SLOVENSKI STANDARD
SIST EN 4832:2018

01-oktober-2018

Aeronavtika - Adapter, cevni navojni priključek 24°, konica do 35 000 kPa (5080 psi), navojni priključek z zapornim obročem in njegovim reduktorjem - Palčne mere - Tehnična specifikacija

Aerospace series - Adaptor, Pipe coupling 24° Cone up to 35 000 kPa (5 080 psi) Ring-locked fitting and Ring-locked fitting-reducer - Inch Series - Technical specification

Luft- und Raumfahrt - Adapter Rohrverschraubung 24° Konus bis 35 000 kPa (5 080 psi) Anschlussverschraubung mit Sicherungsring und Reduzierer - Inch-Reihe - Technische Lieferbedingung

Série aérospatiale - Adapteur Système de raccordement interface conique 24° jusqu'à 35 000 kPa (5 080 psi) Raccords à implanter avec bague de sécurite (normal et de reduction) - Série inch - Spécification technique

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ICS:

49.080	Letalski in vesoljski hidravlični sistemi in deli	Aerospace fluid systems and components

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This European Standard was approved by CEN on 3 December 2017.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 4832:2018) 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of an identical text or by endorsement, at the latest by January 2019, and conflicting national standards shall be withdrawn at the latest by January 2019.

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.

Introduction

This European Standard is co-owned standard and a functional equivalent of AS5000. There should be no technical objection to use AS5000 as replacement of EN 4832 parts. Further revisions to this standard shall be coordinated with the SAE committee.

European Standards use the International System of units (SI); however, large segments of the aerospace industry make use of other measurement systems as a matter of common working practice. All dimensions and units used in this Standard are given in SI units, with other units also indicated for the convenience of the user.

The decimal sign used in European Standards is the comma (“,”); however, the comma is not used in common working practice with non-SI dimensions. Therefore, in common with many other aerospace standards, the decimal point (“.”) is used in this Standard when providing dimensions in inch-pound units.

NOTE The use of non-SI units and the decimal point in this Standard does not constitute general acceptance of measurement systems other than SI within European Standards.

1 Scope

This specification establishes the requirements for ring locked fitting assemblies according to EN 4833 and EN 4836, for use in aircraft systems at nominal operating pressure of 35 000 kPa (5 080 psi) maximum and temperature range of −54 °C to +135 °C (−65 °F to +275 °F).

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 2424, *Aerospace series — Marking of aerospace products*

EN 3311, *Aerospace series — Titanium alloy TI-P64001 (Ti-6Al-4V) — Annealed — Bar for machining D < 110 mm*

EN 3314, *Aerospace series — Titanium alloy TI-P64001, solution treated and aged; bar for machining D ≤ 75 mm*

EN 4833, *Aerospace series — Pipe coupling 24° Cone up to 35 000 kPa (5 080 psi) Ring-locked fitting — Flared End — Inch Series — with Extra Fine Thread Pitch* [1)]

EN 4834, *Aerospace series — Adaptor, Pipe coupling 24° Cone up to 35 000 kPa (5 080 psi) Port for Ring locked fitting — Inch Series — Geometric configuration* [1)]

EN 4836, *Aerospace series — Adaptor, Pipe coupling 24° Cone up to 35 000 kPa (5 080 psi) Ring-locked fitting Reducer — Flared End — with Extra Fine Thread Pitch — Inch Series* [1)]

EN 6102, *Aerospace series — Fluid, Hydraulic, Phosphate ester-base, fire resistant — Technical specification* [1)]

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

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

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

ISO 4287, *Geometrical Product Specification (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

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

ISO 6773, *Aerospace — Fluid systems — Thermal shock testing of piping and fittings*

ISO 7137:1995, *Aircraft — Environmental conditions and test procedures for airborne equipment*

ISO 7257, *Aircraft — Hydraulic tubing joints and fittings — Rotary flexure test*

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1) Published as ASD-STAN-Prestandard at the date of publication of this European Standard (www.asd-stan.org).

ISO 10583:1993, *Aerospace fluid systems — test methods for tube/fitting assemblies*

ISO 11218:1993, *Aerospace — Cleanliness classification for hydraulic fluids*

AMS 2486, *Conversion coating of titanium alloys fluoride-phosphate type*[2)]

AMS 2488, *Anodic treatment — titanium and titanium alloys solution pH 13 or higher*[2)]

AMS 2700, *Passivation of corrosion resistant steels*[2)]

AMS 5643, *Steel, corrosion-resitant, bars, wire, forgings, mechanical tubing, and rings 16Cr — 4.0Ni — 0.30Cb (Nb) — 4.0Cu solution heat treated, precipitation hardenable*[2)]

AMS 5659, *Steel, corrosion-resistant, bars, wire, forgings, rings, and extrusions 15Cr — 4.5Ni — 0.30Cb (Nb) — 3.5Cu*[2)]

AMS 5731, *Steel, corrosion and heat resistant, bars, forgings, tubing, and rings 15Cr 25.5Ni 1.2Mo 2.1Ti 0.006B 0.30V, consumable electrode melted, 1 800 °F (982 °C) solution heat treated*[2)]

AMS 5732, *Steel, corrosion and heat restant, bars, wire, forgings, tubing and rings 15Cr 25.5Ni 1.2Mo 2.1Ti 0.006B 0.30V consumable electrode melted, 1 800 °F (982 °C), solution and precipitation heat treated*[2)]

AMS 5734, *Steel, corrosion and heat resistant, bars, forgings, and tubing 15Cr 25.5Ni 1.2Mo 2.1Ti 0.006B 0.30V, consumable electrode melted, 1 650 °F (899 °C) solution heat treated*[2)]

