

BS EN 61386-25:2011



BSI Standards Publication

## Conduit systems for cable management

Part 25: Particular requirements  
— Conduit fixing devices

**bsi.**

...making excellence a habit.™

EUROPEAN STANDARD

**EN 61386-25**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2011

ICS 29.120.10

English version

**Conduit systems for cable management -  
Part 25: Particular requirements -  
Conduit fixing devices  
(IEC 61386-25:2011)**

Systèmes de conduits pour la gestion du câblage -  
Partie 25: Exigences particulières -  
Dispositifs de fixation de conduit  
(CEI 61386-25:2011)

Elektroinstallationsrohrsysteme für elektrische Energie und für Informationen -  
Teil 25: Besondere Anforderungen für Rohrhalter  
(IEC 61386-25:2011)

This European Standard was approved by CENELEC on 2011-10-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

# CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 23A/635/FDIS, future edition 1 of IEC 61386-25, prepared by SC 23A, Cable management systems, of IEC TC 23, Electrical accessories was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61386-25:2011.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-07-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-10-27

This standard is to be used in conjunction with EN 61386-1:2008.

The clauses of the particular requirements of this Part 25 add to or modify the corresponding clauses in Part 1. Where the text of Part 25 indicates an "addition" to or a "deletion" or a "replacement" of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of the standard. Where no change is necessary, the words "This clause of Part 1 is applicable" are used in Part 25. Subclauses or figures that are additional to those in Part 1 are numbered starting from 101.

NOTE The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## Endorsement notice

The text of the International Standard IEC 61386-25:2011 was approved by CENELEC as a European Standard without any modification.

**Annex ZA**  
(normative)

**Normative references to international publications  
with their corresponding European publications**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

**Addition to Annex ZA of EN 61386-1:2008:**

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 4287	-	Geometrical Product Specifications (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters	EN ISO 4287	-

## CONTENTS

1	Scope .....	5
2	Normative references .....	5
3	Terms and definitions .....	5
4	General requirements .....	6
5	General conditions for tests .....	6
6	Classification .....	6
7	Marking and documentation .....	7
8	Dimensions .....	8
9	Construction .....	8
10	Mechanical properties .....	8
11	Electrical properties .....	11
12	Thermal properties .....	11
13	Fire hazard .....	11
14	External influences .....	11
15	Electromagnetic compatibility .....	12
	Annex A (normative) Classification coding for conduit fixing devices .....	16
	Figure 101 – Arrangement for lateral load test with mandrel .....	13
	Figure 102 – Arrangement for lateral load test with conduit .....	14
	Figure 103 – Arrangement for axial load test .....	15
	Table 2 – Upper temperature range .....	7
	Table 101 – Lateral load for test .....	10

## CONDUIT SYSTEMS FOR CABLE MANAGEMENT –

### Part 25: Particular requirements – Conduit fixing devices

#### 1 Scope

This clause of Part 1 is applicable except as follows:

*Replacement in the first paragraph of the words “conduit fittings” by “conduit fittings and conduit fixing devices”.*

*Addition at the end of the clause:*

This part of IEC 61386 specifies requirements and tests for conduit fixing devices used for support and/or retention of conduit for cable management.

#### 2 Normative references

This clause of Part 1 is applicable with the following exception:

*Addition:*

ISO 4287, *Geometrical Product Specifications (GPS) – Surface texture: Profile method – Terms, definitions and surface texture parameters*

#### 3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

*Addition:*

##### 3.101

##### **conduit fixing device**

device designed to provide retention of conduit(s) when installed at intervals along the length of the conduit. A conduit fixing device is designed so that it can be securely fixed to a mounting surface.

##### 3.102

##### **metallic conduit fixing device**

fixing device consisting of metal only

##### 3.103

##### **non-metallic conduit fixing device**

fixing device consisting of non-metallic material only

##### 3.104

##### **composite conduit fixing device**

fixing device comprising both metal and non-metallic materials

**3.105  
retention**

limitation of the lateral and/or axial movement of the conduit

## **4 General requirements**

This clause of Part 1 is applicable except as follows:

*Replacement:*

**4.1** Conduit fixing devices shall be so designed and constructed that in normal use their performance is reliable.

**4.2** Conduit fixing devices shall withstand the stresses likely to occur during transport, storage, recommended installation practice and application.

