

BS EN 16296:2012



BSI Standards Publication

Imperfections in thermoplastics welded joints — Quality levels

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 16296:2012.

The UK participation in its preparation was entrusted to Technical Committee PRI/80, Welding thermoplastics.

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.

© The British Standards Institution 2012

Published by BSI Standards Limited 2012

ISBN 978 0 580 75090 8

ICS 25.160.40

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 30 November 2012.

Amendments issued since publication

Date	Text affected
------	---------------

ICS 25.160.40

English Version

Imperfections in thermoplastics welded joints - Quality levels

Défauts dans les assemblages soudés en
thermoplastiques - Niveaux de qualitéUnregelmäßigkeiten an Schweißverbindungen von
thermoplastischen Kunststoffen - Qualitätsstufen

This European Standard was approved by CEN on 22 September 2012.

CEN 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 CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG**Management Centre: Avenue Marnix 17, B-1000 Brussels**

Contents	Page
Foreword.....	3
Introduction.....	4
1 Scope.....	5
2 Normative reference.....	6
3 Terms and definitions	6
4 Quality levels.....	6
4.1 Classification.....	6
4.2 Choice of quality level.....	7
5 Requirements for welded joints.....	7
Bibliography.....	18

Foreword

This document (EN 16296:2012) has been prepared by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard should be used as a reference in drafting of application codes and/or other application standards. It contains a simplified selection of imperfections based on the designations given in EN 14728, *Imperfections in thermoplastic welds Classification*.

Some imperfections according to EN 14728 have been used directly and some have been grouped together. The basic numerical referencing system from EN 14728 has been used.

The purpose of this standard is to define quality levels based on typical imperfections, which might occur in normal fabrication. It may be used within a quality system for the production of factory welded joints. It provides three sets of dimensional values from which a selection can be made for a particular application. The quality level necessary in each case should be defined by the application standard or the fabricator in conjunction with the user and/or other parties concerned. The level should be prescribed before the start of production, preferably at the enquiry or order stage.

The quality levels given in this standard are intended to provide basic reference data and are not specifically related to any particular application. They refer to the types of welded joints in a fabrication and not to the complete product or component itself. It is possible, therefore, that different quality levels are applied to individual welded joints in the same product or component.

The choice of quality level for any application should take account of design considerations, subsequent processing, mode of stressing (e.g. static, dynamic), service conditions (e.g. pressure, temperature, environment) and consequences of failure. Economic factors are also important and should include not only the cost of welding but also of inspection, test and repair.

Although this European Standard includes types of imperfections relevant to the processes given in Clause 1, only those which are applicable to the process and application in question need to be considered.

Imperfections are quoted in terms of their actual dimensions. However their detection and evaluation may require the use of one or more methods of non-destructive testing. It should be noted that the detection and sizing of imperfections is dependent on the inspection methods and the extent of testing specified in the application standard or contract.

The need for detection is not the subject of this standard.

This European Standard is directly applicable to visual examination of welds or test specimens. It does not include details of recommended methods of detection and sizing. The indication provided by non-destructive testing should not be used directly for the evaluation of quality levels. Therefore, it needs to be supplemented by requirements for examinations, inspection and testing.

1 Scope

This European Standard provides quality levels for imperfections in thermoplastics welded joints. It applies to material thickness above 2,0 mm.

Three quality levels are given in order to permit application for a wide range of welded fabrication. They are designated by symbols B, C and D, where B is the most stringent. The quality levels refer to production quality and not to the fitness-for-purpose (see 3.2) of the manufactured product.

This European Standard applies to the following thermoplastic materials:

Table 1

Abbreviation	Material description
ABS	Acrylonitrile-butadiene-styrene plastic
ECTFE	Ethylene-chlorotrifluoroethylene copolymer
FEP	Fluorinated ethylene propylene
PB	Polybutylene
PE	Polyethylene
PFA	Perfluoroalkoxy
PP-B	Polypropylene block copolymer
PP-H	Polypropylene homopolymer
PP-R	Polypropylene random copolymer
PVC-C	Chlorinated polyvinyl chloride
PVC-U	Unplasticised polyvinyl chloride (rigid PVC)
PVDF	Polyvinylidene fluoride

and to the following welding processes:

- Heated tool welding;
- Electrofusion welding;
- Hot gas welding using filler rod only;
- Extrusion welding;

Solvent welding of pipes.

