



SLOVENSKI STANDARD

SIST EN 4560:2015

01-oktober-2015

Nadomešča:
SIST EN 4560:2004

Aeronavtika - Cevni priključek 37°, kroglast, do 21 000 kPa - Colska izvedba - Tehnična specifikacija

Aerospace series - Pipe coupling 37°, spherical up to 21 000 kPa - Inch series - Technical specification

Luft- und Raumfahrt - Rohrverschraubung 37° mit Kugelbuchse, bis 21 000 kPa - Inch-Reihe - Technische Lieferbedingungen

Série aérospatiale - Système de raccordement sphérique 37°, jusqu'à 21 000 kPa - Série inch - Spécification technique

Ta slovenski standard je istoveten z: EN 4560:2015

ICS:

49.080

Letalski in vesoljski
hidravlični sistemi in deli

Aerospace fluid systems and
components

SIST EN 4560:2015

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 4560:2015

<https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-f30dfecfa76/sist-en-4560-2015>

EUROPEAN STANDARD

EN 4560

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2015

ICS 49.080

Supersedes EN 4560:2003

English Version

Aerospace series - Pipe coupling 37°, spherical up to 21 000 kPa - Inch series - Technical specification

Série aéronautique - Système de raccordement sphérique
37°, jusqu'à 21 000 kPa - Série inch - Spécification
technique

Luft- und Raumfahrt - Rohrverschraubung 37° mit
Kugelbuchse, bis 21 000 kPa - Inch-Reihe - Technische
Lieferbedingungen

This European Standard was approved by CEN on 10 January 2015.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

[SIST EN 4560:2015](https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-f30dfecfa76/sist-en-4560-2015)

<https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-f30dfecfa76/sist-en-4560-2015>



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

| | Page |
|---|-----------|
| European foreword | 3 |
| 1 Scope | 4 |
| 2 Normative references | 4 |
| 3 Terms and definitions | 5 |
| 3.1 Pressure..... | 5 |
| 3.2 Coupling and assembling | 5 |
| 3.3 Surface defects | 6 |
| 3.4 Quality assurance | 6 |
| 4 Requirements, inspection and test methods | 7 |
| 4.1 Test conditions and preparation of specimens for qualification..... | 7 |
| 4.1.1 Test fluids | 7 |
| 4.1.2 Specimen preparation | 7 |
| 4.1.3 Pipe assembly | 8 |
| 5 Quality assurance | 13 |
| 5.1 Product qualification | 13 |
| 5.2 Quality control records | 13 |
| 5.3 Acceptance conditions | 13 |
| 5.3.1 Classification of defects | 13 |
| 5.3.2 Level of inspection | 14 |
| 5.4 Rejection | 14 |
| 5.5 Purchaser's (user's) quality control..... | 14 |
| 6 Preparation for delivery | 16 |
| 6.1 Cleaning..... | 16 |
| 6.2 Preservation and packaging..... | 16 |
| Annex A (informative) Standard evolution form..... | 17 |

European foreword

This document (EN 4560:2015) 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 European 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 January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

This document supersedes EN 4560:2003.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

(standards.iteh.ai)

[SIST EN 4560:2015](https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-f30dfecfa76/sist-en-4560-2015)

<https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-f30dfecfa76/sist-en-4560-2015>

EN 4560:2015 (E)**1 Scope**

This European Standard specifies the required characteristics, inspection and test methods, quality assurance and procurement requirements for inch series, pipe coupling, 37°, spherical, for temperature ranges from type II to type V according to ISO 6771 and nominal pressure up to 21 000 kPa.

In addition to the requirements of this technical specification, the coupling assemblies shall be qualified in accordance with equipment or component specification requirements.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 2951, *Metallic materials — Test method — Micrographic determination of content of non-metallic inclusions* ¹⁾

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

EN 10204, *Metallic products — Types of inspection documents*

EN ISO 1302, *Geometrical Product Specification (GPS) — Indication of surface texture in technical product documentation (ISO 1302)*

ISO 2685, *Aircraft — Environmental test procedure for airborne equipment — Resistance to fire in designated fire zones*

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 6771, *Aerospace — Fluid systems and components — Pressure and temperature classifications*

ISO 6772, *Aerospace — Fluid systems — Impulse testing of hydraulic hose, tubing and fitting assemblies*

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment*

ISO 8625-1, *Aerospace — Fluid systems — Vocabulary — Part 1: General terms and definitions related to pressure*

TR 2674, *Aerospace series — Design and construction of pipelines for fluids in liquid or gaseous condition — Rigid lines, installation* ²⁾

MIL-L-23699, *Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number O-156* ³⁾

¹⁾ Available on ASD-STAN website (<http://www.asd-stan.org/>).

²⁾ Published as ASD-STAN Technical Report at the date of publication of this European Standard (<http://www.asd-stan.org/>).

³⁾ Published by : Department of Defense (DoD), the Pentagon, Washington, D.C. 20301, US (<http://www.defenselink.mil/>).

3 Terms and definitions

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

3.1 Pressure

nominal pressure, proof pressure, impulse pressure, burst pressure according to Table 1 below.

