

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

The European Standard EN ISO 15973:2000 has the status of a
British Standard

ICS 21.060.40

National foreword

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

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

Closed end blind rivets with break pull mandrel and protruding head - AIA/St (ISO 15973:2000)

Rivets aveugles à rupture de tige à corps fermé, à tête bombée - AIA/St (ISO 15973:2000)

Geschlossene Blindniete mit Sollbruchdorn und Flachkopf - AIA/St (ISO 15973:2000)

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Foreword

The text of the International Standard ISO 15973:2000 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of an identical text or by endorsement, at the latest by June 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 15973:2000 was approved by CEN as a European Standard without any modification.

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

INTERNATIONAL
STANDARD

ISO
15973

First edition
2000-12-15

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

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



Reference number
ISO 15973:2000(E)

Foreword

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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.

International Standard ISO 15973 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 — AIA/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 an aluminium alloy body (AIA) and a steel mandrel (St) and with nominal diameters 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 — Acceptation inspection.*

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

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

3 Dimensions

NOTE Symbols and designations of dimensions are specified in ISO 14588.

3.1 Rivet dimensions

See Figure 1 and Table 1.

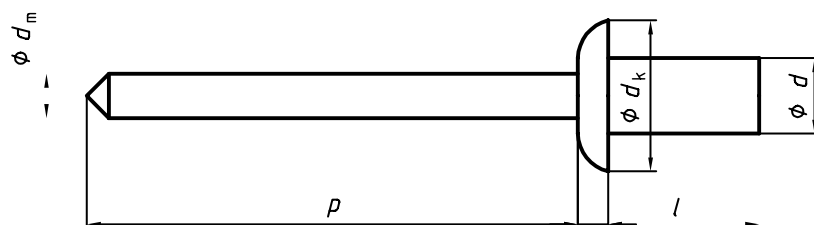


Figure 1 — Rivet dimensions

Table 1 — Rivet dimensions

Dimensions in millimetres

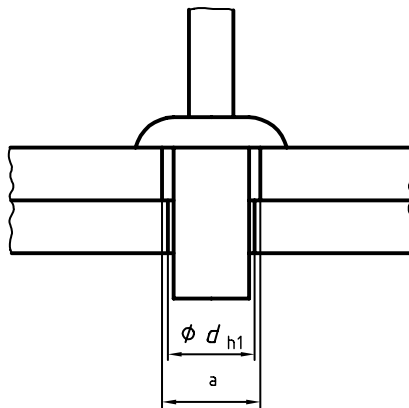
Rivet	d	nom.	3,2	4	4,8	6,4
		max.	3,28	4,08	4,88	6,48
		min.	3,05	3,85	4,65	6,25
	d_k	max.	6,7	8,4	10,1	13,4
		min.	5,8	6,9	8,3	11,6
	k	max.	1,3	1,7	2	2,7
Mandrel	d_m	max.	1,85	2,35	2,77	3,71
	p	min.	25	25	27	27
	l	nom. = min.	Recommended grip ranges ^a			
		max.				
	6,5	7,5	0,5 to 2,0			
	8	9	2,0 to 3,5	0,5 to 3,5		
	8,5	9,5	—	—	0,5 to 3,5	
	9,5	10,5	3,5 to 5,0	3,5 to 5,0	3,5 to 5,0	
	11	12	5,0 to 6,5	5,0 to 6,5	5,0 to 6,5	
	12,5	13,5	6,5 to 8,0	6,5 to 8,0	—	1,5 to 6,5
	13	14		—	6,5 to 8,0	—
	14,5	15,5		8 to 10	8,0 to 9,5	—
	15,5	16,5			—	6,5 to 9,5
	16	17			9,5 to 11,0	—
	18	19			11 to 13	—
	21	22			13 to 16	—
NOTE The rivet body dimensions are generated from the design formulae specified in annex A (informative).						
^a The grip ranges of rivets with dimensions as given in this table and 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 apply lower minimum values in certain cases.						

3.2 Clearance hole diameters

The clearance hole (d_{h1}) to accommodate the rivet in the components to be fastened is shown in Figure 2 and its diameters are given in Table 2.

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

If 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

Table 2 — Clearance hole diameters

Dimensions in millimetres

<i>d</i> nom.	<i>d_{h1}</i>	
	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

4 Material and finish

Blind rivets in accordance with this International Standard shall have a rivet body made of aluminium alloy (AlA) 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 finish shall be natural with a protection for storage.

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

<i>d</i> nom.	Shear load min.	Tensile load min.	Mandrel break load max.
mm	N	N	N
3,2	1 100	1 450	3 500
4	1 600	2 200	5 000
4,8	2 200	3 100	7 000
6,4	3 600	4 900	10 230

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 $l = 12,5$ mm with an aluminium alloy body (AIA) and a steel mandrel (St) is designated as follows:

Blind rivet ISO 15973 - 4 × 12,5 - AIA/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:

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

The minimum shank diameter complies with the formula:

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

A.3 Head diameter

The maximum head diameter complies with the formula:

$$d_{\text{kmax}} = 2,1 d_{\text{nom}}$$

rounded to one decimal place.

A.4 Head diameter tolerance

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

A.5 Head height

The maximum head diameter complies with the formula:

$$k = 0,415 d_{\text{nom}}$$

rounded to one decimal place.

A.6 Clearance hole diameter

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

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

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

Annex ZA
(normative)

Normative references to international publications with their corresponding 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 3269	2000	Fasteners - Acceptance inspection	EN ISO 3269	2000

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