



**SLOVENSKI STANDARD**  
**SIST EN 4289:2019**  
**01-junij-2019**

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**Aeronavtika - Aluminijeva zlitina AL-P7175 - Kovinski materiali**

Aerospace series - Aluminium alloy AL-P7175 - Forging stock

Luft- und Raumfahrt - Aluminiumlegierung AL-P7175 - Schmiedevormaterial

Série aérospatiale - Alliage d'aluminium AL-P7175 - Produits destinés à la forge

**Ta slovenski standard je istoveten z: EN 4289:2019**

[SIST EN 4289:2019](https://standards.iteh.ai/catalog/standards/sist/0e368090-2739-4aed-bfca-4101f7094b75/sist-en-4289-2019)

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**ICS:**

49.025.20      Aluminij                                      Aluminium

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EUROPEAN STANDARD

EN 4289

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2019

ICS 49.025.20

English Version

## Aerospace series - Aluminium alloy AL-P7175- Forging stock

Série aérospatiale - Alliage d'aluminium AL-P7175 -  
Produits destinés à la forge

Luft- und Raumfahrt - Aluminiumlegierung AL-P7175 -  
Schmiedevormaterial

This European Standard was approved by CEN on 26 June 2017.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

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## European foreword

This document (EN 4289:2019) 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 September 2019, and conflicting national standards shall be withdrawn at the latest by September 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.

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EN 4289:2019 (E)

## Introduction

This European Standard is part of the series of EN metallic material standards for aerospace applications. The general organization of this series is described in EN 4258.

This European Standard has been prepared in accordance with EN 4500-2.

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## 1 Scope

This European Standard specifies the requirements relating to:

Aluminium alloy AL-P7175  
Forging stock

for aerospace applications.

## 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 4258, *Aerospace series — Metallic materials — General organization of standardization — Links between types of EN standards and their use*

EN 4400-6, *Aerospace series — Aluminium and aluminium- and magnesium- alloys — Technical specification — Part 6: Aluminium alloy forging stock*

EN 4500-2, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 2: Specific rules for aluminium, aluminium alloys and magnesium alloys* <sup>1)</sup>

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Requirements

See Table 1.

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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), <http://www.asd-stan.org>

Table 1 — Requirements for aluminium alloy AL-P7175 — Forging stock

|      |                           |         |                          |      |     |      |     |                     |      |      |        |       |    |
|------|---------------------------|---------|--------------------------|------|-----|------|-----|---------------------|------|------|--------|-------|----|
| 1    | Material designation      |         | Aluminium alloy AL-P7175 |      |     |      |     |                     |      |      |        |       |    |
| 2    | Chemical composition<br>% | Element | Si                       | Fe   | Cu  | Mn   | Mg  | Cr                  | Zn   | Ti   | Others |       | Al |
|      |                           |         |                          |      |     |      |     |                     |      |      | Each   | Total |    |
|      |                           | min.    | -                        | -    | 1,2 | -    | 2,1 | 0,18                | 5,1  | -    | -      | -     | -  |
| max. | 0,15                      | 0,20    | 2,0                      | 0,10 | 2,9 | 0,28 | 6,1 | 0,10                | 0,05 | 0,15 |        |       |    |
| 3    | Method of melting         |         | -                        |      |     |      |     |                     |      |      |        |       |    |
| 4.1  | Form                      |         | Ingot or billet          |      |     |      |     | Rod, bar or section |      |      |        |       |    |
| 4.2  | Method of production      |         | Cast                     |      |     |      |     | Extruded            |      |      |        |       |    |
| 4.3  | Limit dimension(s)        | mm      | a ≤ 1 000                |      |     |      |     | a ≤ 400             |      |      |        |       |    |
| 5    | Technical specification   |         | EN 4400-6                |      |     |      |     | EN 4400-6           |      |      |        |       |    |

|     |                         |  |                    |  |  |  |  |                    |  |  |  |  |
|-----|-------------------------|--|--------------------|--|--|--|--|--------------------|--|--|--|--|
| 6.1 | Delivery condition      |  | O3                 |  |  |  |  | F                  |  |  |  |  |
|     | Heat treatment          |  | -                  |  |  |  |  | -                  |  |  |  |  |
| 6.2 | Delivery condition code |  | U                  |  |  |  |  | U                  |  |  |  |  |
| 7   | Use condition           |  | O3                 |  |  |  |  | F                  |  |  |  |  |
|     | Heat treatment          |  | Delivery condition |  |  |  |  | Delivery condition |  |  |  |  |

