

Emergency lighting

Approved products versus non-approved Luminaires

Considering their performance.

Features, benefits and downfalls

Chris Watts –Cooper Lighting & Safety Ltd



The need for customer confidence –



In the past after a system was given a fire certificate it was treated as acceptable.

Now the responsible person must ensure that the product quality, system design, installation and maintenance is adequate .The government guide to them states-

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.

System design considerations



Fire Precautions act often the only consideration was -**Initial Cost**

To comply with the Fire Safety Order there are other factors

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

To comply with the fire safety order the ‘responsible person’ has to keep the system working correctly at all times and demonstrate its compliance.

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 fittings performance

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 powered by internal recombination batteries or-
Be supplied by remote centrally powered systems or
generators

BS EN 60598-2-22.

Tests confirm component Quality

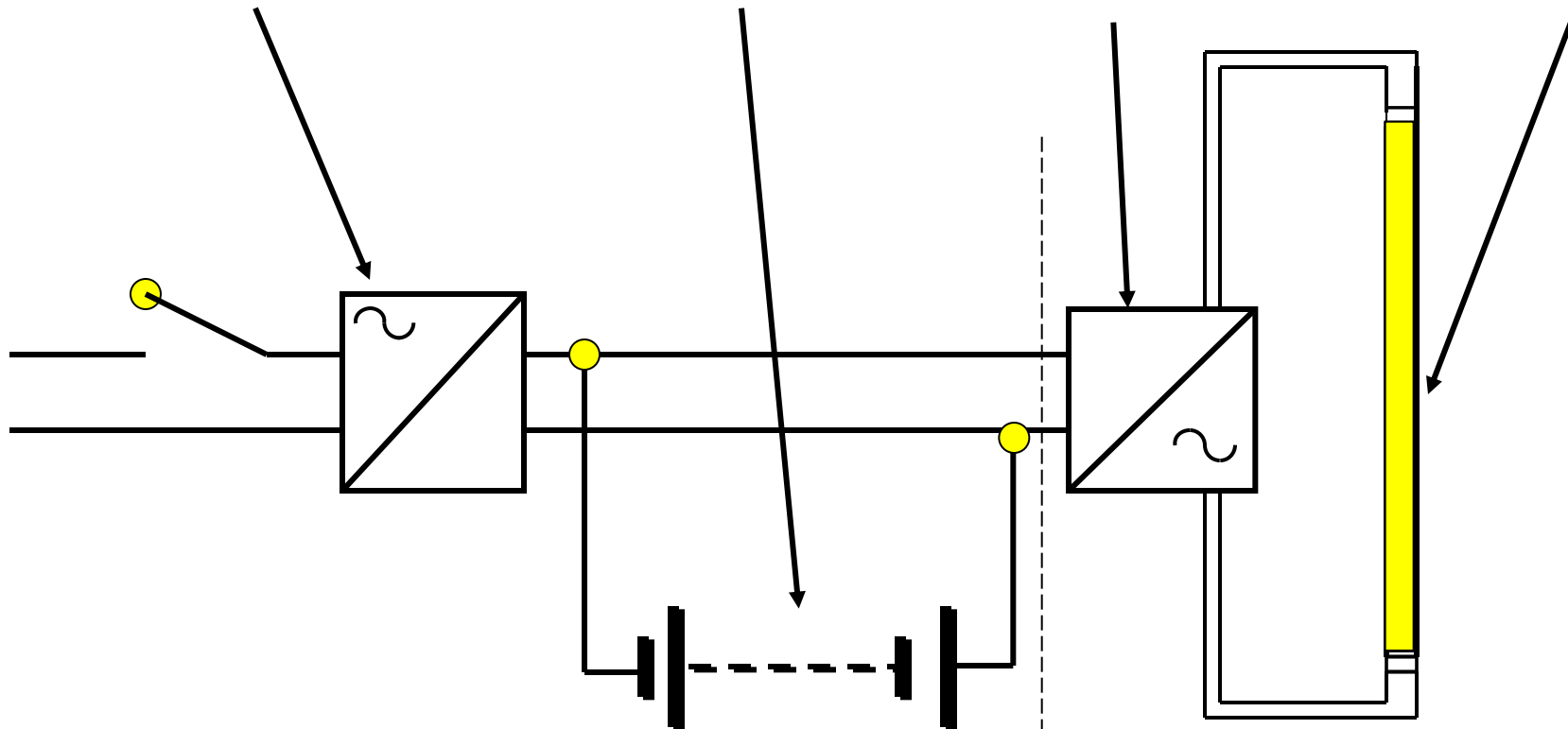


Charger

Battery

Control Gear

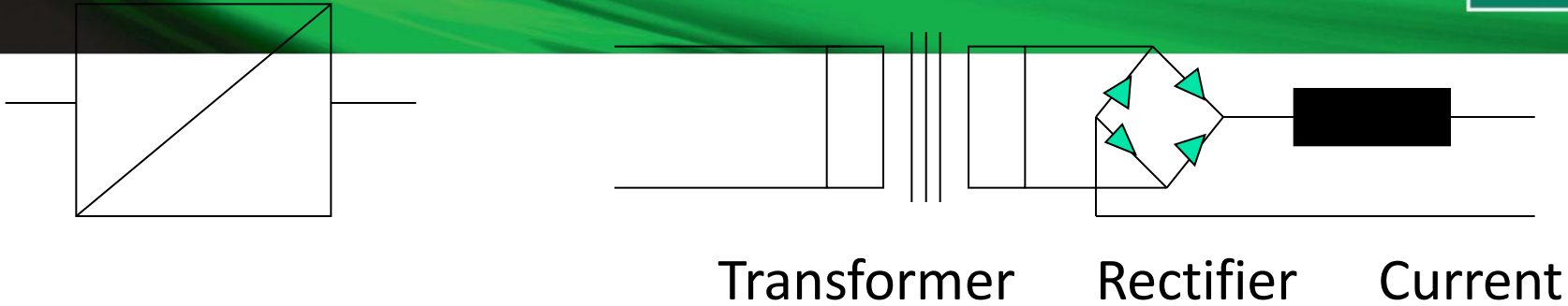
Lamp



Self contained only

All luminaires

BS EN 60598-2-22. Chargers



Chargers must comply to 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

BS EN 60598-2-22. Batteries



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 they must be applied correctly to provide this life when the luminaire is in operation

22.6.12 For luminaires with three or more Nickel Cadmium cells and any lead acid batteries the circuit must provide over discharge cut off protection to stop one or more cells being driven into reverse during discharges longer than the rated duration. The standard limits the power drain after the cut off has operated to protect the cells from premature damage.

Note - Batteries must be labelled with the correct battery disposal method and date of manufacture

