BS EN 62317-5:2015

BSI Standards Publication

Ferrite cores — Dimensions

Part 5: EP-cores and associated parts for use in inductors and transformers

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 62317-5:2015. It is identical to IEC 62317-5:2015. It supersedes BS EN 61596:1997 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/51, Transformers, inductors, magnetic components and ferrite materials.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2016

ISBN 978 0 580 82409 8
ICS 29.100.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2016.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62317-5

December 2015

ICS 29.100.10

Supersedes EN 61596:1997

English Version

Ferrite cores - Dimensions - Part 5: EP-cores and associated parts for use in inductors and transformers (IEC 62317-5:2015)

Noyaux ferrites - Dimensions - Partie 5: Noyaux EP et pièces associées utilisés dans les inductances et transformateurs
(IEC 62317-5:2015)

Ferritkerne - Maße - Teil 5: EP-Kerne und zugehörige Teile zum Einsatz in Drosseln und Transformatore
(IEC 62317-5:2015)

This European Standard was approved by CENELEC on 2015-10-27. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 62317-5:2015 E

European foreword

The text of document 51/1063/CDV, future edition 1 of IEC 62317-5, prepared by IEC/TC 51 "Magnetic components and ferrite materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62317-5:2015.

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) 2016-07-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-10-27

This document supersedes EN 61596:1997.

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 62317-5:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60205:2006	NOTE	Harmonized as EN 60205:2006 (not modified).
IEC 62317-1	NOTE	Harmonized as EN 62317-1.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FERRITE CORES – DIMENSIONS –

Part 5: EP-cores and associated parts for use in inductors and transformers

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62317-5 has been prepared IEC technical committee 51: Magnetic components and ferrite materials.

This first edition cancels and replaces the first edition of IEC 61596 published in 1995. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 61596:

a) addition of EP5-core in Table 1,
b) addition of effective parameter and A_{min} values, main dimensions of coil formers, and pin locations and base outlines for EP5-core.

The text of this standard is based on the following documents:

CDV	Report on voting
51/1063/CDV	51/1103/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62317 series, published under the general title *Ferrite cores – Dimensions*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

IEC 62317 consists of the following parts, under the general title *Ferrite cores – Dimensions*:

Part 1: General specification

Part 2: Pot-cores for use in telecommunications, power supply, and filter applications

Part 3: Half pot-cores[1]

Part 4: RM-cores and associated parts

Part 5: EP-cores and associated parts for use in inductors and transformers

Part 6: ETD-cores for use in power supplies[2]

Part 7: EER-cores

Part 8: E-cores

Part 9: Planar cores

Part 10: PM-cores[3]

Part 11: EC-cores for use in power supply applications[4]

Part 12: Ring cores[5]

Part 13: PQ-cores for use in power supply applications

Part 14: EFD-cores for use in power supply applications[6]

_____

1 Under consideration.

2 To be published.

3 Under consideration.

4 Under consideration.

5 Under consideration.

6 Under consideration.

FERRITE CORES – DIMENSIONS –

Part 5: EP-cores and associated parts for use in inductors and transformers

1 Scope

This part of IEC 62317 specifies the dimensions that are of importance for mechanical interchangeability for a preferred range of EP-cores, the essential dimensions of coil formers to be used with these cores and the locations of their terminal pins on a 2,50 mm printed wiring grid in relation to the base outlines of the cores, and the effective parameter values to be used in calculations involving them.

The general considerations upon which the design of this range of cores is based are as given in Annex A.

2 Normative references

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

Void.

3 Primary standards

3.1 General

Compliance with the following requirements ensures mechanical interchangeability of complete assemblies and wound coil formers.

3.2 Dimensions of EP-cores

3.2.1 Principal dimensions

The principal dimensions of EP-cores shall be as given in Figure 1 and Table 1.