**4.3** *Compliance is checked by carrying out all specified tests.*

## **5 General conditions for tests**

This clause of Part 1 is applicable, except as follows:

**5.1** *Replacement:*

Tests in accordance with this standard are type tests. Conduit fixing devices, having the same classification, which vary in colour only, are considered to be the same product type and only one colour needs to be tested.

Conduit fixing devices are tested as part of a conduit system.

Where a conduit fixing device accommodates a range of conduit sizes, the conduit fixing device shall be tested using the smallest and the largest conduit size.

**5.4** *Replacement:*

Samples of non-metallic and composite conduit fixing devices shall be conditioned for at least 240 h, at a temperature of  $(23 \pm 2)$  °C and a relative humidity between 40 % and 60 %. All tests shall be carried out immediately after general conditioning.

**5.5** *Replacement:*

Unless otherwise specified, the samples for each test shall be in a clean and new condition. Due regard shall be taken of the manufacturer's instructions, especially where force is required in the assembly of the joint.

**5.6 and 5.9** *Not applicable.*

## **6 Classification**

This clause of Part 1 is applicable except as follows:

**6.1.1, 6.1.3, 6.1.4 and 6.1.5** *Not applicable.*

*Addition:*

### 6.1.101 Resistance to lateral load

- 1 Light
- 2 Medium
- 3 Heavy

### 6.1.102 Resistance to axial load

- 1 None declared
- 2 As declared by the manufacturer

### 6.2.2 Upper temperature range

*Replacement of Table 2:*

**Table 2 – Upper temperature range**

Classification	Application and installation – Temperature not more than: °C
0	40
1	60
2	90
3	105
4	120
5	150
6	250
7	400

**6.3, 6.4.1 and 6.4.2** *Not applicable.*

## 7 Marking and documentation

This clause of Part 1 is applicable except as follows:

*Replacement:*

**7.1** Each conduit fixing device shall be marked with

- the manufacturer's or responsible vendor's name or trade mark or identification mark,
- a product identification mark, which may be, for example, a catalogue number, a symbol or the like, in such a way that it can be identified in the manufacturer's or responsible vendor's literature.

**7.1.1** The manufacturer shall be responsible for indicating the compatibility of conduit fixing devices within conduit systems according to the IEC 61386 series.

**7.1.2** The manufacturer shall provide in his literature its classification in accordance with Clause 6 and all information necessary for the proper and safe transport, storage, installation and use.

## 7.2 Replacement:

The conduit fixing device shall be marked in accordance with 7.1, on the product wherever possible, but where this is impractical, then the mark may be on a label attached to the product, or on the smallest supplied package.

7.3 and 7.4 Not applicable.

## 8 Dimensions

This clause of Part 1 is replaced by the following text:

Conduit fixing devices shall be capable of accommodating the size or range of conduit diameters as declared by the manufacturer or responsible vendor.

## 9 Construction

This clause of Part 1 is applicable except as follows:

*Replacement:*

**9.1** Within the conduit fixing device there shall be no sharp edges, burrs or surface projections which are likely to damage the conduit system, or inflict injury on the installer or user.

*Compliance is checked by inspection, if necessary after cutting the samples apart.*

**9.2** Fixing means shall be designed to withstand the mechanical stresses occurring during installation and normal use.

Screws, if any, used for assembly of the conduit fixing device, shall not cause damage to the conduit system components when correctly assembled.

*Compliance for screw fixing using preformed threads is checked by the test in 9.3, followed by inspection.*

*Compliance for screw fixing using thread-forming screws is checked by the test in 9.4, followed by inspection.*

*Compliance for reusable fixings other than screws is checked by assembly and removal ten times according to the manufacturer's instruction.*

*Compliance for non-reusable fixings is checked by assembly to the manufacturer's instruction.*

9.5 and 9.6 Not applicable.