2 Normative reference

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.

EN 14728, *Imperfections in thermoplastic welds — Classification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply

3.1

quality level

description of the qualities of a weld on the basis of type and size of selected imperfections

3.2

fitness-for-purpose

ability of a product, process or service to serve a defined purpose under specific conditions

4 Quality levels

4.1 Classification

Three quality levels are defined as B, C and D in order to permit application for a wide range of welded fabrications (see Table 2).

Symbol	Requirement
B	Stringent
C	Intermediate
D	Moderate

The purpose of this standard is to define quality levels based on typical imperfections, which might occur in normal fabrications and are classified in EN 14728. It may be used within a quality system for the production of factory welded joints. It provides three sets of dimensional values from which a selection can be made for a particular application. The quality level necessary in each case should be defined by the application standard or the fabricator in conjunction with the user and/or other parties concerned. The level should be prescribed before the start of production, preferably at the enquiry or order stage.

For specific applications, additional requirements not covered by this standard may need to be prescribed. These additional requirements shall be defined as quality level A.

4.2 Choice of quality level

For the choice of the quality level, the following factors, among others, shall be taken into account:

- mechanical loading (static, dynamic);
- environment (media, temperature);
- material properties (ductile, brittle);
- manufacturing conditions (workshop, construction site, welding in constrained condition);
- operating conditions;
- potential danger in the event of failure.

5 Requirements for welded joints

The requirements for the above mentioned quality levels (B, C and D) are listed as follows:

Heated tool butt welds: Table 3;

Heated tool socket welds: Table 4;

Electrofusion welds: Table 5;

Hot gas welds: Table 6;

Extrusion welds: Table 7;

Solvent welds in pipes: Table 8.

Different types of imperfection occurring simultaneously at any cross-section of the joint may need special consideration and advice should be sought from the product manufacturer.

Any two adjacent imperfections separated by a distance smaller than the major dimension of the smaller imperfection shall be considered as a single imperfection.

In certain circumstances, it is necessary to machine the completed weld. In this case, the weld shall be examined both before and after machining.

Table 3 Definition of quality levels for heated tool butt

welds				
Number	Designations	Level B	Level C	Level D
1AAAA	Cracks	Not permissible	Not permissible	Not permissible
2BAAA	Gas cavity	Isolated cavities permissible if diameter $\leq 5\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness
2CAAA	Shrinkage cavity	Isolated cavities permissible if diameter $\leq 5\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness
2DAAA	Craze	Not permissible	Not permissible	Not permissible
3AAAA	Inclusion	Isolated inclusion permissible if maximum dimension $\leq 5\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 10\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 15\%$ of wall thickness
3KAAA	Degraded polymer	Not permissible	Not permissible	Not permissible
4BAAA	Lack of fusion	Not permissible	Not permissible	Not permissible
5AAAA	Imperfect shape	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended
5EJAA	Linear misalignment	Permissible if misalignment is not greater than 10% of the wall thickness	Permissible if misalignment is not greater than 15% of the wall thickness	Permissible if misalignment is not greater than 20% of the wall thickness
5EKAA	Angular misalignment	Permissible if misalignment is not greater than $0,2^\circ$	Permissible if misalignment is not greater than $0,4^\circ$	Permissible if misalignment is not greater than $0,8^\circ$
5HAAA	Irregular surface	Not permissible	Not permissible	Not permissible
6EAAA	Excessive upset	Not permissible	Not permissible	Not permissible
6HAAA 6HAAC	Excessive asymmetry of welds	Permissible if smaller half of weld bead is not less than 70% of	Permissible if smaller half of weld bead is not less than 60% of	Permissible if smaller half of weld bead is not less than 50% of

Number	Designations	Level B	Level C	Level D
		larger half of weld bead around the whole circumference	larger half of weld bead around the whole circumference	larger half of weld bead around the whole circumference
7BAAA	Thermal damage	Not permissible	Not permissible	Not permissible
9CAAA	Tool mark	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 0,5 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 1,0 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 15 % of the wall thickness and not greater than 2,0 mm
NOTE The data in this table can also be found in DVS 2202-1 [1].				

