



# SLOVENSKI STANDARD

## SIST EN 2709:2019

01-januar-2019

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**Aeronavtika - Aluminijeva zlitina 2024- - T3510 - Palice in profili - 1,2 mm  $\leq$  (a or D)  $\leq$  150 mm - S kontrolo debelozrnatega obrobja**

Aerospace series - Aluminium alloy 2024- - T3510 - Bar and section - 1,2 mm  $\leq$  (a or D)  $\leq$  150 mm - With peripheral coarse grain control

Luft- und Raumfahrt - Aluminiumlegierung 2024- - T3510 - Stangen und Profile - 1,2 mm  $\leq$  (a oder D)  $\leq$  150 mm - Mit Kontrolle der Grobkomrandzone

Série aérospatiale - Alliage d'aluminium 2024- - T3510 - Barres et profilés - 1,2 mm  $\leq$  (a ou D)  $\leq$  150 mm - Limitation à la zone périphérique à gros grains

<https://standards.iteh.ai/catalog/standards/sist/e77b8d19-5054-4a2b-aa25-464a0634b42e/sist-en-2709-2019>

**Ta slovenski standard je istoveten z: EN 2709:2018**

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**ICS:**

49.025.20      Aluminij      Aluminium

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EUROPEAN STANDARD

EN 2709

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2018

ICS

English Version

## Aerospace series - Aluminium alloy 2024- - T3510 - Bars and sections - $1,2 \text{ mm} \leq (a \text{ or } D) \leq 150 \text{ mm}$ - With peripheral coarse grain control

Série aérospatiale - Alliage d'aluminium 2024- - T3510  
- Barres et profilés -  $1,2 \text{ mm} \leq (a \text{ ou } D) \leq 150 \text{ mm}$  -  
Limitation à la zone périphérique à gros grains

Luft- und Raumfahrt - Aluminiumlegierung 2024- -  
T3510 - Stangen und Profile -  $1,2 \text{ mm} \leq (a \text{ oder } D) \leq$   
150 mm - Mit Kontrolle der Grobkornrandzone

This European Standard was approved by CEN on 17 September 2018.

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.

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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.

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.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>		Page
<b>European foreword</b> .....		<b>3</b>
<b>Introduction</b> .....		<b>4</b>
<b>1</b>	<b>Scope</b> .....	<b>5</b>
<b>2</b>	<b>Normative references</b> .....	<b>5</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>5</b>
<b>4</b>	<b>Requirements</b> .....	<b>5</b>

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<https://standards.iteh.ai/catalog/standards/sist/e77b8d19-5054-4a2b-aa25-464a0634b42e/sist-en-2709-2019>

## European foreword

This document (EN 2709:2018) 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 May 2019, and conflicting national standards shall be withdrawn at the latest by May 2019.

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

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**EN 2709:2018 (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 2024-  
T3510  
Bars and sections  
 $1,2 \text{ mm} \leq (a \text{ or } D) \leq 150 \text{ mm}$   
With peripheral coarse grain control

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 2004-1, *Aerospace series — Test methods for aluminium and aluminium alloy products — Part 1: Determination of electrical conductivity of wrought aluminium alloy products*

EN 2047, *Aerospace series — Beaded L-section, extruded in aluminium alloys — Dimensions*

EN 2048, *Aerospace series — Extruded L-section, extruded in aluminium alloys — Dimensions*

EN 2049, *Aerospace series — Extruded channel section, extruded in aluminium alloys — Dimensions*

EN 2050, *Aerospace series — Extruded T-section, in aluminium alloys — Dimensions*

EN 2070-1, *Aerospace series — Aluminium and aluminium alloy wrought products — Technical specification — Part 1: General requirements*

EN 2070-3, *Aerospace series — Aluminium and aluminium alloy wrought products — Technical specification — Part 3: Bar and section*

EN 2134, *Aerospace series — Round bars, extruded in aluminium and aluminium alloys, diameter  $10 \text{ mm} \leq D \leq 220 \text{ mm}$  — Dimensions*

EN 2341, *Aerospace series — Aluminium and aluminium alloy — Square and rectangular extruded bars — Dimensions*<sup>1)</sup>

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

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/>

## EN 2709:2018 (E)

Table 1 — Requirements for Aluminium alloy 2024- T3510 — Bars and sections

1	Material designation		Aluminium alloy 2024-												
2	Chemical composition %	Element	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ti+Zr	Others		Al
													Each	Total	
		min.	-	-	3,8	0,30	1,2	-	-	-	-	-	-	-	-
max.	0,50	0,50	4,9	0,9	1,8	0,10	-	0,25	0,15	0,20	0,05	0,15			
3	Method of melting		-												
4.1	Form		Bars and sections												
4.2	Method of production		Extruded												
4.3	Limit dimension(s)	mm	$1,2 \leq (a \text{ or } D) \leq 150$												
5	Technical specification		See EN 2070-1 and EN 2070-3 EN 2047 to EN 2050, EN 2134 and EN 2341.												

6.1	Delivery condition		T3510												
	Heat treatment		Solution treated $495 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C/WQ}$ $\theta \leq 40 \text{ }^\circ\text{C}$ + $1,5 \leq$ controlled stretched $\leq 3 \%$ /No straightening after stretching allowed + Naturally aged $t \geq 5 \text{ d}$												
6.2	Delivery condition code		-												
7	Use condition		T3510												
	Heat treatment		Delivery condition												

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Characteristics

8.1	Test sample(s)		-													
8.2	Test piece(s)		-													
8.3	Heat treatment		T3510													
9	Dimensions concerned	a or D	mm	$\geq 1,2$ $\leq 2,0$	$> 2,0$ $\leq 10$	$> 10$ $\leq 25$	$> 25$ $\leq 75$	$> 75$ $\leq 100$	$> 100$ $\leq 150$							
10	Thickness of cladding on each face		%	-												
11	Direction of test piece			L	L	L	L	L	L							
12	Temperature	$\theta$	$^\circ\text{C}$	Ambient												
13	Proof stress	$R_{p0,2}$	$\text{MPa}^*$	$\geq 330$	$\geq 340$	$\geq 340$	$\geq 350$	$\geq 345$	$\geq 325$							
14	T Strength	$R_m$	$\text{MPa}^*$	$\geq 440$	$\geq 460$	$\geq 460$	$\geq 480$	$\geq 470$	$\geq 450$							
15	Elongation	A	%	$\geq 12^a$	$\geq 11^a$	$\geq 10$	$\geq 10$	$\geq 10$	$\geq 8$							
16	Reduction of area	Z	%	-												
17	Hardness (HB)		120 (for information)													
18	Shear strength	$R_c$	$\text{MPa}^*$	-												
19	Bending	k	-	-												
20	Impact strength		-													
21	Temperature	$\theta$	$^\circ\text{C}$	-												
22	Time		h	-												
23	Stress	$\sigma_a$	$\text{MPa}^*$	-												
24	Elongation	a	%	-												
25	Rupture stress	$\sigma_R$	$\text{MPa}^*$	-												
26	Elongation at rupture	A	%	-												
27	Notes (see line 98)		*, a													



28	-	-	-
32	Electrical conductivity	-	See EN 2004-1.
		7	17 MS/m $\leq \gamma \leq$ 20 MS/m (for information)
34	Grain size	-	See EN 2070-3 – Level A (Table 5).
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95	Marking inspection	-	-
96	Dimensional inspection	-	-
98	Notes	-	* 1 MPa = 1 N/mm <sup>2</sup> . a A <sub>50mm</sub> .
99	Typical use	-	-