SLOVENSKI STANDARD
SIST EN 6099:2021

01-junij-2021

Aeronavtika - Končnik, zglobni drsni ležaj, kovina-kovina - Tehnična specifikacija

Aerospace series - Rod-end, spherical, plain bearing, metal to metal - Technical specification

Luft- und Raumfahrt - Ösenkopf mit Gelenklager, Metall auf Metall - Technische Lieferbedingungen

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Série aérospatiale - Embouts à rotule lisses en acier, métal à métal - Spécification technique

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Ta slovenski standard je istoveten z: **EN 6099:2021**

ICS:

21.100.10	Drsni ležaji	Plain bearings
49.035	Sestavni deli za letalsko in vesoljsko gradnjo	Components for aerospace construction

SIST EN 6099:2021 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 6099

March 2021

ICS 49.035

English Version

Aerospace series - Rod-end, spherical, plain bearing, metal to metal - Technical specification

Série aérospatiale - Embout à rotule lisse, métal à métal - Spécification technique

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN 6099:2021) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

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

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of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This document is published at edition P2. Former editions P1 draft may exist for Airbus development only but without any ASD-STAN official publication. In consequence configuration management discrepancies with these unofficial documents are under Airbus responsibility.

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1 Scope

This document specifies the required characteristics, inspections and test methods, quality assurance, conditions for qualification, acceptance and delivery of rod-ends with self-aligning bearings metal to metal designed to withstand slight swivelling under load. They are intended for use in fixed or moving parts of the aircraft structure and their control mechanisms.

This document is applicable to all rod-ends with self-aligning bearings metal to metal. It may be applied when referred to in a product standard or in a design specification.

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 2335, *Aerospace series — Bearings, spherical plain in corrosion resisting steel without assembly slot — Dimensions and loads*

EN 2337:2006, *Aerospace series — Spherical plain bearings — Technical specification*

EN 2424, *Aerospace series — Marking of aerospace products*

EN 4265, *Aerospace series — Bearing spherical plain, metal to metal in corrosion resisting steel — Wide series — Dimensions and loads — Inch series*

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EN 6046, *Aerospace series — Bearing, spherical, plain, in corrosion resisting steel — Narrow series — Dimensions and loads — Inch series*

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EN 6097, *Aerospace series — Bearing, spherical plain, metal to metal, extra wide inner ring in corrosion resisting steel — Dimensions and loads — Inch series*

ISO 3161, *Aerospace — UNJ threads — General requirements and limit dimensions*

ISO 5855-1, *Aerospace — MJ threads — Part 1: General requirements*

TR 4475, *Bearings and mechanical transmissions for airframe applications — Vocabulary*[1]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in TR 4475 apply.

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

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

[1] Published as ASD-STAN Technical Report at the date of publication of this standard by AeroSpace and Defence Industries Association of Europe – Standardization (ASD-STAN) (www.asd-stan.org).

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3.1
rod-end with self-aligning bearing
rod-end in which a self-aligning bearing to EN 4265, EN 6097, EN 2335 or EN 6046 is mechanically swaged into position on the threaded shank, which may have a longitudinal groove for the locking device

3.2
production batch
rod-ends of the same type, the same dimensions and from the same material batch, specified by the same product standard

3.3
delivery batch
rod-ends with the same identity block, which may come from different production batches

3.4
internal clearances

3.4.1
radial
total value of possible radial displacements of the inner ring in relation to the rod-end and body

3.4.2
axial
total value of possible axial displacements of the inner ring in relation to the rod-end and body

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4 Required characteristics, inspections and test methods

According to Table 1.

