A Guide to Emergency Lighting

Third edition

Chris Watts and Ian Watts





A Guide to Emergency Lighting

This is a preview. Click here to purchase the full publication.



A Guide to Emergency Lighting

Third Edition

Chris Watts and Ian Watts

bsi.

This is a preview. Click here to purchase the full publication.

First published in the UK in 2006 by BSI Standards Limited, 389 Chiswick High Road, London W4 4AL.
Second edition published in 2012
Third edition published in 2020

© The British Standards Institution 2020

All rights reserved. Except as permitted under the *Copyright, Designs and Patents Act 1988*, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior permission in writing from the publisher.

Whilst every care has been taken in developing and compiling this publication, BSI accepts no liability for any loss or damage caused, arising directly or indirectly in connection with reliance on its contents except to the extent that such liability may not be excluded in law.

While every effort has been made to trace all copyright holders, anyone claiming copyright should get in touch with the BSI at the above address.

BSI has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this book, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

The right of Chris Watts to be identified as the author of this work has been asserted by him in accordance with Sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN 978 0 539 13195 6

Contents

Acknowledgements	IX
1 Introduction Emergency lighting terminology Development of legislation UK legislation Implementation of UK fire safety national legislation The future of fire safety legislation Definitions	1 3 5 7 10 12
2 Emergency lighting standards: an overview Structure of standards production and administration Emergency lighting standards Other related standards	19 19 22 25
3 Code of practice for the emergency lighting of premises (BS 5266-1) Development of the standard Consultation (4.1)	27 28 29
Safety lighting considerations in addition to emergency escape lighting (5.3 and Annex C) Illumination for emergency lighting conditions (Clause 5) Procedure to design a system to comply with BS 5266-1:2016 Considerations for the use of non-static emergency escape	33 34 36
lighting systems Points of emphasis – needed to comply with BS 5266-1 (5.2.8.1 and Annex E) and also called up in BS EN 1838	44 50
Points of emphasis – needed to comply with BS 5266-1 (5.2.8) but not called up in BS EN 1838 Points of emphasis – locations identified in BS 5266-1	53
(Annex E) to be considered in the risk assessment Safety lighting System integrity Wiring and installation practices Design of system (10.4) Routine inspections and tests (12)	56 64 64 70 78 79
4 Emergency lighting (BS EN 1838:2013) Introduction General principles Escape route lighting (4.2) Compliance with the requirements of BS EN 1838 Open area lighting (4.3) High risk task area lighting (4.4) Response time (4.4.6) Safety signs (Clause 5)	81 82 84 86 87 88 90

5 Emergency lighting application standard (BS EN 50172) General guidance (4.1) Identification and illumination of emergency exit signs (4.2) Open area (anti-panic) lighting (4.4, also covered in 3.4) Emergency escape lighting system design (Clause 5) Emergency escape lighting system records and reporting (Clause 6) Servicing and testing (Clause 7)	93 93 94 94 95 98
6 Emergency lighting luminaires (BS EN 60598-2-22) Self-contained luminaires Centrally supplied luminaires	103 104 104
7 Centrally powered supply systems (BS EN 50171) Acronyms commonly used in centrally powered system designs Types of central power supply systems (Clause 4) Operating conditions and requirements (Clause 5) Construction (Clause 6) Types of AC output central power units	113 113 114 117 118 120
(BS EN 62034 and other standards) Type S: self-contained with stand-alone facilities Type P: emergency luminaires with remote panel Type ER: emergency luminaires with remote panel Type ER: emergency luminaires with remote panel that records results Type PER Type PER Safety, construction and installation instructions (4.1) Monitoring of the timing circuit (4.2) The automatic test system (ATS) (4.3.1) Emergency supply (4.3.2–4.3.4) Protection against system part failures and faults (4.4) Test of emergency lamp(s) (4.5) Functional test (5.1) Duration test (5.2) Protection of a building during the periods of test and subsequent recharge of the emergency lighting system (Clause 6) Selection of a suitable system	129 129 130 130 130 131 131 131 132 132 133 133
9 Other relevant standards Battery standards Other standards Lighting terms and photometry Other relevant documents	139 139 140 140 142
10 Regulatory Reform (Fire Safety) Order 2005 Legislative background Regulatory Reform (Fire Safety) Order	143 143 143
11 The Building Regulations Approved Document B, Volume 2, 2019 Emergency lighting compliance checklist	153 153 154

12 System design Design objectives Initial considerations UK legislative requirements Pre-design information Design of new installations Spacing tables High risk task area lighting Design control procedures Testing and log book Test records	159 159 159 160 161 164 173 175 175
13 System selection System requirement Power source Typical applications Modes of operation Design of central systems	179 179 179 182 182 191
14 Photometry for emergency lighting Photometric theory Lighting requirements Verification of photometric design Products that are difficult to provide with photometric data	193 193 194 197 199
15 Design considerations for major applications Hospitals and nursing homes High-rise, high risk accommodation blocks Hotels and boarding houses Non-residential premises used for recreation Shops and covered shopping precincts General industrial premises and warehouses Offices Schools and colleges Transport locations	201 204 206 207 209 211 212 213 215
16 Installation, maintenance and testing of emergency lighting Initial procedures Self-contained systems Central battery systems	217 217 217 218
17 Responsible person's role in supervising the operation of the emergency lighting installation Responsible person's duties Over-discharge damage to batteries Emergency lighting maintenance	221 221 222 222
18 Documentation System documentation needed prior to starting the design	227 227

Appendices	231
Appendix A Inspection and test certificates	233
Appendix B Emergency lighting completion certificates	239
Appendix C Compliance checklist for inspecting engineers	25′
Appendix D Additional guidance on the compliance checklist and report for an existing site	257
Appendix E Mathematical table for use in photometric calculations	26′
Appendix F Bibliography	265

Acknowledgements

The authors would like to thank all their colleagues in the UK, Europe and further afield whose helpful discussions and support have enabled us to produce the present generation of emergency lighting standards that are now available. The members of the trade associations Industry Committee for Emergency Lighting (ICEL), the Fire Industries Association (FIA) and the Chartered Institution of Building Services Engineers (CIBSE) have been particularly helpful in providing information on the application techniques.

They would also like to record their thanks to Eaton Lighting and Kohler Uninterruptible Power, who have provided information on their product ranges and the performance data used in the production of this book.