## 10 Mechanical properties

This clause of Part 1 is applicable except as follows:

*Replacement:*

**10.1.1** Conduit fixing devices shall have adequate mechanical strength.

**10.1.2** *Compliance is checked by the tests specified in 10.3, 10.101 and 10.102.*

**10.2 Compression test** *Not applicable.*

**10.3.1 Replacement:**

*Twelve assemblies of a conduit fixing device and a steel mandrel or conduit are subjected to the impact test by means of the apparatus shown in Figure 2.*

*Conduit fixing devices which can be used with any type of conduit, with outside diameters according to IEC 60423, shall be tested using a steel mandrel with an outside diameter according to the minimum diameter of the relevant size.*

*The manufacturing tolerance of the mandrel shall be  $(\begin{smallmatrix} 0 \\ -0,02 \end{smallmatrix})$  mm up to and including 20 mm and  $(\begin{smallmatrix} 0 \\ -0,03 \end{smallmatrix})$  mm above nominal size 20 mm.*

*Conduit fixing devices which can only be used with a specific conduit shall be tested using that conduit.*

*The test assembly is fixed on a vertical surface as shown in Figure 101 or Figure 102 but with only one fixing device.*

*Conduit fixing devices, whose maximum dimension is less than 20 mm, are not subjected to this test.*

**10.3.2 Replacement of the last paragraph:**

*The test shall be made on the weakest part of the conduit fixing device.*

**10.3.3 Replacement:**

*After the test, the mandrel or conduit shall remain inside the conduit fixing device and there shall be no sign of disintegration nor shall there be any crack visible to normal or corrected vision without magnification.*

*At least nine of the twelve samples shall pass the test.*

**10.4 Bending test** *Not applicable.*

**10.5 Flexing test** *Not applicable.*

**10.6 Collapse test** *Not applicable.*

**10.7 Tensile test** *Not applicable.*

**10.8 Suspended load test** *Not applicable.*

*Addition:*

**10.101 Lateral load test**

**10.101.1** *Two conduit fixing devices are mounted with a mandrel as shown in Figure 101 or with an appropriate length of conduit as shown in Figure 102.*

*Conduit fixing devices which can be used with any type of conduit, with outside diameters according to IEC 60423, shall be tested using a steel mandrel with an outside diameter*

according to the minimum diameter of the relevant size, applying a load, including the weight of the steel mandrel, according to the classification in 6.1.101, and Table 101.

The steel mandrel shall have a surface roughness of  $7 \mu\text{m Ra}$  in accordance with ISO 4287. The manufacturing tolerance of the mandrel shall be  $(\begin{smallmatrix} 0 \\ -0,02 \end{smallmatrix})\text{mm}$  up to and including 20 mm and  $(\begin{smallmatrix} 0 \\ -0,03 \end{smallmatrix})\text{mm}$  above nominal size 20 mm.

Conduit fixing devices which can only be used with a specific conduit shall be tested using that conduit and the manufacturer shall declare the performance of the combination of conduit and fixing device. For the purpose of applying the load, a steel rod with an outside diameter of 30 % to 50 % of the inside diameter of the conduit is inserted through the conduit and a load including the weight of the steel rod, according to the classification in 6.1.101, and Table 101, is applied across the two ends of the steel rod.

The test is carried out on 3 pairs of conduit fixing devices wall mounted and another 3 pairs of conduit fixing devices ceiling mounted.

**10.101.2** For metallic fixing devices, the test load, as declared by the manufacturer or responsible vendor, is applied, without shock, for a period of  $(300_0^{+10})\text{ s}$  at ambient temperature.

**10.101.3** For non-metallic and composite fixing devices, the sample assembly is then placed in a full draft air circulating oven. The tests are carried out after the oven temperature has reached and maintained the declared maximum temperature according to Table 2 with a tolerance of  $(\begin{smallmatrix} +2 \\ -2 \end{smallmatrix})\text{ }^\circ\text{C}$ . The load is applied, without shock, and held for a period of  $(60_0^{+5})\text{ min}$ .