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Table 1 — Required characteristics, inspections and test methods *(1 of 3)*

Sub-clause	Characteristics	Requirements	Inspections and test methods	Q[a]	A[b]
4.1	Materials	In accordance with the product standards or design documentation.	Chemical analysis or certificate of conformity issued by semi-finished products manufacturer	X	X
4.2	Dimensions and tolerances	In accordance with the product standards or design documentation.	Suitable measuring instruments	X	X
4.3	Masses	In accordance with the product standards or design documentation.	Suitable methods	X	
4.4	Marking	In accordance with relevant product standards per EN 2424.	Visual examination	X	X
4.5	Surface appearance				
4.5.1	of rod-end body	No surface discontinuity except those permitted in 4.9.	Magnetic inspection[c] or dye penetrant inspection	X	X
4.5.2	of complete rod-end	The bearing shall be correctly swaged into position. There shall be no cracks in the swaging groove area.	Visual check using ×10 magnification		X
			Magnetic or dye penetrant inspection.	X	

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Table 1 — Required characteristics, inspections and test methods *(2 of 3)*

Sub-clause	Characteristics	Requirements	Inspections and test methods	Q[a]	A[b]
4.6	Hardness	In accordance with the product standards or design documentation.	Suitable processes[c] and measuring Instruments.	X	X
4.7	Surface roughness	In accordance with the product standards or design documentation.	Suitable measuring instruments or visual-tactile samples.	X	X
4.8	Lubrication	In accordance with the product standards or design documentation. The dry lubricant shall be compatible with the code A or code B grease (according to EN 2337:2006, Annex C) which may be used in accordance with the product standards or design documentation.	Visual examination		X
			— Suitable method	X	
4.9	Surface treatment	In accordance with the product standards or design documentation.	— Visual inspection — As per surface treatment standard	X	X
4.10	Longitudinal grooves	Shall not change the thread function.	Visual and threaded gauge	X	X
4.11	Thread discontinuities	Thread tapping shall conform with product standards. — No discontinuity below effective diameter. — No discontinuities greater than 20 % of height of base thread are allowed above effective diameter (according to Figure 2). — No surface irregularities greater than 20 % of the height of the base thread are permitted on crest of threads (according to Figure 1).	Visual examination[c] Examination of micrographic[c] section for: — qualification: on finished parts — acceptance: by sampling during manufacture	X	X
4.12	Internal clearances: — radial — axial	— In accordance with the product standards or design documentation	According to Annex C	X	X
4.13	Permissible static loads: — radial C_s:	In accordance with the product standards. The permanent deformation after removing the load shall be not more than 0,07 mm (according to Annex A and EN 2337)	According to Annex A	X	

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Table 1 — Required characteristics, inspections and test methods *(3 of 3)*

Sub-clause	Characteristics	Requirements	Inspections and test methods	Q[a]	A[b]
4.14	Ultimate static loads: — radial	In accordance with the product standards. After the removal of loads, there shall be no cracks or deterioration of the rod-end.	According toAnnex A	X	
4.15	Axial static proof load	In accordance with the product standards. After removing the load, no permanent displacement of the bearing in the rod-end greater than 0,10 mm – in both directions – is permitted.	According to Annex B	X	
4.16	Fatigue radial loads	In accordance with product standards or design documentation. After the removal of fatigue loads, there shall be no cracks or deterioration of the rod-end.	According to Annex D	X	
4.17	Behaviour in rotation and swiveling	The bearings shall be able to move freely within the angular limits specified in the product standard or design documentation for swivelling.	Manual inspection	X	X

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a Q = Qualification test

b A = Acceptance test

c These inspections shall be made in the absence of surface treatment, which, for the purpose of qualification, may be removed by a chemical process.