Table 4 Definition of quality levels for heated tool socket

welds				
Number	Designations	Level B	Level C	Level D
2BAAA	Gas cavity	Isolated cavities permissible if diameter $\leq 5\%$ of insertion length	Permissible if diameter of largest cavity $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness
2DAAA	Craze	Not permissible	Not permissible	Not permissible
3AAAA	Inclusion	Isolated inclusion permissible if maximum dimension $\leq 5\%$ of fusion length	Isolated and rows of inclusions permissible if maximum dimension $\leq 10\%$ of fusion length	Isolated and rows of inclusions permissible if maximum dimension $\leq 15\%$ of fusion length
3KAAA	Degraded polymer	Not permissible	Not permissible	Not permissible
4BAAA	Lack of fusion	Not permissible	Not permissible	Not permissible
4RAAA	Compressed pipe ends	Not permissible	Not permissible	Not permissible
4SAAA	Insufficient penetration	Permissible if inserted length is no more than 10% less than the specified insertion length	Permissible if inserted length is no more than 15% less than the specified insertion length	Permissible if inserted length is no more than 20% less than the specified insertion length
5AAAA	Imperfect shape of weld flash	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended
5EKAA	Angular misalignment	Permissible if misalignment is not greater than 0,2°	Permissible if misalignment is not greater than 0,4°	Permissible if misalignment is not greater than 0,8°
6EAAA	Excessive upset	Not permissible	Not permissible	Not permissible
6HAAA 6HAAC	Excessive asymmetry of welds	Not permissible	Not permissible	Not permissible
7BAAA	Thermal damage	Not permissible	Not permissible	Not permissible

NOTE The data in this table can also be found in DVS 2202-1 [1].

Table 5 Definition of quality levels for electrofusion

welds				
Number	Designations	Level B	Level C	Level D
3AAAA	Inclusion	Isolated inclusion permissible if maximum dimension $\leq 5\%$ of fusion length	Isolated and rows of inclusions permissible if maximum dimension $\leq 10\%$ of fusion length	Isolated and rows of inclusions permissible if maximum dimension $\leq 15\%$ of fusion length
3KAAA	Degraded polymer	Not permissible	Not permissible	Not permissible
4BAAA	Lack of fusion	Not permissible	Not permissible	Not permissible
4SAAA	Insufficient penetration	Permissible if inserted length is not less than the specified insertion length minus 10 % of the length of the internal cold zone	Permissible if inserted length is not less than the specified insertion length minus 10 % of the length of the internal cold zone	Permissible if inserted length is not less than the specified insertion length minus 15 % of the length of the internal cold zone
4TAAA	Displaced filament	Not permissible	Not permissible	Not permissible
4UAAA	Failure of welding indicator	Not permissible	Not permissible	Not permissible
5EKAA	Angular misalignment	Permissible if misalignment is not greater than 0,2°	Permissible if misalignment is not greater than 0,4°	Permissible if misalignment is not greater than 0,8°
6EAAA	Excessive upset (molten material exuding between pipe and fitting)	Not permissible	Not permissible	Not permissible
7BAAA	Thermal damage	Not permissible	Not permissible	Not permissible
9CAAA	Tool mark	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness of the pipe or fitting at the location of the notch	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness of the pipe or fitting at the location of the notch	Locally permissible if bottom of notch is not acute and the notch depth is less than 15 % of the wall thickness of the pipe or fitting at the location of the notch

NOTE The data in this table can also be found in DVS 2202-1 [1].

