SLOVENSKI STANDARD
SIST EN 3079:2009

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Aeronavtika - Cevni priključ ek 8Á30' do 28 000 kPa - Adapterji - Metrska serija - Tehniļ na specifikacija

Aerospace series - Pipe coupling 8°30' up to 28 000 kPa - Adaptors - Metric series - Technical specification

Luft- und Raumfahrt - Rohrverschraubung 8°30' bis 28 000 kPa - Anschlussverschraubungen - Metrische Reihe - Technische Lieferbedingungen

Série aérospatiale - Système de raccordement 8°30' jusqu'à 28 000 kPa - Raccords à implanter - Série métrique - Spécification technique

Ta slovenski standard je istoveten z: **EN 3079:2006**

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

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English Version

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Foreword

This European Standard (EN 3079:2006) has been prepared by the AeroSpace and Defense 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of an identical text or by endorsement, at the latest by January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

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1 Scope

This standard specifies the required characteristics, inspection and test methods, quality assurance and procurement requirements for metric series 8°30' adaptors, for temperature ranges type II and III according to ISO 6771 and nominal pressure up to 28 000 kPa.

2 Normative references

The following referenced documents are indispensable for the application 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.

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

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

ISO 9538, *Aerospace — Hydraulic tubing joints and fittings — Planar flexure test.*

EN 2000, *Aerospace series — Quality assurance — EN aerospace products — Approval of the quality system of manufacturers.*

EN 2491, *Aerospace series — Molybdenum disulphide dry lubricants — Coating methods.*

EN 2607, *Aerospace series — Straight metric-size unions with locking ring — Configuration, O-ring dimensions.*[1)]

EN 2608, *Aerospace series — Installation and removal requirements for 8°30' adaptor, threaded, with lockring.*[1)]

EN 2813, *Aerospace series — Aluminium alloy AL-P6061-T6 — Drawn tube for pressure applications 0,6 mm ≤ a ≤ 12,5 mm.*[1)]

EN 3120, *Aerospace series — Titanium alloy TI-P64003 — Cold worked and stress relieved — Seamless tube for pressure systems 4 mm ≤ D ≤ 51 mm — 690 MPa ≤ R_m ≤ 1 030 MPa.*[1)]

EN 3566, *Aerospace series — Pipe coupling 8°30' in titanium alloy — Adaptors with lockring*.

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts.*[1)]

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

MIL-H-5606, *Hydraulic fluid, Petroleum Base, Aircraft, Missile and Ordnance.*[2)]

MIL-H-8446, *Hydraulic fluid, Nonpetroleum Base, Aircraft.*[2)]

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1) Published as ASD Prestandard at the date of publication of this standard.

2) Published by: Department of Defense (DoD), the Pentagon, Washington, D. C. 20301.

3 Terms and definitions

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

3.1
nominal pressure, proof pressure, impulse pressure, burst pressure according to ISO 8625-1

3.2
port
boss
threaded connection with a seal, component to pipe line, machined into the component

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 formatting 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 of forging

2) Foreign material, stringer in the material, which is not homogenous 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
batch
a manufacture run of a given part number from the same batch of material, processed at the same time and in the same manner

3.4.2
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

3.4.3
qualification
testing required to demonstrate successful performance of the coupling assembly in simulated service (overload, destructive and fatigue tests)

4 Requirements, inspection and test methods

See Tables 1 and 2.

4.1 Test conditions and preparation of specimens for qualification

4.1.1 Test fluids

Unless otherwise specified, tests shall be conducted using e.g. a petroleum base hydraulic fluid to MIL-H-5606 for coupling assemblies of type II temperature range and a silicate ester base hydraulic fluid to MIL-H-8446 for those of type III temperature range. Water may be used, whenever practical, for proof, burst, stress corrosion and re-use capability testing. For other than hydraulic system applications, it is preferable to use system fluid for leakage (gaseous pressure) and proof testing.

4.1.2 Specimen preparation

Test specimen shall be assembled as illustrated in Table 2 and Figures 2, 4 and 5.

4.1.3 Lubricants

Hydraulic system fittings shall be assembled using the system fluid as lubricant, or another lubricant which is compatible with the system fluid, and which has essentially the same lubricity characteristics, only where specified in this standard or by the purchaser.

4.1.4 Adaptor installation

Adaptor shall be installed according to EN 2607 and EN 2608.

