



## SLOVENSKI STANDARD

### SIST EN 4099:2005

01-november-2005

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**Aerospace series - Aluminium alloy AL-P2219-T6 or T62 - Clad sheet and strip - 0,5 mm <a <6 mm**

Aerospace series - Aluminium alloy AL-P2219-T6 or T62 - Clad sheet and strip - 0,5 mm <a <6 mm

Luft- und Raumfahrt - Aluminiumlegierung AL-P2219-T6 oder T62 - Bleche und Bänder, plattiert - 0,5 mm <a <6 mm **(standards.iteh.ai)**

Série aérospatiale - Alliage d'aluminium AL-P2219-T6 ou T62 - Tôles et bandes plaquées - 0,5 mm <a <6 mm

**Ta slovenski standard je istoveten z: EN 4099:2005**

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**ICS:**

49.025.20      Aluminij                      Aluminium

**SIST EN 4099:2005**                      **en**

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EUROPEAN STANDARD

EN 4099

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2005

ICS 49.025.20

English version

## Aerospace series - Aluminium alloy AL-P2219-T6 or T62 - Clad sheet and strip - 0,5 mm $\leq a \leq 6$ mm

Série aérospatiale - Alliage d'aluminium AL-P2219-T6 ou T62 - Tôles et bandes plaquées - 0,5 mm  $\leq a \leq 6$  mm

Luft- und Raumfahrt - Aluminiumlegierung AL-P2219-T6 oder T62 - Bleche und Bänder, plattiert - 0,5 mm  $\leq a \leq 6$  mm

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

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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 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.

[SIST EN 4099:2005](https://standards.iteh.ai/catalog/standards/sist/751a8c27-4717-4ad6-8646-9d82d170eb78/sist-en-4099-2005)

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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 4099:2005) 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-P2219-  
T6 or T62  
Clad sheet and strip  
 $0,5 \text{ mm} \leq a \leq 6 \text{ mm}$

for aerospace application.

## 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 4099:2005 (E)

1	Material designation		Aluminium alloy AL-P2219-											
2	Chemical composition %	Element	Si	Fe	Cu	Mn	Mg	Zn	Ti	V	Zr	Others		Al
												Each	Total	
		min.	–	–	5,8	0,20	–	–	0,02	0,05	0,10	–	–	Base
max.	0,20	0,30	6,8	0,40	0,02	0,10	0,10	0,15	0,25	0,05	0,15			
3	Method of melting		–											
4.1	Form		Clad sheet and strip											
4.2	Method of production		Rolled											
4.3	Limit dimension(s)	mm	$0,5 \leq a \leq 6$											
5	Technical specification		EN 4400-2											

6.1	Delivery condition	O	H111	T6
	Heat treatment	–	–	$530\text{ °C} \leq \theta \leq 540\text{ °C} / \text{WQ } \theta \leq 40\text{ °C}$ $+ 185\text{ °C} \leq \theta \leq 196\text{ °C} / 30\text{ h} \leq t \leq 40\text{ h}$
6.2	Delivery condition code	A	F	U
7	Use condition	T62 <sup>a</sup>		T6
	Heat treatment	Delivery condition $+ 530\text{ °C} \leq \theta \leq 540\text{ °C} / \text{WQ } \theta \leq 40\text{ °C}$ $+ 185\text{ °C} \leq \theta \leq 196\text{ °C} / 30\text{ h} \leq t \leq 40\text{ h}$		Delivery condition

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Characteristics

8.1	Test sample(s)		See EN 4400-2.					
8.2	Test piece(s)		See EN 4400-2.					
8.3	Heat treatment		Delivery condition: O or H111			Use condition: T6 or T62		
9	Dimensions concerned	mm	$0,5 \leq a \leq 1,0$	$1,0 < a \leq 2,5$	$2,5 < a \leq 6$	$0,5 \leq a \leq 1,0$	$1,0 < a \leq 2,5$	$2,5 < a \leq 6$
10	Thickness of cladding on each face	%	$\geq 8$	$\geq 4$	$\geq 2$	$\geq 8$	$\geq 4$	$\geq 2$
11	Direction of test piece		LT	LT	LT	LT	LT	LT
12	Temperature	$\theta$ °C	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient
13	Proof stress	$R_{p0,2}$ MPa	$\leq 110$	$\leq 110$	$\leq 110$	$\geq 200$	$\geq 220$	$\geq 235$
14	T Strength	$R_m$ MPa	$\leq 220$	$\leq 220$	$\leq 220$	$\geq 305$	$\geq 340$	$\geq 350$
15	Elongation	A %	$A_{50\text{ mm}} \geq 12$	$A_{50\text{ mm}} \geq 12$	$A_{50\text{ mm}} \geq 12$	$A_{50\text{ mm}} \geq 6$	$A_{50\text{ mm}} \geq 7$	$A_{50\text{ mm}} \geq 7$
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	C Stress	$\sigma_a$ MPa	–					
24	C Elongation	a %	–					
25	C Rupture stress	$\sigma_R$ MPa	–					
26	C Elongation at rupture	A %	–					
27	Notes (see line 98)		a					

44	External defects	–	See EN 4400-2.								
62	Diffusion in the cladding	–	See EN 4400-2.								
72	Cladding chemical composition %	–	See EN 4400-2.								
		7	Material designation	Aluminium alloy AL-P7072-							
			Element	Si + Fe	Cu	Mn	Mg	Zn	Others		Al
									Each	Total	
			min.	–	–	–	–	0,8	–	–	Base
max.	0,7	0,10	0,10	0,10	1,3	0,05	0,15				
82	Batch uniformity	–	See EN 4400-2.								
		5	T6								
		7	Electrical conductivity				See EN 4400-2.				
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95	Marking inspection	–	See EN 4400-2.								
96	Dimensional inspection	–	See EN 4400-2.								
98	Notes	–	<sup>a</sup> Repeated re-solution heat treatment is not recommended due to the effects of copper diffusion in the cladding upon elevated temperature properties.								
99	Typical use	–	–								

