BRITISH STANDARD

BS EN ISO 15976:2002

Incorporating Corrigenda Nos. 1 and 2

Closed end blind rivets with break pull mandrel and protruding head — St/St

The European Standard EN ISO 15976:2002 has the status of a British Standard

ICS 21.060.40

BSI British Standards

National foreword

This British Standard is the official English language version of EN ISO 15976:2002. It is identical with ISO 15976:2002.
BS EN ISO 15976:2002, together with BS EN ISO 14588:2001, BS EN ISO 14589:2001, BS EN ISO 15973:2000, BS EN ISO 15974:2001, BS EN ISO 15975:2002, BS EN ISO 15977:2002, BS EN ISO 15978:2002 and BS EN ISO 15979:2002, supersedes BS 7349-1:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FME/6, Rivets, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, pages ii and iii, a blank page, pages 1 to 5, the Annex ZA page, an inside back cover and a back cover.

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee and comes into effect on
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14325 Corrigendum No. 1	3 February 2003	Correction to EN ISO foreword page and addition of Annex ZA page details
15345 Corrigendum No. 2	29 November 2004	Correction to National foreword supersession details

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 15976

November 2002

ICS 21.060.40

English version

Closed end blind rivets with break pull mandrel and protrudiing head - St/St (ISO 15976:2002)

Rivets aveugles à rupture de tige à corps fermé, à tête bombée - St/St (ISO 15976:2002)

Geschlossene Blindniete mit Sollbruchdorn und Flachkopf - St/St (ISO 15976:2002)

This European Standard was approved by CEN on 14 October 2002.

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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 Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

CORRECTED 2002-12-18

Foreword

This document (EN ISO 15976:2002) has been prepared by Technical Committee ISO/TC 2 "Fasteners" in collaboration with Technical Committee CEN/TC 185 "Threaded and non-threaded mechanical fasteners and accessories", the secretariat of which is held by DIN.

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 May 2003, and conflicting national standards shall be withdrawn at the latest by May 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 15976:2002 has been approved by CEN as EN ISO 15976:2002 without any modifications.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

EN ISO 15976:2002

INTERNATIONAL STANDARD

ISO 15976

First edition
2002-11-01

Closed end blind rivets with break pull mandrel and protruding head — St/St

Rivets aveugles à rupture de tige à corps fermé, à tête bombée — St/St

Reference number
ISO 15976:2002(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15976 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

Annex A of this International Standard is for information only.

Closed end blind rivets with break pull mandrel and protruding head — St/St

1 Scope

This International Standard specifies dimensional and mechanical characteristics and application data for closed end blind rivets with break pull mandrel and protruding head, with a steel body (St) and an steel mandrel (St) and with nominal diameters, d, from 3,2 mm up to and including 6,4 mm.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3269:2000, *Fasteners — Acceptance inspection*

ISO 4042:1999, *Fasteners — Electroplated coatings*

ISO 4520:1981, *Chromate conversion coatings of electroplated zinc and cadmium coatings*

ISO 14588:2000, *Blind rivets — Terminology and definitions*

ISO 14589:2000, *Blind rivets — Mechanical testing*

3 Dimensions

3.1 General

Symbols and designations of dimensions are specified in ISO 14588.

3.2 Rivet dimensions

See Figure 1 and Table 1.

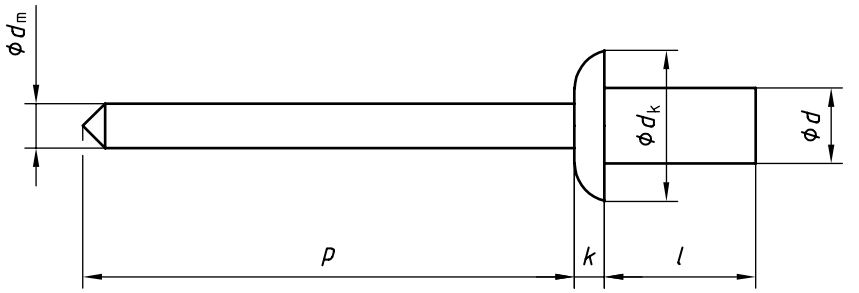


Figure 1 — Rivet dimensions

Table 1 — Rivet dimensions

Dimensions in millimetres

Rivet body	d	nom.	**3,2**	**4**	**4,8**	**6,4**
		max.	3,28	4,08	4,88	6,48
		min.	3,05	3,85	4,65	6,25
	d_k	max.	6,7	8,4	10,1	13,4
		min.	5,8	6,9	8,3	11,6
	k	max.	1,3	1,7	2	2,7
Mandrel	d_m	max.	2	2,35	2,95	3,9
	p	min.	25	25	27	27

Rivet length l		**Recommended grip ranges**[a]			
nom. = min.	max.				
6	7	0,5 to 1,5	0,5 to 1,5	—	—
8	9	1,5 to 3,0	1,5 to 3,0	0,5 to 3,0	—
10	11	3 to 5	3 to 5	3 to 5	—
12	13	5,0 to 6,5	5,0 to 6,5	5,0 to 6,5	—
15	16	—	6,5 to 10,5	6,5 to 10,5	3,0 to 6,5
16	17	—	—	—	6,5 to 8,0
21	22	—	—	—	8,0 to 12,5

NOTE The rivet body dimensions are generated from the design formulae specified in the annex A.

