# SLOVENSKI STANDARD
# SIST EN 3275:2019

**01-julij-2019**

**Nadomešča:**
**SIST EN 3275:2004**

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**Aeronavtika - Cevni priključek 8°30' do 28 000 kPa - Dinamično tesnilo snopa - Metrične serije - Tehnična specifikacija**

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

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



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



**Ta slovenski standard je istoveten z:** **EN 3275:2019**

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**ICS:**

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

**SIST EN 3275:2019** **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 3275

May 2019

ICS 49.080

Supersedes EN 3275:2002

English Version

# Aerospace series - Pipe coupling 8°30' up to 28 000 kPa Dynamic beam seal - Metric series - Technical specification

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

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

This European Standard was approved by CEN on 5 November 2018.

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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 COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 3275:2019 E

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## European foreword

This document (EN 3275:2019) 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 November 2019, and conflicting national standards shall be withdrawn at the latest by November 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.

This document supersedes EN 3275:2002.

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.

## 1 Scope

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

## 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 2813, *Aerospace series — Aluminium alloy AL-P-6061- — 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*

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

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



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 5855 (all parts), *Aerospace — MJ threads*

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 related to pressure*

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

TR 2674, *Design and construction of pipeline for fluids in liquid or gaseous condition — Rigid lines, installation*[2]

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

2 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).

MIL-H-5606, *Hydraulic fluid, Petroleum Base, Aircraft, Missile and Ordnance*[3]

MIL-H-8446, *Hydraulic fluid, Nonpetroleum Base, Aircraft*[3]

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/

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

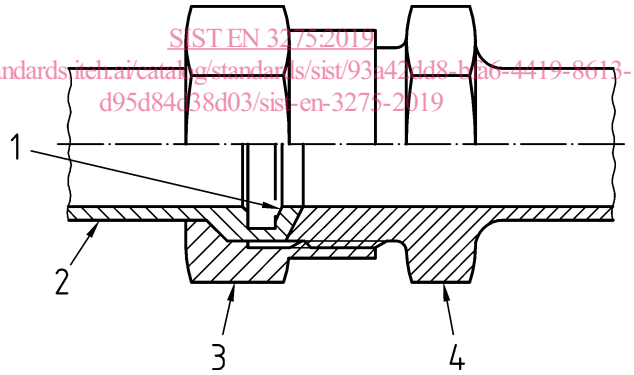
**3.2**
**coupling**

**3.2.1**
**coupling assembly**
assembled and torque-tightened nut, ferrule and pipe mating with e.g. unions, tees or elbows



Note 1 to entry: See Figure 1.






**Key**

1 dynamic beam seal
2 ferrule
3 nut
4 union end

**Figure 1 — Example of coupling assembly**

**3.2.2**
**straight coupling**
union connecting pipe to pipe

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

**3.2.3**
**forged parts**
**shaped parts**
couplings machined out of individual forging blanks

Note 1 to entry: For crosses, tees and elbows machined out of bar or plate stock the term “shaped” may be used.

**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

Note 1 to entry: 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



Note 1 to entry: 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**
**acceptable quality level**
**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 Symbols



| | |
|---|---|
| $A$ | Elongation, in percent [%] |
| $D_0$ | Actual outside diameter of pipe, in millimetres [mm] |
| $D_1$ | Actual inside diameter of pipe, in millimetres [mm] |
| DN | Nominal outside diameter of pipe |
| $P$ | Working pressure, in megapascals [MPa] |
| $R_m$ | Tensile strength, in megapascals [MPa] |
| $R_{p0,2}$ | 0,2 % proof stress, in megapascals [MPa] |
| $\sigma_x$ | Axial stress due to pressure, in megapascals [MPa] |

## 5 Requirements, inspection and test methods

See Table 1 and Table 2.

## 5.1 Test conditions and preparation of specimens for qualification

**Tests fluids**

Unless otherwise specified, tests shall be carried out 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. When specified in the test method, the test fluid is used as a lubricant.

**Specimen preparation**

Shaped parts shall be machined with the grain flow of the bar or plate in the direction of the fluid. Specimens shall be assembled as illustrated in Table 2. Installations on the pipe end shall be in accordance with TR 2674. Prior to testing, all couplings shall be assembled using the maximum specified torque. Except, when specified in Table 2, the coupling shall be assembled using the minimum installation torque for at least half of the specimens, and maximum torques for the remainder.