**Table 101 – Lateral load for test**

Conduit size up to mm	Light lateral load (classification code 2) kg	Medium lateral load (classification code 3) kg	Heavy lateral load (classification code 4) kg
6	0,1	0,2	0,4
8	0,2	0,4	0,8
10	0,3	0,6	1,2
12	0,5	1	2
16	0,8	1,6	3,2
20	1	2	4
25	2	4	8
32	3,3	6,6	13,2
40	5,1	10,2	20,4
50	8,0	16	32
63	12,7	25,4	50,8
75	18	36	72
90	25,9	51,8	103,6
110	38,7	77,4	154,8
NOTE 1 Load tolerance up to but not including 1 kg: + 5 %			
NOTE 2 Load tolerance 1 kg to 10 kg: + 2 %			
NOTE 3 Load tolerance above 10 kg: + 1 %			

**10.101.4** *After the test, the conduit shall still be supported by the conduit fixing devices. This test is not intended to check the fixing into the mounting surface.*

### **10.102 Axial load test**

**10.102.1** *Conduit fixing devices declaring axial conduit retention according to 6.1.102 are tested as follows:*

*Conduit fixing devices which can be used with any type of conduit, with outside diameters according to IEC 60423, shall be tested using a steel mandrel of appropriate length with an outside diameter according the minimum diameter of the relevant size.*

*The steel mandrel shall have a surface roughness of 7  $\mu\text{m}$  Ra in accordance with ISO 4287. The manufacturing tolerance of the mandrel shall be  $(\begin{smallmatrix} 0 \\ -0,02 \end{smallmatrix})\text{mm}$  up to and including 20 mm and  $(\begin{smallmatrix} 0 \\ -0,03 \end{smallmatrix})\text{mm}$  above nominal size 20 mm. The mandrel is assembled to a conduit fixing device, in accordance with the manufacturer's instructions and Figure 103.*

*Conduit fixing devices which can only be used with a specific conduit shall be tested using that conduit and the manufacturer shall declare the performance of the combination of conduit and fixing device.*

*A sample of conduit with appropriate length is assembled to a conduit fixing device, in accordance with the manufacturer's instructions and Figure 103.*

*For metallic fixing devices, the test load, as declared by the manufacturer or responsible vendor, is applied, without shock, for a period of  $(300 \pm 10)$  s at ambient temperature.*

*For non-metallic and composite fixing devices, the sample assembly is then placed in a full draft air circulating oven. The tests are carried out after the oven temperature has reached and maintained the declared maximum temperature according to Table 2 with a tolerance of  $(\begin{smallmatrix} +2 \\ -2 \end{smallmatrix})\text{ }^\circ\text{C}$ . The load is applied, without shock. Then the axial load is maintained for  $(300 \pm 10)$  s.*

**10.102.2** *After the test, the conduit shall remain properly assembled to the conduit fixing device, the conduit shall not have displaced more than 2 mm through the conduit fixing device and there shall be no damage visible to normal or corrected vision without magnification.*

## **11 Electrical properties**

This clause of Part 1 is not applicable.

## **12 Thermal properties**

This clause of Part 1 is not applicable.

## **13 Fire hazard**

This clause of Part 1 is applicable. If declared as non-flame propagating, conduit fixing devices are tested as conduit fittings at a glow wire temperature of 650  $^\circ\text{C}$ .

## **14 External influences**

This clause of Part 1 is applicable except as follows:

#### **14.1.2 Degree of protection – Ingress of foreign solid objects**

This subclause of Part 1 is not applicable.