[a] The grip ranges of rivets with dimensions as given in Table 1, with the material combination as given in clause 4, are specified by the minimum and maximum grip lengths. The minimum grip lengths are given as a recommendation only. It may be possible to go into individual cases below the minimum values.

3.3 Clearance hole diameters

The diameters of the clearance holes (d_{h1}) to accommodate the rivet in the components to be fastened are given in Table 2.

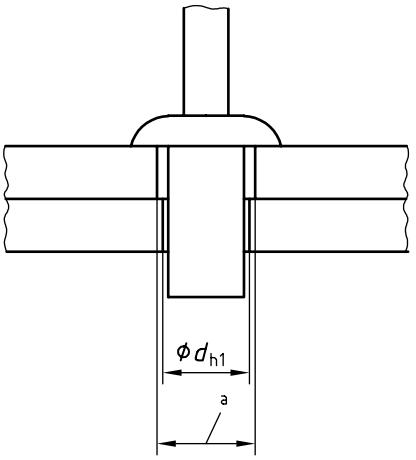
Table 2 — Clearance hole diameters

Dimensions in millimetres

d	d_{h1}	
nom.	min.	max.
3,2	3,3	3,4
4	4,1	4,2
4,8	4,9	5,0
6,4	6,5	6,6

Non-conformance to the values listed in Table 2 may result in assembly difficulties and/or reduction in the shear and tensile loads specified in Table 3.

When necessary to facilitate alignment, only the component on the access side may have a clearance hole larger than specified in Table 2 (see Figure 2). This may also result in a reduction of the shear and tensile loads specified in Table 3.



a Enlarged clearance hole

Figure 2 — Enlarged clearance hole to facilitate alignment

4 Material and finish

Blind rivets in accordance with this International Standard shall have a rivet body made of steel (St) and a mandrel made of steel (St) and shall have mechanical properties as specified in clause 5.

Material specification is at the discretion of the manufacturer.

The surface of rivet body and mandrel shall be zinc plated 5 µm minimum in accordance with ISO 4042 measured at the rivet head.

The chromate conversion coating shall be c2C in accordance with ISO 4520:1981.

The complete finish designation is then Fe/Zn5c2C.

5 Mechanical properties

The minimum shear load, minimum tensile load and maximum mandrel break load shall be as specified in Table 3 when tested in accordance with ISO 14589.

Table 3 — Mechanical properties

d nom. mm	**Shear load** min. N	**Tensile load** min. N	**Mandrel break load** max. N
3,2	1 150	1 300	4 000
4	1 700	1 550	5 700
4,8	2 400	2 800	7 500
6,4	3 600	4 000	10 500

6 Workmanship

Rivets shall be free from burrs and harmful defects and shall have well-formed heads and shanks.

After setting, rivets shall not show evidence of cracking when viewed at 5 × magnification.

7 Acceptance testing

If there is no other agreement, acceptance inspection in accordance with ISO 3269 applies.

8 Designation

EXAMPLE A closed end blind rivet, with break pull mandrel and protruding head, with nominal diameter $d = 4$ mm and nominal length $l = 12$ mm with a steel body (St) and a steel mandrel (St) is designated as follows:

Blind rivet ISO 15976 - 4 × 12 - St/St

Annex A
(informative)

Design formulae

A.1 General

Blind rivets in accordance with this International Standard comply with the following design formulae and tolerances.

A.2 Shank diameter

The maximum shank diameter complies with the formula:

$$d_{max} = d_{nom} + 0{,}08 \text{ mm}$$

The minimum shank diameter complies with the formula:

$$d_{min} = d_{nom} - 0{,}15 \text{ mm}$$

A.3 Head diameter

The maximum head diameter complies with the formula:

$$d_{k\,max} = 2{,}1\ d_{nom}$$

rounded to one decimal place.

A.4 Head diameter tolerance

The head diameter tolerance is h16 for $d_{nom} \leqslant 3{,}2$ mm and h17 for $d_{nom} > 3{,}2$ mm.

A.5 Head height

The maximum head height complies with the formula:

$$k_{max} = 0{,}415\ d_{nom}$$

rounded to one decimal place.

A.6 Clearance hole diameter

The clearance hole diameter for blind rivet application complies with the formulae:

$$d_{h1\,max} = d_{nom} + 0{,}2 \text{ mm}$$

$$d_{h1\,min} = d_{nom} + 0{,}1 \text{ mm}$$

Annex ZA
(normative)

Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

Publication	Year	Title	EN	Year
ISO 3269	2000	Fasteners - Acceptance inspection	EN ISO 3269	2000
ISO 4042	1999	Fasteners - Electroplated coatings	EN ISO 4042	1999
ISO 14588	2000	Blind rivets - Terminology and definitions	EN ISO 14588	2000
ISO 14589	2000	Blind rivets - Mechanical testing	EN ISO 14589	2000

BSI — British Standards Institution

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