Emergency Lighting Practices in the UAE

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SLL Vice President

Society of Light and Lighting
• UAE emergency lighting requirements

• Emergency systems and luminaires
  • Emergency lighting design

• Approved products
UAE Fire & Life Safety Code of Practice

- Chapter 6 - Emergency and Exit lighting requirements

- Mixture of British, European and American standards

- Emergency lighting products require Civil Defence approval
• Technically known as “Escape Lighting”

• To facilitate safe exit from the building when the normal lighting fails

• To allow potentially dangerous equipment to be made safe before evacuation

• To enable Fire Wardens & Fire and Rescue Service to search the building & locate missing people
Emergency lighting must:-

• Indicate clearly and unambiguously the escape routes

• Provide illumination along such routes to allow safe movement towards and through the exits provided

• Ensure that fire alarm call points and fire fighting equipment provided along the escape routes can be readily located

• Permit operations concerned with safety measures

Source: UAE Fire & Life Safety Code of Practice
Emergency Lighting Requirements

- Emergency Lighting
  - Escape Lighting
  - Standby Lighting
Emergency Lighting Requirements

Standby Lighting

• Providing full output if mains fails
Emergency Lighting Requirements

- Emergency Lighting
  - Escape Lighting
    - Escape Route
  - Open Area
  - High Risk Area
  - Standby Lighting
Escape Route Lighting

- Applies to corridors, lobbies and staircases

- Illumination level: 10.8 lux average, 1.1 lux minimum

- Uniformity (max:min)= 40:1

Source: UAE Fire & Life Safety Code of Practice
Emergency Lighting Requirements

Open Area Lighting

- >60m² or as determined by Risk Assessment
- Illumination Level: 10.8 lux average, 1.1 lux minimum
- Uniformity (max:min) = 40:1
- Exclude 0.5m border around perimeter of area

Source: UAE Fire & Life Safety Code of Practice
Emergency Lighting Requirements

High Risk Lighting

- Safe termination of hazardous activity
- Safe passage / rescue access
- Illumination level: 10.8 lux minimum
- Applies to all areas where high risks have been identified within a risk assessment, these may include:
  - Kitchens
  - Plant rooms
  - Areas of refuge
  - First aid rooms
  - Fire control equipment rooms
  - etc

Source: UAE Fire & Life Safety Code of Practice
Points of Emphasis

- Stairs so that each flight receives direct light
- Changes in level
- Changes of escape route direction
- Corridor intersections
- First aid posts
- Fire alarm call points or pieces of fire fighting equipment
- External areas in the immediate vicinity of final exits
- Moving stairways and walkways
- Motor generator, control and plant rooms
- Lift cars
- Covered car parks
- Areas of refuge
- Toilet facilities exceeding 8m² or any multiple closet facility without borrowed light
- All other areas as deemed by the Risk Assessment

Source: UAE Fire & Life Safety Code of Practice/BSEN5266
Emergency lighting must be provided for 3 hours
Emergency lighting levels should not fall below 60% of the target level (6.5 lux ave / 0.65 lux min) after 1.5 hrs of operation.
Hotel rooms or suites need to be covered
Buildings where many people maybe in attendance
Emergency luminaire should be feed from the local lighting circuit

Source: UAE Fire & Life Safety Code of Practice
Emergency Lighting Requirements

Testing of Emergency Luminaires

- Emergency luminaires shall be automatically monitored and tested through a dedicated control system.

- The control system shall be interfaced with the BMS and fire alarm control.

Source: UAE Fire & Life Safety Code of Practice
Emergency Lighting Requirements

Exit Signage
Exit Signage

- Required to ensure ESCAPE ROUTES are apparent from any location
- Should be conspicuous
- Consider smoke accumulation
Exit Signage

• Externally Lit
  – Viewing Distance = 100 x Sign Height = 15m (150mm tall sign)

• Internally Lit
  – Viewing Distance = 200 x Sign Height = 30m (150mm tall sign)

Source: BS5266-7/EN1838
Clear and unambiguous instructions!

Which way?
Agenda

- UAE emergency lighting requirements
- Emergency systems and luminaires
  - Emergency lighting design
  - Approved products
Emergency Systems and Luminaires

Stand Alone system

- Easier to install
- Greater flexibility
- Maintenance costs are spread over time
- Can be difficult to achieve higher emergency light levels

Central Battery system

- Higher illumination values
- Longer battery life (Maintenance required)
- Luminaires do not need conversion
- Increased wiring complexity/cost
- Needs daily inspection
- Fixed capacity
- Higher battery replacement costs
Emergency Lighting Requirements

Stand alone systems shall:-

• Provide 3 hour duration

• Be connected an automatic monitoring and testing system

• The control system shall monitor the luminaires for:-
  – Low battery
  – Faults
  – Status

Source: BS5266-7/EN1838
Central battery systems shall:-

- Provide 3 hour duration

- Be connected to an automatic monitoring and testing system

- Provide a cross zoning arrangement where at least two circuits shall cover each area in an overlapping of light units

Source: BS5266-7/EN1838
Emergency Systems and Luminaires

- **Non-maintained**
  - Normal mode off
  - Switches ON when mains fails

- **Maintained**
  - Normal mode permanently on or switched
  - Switches to battery when mains fails

- **Sustained**
  - “Normal” lamp is switched
  - “Emergency” lamp switches ON when mains fails
Product suitability

- Aesthetics of stand alone emergency products often undesirable
• LED technology has allowed emergency lighting to become more discrete

• Enhanced performance over traditional light sources

• Longer life/less maintenance
Product suitability

- Lens technology to optimise light distribution

- Efficiency - 3W LED @ 1000mA = 280 lumen output

- Long Life - typically >50,000 hours

- Small form factor - just 50mm Ø
Emergency Systems and Luminaires
Emergency Systems and Luminaires

Exit signage

50,000 hr 4w LED strip

vs.