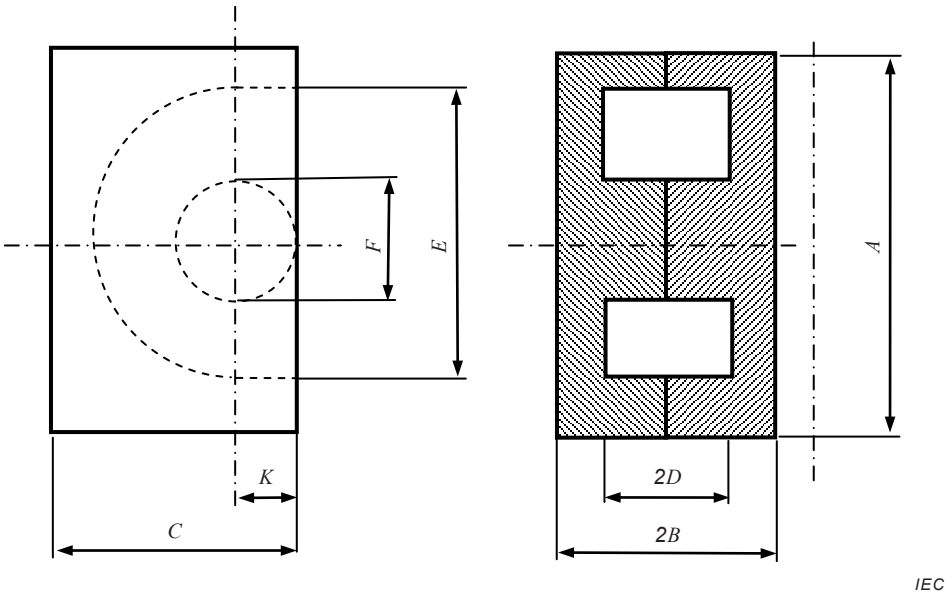


Figure 1 – Principal dimensions of EP-cores

Table 1 – Principal dimensions of EP-cores

Size	*A* mm		*C* mm		*K* mm	*E* mm		*F* mm		2*B* mm		2*D* mm	
	Min.	**Max.**	**Min.**	**Max.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
EP5	5,85	6,15	3,70	3,90	1,00	4,25	4,55	1,60	1,80	5,50	5,70	3,80	4,20
EP7	9,00	9,40	6,20	6,50	1,80	7,20	7,60	3,20	3,40	7,30	7,50	5,00	5,40
EP10	11,2	11,8	7,45	7,85	1,95	9,20	9,60	3,15	3,45	10,0	10,4	7,20	7,60
EP13	12,2	12,8	8,60	9,00	2,50	9,70	10,3	4,20	4,50	12,7	13,0	9,00	9,40
EP17	17,6	18,4	10,75	11,25	3,45	11,6	12,4	5,50	5,85	16,6	17,0	11,0	11,6
EP20	23,5	24,5	14,6	15,3	4,70	16,1	16,9	8,50	9,00	21,2	21,6	14,0	14,6
EP30	30,5	31,5	22,6	23,6	7,85	23,6	24,4	14,5	15,0	29,7	30,0	23,0	23,8

3.2.2 Effective parameter and A_{min} values

The effective parameter values of a pair of cores having the dimensions given in 3.2.1 are as shown in Table 2.

Table 2 – Effective parameter and A_{min} values

Size	C_1 mm^{-1}	C_2 mm^{-3}	l_e mm	A_e mm^2	V_e mm^3	A_{min} [a] mm^2
EP5	3,206 3	1 070,7 × 10^{-3}	9,60	2,99	28,8	2,27
EP7	1,450 6	135, 85 × 10^{-3}	15,5	10,7	65	8,55
EP10	1,696 8	150, 50 × 10^{-3}	19,1	11,3	216	8,55
EP13	1,234 1	63, 326 × 10^{-3}	24,1	19,5	469	14,9
EP17	0,840 01	24, 868 × 10^{-3}	28,4	33,8	958	25,3
EP20	0,507 91	6, 460 3 × 10^{-3}	39,9	78,6	3 140	60,1
EP30	0,348 63	1, 950 0 × 10^{-3}	62,3	179	11 100	149

NOTE The above values have been calculated using the method given in 3.8 of IEC 60205:2006.

[a] A_{min} is selected as the smallest value among A_1, A_2, A_3, A_4 and A_5 using the mean value of each dimension.

3.3 Main dimensions of coil formers

The main dimensions of coil formers suitable for use with a pair of EP-cores shall be as given in Figure 2 and Table 3.