AMS 5737, *Steel, corrosion and heat resistant, bars, wire, forgings and tubing 15Cr 25.5Ni 1.2Mo 2.1Ti 0.006B 0.30V, consumable electrode melted, 1 650 °F (899 °C), solution and precipitation heat treated*[2)]

AMS 5743, *Steel, corrosion and heat-resistant, bars, and forging 15.5Cr — 4.5Ni — 2.9Mo — 0.10N solution heat treated, sub-zero cooled, equalized, and over-tempered*[2)]

AMS-QQ-A-225/9, *Aluminium alloy 7075, bar, rod, wire, and special shapes; rolled, drawn or cold finished*[2)]

AS 5620, *Titanium hydraulic tubing, Ti-3Al-2.5V cold worked and stress relieved, up to 35 000 kPa (5 080 psi), requirements for qualification testing and control*[2)]

2) Published by: SAE International (www.sae.org).

3 Technical Requirements

3.1 System Description

3.1.1 Hydraulic pressures

3.1.1.1 High pressure lines

Nominal pressure: 35 000 kPa (5 080 psi)

Maximum pressure: 42 000 kPa (6 091 psi) ⇔ relief valve setting

Intermediate pressure: 450 kPa (65 psi) ⇔ hydraulic reservoir pressure

Minimum pressure: atmospheric pressure ⇔ depressurised system

3.1.1.2 Low pressure lines

Minimum pressure: atmospheric pressure ⇔ depressurised system

Nominal pressure: 6 900 kPa (1 000 psi) up to dash 24

3.1.1.3 Suction Lines

Nominal pressure: 1 520 kPa (220 psi)

Minimum pressure: 21 kPa absolute (3 psi) ⇔ pump suction lines

3.1.2 Environmental conditions

3.1.2.1 Hydraulic pressures:

Proof pressure: 2 × nominal pressure[3)]

Burst pressure: 4 × nominal pressure[3)]

Air ambient temperature (outside engine and nacelle area)

Normal operating conditions:	−40 °C to +94 °C	(−40 °F to +201 °F)
Extreme operating conditions:	−54 °C to +135 °C	(−65 °F to +275 °F)
Storage conditions:	−54 °C to +85 °C	(−65 °F to +185 °F)
Survival conditions:	−60 °C to +135 °C	(−76 °F to +275 °F)

3) Nominal pressure according to 3.1.1.1 High pressure lines.

Air ambient temperature in engine and nacelle area

Normal operating conditions:	−40 °C to +170 °C	(−40 °F to +338 °F)
Extreme operating conditions:	−54 °C to +200 °C	(−65 °F to +392 °F)
Storage conditions:	−54 °C to +85 °C	(−65 °F to +185 °F)
Survival conditions:	−60 °C to +200 °C	(−76 °F to +392 °F)

Hydraulic fluid temperature (outside engine and nacelle area)

Normal operating conditions:	−40 °C to +110 °C	(−40 °F to +230 °F)
Extreme operating conditions:	−54 °C to +135 °C	(−65 °F to +275 °F)
Storage conditions:	−54 °C to +85 °C	(−65 °F to +185 °F)
Survival conditions:	−60 °C to +135 °C	(−76 °F to +275 °F)

Hydraulic fluid temperature in engine and nacelle area

Normal operating conditions:	−40 °C to +120 °C	(−40 °F to +248 °F)
Extreme operating conditions:	−54 °C to +135 °C	(−65 °F to +275 °F)
Storage conditions:	−54 °C to +85 °C	(−65 °F to +185 °F)
Survival conditions:	−60 °C to +150 °C	(−76 °F to +300 °F)

3.1.3 Hydraulic architecture

See Table 1.

Table 1 — size code of lines

High pressure lines	04	06	08	10	12	16	20	—
Low pressure lines	04	06	08	10	12	16	20	24
Suction lines	08	10	12	16	20	24	32	—

3.1.4 Hydraulic fluid

Type IV or V fire resistant phosphates ester based fluid in accordance with EN 6102.

3.1.5 Reliability

Plug-in unions shall be designed for the aircraft life duration:

140 000 flight hours/19 000 flight cycles/25 years, whichever comes first.

3.1.6 Maintainability

During the aircraft life, the plug-in unions will not need any maintenance and shall stay without leakage or seepage.

The use of "locked" plug-in unions shall be considered in order to:

— eliminate the risk of adapter rotation in the port at tubing connection/disconnection (overtightening or loosing) in order to prevent the risk of a port damage or hydraulic leakage;

— enable tubing connection/disconnection with one hand and one tool.

3.1.7 Particular conditions

Plug-in unions shall be:

— electrically conductive;

— designed to prevent jamming risk;

— corrosion resistant;

— galvanic corrosion resistant;

— designed with parts which cannot be lost during installation and maintenance phases;

— fire resistant (5 min) or fire proof (15 min), if required;

— UV resistant.

3.2 Design and construction

3.2.1 Materials and surfaces protection

Fittings shall be fabricated of materials listed in Table 2 and in compliance with requirements in this specification or as specified on the applicable part standard drawings.

Table 2 — Plug-in union materials

Plug-in union
Titanium alloy Ti6Al-4V according to EN 3311 and EN 3314[a]
Steel 17 – 4 PH according to AMS 5643
Steel 15 – 5 PH according to AMS 5659 or AMS 5743
Steel A 286 according to AMS 5731 or AMS 5732 or AMS 5734 or AMS 5737
Aluminium alloy 7075T73 per AMS-QQ-A-225/9 only for large sizes from –24 to –32

[a] Standards are equivalent to AMS 4928 or AMS 4965 or AMS 4967.