Table 6 Definition of quality levels for hot gas

welds				
Number	Designations	Level B	Level C	Level D
1AAAA	Cracks	Not permissible	Not permissible	Not permissible
2BAAA	Gas cavity	Isolated cavities permissible if diameter $\leq 5\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness
2DAAA	Craze	Not permissible	Not permissible	Not permissible
3AAAA	Inclusion	Isolated inclusion permissible if maximum dimension $\leq 5\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 10\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 15\%$ of wall thickness
3KAAA	Degraded polymer	Not permissible	Not permissible	Not permissible
4BAAA	Lack of fusion	Not permissible	Not permissible	Not permissible
4CAAG	Incomplete penetration	Not permissible	Not permissible	Not permissible
4DAAG	Excessive penetration	Locally permissible if less than ($<$) 15% of the wall thickness	Permissible if less than 20% of the wall thickness, but not greater than 3 mm	Permissible if less than 25% of the wall thickness, but not greater than 4 mm
4EAAA	Undercut	Not permissible	Locally permissible if no sharp edges and undercut is less than 10% of the wall thickness.	Locally permissible if no sharp edges and undercut is less than 10% of the wall thickness,
4QAAA	Groove in upset or reinforcement	Locally permissible if bottom of groove above the plate surface	Locally permissible if bottom of groove above the plate surface	Locally permissible if bottom of groove above the plate surface
5EJAA	Linear misalignment	Permissible if misalignment is not greater than 10% of the wall thickness	Permissible if misalignment is not greater than 15% of the wall thickness.	Permissible if misalignment is not greater than 20% of the wall thickness.

Number	Designations	Level B	Level C	Level D
5EKAA	Angular misalignment	Permissible if misalignment is not greater than 0,6°	Permissible if misalignment is not greater than 1,0°	Permissible if misalignment is not greater than 1,5°
5HAAA	Irregular surface	Not permissible	Only isolated occurrences permissible	Only isolated occurrences permissible
6BAAA	Excess weld material	Permissible if weld height between 10 % and 40 % of wall thickness	Permissible if weld height between 5 % and 50 % of wall thickness	Permissible if weld height between 5 % and 60 % of wall thickness
6FAAA	Incompletely filled groove	Not permissible	Not permissible	Not permissible
6HAAA	Excessive asymmetry of welds	Not permissible	Not permissible	Not permissible
7BAAA	Thermal damage	Not permissible	Only isolated occurrences permissible	Only isolated occurrences permissible
7GAAA	Poor restart	Not permissible	Small cross-section reductions permissible if there are no sharp transitions	Small cross-section reductions permissible if there are no sharp transitions
7VAAA	Weld intersections	Not permissible	Not permissible	Not permissible
9CAAA	Tool mark	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 0,5 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 1,0 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 15 % of the wall thickness and not greater than 2,0 mm

NOTE The data in this table can also be found in DVS 2202-1 [1].

Table 7 Definition of quality levels for extrusion

welds				
Number	Designations	Level B	Level C	Level D
1AAAA	Cracks	Not permissible	Not permissible	Not permissible
2BAAA	Gas cavity	Isolated cavities permissible if diameter $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 20\%$ of wall thickness
2CAAA	Shrinkage cavity	Isolated cavities permissible if diameter $\leq 10\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 15\%$ of wall thickness	Permissible if diameter of largest cavity $\leq 20\%$ of wall thickness
2DAAA	Craze	Not permissible	Not permissible	Not permissible
3AAAA	Inclusion	Isolated inclusion permissible if maximum dimension $\leq 5\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 10\%$ of wall thickness	Isolated and rows of inclusions permissible if maximum dimension $\leq 15\%$ of wall thickness
3KAAA	Degraded polymer	Not permissible	Not permissible	Not permissible
4BAAA	Lack of fusion	Not permissible	Not permissible	Not permissible
4CAAG	Incomplete penetration	Not permissible	Not permissible	Permissible if difference between actual and specified penetration less than 10% of wall thickness, but not greater than 1 mm
4DAAG	Excessive penetration	Permissible (PE and PP only) if between 10% and 25% of the wall thickness	Permissible (PE and PP only) if between 5% and 30% of the wall thickness	Permissible (PE and PP only) if between 0% and 40% of the wall thickness
4EAAA	Undercut	Locally permissible if no sharp edges and undercut is less than 10% of the wall thickness, but not greater than 1 mm	Permissible if no sharp edges and undercut is less than 10% of the wall thickness, but not greater than 2 mm	Permissible if no sharp edges and undercut is less than 20% of the wall thickness, but not greater than 3 mm