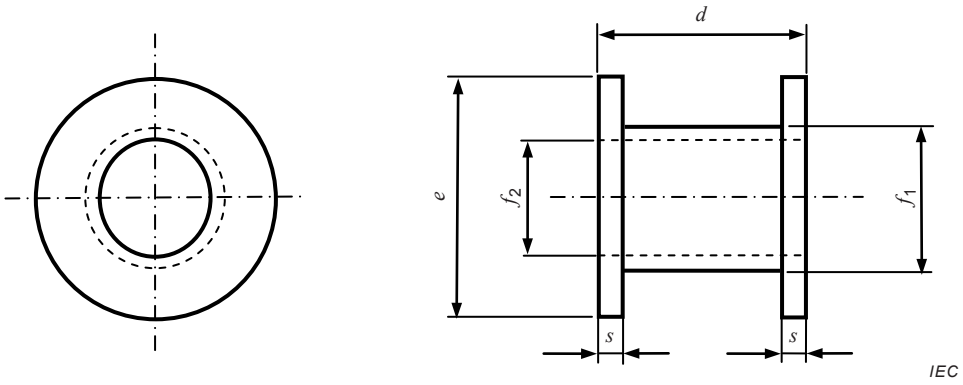


Figure 2 – Main dimensions of coil formers for EP-cores

Table 3 – Main dimensions of coil formers for EP-cores

Size	e mm		f_1 mm		f_2 mm		d mm		s mm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
EP5	4,00	4,20	2,65	2,85	1,85	2,05	3,50	3,70	0,30	0,50
EP7	6,70	7,00	4,30	4,70	3,60	3,80	4,45	4,75	0,60	0,80
EP10	8,60	9,00	4,65	4,95	3,60	3,80	6,70	7,00	0,50	0,70
EP13	9,30	9,60	5,55	5,85	4,60	4,80	8,60	8,90	0,45	0,65
EP17	11,1	11,4	7,05	7,35	6,00	6,30	10,6	10,9	0,55	0,75
EP20	15,6	15,9	10,0	10,3	9,10	9,40	13,5	13,9	0,55	0,75
EP30	23,1	23,5	16,7	17,0	15,1	15,4	22,5	22,9	0,80	1,00

3.4 Pin locations and base outlines

Pin locations and base outlines shall be as shown in Figure 3, in which the base is viewed in the mounting direction, i.e. from the upper side of the printed wiring board, and in Figure 4, in which the base is viewed from the pin side, i.e. from the underside of the printed wiring boards.

