



DPC: 18 / 30386841 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

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Responsible committee: ACE/12 Aerospace fasteners and fastening systems

Interested committees:

Title: Draft BS EN 6104 Aerospace series - Rivets, solid, in aluminium or aluminium alloy - Inchseries - Technical Specification

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Responsible Committee Secretary: **Dr Beata Mroz-Orlikowska (BSI)**Direct tel: **020 8996 7773**E-mail: **beata.mroz-orlikowska@bsigroup.com**

Introduction

This draft standard is based on European discussions in which the UK has taken an active part. Your comments on this draft are welcome and will assist in the preparation of the consequent British Standard. Comment is particularly welcome on national, legislative or similar deviations that may be necessary.

Even if this draft standard is not approved by the UK, if it receives the necessary support in Europe, the UK will be obliged to publish the official English Language text unchanged as a British Standard and to withdraw any conflicting standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

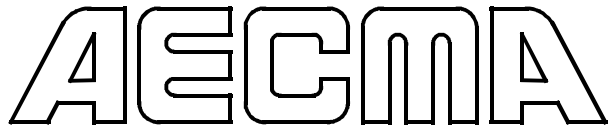
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Template for comments and secretariat observations

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



prEN 6104

Edition : Airbus
agreed v. P3

Date: 06.10

STUDY:

STAGE :

Ref. :

Superseding Ref. :

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

Master document : ☒ en ☐ fr ☐ de

Sponsor : Airbus Industrie TF3/WG1

THE EUROPEAN ASSOCIATION OF AEROSPACE INDUSTRIES - STANDARDIZATION
Gulledelle 94, B - 1200 Bruxelles Tel. : (32) 2 775 8110 Fax. : (32) 2 775 8111

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1 Scope

This standard 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

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).

AMS 2770	Heat treatment of wrought aluminium alloy parts ¹⁾
EN 2114	Aerospace series – Aluminium 1050A-H14 – Wire for solid rivets – $D \leq 10\text{mm}$ ²⁾
EN 2115	Aerospace series – Aluminium alloy 2117-T42 – Wire for solid rivets – $D \leq 10\text{mm}$ ²⁾
EN 2116	Aerospace series – Aluminium alloy 2017A-T42 – Wire for solid rivets – $D \leq 10\text{mm}$ ²⁾
EN 2117	Aerospace series – Aluminium alloy AL-P5056A (5056A) -H32 – Wire for solid rivets – $D \leq 10\text{mm}$ ²⁾
EN 3115	Aerospace series – Aluminium alloy 7050-T73 – Wire for solid rivets – $D \leq 10\text{mm}$ ²⁾
EN 9100	Aerospace series - Quality management systems - Requirements (based on ISO 9001:2000) and Quality systems - Model for quality assurance in design, development, production, installation and servicing (based on ISO 9001:1994)
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 plans indexed by acceptable quality level (AQL) for lot-by-lot inspection ³⁾
ISO 7870	Control charts – General guide and introduction ³⁾
ISO 7966	Acceptance control charts ³⁾
ISO 8258	Shewhart control charts ³⁾
ISO/TR 13425	Guide for the selection of statistical methods in standardisation and specification ³⁾
ASTM B 193	Standard Test Method for Resistivity of Electrical Conductor Materials ⁴⁾
ASTM B 565	Standard test method for shear testing of aluminum and aluminum alloy rivets and cold-heading wire and rods ⁴⁾
ASTM D 3951	Standard Practice for Commercial Packing ⁴⁾
ASTM E 112	Standard test methods for determining average grain size ⁴⁾
ASTM G 110	Standard practice for evaluating intergranular corrosion resistance of heat treatable aluminium alloys by immersion in sodium chloride and hydrogen peroxide solution ⁴⁾
NAS9800	Head Protrusion Gaging, 100 ° Flush Head Fasteners, Gage Block, Gage Diameters, and Stylus ⁵⁾

¹⁾ Published by: Society of Automotive Engineers (SAE), (www.sae.org)

²⁾ Published as ASD-STAN Prestandard at the date of publication of this standard by: Aerospace and Defence Industries Association of Europe –Standardisation (ASD-STAN), (www.asd-stan.org)

³⁾ Published by: International Organisation for Standardisation (ISO), (www.iso.org)

⁴⁾ Published by: American Society for Testing and Materials (ASTM), (www.astm.org)

⁵⁾ Published by: Aerospace Industries Association / National Aerospace Standards (AIA / NAS), (www.aia-aerospace.org)

3 Definitions

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

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: The rivet wire samples must undergo the same heat treatments as the rivets of the batch, at the same time.

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. They may 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

A defect is a non-fulfillment of a requirement related to an intended or specified use.

3.13 Major defect

A 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.

3.15 Hydrogen porosity (high temperature oxidation)

Racks and fixtures used shall be constructed to preclude entrapment of water. Ammonium fluoroborate or equivalent should be used in air furnace as necessary.

3.16 Blistering

Defect in the metal on or near the surface, resulting from expansion of gas or entrapped lubricant from forging process in a sub-surface zone.

3.17 Eutectic melting

Mixture of different phases with eutectic composition, which melts below the solidus temperature of the alloy. Eutectic melting is characterised by small rosettes in the microstructure or by outlined grain boundaries, particularly at triple intersections. It may occur when raw material is not homogenized or worked properly.

3.18 Intergranular corrosion

A selective corrosion attack along grain boundaries or closely adjacent regions without appreciable attack of the grains.

3.19 Sampling plan

Plan according to which one or more samples are taken from a batch in order to do acceptance tests to demonstrate conformity of the batch.

3.20 Acceptable quality level (AQL)

Maximum percent defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average.

NOTE: Variant: quality level, which in a sampling plan corresponds to a specified but relatively high probability of acceptance.