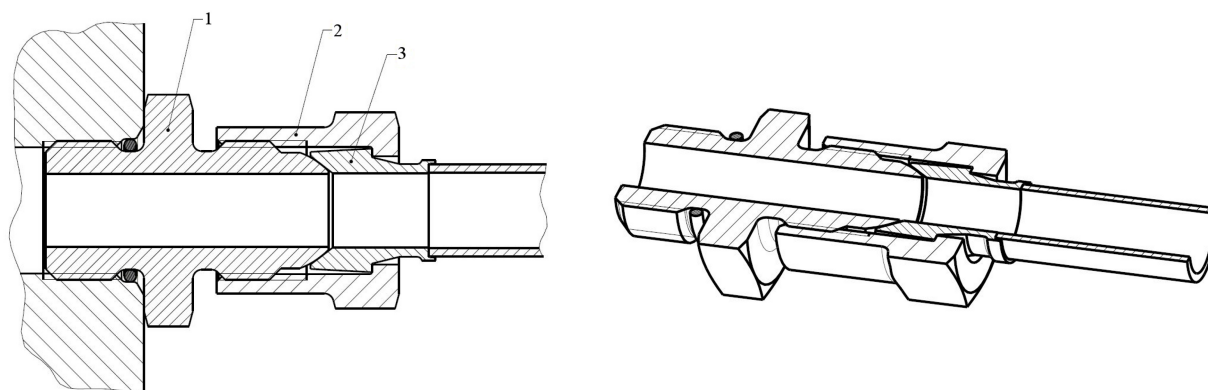
Table 1

| Dimensional code | Nominal diameter mm | Wall thickness 0,71 mm | | | | Wall thickness 0,89 mm | | | |
|------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|--------------------------|------------------------|
| | | Nominal pressure bars | Proof pressure bars | Impulse pressure bars | Burst pressure bars | Nominal pressure bars | Proof pressure bars | Impulse pressure bars | Burst pressure bars |
| 03 | 4,76 | 210 | 420 | 210 | 840 | 210 | 420 | 210 | 840 |
| 04 | 6,35 | | | | | | | | |
| 05 | 7,92 | | | | | | | | |
| 06 | 9,52 | 160 | 270 | | 540 | | 360 | | 720 |
| 08 | 12,70 | 105 | 210 | 105 | 420 | 160 | 270 | 105 | 540 |
| 10 | 15,87 | | 180 | | 360 | | 210 | | 420 |
| 12 | 19,05 | | 140 | | 280 | | 180 | | 360 |
| 16 | 25,40 | 40 | 105 | 40 | 210 | | 140 | | 280 |

3.2 Coupling and assembling

3.2.1

coupling assembly <https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-60019e5611e4/4560>
assembled nut, ferrule and pipe mating with e.g. nipple, union, elbow, see Figure 1



Key

- 1 Straight union
- 2 Nut
- 3 Ferrule

Figure 1 — Example of coupling assembly

EN 4560:2015 (E)**3.2.2****dimensional code**

corresponds to the nominal diameter given in 16th of inches within two digits

3.2.3**snug**

moment when positive resistance to rotation is observed during assembling

3.3 Surface defects**3.3.1****surface irregularity**

nonconformity with general surface appearance, possible defect

3.3.2**crack**

clean (crystalline) fracture passing through or across the grain boundaries that possibly follows inclusions of foreign elements. Cracks are normally caused by overstressing the metal during forging or other forming operations, or during heat treatment. Where parts are subject to significant reheating, cracks are usually discoloured by scale

3.3.3**fold**

doubling over of metal, which can occur during the forging operation. Folds can occur at or near the intersection of diameter changes and are especially prevalent with non-circular necks, shoulders and heads.

3.3.4**lap**

fold-like machining defect

3.3.5**seam**

- (1) usually a surface opening or crack resulting from a defect obtained during casting or forging
 (2) extraneous material, stringer in the material, which is not homogeneous with base metal

3.3.6**pit**

void or hole in the surface as caused, for example, by corrosion

3.4 Quality assurance**3.4.1****production batch**

definite quantity of some commodity or service produced at one time under conditions that are presumed uniform

3.4.2**delivery batch**

batch consisting of couplings with the same identity block which may come from different production batches

3.4.3**acceptance quality limit****AQL**

when a continuing series of lots is considered, a quality level which for the purposes of sampling inspection is the limit of a satisfactory process average

3.4.4**qualification**

testing required to demonstrate successful performance of the coupling assembly in simulated service (overload, destructive and fatigue tests)

3.4.5**major defect**

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

3.4.6**minor defect**

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

4 Requirements, inspection and test methods

See Table 2 and Table 3.

Qualification tests given from 4.12 to 4.15 shall only be made when required. Complementary qualification tests may be determined in direct relation with the application (e.g. vibration test, thermal shock test).

The coupling shown on the figures of this European Standard are for information only. The test specimens shall be assembled with the part to test (e.g. elbow fitting instead of straight fitting).

Non removable coupling (e.g. welded elbow, welded reducer) shall be tested on sample pipes in combination with removable (threaded) couplings

4.1 Test conditions and preparation of specimens for qualification**4.1.1 Test fluids**

<https://standards.iteh.ai/catalog/standards/sist/ea3c9cde-23a3-4ce8-a37b-b30dfecfa76/sist-en-4560-2015>

Unless otherwise specified, tests shall be carried out using e.g. oil compatible with the test temperature range. Water may be used, whenever practical, for proof, burst, stress corrosion and re-use capability testing.

4.1.2 Specimen preparation

Shaped parts shall be machined with the grain flow of the bar or plate in the direction of the fluid. Installations on the coupling shall be in accordance with TR 2674. The coupling shall not be lubricated prior the first assembling. For the next assembling they shall be lubricated with engine oil (e.g. according to MIL-L-23699) at the interface between the nut and the ferrule.

Prior to testing, and unless otherwise specified, all couplings with dimensional code up to 12 shall be assembled using either of the following methods. For couplings with dimensional code greater than 12 the assembling shall be made by using the torque tightening method:

— torque tightening method:

A torque value comprised between the minimum and the maximum given in Table 4 shall be applied to the nut per TR 2674.

— angle tightening method:

The following sequence shall be applied:

- 1) tighten the nut with a wrench to snug;
- 2) turn the nut an additional 60° [see Figure 2 a)];