



# SLOVENSKI STANDARD

## SIST EN 4101:2005

01-november-2005

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**Aerospace series - Aluminium alloy AL-P2024-T4 - Sheet and strip with improved stretch forming capability - 0,4 mm <a <6 mm**

Aerospace series - Aluminium alloy AL-P2024-T4 - Sheet and strip with improved stretch forming capability - 0,4 mm <a <6 mm

Luft- und Raumfahrt - Aluminiumlegierung AL-P2024-T4 - Bleche und Bänder mit besserer Eignung zum Streckziehen - 0,4 mm <a <6 mm

Série aérospatiale - Alliage d'aluminium AL-P2024-T4 - Tôles et bandes avec aptitude améliorée à l'étirage sur forme - 0,4 mm <a <6 mm

**Ta slovenski standard je istoveten z: EN 4101:2005**

**ICS:**

49.025.20      Aluminij    Aluminium

**SIST EN 4101:2005**    **en**

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EUROPEAN STANDARD

EN 4101

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2005

ICS 49.025.20

English version

## Aerospace series - Aluminium alloy AL-P2024-T4 - Sheet and strip with improved stretch forming capability - 0,4 mm $\leq a \leq 6$ mm

Série aérospatiale - Alliage d'aluminium AL-P2024-T4 -  
Tôles et bandes avec aptitude améliorée à l'étirage sur  
forme - 0,4 mm  $\leq a \leq 6$  mm

Luft- und Raumfahrt - Aluminiumlegierung AL-P2024-T4 -  
Bleche und Bänder mit besserer Eignung zum Streckziehen  
- 0,4 mm  $\leq a \leq 6$  mm

This European Standard was approved by CEN on 22 April 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Foreword

This document (EN 4101:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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 December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## Introduction

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

## 1 Scope

This standard specifies the requirements relating to:

Aluminium alloy AL-P2024-  
T4  
Sheet and strip  
with improved stretch forming capability  
 $0,4 \text{ mm} \leq a \leq 6 \text{ mm}$

for aerospace application.

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## 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.

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

EN 4400-2, *Aerospace series — Aluminium and aluminium alloy wrought products — Technical specification — Part 2: Sheet and strip.* <sup>1)</sup>

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>

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

## EN 4101:2005 (E)

1	Material designation		Aluminium alloy AL-P2024-										
2	Chemical composition %	Element	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	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	0,05	0,15			
3	Method of melting		-										
4.1	Form		Sheet and strip										
4.2	Method of production		Rolled										
4.3	Limit dimension(s)	mm	$0,4 \leq a \leq 6$										
5	Technical specification		EN 4400-2										

6.1	Delivery condition	T4										
	Heat treatment	$490 \text{ }^\circ\text{C} \leq \theta \leq 500 \text{ }^\circ\text{C} / \text{WQ } \theta \leq 40 \text{ }^\circ\text{C}$ $+ \theta = \text{ambient} / t \geq 5 \text{ d}$										
6.2	Delivery condition code	U										
7	Use condition	T4										
	Heat treatment	Delivery condition										

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8.1	Test sample(s)		See EN 4400-2.										
8.2	Test piece(s)		See EN 4400-2.										
8.3	Heat treatment		Use condition.										
9	Dimensions concerned	mm	$0,4 \leq a \leq 0,8$				$0,8 < a \leq 3,2$				$3,2 < a \leq 6$		
10	Thickness of cladding on each face	%	-				-				-		
11	Direction of test piece		LT				LT				LT		
12	Temperature	$\theta$	$^\circ\text{C}$				Ambient				Ambient		
13	Proof stress	$R_{p0,2}$	MPa				$\geq 265$				$\geq 265$		
14	T Strength	$R_m$	MPa				$\geq 430$				$\geq 430$		
15	Elongation	A	%				$A_{50 \text{ mm}} \geq 16$				$A_{50 \text{ mm}} \geq 18$		
16	Reduction of area	Z	%				-				-		
17	Hardness		-				-				-		
18	Shear strength	$R_c$	MPa				-				-		
19	Bending	k	-				$2; \alpha = 180^\circ$				$2,5; \alpha = 180^\circ$		
20	Impact strength		-										
21	Temperature	$\theta$	$^\circ\text{C}$				-				-		
22	Time		h				-				-		
23	C Stress	$\sigma_a$	MPa				-				-		
24	Elongation	a	%				-				-		
25	Rupture stress	$\sigma_R$	MPa				-				-		
26	Elongation at rupture	A	%				-				-		
27	Notes (see line 98)		-										

38	Intergranular corrosion	–	See EN 4400-2.				
		7	Dimensions (mm)	$0,4 \leq a \leq 1,6$	$1,6 < a \leq 3,2$	$3,2 < a \leq 6$	
			Depth of penetration ( $\mu\text{m}$ )	$\leq 125$	$\leq 150$	$\leq 200$	
44	External defects	–	See EN 4400-2.				
82	Batch uniformity	–	See EN 4400-2.				
		7	Electrical conductivity	$\gamma$	MS/m	17,5 (Typical value)	
			or				
			Hardness	HB	120 (Typical value)		
$\delta \leq 16$ per product	$\Delta \leq 24$ per batch						
95	Marking inspection	–	See EN 4400-2.				
96	Dimensional inspection	–	See EN 4400-2.				
		7	For sheet, maximum acceptable deviation from flatness: 1,5 % of length or width.				
98	Notes	–	–				
99	Typical use	–	–				

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## EN 4101:2005 (E)

100	-	Product qualification	-	See EN 4400-2.
Qualification programme to be agreed between manufacturer and purchaser.				
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