questions?

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