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SIST EN 2813:2019

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EUROPEAN STANDARD

EN 2813

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2018

ICS 49.025.20

English Version

Aerospace series - Aluminium alloy AL-P-6061- - T6 - Drawn tube for pressure applications - $0,6 \text{ mm} \leq a \leq 12,5$ mm

Série aérospatiale - Alliage d'aluminium AL-P-6061- -
T6 - Tubes étirés pour applications sous pression - $0,6$
 $\text{mm} \leq a \leq 12,5 \text{ mm}$

Luft- und Raumfahrt - Aluminiumlegierung AL-P-6061-
- T6 - Kaltgezogene Hydraulikrohre - $0,6 \text{ mm} \leq a \leq 12,5$
mm

This European Standard was approved by CEN on 24 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

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European foreword

This document (EN 2813:2018) 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 document 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 2813:2018 (E)

Introduction

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

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1 Scope

This document specifies the requirements relating to:

Aluminium alloy AL-P-6061-
T6
Drawn tube for pressure applications
 $0,6 \text{ mm} \leq a \leq 12,5 \text{ mm}$

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 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*

EN 2070-5, *Aerospace series — Aluminium and aluminium alloy wrought products — Technical specification — Part 5: Tube used under pressure*

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*¹⁾

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

Table 1 shows the requirements for aluminium alloy AL-P-6061-T6, drawn tube for pressure applications, $0,6 \text{ mm} \leq a \leq 12,5 \text{ mm}$.

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 2813:2018 (E)

Table 1 — Requirements for aluminium alloy AL-P-6061-T6, drawn tube for pressure applications, $0,6 \text{ mm} \leq a \leq 12,5 \text{ mm}$

1	Material designation		Aluminium alloy AL-P-6061-										
2	Chemical composition %	Element	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others		Al
											Each	Total	
		min.	0,40	-	0,15	-	0,8	0,04	-	-	-	-	Base
max.	0,8	0,7	0,40	0,15	1,2	0,35	0,25	0,15	0,05	0,15			
3	Method of melting		-										
4.1	Form		Tube										
4.2	Method of production		Drawn										
4.3	Limit dimension(s)	mm	$0,6 \leq a \leq 12,5$										
5	Technical specification		See EN 2070-5.										

6.1	Delivery condition	T6									
	Heat treatment	$510 \text{ °C} \leq \theta \leq 540 \text{ °C/WQ}$ $\theta \leq 40 \text{ °C}$ $+ 155 \text{ °C} \leq \theta \leq 165 \text{ °C}/15 \text{ h} \leq t \leq 20 \text{ h}$ or $170 \text{ °C} \leq \theta \leq 195 \text{ °C}/8 \text{ h} \leq t \leq 12 \text{ h}$									
6.2	Delivery condition code	U									
7	Use condition	T6									
	Heat treatment	Delivery condition									

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8.1	Test sample(s)		See EN 2070-5.									
8.2	Test piece(s)		See EN 2070-5.									
8.3	Heat treatment		Use condition									
9	Dimensions concerned	mm	$0,6 \leq a \leq 1,2$			$1,2 < a \leq 6$			$6 < a \leq 12,5$			
10	Thickness of cladding on each face	%	-			-			-			
11	Direction of test piece		L			L			L			
12	Temperature	θ	°C			Ambient			Ambient			
13	Proof stress	$R_{p0,2}$	MPa			≥ 240			≥ 240			
14	T Strength	R_m	MPa			≥ 290			≥ 290			
15	Elongation	A	%			$A_{50\text{mm}} \geq 8^a$ or 10^b			$A_{50\text{mm}} \geq 10^a$ or 12^b			
16	Reduction of area	Z	%			-			-			
17	Hardness		-									
18	Shear strength	R_c	MPa			-			-			
19	Bending	k	-			-			-			
20	Impact strength		-									
21	Temperature	θ	°C			-			-			
22	Time		h			-			-			
23	Stress	σ_a	MPa			-			-			
24	C Elongation	a	%			-			-			
25	Rupture stress	σ_R	MPa			-			-			
26	Elongation at rupture	A	%			-			-			
27	Notes (see line 98)		a, b									

33	Flattening of tubes	-	See EN 2070-5.	
		2	If any test specimen fails, retest frequency shall be agreed between manufacturer and purchaser	
		6	$a/D \leq 0,1$	$Z \leq 8 a$
			$a/D > 0,1$	$Z \leq 0,9 D$
34	Grain size	-	See EN 2070-5.	
		7	$G \geq 4$	
41	Flarability	-	See EN 2070-5.	
		2	If any test specimen fails, retest frequency shall be agreed between manufacturer and purchaser	
55	Deformation under pressure of tubes	-	See EN 2070-5.	
82	Batch uniformity	-	See EN 2070-5.	
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95	Marking inspection	-	See EN 2070-5.	
96	Dimensional inspection	-	See EN 2070-5.	
98	Notes	-	a	Strip test piece.
		-	b	Full tube section.
99	Typical use	-	-	