#### **14.1.3 Degree of protection – Ingress of water**

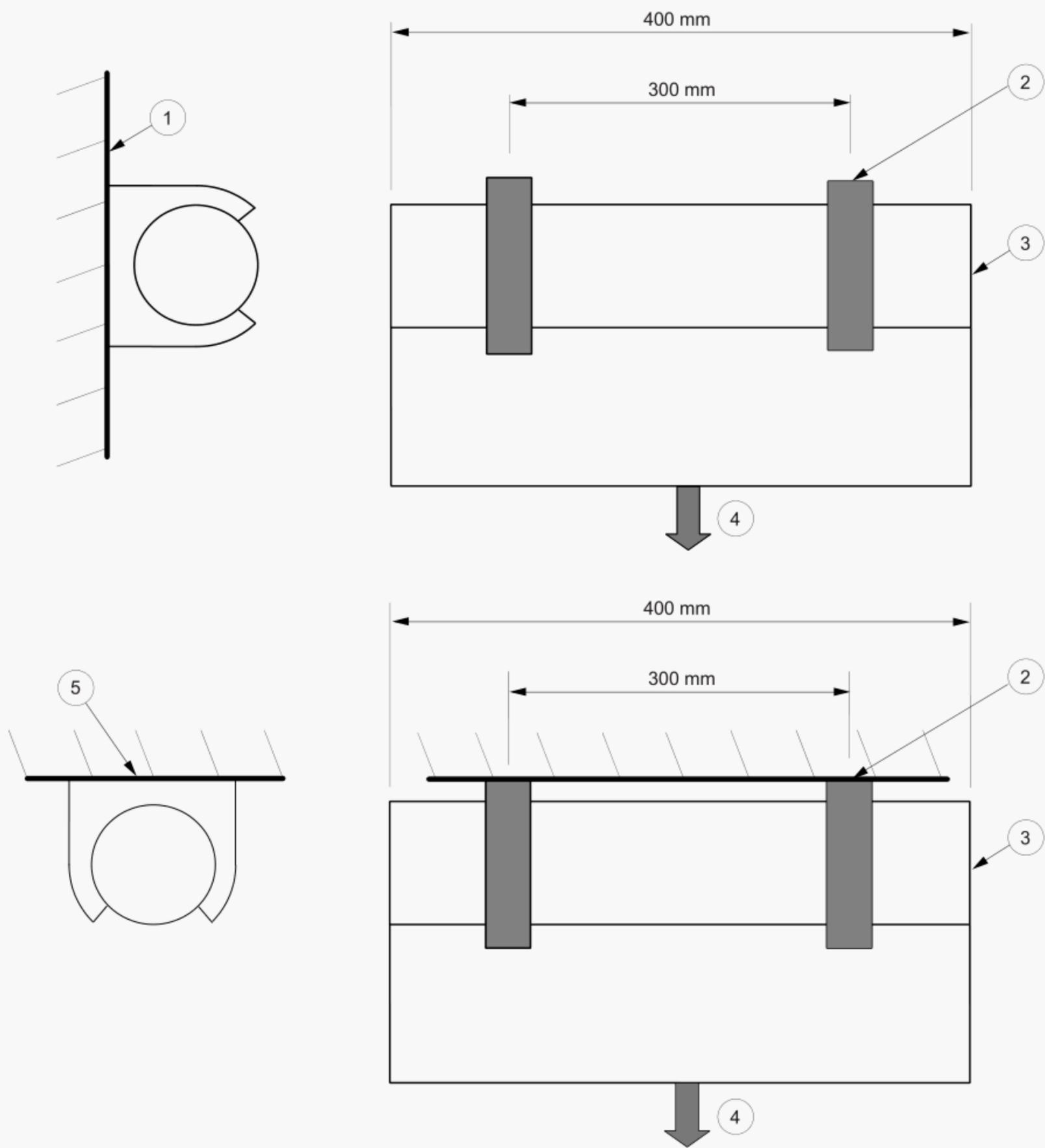
This subclause of Part 1 is not applicable.

### **15 Electromagnetic compatibility**

This clause of Part 1 is applicable.