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Characteristics  
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|     |                                    |            |                          |                    |  |  |  |                   |                    |  |  |  |  |
|-----|------------------------------------|------------|--------------------------|--------------------|--|--|--|-------------------|--------------------|--|--|--|--|
| 8.1 | Test sample(s)                     |            | See EN 4400-6.           |                    |  |  |  | See EN 4400-6.    |                    |  |  |  |  |
| 8.2 | Test piece(s)                      |            | See EN 4400-6, 4289:2019 |                    |  |  |  | See EN 4400-6.    |                    |  |  |  |  |
| 8.3 | Heat treatment                     |            | T73 (see line 29)        |                    |  |  |  | T73 (see line 29) |                    |  |  |  |  |
| 9   | Dimensions concerned               | mm         | See EN 4400-6.           |                    |  |  |  | a or D ≤ 400      |                    |  |  |  |  |
| 10  | Thickness of cladding on each face | %          | -                        |                    |  |  |  | -                 |                    |  |  |  |  |
| 11  | Direction of test piece            |            | L                        |                    |  |  |  | L                 |                    |  |  |  |  |
| 12  | Temperature                        | $\theta$   | °C                       | Ambient            |  |  |  |                   | Ambient            |  |  |  |  |
| 13  | Proof stress                       | $R_{p0,2}$ | MPa                      | ≥ 385 <sup>a</sup> |  |  |  |                   | ≥ 385 <sup>a</sup> |  |  |  |  |
| 14  | T Strength                         | $R_m$      | MPa                      | ≥ 455 <sup>a</sup> |  |  |  |                   | ≥ 455 <sup>a</sup> |  |  |  |  |
| 15  | Elongation                         | A          | %                        | ≥ 7 <sup>a</sup>   |  |  |  |                   | ≥ 7 <sup>a</sup>   |  |  |  |  |
| 16  | Reduction of area                  | Z          | %                        | -                  |  |  |  |                   | -                  |  |  |  |  |
| 17  | Hardness                           |            | -                        |                    |  |  |  | -                 |                    |  |  |  |  |
| 18  | Shear strength                     | $R_c$      | MPa                      | -                  |  |  |  |                   | -                  |  |  |  |  |
| 19  | Bending                            | k          | -                        | -                  |  |  |  |                   | -                  |  |  |  |  |
| 20  | Impact strength                    |            | -                        |                    |  |  |  | -                 |                    |  |  |  |  |
| 21  | Temperature                        | $\theta$   | °C                       | -                  |  |  |  |                   | -                  |  |  |  |  |
| 22  | Time                               |            | h                        | -                  |  |  |  |                   | -                  |  |  |  |  |
| 23  | Stress                             | $\sigma_a$ | MPa                      | -                  |  |  |  |                   | -                  |  |  |  |  |
| 24  | C Elongation                       | a          | %                        | -                  |  |  |  |                   | -                  |  |  |  |  |
| 25  | Rupture stress                     | $\sigma_R$ | MPa                      | -                  |  |  |  |                   | -                  |  |  |  |  |
| 26  | Elongation at rupture              | A          | %                        | -                  |  |  |  |                   | -                  |  |  |  |  |
| 27  | Notes (see line 98)                |            | a, b                     |                    |  |  |  |                   |                    |  |  |  |  |



|  |                          |   |   |
|--|--------------------------|---|---|
| 29   | Reference heat treatment | - | Forged test pieces (cast stock) or delivery condition (extruded section)<br>+ 460 °C ≤ $\theta$ ≤ 480 °C / WQ $\theta$ ≤ 80 °C <sup>b</sup><br>+ 100 °C ≤ $\theta$ ≤ 120 °C / 6 h ≤ $t$ ≤ 24 h<br>+ 170 °C ≤ $\theta$ ≤ 182 °C / 6 h ≤ $t$ ≤ 18 h |
| 44   | External defects         | - | See EN 4400-6.  |
| 51   | Macrostructure           | - | See EN 4400-6.  |
|  |                          | 5 | Extruded forging stock  |
|  |                          | 7 | Back end defects: see EN 4400-6.<br>Peripheral coarse grain: level A (as per EN 4400-6)   |
| 61   | Internal defects         | - | See EN 4400-6.  |
| <p><b>iTeh STANDARD PREVIEW</b><br/>(standards.iteh.ai)</p> <p>SIST EN 4289:2019<br/><a href="https://standards.iteh.ai/catalog/standards/sist/0e368090-2739-4aed-bfca-4101f7094b75/sist-en-4289-2019">https://standards.iteh.ai/catalog/standards/sist/0e368090-2739-4aed-bfca-4101f7094b75/sist-en-4289-2019</a></p> |                          |   |   |
| 95   | Marking inspection       | - | See EN 4400-6.  |
| 96   | Dimensional inspection   | - | See EN 4400-6.  |
| 98   | Notes                    | - | <sup>a</sup> The "capability clause" applies.<br><sup>b</sup> The use of quench additives or higher quenchant temperature shall be subject to agreement between manufacturer and purchaser.   |
| 99   | Typical use              | - | -   |