Number	Designations	Level B	Level C	Level D
4QAAA	Groove in upset or reinforcement	Locally permissible if bottom of groove above the plate surface	Locally permissible if bottom of groove above the plate surface	Locally permissible if bottom of groove above the plate surface
5AAAA	Imperfect shape	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended	Mechanical testing of sample welds is recommended
5DAAA	Overlap	Not permissible	Locally permissible if unfused overlap length is less than 5 mm	Locally permissible if unfused overlap length is less than 10 mm
5EJAA	Linear misalignment	Permissible if misalignment is not greater than 10 % of the wall thickness	Permissible if misalignment is not greater than 20 % of the wall thickness	Permissible if misalignment is not greater than 30 % of the wall thickness
5EKAA	Angular misalignment	Permissible if misalignment is not greater than 0,6°	Permissible if misalignment is not greater than 1,0°	Permissible if misalignment is not greater than 1,5°
5GAAA	Irregular width	Permissible if only occurring in isolated sections	Permissible	Permissible
5HAAA	Irregular surface	Not permissible	Not permissible	Not permissible
6BAAA	Excess weld material	Permissible if weld height is between 10 % and 30 % of the wall thickness, but not greater than 6 mm	Permissible if weld height is between 5 % and 40 % of the wall thickness, but not greater than 8 mm	Permissible if weld height is between 0 % and 50 % of the wall thickness, but not greater than 10 mm
6FAAA	Incompletely filled groove	Not permissible	Not permissible	Not permissible
7BAAA	Thermal damage	Not permissible	Not permissible	Not permissible
7GAAA	Poor restart	Not permissible	Small cross-section reductions permissible if there are no sharp transitions	Small cross-section reductions permissible if there are no sharp transitions
7VAAA	Weld intersections	Not permissible	Not permissible	Not permissible

Number	Designations	Level B	Level C	Level D
8VAAA	Transverse ripple	Permissible if only in isolated sections	Permissible	Permissible
9CAAA	Tool mark	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 0,5 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 10 % of the wall thickness and not greater than 1,0 mm	Locally permissible if bottom of notch is not acute and the notch depth is less than 15 % of the wall thickness and not greater than 2,0 mm
NOTE The data in this table can also be found in DVS 2202-1 [1].				

Table 8 Definition of quality levels for solvent welds in

pipes				
Number	Designations	Level B	Level C	Level D
1AAAA	Cracks	Not permissible	Not permissible	Not permissible
2BAAA	Gas / air cavity	Isolated cavities permissible if diameter $\leq 5\%$ of insertion length	Permissible if diameter of largest cavity $\leq 10\%$ of insertion length	Permissible if diameter of largest cavity $\leq 15\%$ of insertion length
3AAAA	Inclusion	Not permissible	Not permissible	Isolated inclusion permissible if maximum dimension is $\leq 5\%$ of insertion length
4RAAA	Compressed pipe ends (over penetration of pipe into socket)	Not permissible	Not permissible	Not permissible
4SAAA	Insufficient penetration	Permissible if inserted length is no more than 10 % less than the specified insertion length	Permissible if inserted length is no more than 10 % less than the specified insertion length	Permissible if inserted length is no more than 15 % less than the specified insertion length
5EKAA	Angular misalignment	Permissible if misalignment is not greater than 0,2°	Permissible if misalignment is not greater than 0,4°	Permissible if misalignment is not greater than 0,8°
6BAAA	Excess weld material (solvent cement)	Not permissible	Not permissible	Not permissible
6FAAA	Incompletely filled groove	Not permissible	Not permissible	Not permissible

Bibliography

- [1] DVS 2202-1, *Imperfections in thermoplastic welded joints* *Features, descriptions, evaluation*

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.

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

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 Group Headquarters

389 Chiswick High Road London W4 4AL UK



...making excellence a habit.™