### **Figures**

*Addition:*

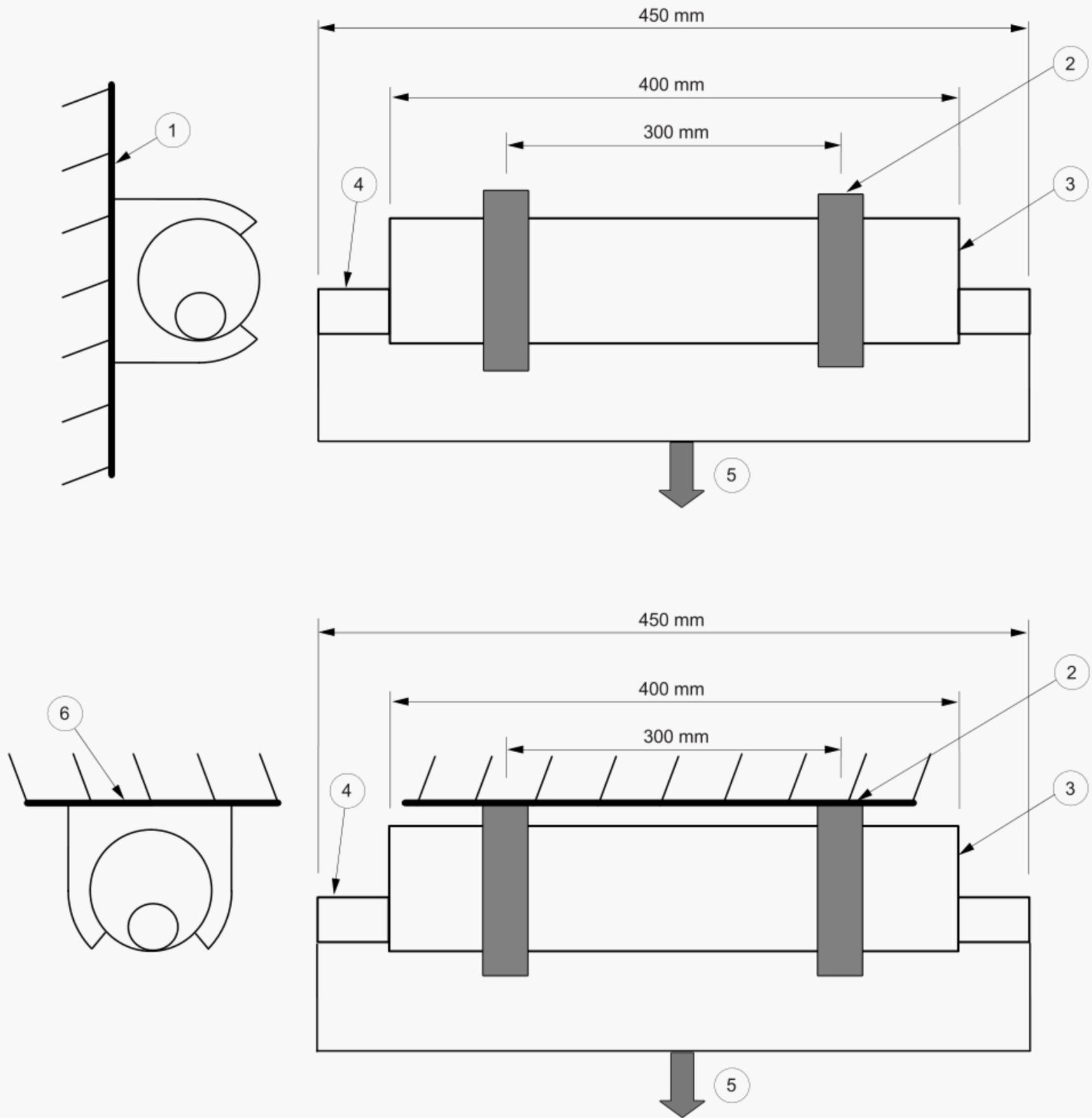


IEC 2084/11

**Key**

- 1 Vertical mounting surface
- 2 Conduit fixing device
- 3 Steel mandrel
- 4 Load (including weight of mandrel)
- 5 Horizontal mounting surface