Table 1 — Requirements, inspection and test methods

Clause	Characteristic	Requirement	Inspection and test method	Q[a]	A[a]
4.2[b]	Materials	Conformity with the product standards	Chemical analysis or certificate of compliance to EN 10204 issued by semi-finished product manufacturer	X 100 %	X 100 %
4.3[b]	Dimensions	Conformity with the product standards	Suitable measuring instruments	X 100 %	X 50 %
4.4[b]	Product identification	Marking according to product standards and definition documents including batch identification to the Annex A. It shall be legible and shall not adversely affect the materials or the functioning of the products.	Visual examination	X 100 %	X 100 %
4.5[b]	Surface roughness	Conformity with the product standards. Sealing surface shall not contain any radial tool marks.	Suitable measuring instruments or visual-tactile samples	X 100 %	X 100 %
4.6[b]	Surface treatment	Conformity with the product standards	Visual examination	X 100 %	X 100 %
4.7[b]	Surface defects	Parts shall be free from surface defects indicated in 3.3 liable to have an adverse effect on their characteristics and endurance.	Visual inspection using suitable methods.	X 100 %	X 100 %
	Threads	Threads may be cut, rolled or ground, except titanium alloys which external threads should be rolled and, if machined, shall have an arithmetical mean deviation, R_a, of the profile of 3,2 µm or smoother. The grain flow in rolled threads should be continuous and follow the general thread contour with the maximum density at the thread root. Surface defects are not acceptable on any part of the thread except the crest.	Visual examination Specimens shall be taken from finished parts by sectioning on a longitudinal plane across the thread area.	X 100 %	X 100 %

continued

Table 1 *(continued)*

Clause	Characteristic	Requirement	Inspection and test method	Q[a]	A[a]
4.8	Proof pressure	The coupling assembly shall withstand pressure equal to twice the nominal pressure of the fluid system for 5 min, at ambient temperature without leakage and shall not show any evidence of permanent deformation or other malfunction, when using the specified torque values.	The coupling assembly shall be connected to a pressure source with one end free to move. Rate of pressure increase shall be 150 000 kPa ± 37 500 kPa/min.	X	
4.9	Gaseous pressure	The coupling assembly shall withstand a gaseous pressure equal to the nominal pressure for 5 min, at ambient temperature. There shall be no visible formation of bubbles after 1 min at pressure or other malfunction that would affect assembly or disassembly, when using the torque values specified.	The coupling assembly shall be solvent cleaned and air dried prior to testing. It shall be assembled and tightened to the minimum torques specified in table 3a. It shall then be pressurised with nitrogen to the nominal pressure. This pressure shall be maintained for 5 min while the specimens are immersed in water or suitable oil (see figure 1).	X	
4.10	Hydraulic impulse resistance	The coupling assembly shall withstand 200 000 impulse pressure cycles without leakage.	The coupling assembly shall be impulse tested at the temperatures and in the sequence specified in ISO 6772.	X	
4.11	Minimum burst pressure	Pressure of four times the specified nominal pressure shall be applied. There shall be no leakage or burst at less than this pressure. The test assembly need not meet any disassembly or assembly requirements after this test. It is not essential that the assembly actually be burst but it shall be able to maintain four times the nominal system operating pressure at a minimum of 5 min.	The coupling assembly shall be connected to a source of pressure with one end free to move. The pressure shall be increased continuously at a rate of 150 000 kPa ± 37 500 kPa/min until the assembly bursts or leaks, or as a minimum, reaches the specified burst pressure. Three ambient assemblies shall be tested at ambient temperature and three assemblies at a maximum rated temperature.	X	

continued

Table 1 *(continued)*

Clause	Characteristic	Requirement	Inspection and test method	Q[a]	A[a]
4.12	Flexure fatigue resistance	Standard flexure test temperature type II and type III pressure class D, E. When tested with cold worked and stress relieved titanium tubing (as defined in EN 3120), welded fittings tested by the planar flexure test method to ISO 9538 or rotary flexure test method to ISO 7257 shall achieve a target minimum flexure fatigue stress of 130 N/mm^2 for 10^7 cycles. This bending stress shall be determined prior to the application of internal pressure. In order to obtain the true bending stress, it is always necessary to measure the microstrain dynamically at the flexure test frequency. The tolerance for the specified bending shall be +10 %/0 %. Specimens according to figure 2 shall pass this test without leakage from the adaptor or the tube fitting junction. Recorded S/N curves shall show characteristics equal to or greater than those of figure 3.	In accordance with either ISO 7257 and ISO 9538 respectively. The bending stress shall be determined prior to the application of internal pressure. NOTE If it is desired to express the stress in terms of combined pressure and bending stress, the axial pressure stress is calculated by the formula: $$\sigma_x = P_o \frac{D_1^2}{D_0^2 - D_1^2}$$ where P_o working pressure, expressed in Megapascal (MPa); D_o actual pipe outside diameter, expressed in millimetres (mm); D_1 actual pipe inside diameter, expressed in millimetres (mm); σ_x axial stress due to pressure, expressed in Megapascal (MPa).	X	
4.13	Flexure test for other temperature types and pressure classes	Test assemblies of other temperature types and pressure classes (see ISO 6771) shall be qualified by testing to the same definition stress as obtained or testing to the same deflection stress as obtained for testing in accordance with 4.12.		X	

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