BS EN 60598-2-22. Control gear




The Control gear must comply to IEC60924

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

Lamps

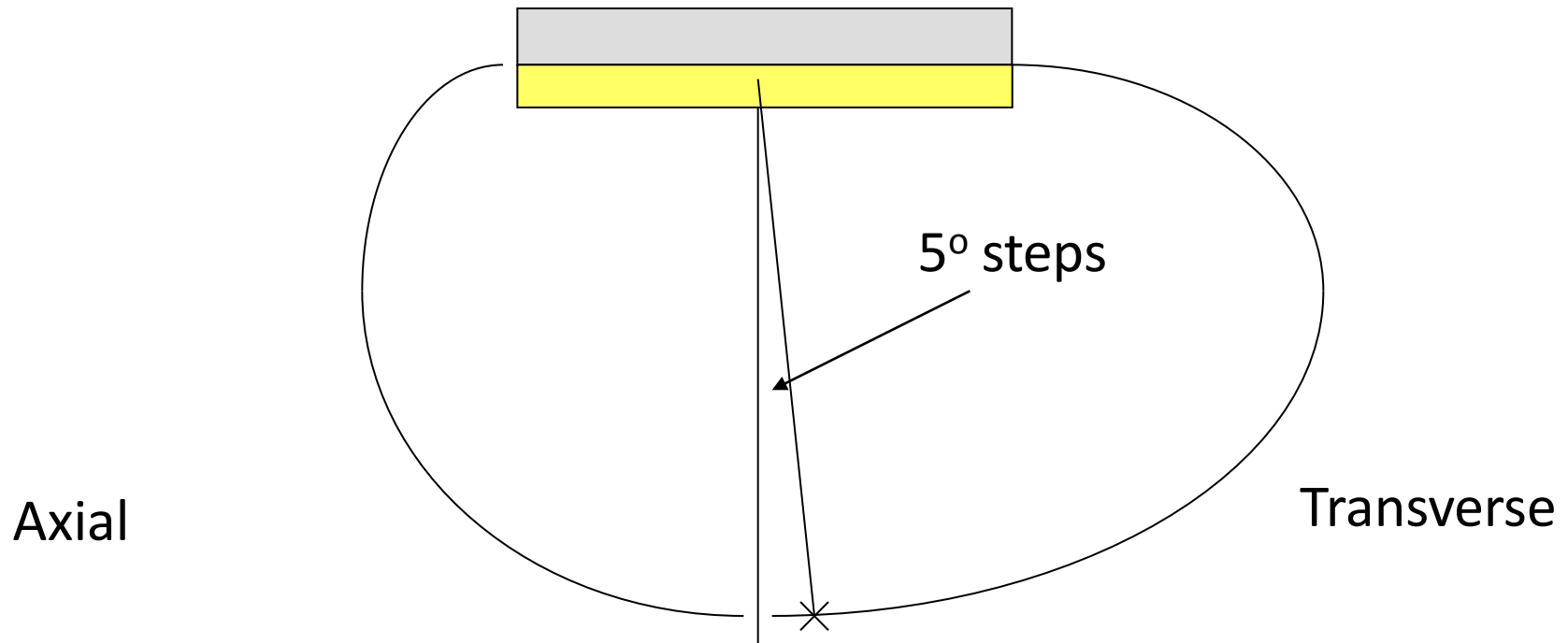
A vertical yellow bar with a black outline, positioned on the left side of the slide. It has a small black rectangular detail at the top and bottom, resembling a lamp holder or a section of a lamp tube.

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 $RA > 40$

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 fittings 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.

	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	-	-	-	-

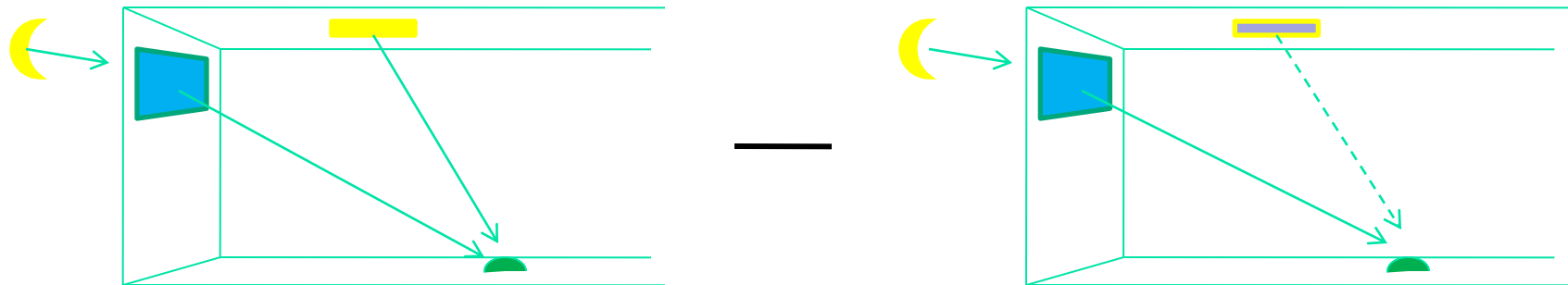
Assessment of illumination levels



If authenticated data is not available an evaluation can be made from appropriate meter readings.

During the tests the effects of stray light should be minimised by procedures such as taking readings at night and masking out the light from street lights and moonlight.

Where stray light can not be completely excluded a reading should be taken with the emergency lights switched off and this value of residual light deducted from the readings



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 low life and poor 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?

Chris Watts –Cooper Lighting & Safety Ltd