**Figure 101 – Arrangement for lateral load test with mandrel**

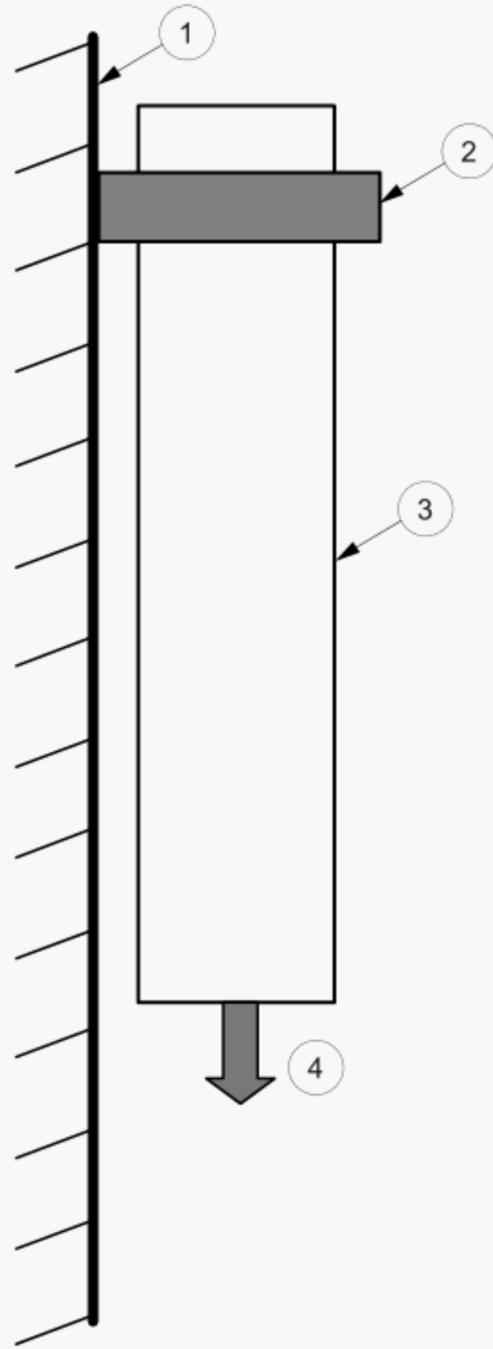


IEC 2085/11

**Key**

- 1 Vertical mounting surface
- 2 Conduit fixing device
- 3 Conduit
- 4 Steel rod
- 5 Load (including weight of steel rod)
- 6 Horizontal mounting surface

**Figure 102 – Arrangement for lateral load test with conduit**



IEC 2086/11

**Key**

- 1 Vertical mounting surface
- 2 Conduit fixing device
- 3 Steel mandrel or conduit
- 4 Load (including weight of mandrel)

**Figure 103 – Arrangement for axial load test**

## Annex A (normative)

### Classification coding for conduit fixing devices

*Replacement:*

NOTE Annex A shows the classification coding format for declared properties of the conduit fixing device, which may be incorporated in the manufacturer's literature.

<b>First digit – Resistance to lateral load (see 6.1.101)</b>	
Light lateral load	2
Medium lateral load	3
Heavy lateral load	4

<b>Second digit – Resistance to impact (see 6.1.2)</b>	
Very light impact strength	1
Light impact strength	2
Medium impact strength	3
Heavy impact strength	4
Very heavy impact strength	5

<b>Third digit – Lower temperature range (see 6.2.1)</b>	
+5 °C	1
-5 °C	2
-15 °C	3
-25 °C	4
-45 °C	5

<b>Fourth digit – Upper temperature range (see 6.2.2)</b>	
+40 °C	0
+60 °C	1
+90 °C	2
+105 °C	3
+120 °C	4
+150 °C	5
+250 °C	6
+400 °C	7

<b>Fifth digit – Resistance against corrosion (see 6.4.3)</b>	
Low protection inside and outside	1
Medium protection inside and outside	2
Medium protection inside, high protection outside	3
High protection inside and outside	4

<b>Sixth digit – Resistance to flame propagation (see 6.5)</b>	
Non-flame propagating	1
Flame propagating	2

<b>Seventh digit – Resistance to axial load (see 6.1.102)</b>	
None declared	0
As declared by the manufacturer	1

—————





# British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

## About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

## Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at [bsigroup.com/standards](http://bsigroup.com/standards) or contacting our Customer Services team or Knowledge Centre.

## Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at [bsigroup.com/shop](http://bsigroup.com/shop), where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

## Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to [bsigroup.com/subscriptions](http://bsigroup.com/subscriptions).

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

**PLUS** is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit [bsigroup.com/shop](http://bsigroup.com/shop).

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email [bsmusales@bsigroup.com](mailto:bsmusales@bsigroup.com).

## BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

## Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

## Copyright

All the data, software and documentation set out in all British Standards and other BSI publications are the property of and copyrighted by BSI, or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. Details and advice can be obtained from the Copyright & Licensing Department.

## Useful Contacts:

### Customer Services

**Tel:** +44 845 086 9001

**Email (orders):** [orders@bsigroup.com](mailto:orders@bsigroup.com)

**Email (enquiries):** [cservices@bsigroup.com](mailto:cservices@bsigroup.com)

### Subscriptions

**Tel:** +44 845 086 9001

**Email:** [subscriptions@bsigroup.com](mailto:subscriptions@bsigroup.com)

### Knowledge Centre

**Tel:** +44 20 8996 7004

**Email:** [knowledgecentre@bsigroup.com](mailto:knowledgecentre@bsigroup.com)

### Copyright & Licensing

**Tel:** +44 20 8996 7070

**Email:** [copyright@bsigroup.com](mailto:copyright@bsigroup.com)