4,000 hr T5 8w fluorescent
Inspection & testing

• **Daily**
  
  • Central battery cabinets only
    
    • Visual inspection to ensure the system is in a ready condition

• **Monthly**
  
  • Short duration test
    
    • To ensure that all emergency luminaires illuminate correctly (lamps and batteries are working)

• **Annually**
  
  • Full duration test
    
    • To ensure that all emergency luminaires illuminate correctly and fully achieve duration required (3 hours)
Inspection & testing

- Automatic testing systems
• UAE emergency lighting requirements
• Emergency systems and luminaires
  • Emergency lighting design
• Approved products
Emergency Lighting Design

Design process

- Identify the type of building
- Identify exits, final exits and safe areas
- Identify escape routes
- Identify open plan areas >60m²
- Identify hazardous areas
- Identify points of emphasis
- Select emergency lighting products
- Position luminaires at points of emphasis and add extra fitting is until lighting levels are reached
- Check glare and uniformity

Other design considerations

- Height & position of calculation plane
- Reflectance’s of room
- Maintenance factors
Luminaire spacing tables

- Lighting software can provide spacing table information

<table>
<thead>
<tr>
<th>Mounting Height [m]</th>
<th></th>
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<td>10.19</td>
<td>10.46</td>
<td>4.60</td>
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## Avoiding glare

<table>
<thead>
<tr>
<th>Mounting height above floor level $h$ (m)</th>
<th>Escape route and open area maximum Luminous intensity $I_{max}$ (cd)</th>
<th>High-risk task area lighting maximum Luminous intensity $I_{max}$ (cd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$h &lt; 2.5$</td>
<td>500</td>
<td>1000</td>
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<tr>
<td>$2.5 \leq h &lt; 3.0$</td>
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<td>1800</td>
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<td>$4.0 \leq h &lt; 4.5$</td>
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<tr>
<td>$h \leq 4.5$</td>
<td>5000</td>
<td>10000</td>
</tr>
</tbody>
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![Diagram 1](image1.png)

![Diagram 2](image2.png)
Emergency Lighting Design

Avoiding glare
Minimum 2 luminaires per compartment
• UAE emergency lighting requirements

• Emergency systems and luminaires
  • Emergency lighting design

• Approved products
All life safety, fire safety and emergency services shall be listed, approved and registered by the Civil Defence Ministry.
Requirements from the UK perspective

- Civil Defence approval certificate
Approved Products

Emergency Lighting Luminaires

A. Exit Luminaires:

1. Super 7 Range, Rated: 230-240 V 50Hz
   - Models: S7000 LE, S7000 LM, S7000 DL, S7000 YL, DSV1262/7,8/9, TSV1152/7,8/9, Duration: 3 Hrs.

2. Mini Cylinder Range, Rated: 230-240 V 50Hz
   - Models: 250MCHDA, 250MCHLLE, 250MCHLML, 250MCHSLML, 250MCHML, 250MCHV, 250MCHSDA, 250MCSV, 250MCSVYL, 250MCSVYL, 250MCRY, 250MCRV, 250MCRVLML, 250MCRVYL, 250MCRVLDA, 250MCRVHL, 250MCRVINLML, 250MCRVINLML, Duration: 3 Hrs.

3. Architectural Range, Rated: 230-240 V 50Hz
   - Models: 250FCDA, 250FCCE, 250FCCLML, 250FCDLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, 250FCFLML, Duration: 3 Hrs.

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Notice:

1. The certificates are valid for the specified periods. Failure to comply may result in penalties.
2. The products must be properly installed and maintained in accordance with the manufacturer's instructions.
3. Responsibility for any accidents or incidents occurring during use rests with the user.
4. The products are tested and certified to meet the relevant standards and regulations.
Certificate of Compliance

Certificate of Compliance No. CC 62142
Certificate of Compliance Issue date: 25 November 2014
Certificate Expiry date: 24 November 2017

Based on:
BSI Certificate Number: KM 087539
Certificate Issue date: 7th August 2014
Certificate Expiry date: Not applicable

Name and Address of Certificate Holder:
Philip Payne Ltd
Thorntill House
Thorntill Road
Lack Saw
BRI 2NP
United Kingdom

Name and Address of Factory/Manufacturer:
Philip Payne Ltd
Thorntill House
Thorntill Road
Lack Saw
BRI 2NP
United Kingdom

Name of the Brand: Philip Payne
Logo on the product:

Model/Number: See Table 1 for listing

Description of Product: Emergency Lighting Luminaires

Text Standard: BS EN 60598-2-2

Test Description: General requirements and tests for Luminaires for Emergency Lighting

Specification of Test Specimen: As a minimum, the worst case product was tested and limited testing conducted on the other products as deemed appropriate to cover the full product series covered by the certificate.

Test Results: PASS

Product Application Guidance (End use):
This section of BS EN 60598-2 specifies requirements for emergency lighting luminaires for use with electrical light sources or emergency power supplies not exceeding 1,000 V.

This section does not cover the effects of non-emergency voltage reductions on luminaires incorporating high pressure discharge lamps.

This section also includes relevant requirements and tests that shall be conducted and complied with for control gears, as specified in IEC 61347, that incorporate additional facilities such as remote control devices, indicators, charge_source devices, etc.
Approved Products

Civil Defence Approved Products

<table>
<thead>
<tr>
<th>DCD</th>
<th>Dubai</th>
<th>Approved</th>
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<tbody>
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<td>QCD</td>
<td>Qatar</td>
<td>Approved</td>
</tr>
<tr>
<td>ADCD</td>
<td>Abu Dhabi</td>
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</table>
Thank You