**Pipe assembly**

The method of joining the pipe to the coupling end (brazing, welding, mechanical attachment, etc.) shall not be detrimental to the properties, strength or geometry of the pipe and the coupling end. The joint shall be in accordance with the design instructions and shall be inspected by direct measurement, X-ray or other non-destructive methods.



**Table 1 — Requirements, inspection and test methods**



| Clause | Characteristic | Requirement | Inspection and test method | Q[a] | A[a] |
|---|---|---|---|---|---|
| 5.2[b] | Materials | Conformity with the product standards | Chemical analysis or certificate of compliance to EN 10204 issued by the semi-finished product manufacturer. | X<br>100 % | X<br>100 % |
| 5.3[b] | Dimensions | Conformity with the product standards | Suitable measuring instruments | X<br>100 % | X<br>50 % |
| | Fluid passages | Conformity with the product standards | A ball with a diameter 0,5 mm less than the minimum diameter specified for the passage shall pass through the coupling. | X<br>100 % | X<br>20 % |
| 5.4[b] | Product identification | Marking according to product standards and definition documents including batch identification of Annex A. It shall be legible and shall not adversely affect the material or the functioning of the products. | Visual examination | X<br>100 % | X<br>100 % |
| 5.5[b] | Surface roughness | Conformity with the product standards<br>Interpreted in accordance with EN ISO 1302 | Suitable measuring instruments or visual-tactile samples | X<br>100 % | X<br>100 % |

<table>
<tr><th>Clause</th><th>Characteristic</th><th>Requirement</th><th>Inspection and test method</th><th>Q[a]</th><th>A[a]</th></tr>
<tr><td>5.6[b]</td><td>Surface treatment</td><td>Conformity with the product standards</td><td>Visual examination<br>The thread shall be tested using a gauge with a tolerance class of 4h6h.</td><td>X<br>100 %</td><td>X<br>100 %</td></tr>
<tr><td rowspan="3">5.7[b]</td><td>Surface defects</td><td rowspan="2">Parts shall be free from surface defects indicated in 3.3 liable to have an adverse affect on their characteristics and endurance.</td><td>Visual inspection using suitable methods</td><td>X<br>100 %</td><td>X<br>100 %</td></tr>
<tr><td></td><td>Visual examination</td><td>X<br>100 %</td><td>X<br>100 %</td></tr>
<tr><td>Threads</td><td>Threads may be cut, rolled or ground, except titanium alloys which shall be cut or rolled. The external threads of couplings should be rolled and, if machined, shall have an arithmetical mean deviation, Ra, of the profile of 3,2 µm or smoother in accordance with EN ISO 1302.<br>The grain flow in rolled threads shall be continuous and follow the general thread contour with the maximum density at the thread root.<br>Laps, cracks, surface irregularities and seams (see 3.3) are not acceptable on any part of the pressure thread flank, in the thread root or on the non-pressure thread flank. Laps and seams, depths of which are within the limits of table, are acceptable on the crest and the non-pressure thread flank above the pitch diameter.
<table>
<tr><th>DN</th><th>Depth<br>mm</th></tr>
<tr><td>05</td><td>0,15</td></tr>
<tr><td>06</td><td>0,18</td></tr>
<tr><td>08</td><td>0,18</td></tr>
<tr><td>10</td><td>0,20</td></tr>
<tr><td>12</td><td>0,23</td></tr>
<tr><td>14 to 32</td><td>0,25</td></tr>
</table></td><td>Thread flanks in rolled threads shall be examined by micro-examination. Specimens shall be taken from the finished part by sectioning on a longitudinal plane across the threaded area. The specimens shall be polished and etched to reveal the surface defects.</td><td>X<br>10 %</td><td>X<br>5 %</td></tr>
</table>

| Clause | Characteristic | Requirement | Inspection and test method | Q[a] | A[a] |
|---|---|---|---|---|---|
| 5.8 | Proof pressure | The coupling assembly shall withstand a 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 ± 37 500) kPa/min. | X | |
| 5.9 | 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 3. It shall then be pressurized 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 2). | X | |
| 5.10 | 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 | |
| 5.11 | Minimum burst pressure | The coupling assembly shall withstand a pressure equal to four times the nominal pressure of the fluid system for 5 min, when tested at ambient temperature.<br>There shall be no leakage or burst.<br>Pipe expansion is permissible. The coupling assemblies need not meet any disassembly or assemblies requirements after this test. | The coupling assembly shall be connected to a pressure source with one end free to move.<br>Rate of pressure increase shall be (150 000 ± 37 500) kPa/min. | X | |