



DPC: 24/30505142 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 14 November 2024

Origin: European

Latest date for receipt of comments: 07 January 2025

Project No. 2018/03400

Responsible committee: ACE/12 Aerospace fasteners and fastening systems

Interested committees:

Title: Draft BS EN 6104 BS EN 6104 Aerospace series - Rivets, solid, in aluminium or aluminium alloy - Inch series - Technical specification.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 07 January 2025

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.

Information on the co-operating organizations represented on the committees referenced above may be obtained from <https://standardsdevelopment.bsigroup.com/>.

Responsible Committee Secretary: Dr Beata Mroz-Orlikowska (BSI)

Direct tel: 020 8996 7773

E-mail: beata.mroz-orlikowska@bsigroup.com

Full document details: 24/30505142 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Aerospace series - Rivets, solid, in aluminium or aluminium alloy - Inch series - Technical specification

Série aéronautique - Rivets ordinaires en aluminium ou
en alliage d'aluminium - Série en inches - Spécification
technique

Luft- und Raumfahrt - Vollniete aus Aluminium oder
Aluminiumlegierung - Zoll-Reihe - Technische
Lieferbedingung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents		Page
European foreword		3
1	Scope.....	4
2	Normative references.....	4
3	Terms and definitions	4
4	Quality assurance	6
4.1	General.....	6
4.1.1	Approval of manufacturers	6
4.1.2	Acceptance of solid rivets	7
4.2	Acceptance inspection and test conditions	7
4.3	Use of statistical process control (SPC).....	7
5	Requirements and test methods	8
6	Records and test reports	15
7	Certificate of compliance.....	16
8	Preparation for delivery	16
8.1	General.....	16
8.2	Marking	16
8.3	Packing	16
8.4	Labelling.....	16
Annex A (informative) Record of revisions		17
Bibliography		20

European foreword

This document (prEN 6104:2024) has been prepared by ASD-STAN.

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

1 Scope

This document defines the characteristics and quality assurance requirements for solid rivets and slugs made in aluminium or aluminium alloys, inch series, for aerospace application. Following aluminium alloys are covered by this specification: 1050A-H14, 2017A-T42, 2117-T42, 5056A-H32 and 7050-T73.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 2002-001, *Aerospace series — Metallic materials — Test methods — Part 1: Tensile testing at ambient temperature*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 7870-1, *Control charts — Part 1: General guidelines*

ISO 7870-2, *Control charts — Part 2: Shewhart control charts*

ISO 7870-3, *Control charts — Part 3: Acceptance control charts*

NAS9800¹, *Head protrusion gaging, 100 ° flush head fasteners, gage block, gage diameters, and stylus*

SAE AMS2770², *Heat treatment of wrought aluminum alloy parts*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 batches

quantity of finished rivets, manufactured using the same process, from a single material cast (single heat of alloy), having the same standard number, diameter and length code, heat treated together to the same specified condition and produced as one continuous run

3.2 rivet wire sample

length of wire, sampled at each end of the coil used for the manufacture of rivets of the batch

Note 1 to entry: The rivet wire samples undergo the same heat treatments as the rivets of the batch, at the same time.

¹ Published by Aerospace Industries Association (AIA), available at: <https://www.aia-aerospace.org/>.

² Published by: Society of Automotive Engineers (SAE), available at: <https://www.sae.org/>.

3.3

rivet sample

rivet sampled at random from the batch

3.4

crack

rupture in the material, which may extend in any direction and which may be intercrystalline or transcrystalline in character

3.5

seam

longitudinal open surface defect

3.6

lap

surface defect caused by folding over metal fins or sharp corners and then forming them into the surface

3.7

cold shut

doubling over of metal, this may occur during the cold heading operation

3.8

double ring

the discontinuity is wide but shallow and open to the surface at both ends of the discontinuity

3.9

pit

small cavity in a metal surface caused by non-uniform electro deposition or by corrosion

3.10

inclusion

non-metallic particles originating from the aluminium alloy making process

Note 1 to entry: They can exist as discrete particles or strings of particles extending in a longitudinal direction.

3.11

material separation

any loss of material from preformed head induced by installation of the rivet

3.12

defect

non-fulfilment of a requirement related to an intended or specified use

3.13

major defect

defect that is likely to result in a failure or to reduce materially the usability of the considered product for its intended purpose

3.14

minor defect

defect that is not likely to reduce materially the usability of the considered product for its intended purpose, or that represents a departure from established specification having little bearing on the effective use or operation of this product