Dimensions in mm

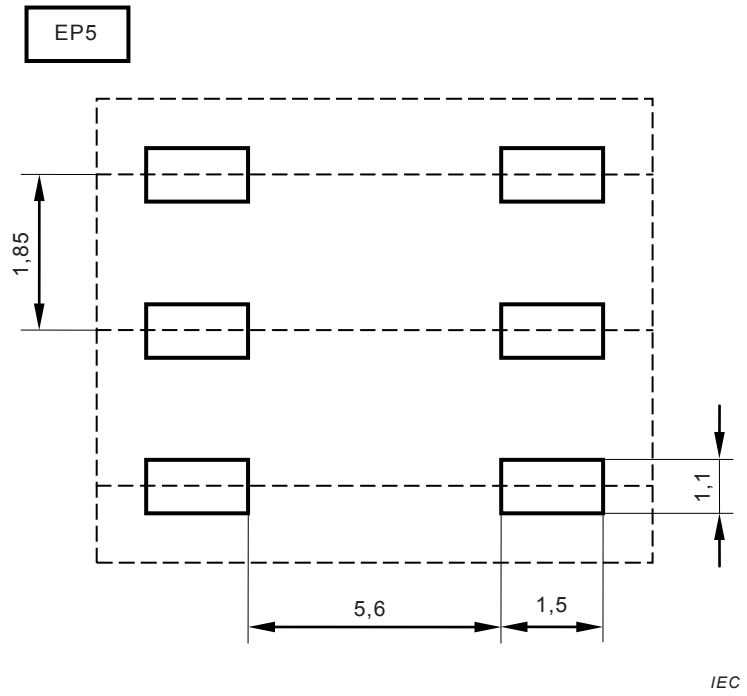
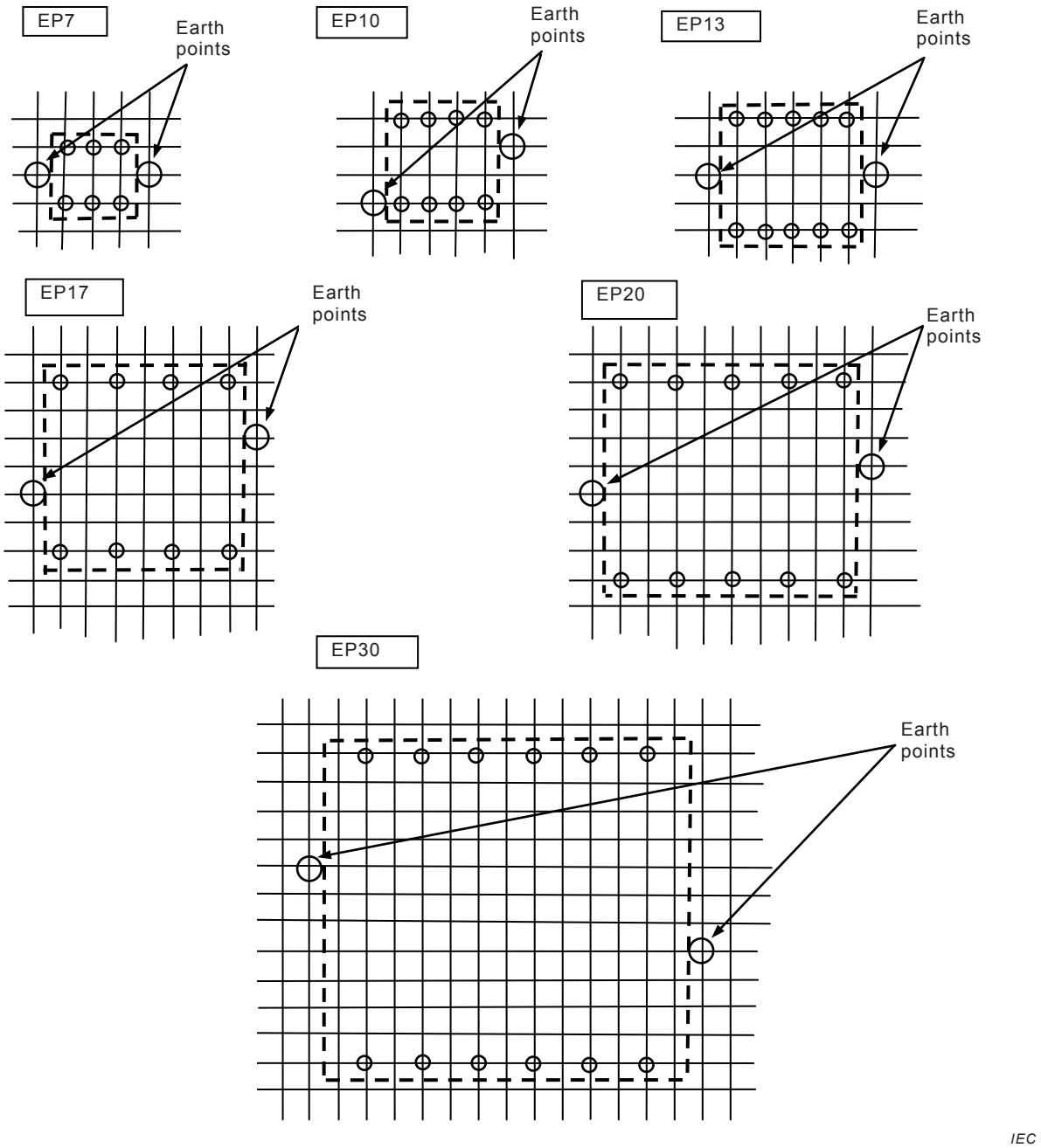


Figure 3 – Pin locations (SMD type) viewed from the upper side of the board



NOTE 2,50 mm grids.

Figure 4 – Pin locations (PTH type) viewed from the underside of the board

Annex A
(normative)

EP-core design

A.1 General

The design of EP-cores standardized by the IEC is based on the following conditions:

a) EP-cores are primarily used for inductors and transformers, but they can also be used for broad-band transformers and switched mode power supply applications.

b) EP-cores, except for EP5-cores, are especially suited for use on printed wiring boards, because it is possible to solder the wire leads of the coils directly to the pin terminals inserted into the coil former. Normally, these pins should remain within the outline of the core base.

c) The base areas, except for EP5-cores, are square and the winding space is annular.

d) EP5-cores have been newly designed as a surface mount type. The EP5-cores are of miniature size and do not follow the design concept of EP-cores.

A.2 Pin locations and base outlines

In order to provide the largest possible number of pins, a minimum distance between pin centres of 2,50 mm shall be chosen. This can be safely handled by soldering techniques for miniature printed wiring. It leads to a maximum of six pins on the smallest cores (e.g. base dimensions 9,5 mm × 7,5 mm) and up to 12 pins for the largest cores (base dimensions 32 mm × 30 mm).

Bibliography

IEC 60205:2006, *Calculation of the effective parameters of magnetic piece parts*

IEC 62317-1, *Ferrite cores – Dimensions – Part 1: General specification*

This page deliberately left blank

This page deliberately left blank

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 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, 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.

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.

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.

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

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.