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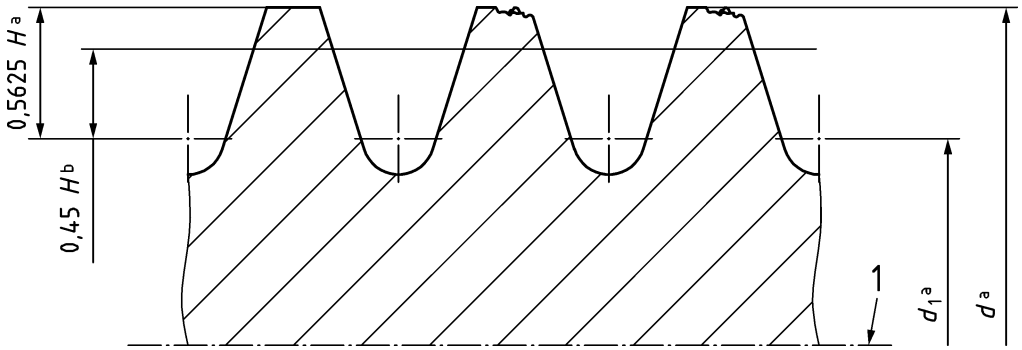

Key

1 Rod-end axis

a According to ISO 3161 (or ISO 5855-1)

b No discontinuity in this area

Figure 1 — Discontinuities on crest of thread

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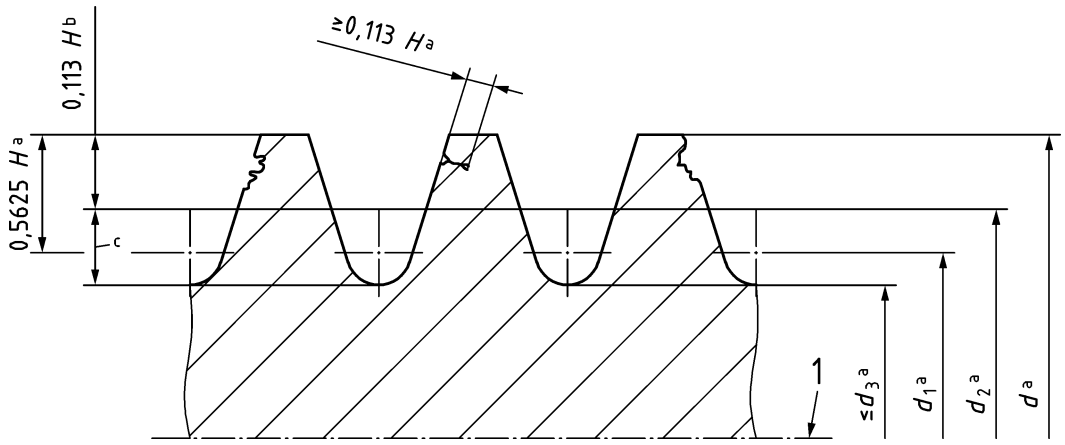

Key

1 Rod-end axis

a According to ISO 3161 (or ISO 5855-1)

b Area where discontinuities not exceeding 0,113 H are tolerated

c No discontinuity in this area

Figure 2 — Discontinuity on thread flank

5 Product qualification plan

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According to Table 2 and Table 3.

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The manufacturer shall obtain qualification for each type of rod-end and for all the dimensions indicated in the standards.

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Table 2 — Non-destructive inspections and tests to be carried out for qualification

Type of inspections and tests[a]	Specified in	Serial No. of inspected samples					
		1	2	3	4	5	6
Materials	4.1	X	X	X	X	X	
Dimensions and tolerances	4.2	X	X	X	X	X	
Masses	4.3	X	X	X	X	X	
Marking	4.4	X	X	X	X	X	
Surface appearance of rod-end body	4.5.1	X	X	X	X	X	X
Surface appearance of complete rod-end	4.5.2	X	X	X	X	X	X
Hardness	4.6	X	X				
Surface roughness	4.7				X	X	X
Lubrication	4.8	X	X	X	X	X	
Surface treatment	4.9				X	X	
Longitudinal grooves	4.10	X	X	X	X	X	
Internal clearances	4.12	X	X	X	X	X	
Test of bearing axial static proof load	4.15	X	X	X	X	X	
Behaviour in rotation and swivelling	4.17	X	X	X	X	X	

[a] The order of the non-destructive inspections and tests is left to the initiative of the qualification authority.