Aerospace series — Titanium alloy TI-P63001 (Ti-4Al-4Mo-2Sn) — Solution treated and aged — Plate — 6 mm < a ≤ 50 mm

ICS 49.025.30

National foreword

This British Standard is the UK implementation of EN 3459:2010. Together with BS 2TA 57:2009, it supersedes BS TA 57:1974 which is withdrawn.

BS EN 3459:2010 covers plate in the thickness range 6 mm to 50 mm, and BS 2TA57:2009 covers plate in the thickness range 50 mm to 65 mm.

The UK participation in its preparation was entrusted to Technical Committee ACE/61/-/49, Titanium and its Alloys for Aerospace Purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Aerospace series - Titanium alloy TI-P63001 (Ti-4Al-4Mo-2Sn) - Solution treated and aged - Plate - 6 mm < a ≤ 50 mm

Série aérospatiale - Alliage de titane TI-P63001 (Ti-4Al-4Mo-2Sn) - Mis en solution et revenu - Plaques - 6 mm < a ≤ 50 mm

Luft- und Raumfahrt - Titanlegierung TI-P63001 (Ti-4Al-4Mo-2Sn) - Lösungsgeglüht und ausgelagert - Platten - 6 mm < a ≤ 50 mm

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 3459:2010) 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of an identical text or by endorsement, at the latest by October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.

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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 4500-4.

1 Scope

This standard specifies the requirements relating to:

Titanium alloy TI-P63001 (Ti-4Al-4Mo-2Sn)
Solution treated and aged
Plate
6 mm < a ≤ 50 mm

for aerospace applications.

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

EN 3114-003, *Aerospace series — Test method — Microstructure of (α + β) titanium alloy wrought products — Part 003: Microstructure of plate*

EN 4050-1, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 1: General requirements*

EN 4050-4, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 4: Acceptance criteria*

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

EN 4500-4, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 4: Specific rules for titanium and titanium alloys*

EN 4800-001, *Aerospace series — Titanium and titanium alloys — Technical specification — Part 001: Plate, sheet and strip*

1	Material designation		Titanium alloy TI-P63001 (Ti-4Al-4Mo-2Sn)											
2	Chemical composition %	Element	Al	Mo	Si	Sn	O	N	H	C	Fe	Others 1) Each	Others 1) Total	Ti
		min.	3,0	3,0	0,3	1,5	–	–		–	–	–	–	Base
		max.	5,0	5,0	0,7	2,5	0,25	0,03	0,0125	0,08	0,20	0,10	0,40	
3	Method of melting		See EN 4800-001											
4.1	Form		Plate											
4.2	Method of production		Wrought											
4.3	Limit dimension(s)	mm	$6 < a \leq 50$											
5	Technical specification		EN 4800-001											

6.1	Delivery condition	Solution treated and aged
	Heat treatment	900 °C ± 10 °C/t ≥ 20 min/AC + 500 °C ± 10 °C/t = 24 h/AC
6.2	Delivery condition code	U
7	Use condition	Delivery condition
	Heat treatment	–

Characteristics

8.1	Test sample(s)			EN 4800-001						
8.2	Test piece(s)			EN 4800-001						
8.3	Heat treatment			Delivery condition						
9	Dimensions concerned		mm	$6 < a \leq 40$			$40 < a \leq 50$			
10	Thickness of cladding on each face		%	–						
11	Direction of test piece			L	LT		L	LT	ST	
12	T	Temperature	θ °C	Ambient						
13	T	Proof stress	$R_{p0,2}$ MPa	≥ 900	≥ 920		≥ 900	≥ 920	≥ 900	
14	T	Tensile strength	R_m MPa	$1\,030 \leq R_m \leq 1\,220$	$1\,030 \leq R_m \leq 1\,220$		$1\,030 \leq R_m \leq 1\,220$	$1\,030 \leq R_m \leq 1\,220$	$1\,030 \leq R_m \leq 1\,220$	
15	T	Elongation	A %	≥ 9	≥ 9		≥ 9	≥ 9	≥ 7	
16	T	Reduction of area	Z %	≥ 20	≥ 20		≥ 20	≥ 20	≥ 20	
17	Hardness			–						
18	Shear strength	R_c	MPa	–						
19	Bending	k	–	–						
20	Impact strength			–						
21	C	Temperature	θ °C	–						
22	C	Time	h	–						
23	C	Stress	σ_a MPa	–						

24		Elongation	a	%	_			
25		Rupture stress	σ_R	MPa	_			
26		Elongation at rupture	A	%	_			
27	Notes (see line 98)				1)			
30	Microstructure				–	See EN 4800-001		
					1	EN 3114-003		
					7	a (mm)	Acceptable microstructure	Unacceptable microstructure
						$6 < a \leq 30$	3 T 1 to 3 T 19	3 T 20 and 3 T 21
							3 T 22 to 3 T 27	3 T 28 to 3 T 30
							3 T 31 to 3 T 33	3 T 34 to 3 T 38
							3 T 100 and 3 T 101, if incidence less than 5 per cm² of the sampling section	3 T 100 and 3 T 101, if incidence of 5 or more per cm² of the sampling section
							_	3 T 102 to 3 T 106
							3 A 1 to 3 A 8	_
							_	3 T 200 to 3 T 202
						$30 < a \leq 50$	3 T 1 to 3 T 19	3 T 20 and 3 T 21
							3 T 22 to 3 T 38	_
							3 T 100 to 3 T 102	3 T 103 and 3 T 104
							3 T 105	_
							3 T 106; if incidence less than 5 per cm² of the sampling section	3 T 106; if incidence of 5 or more per cm² of the sampling section
							3 A 1 to 3 A 8	_
							_	3 T 200 to 3 T 202
44	External defects				_	See EN 4800-001		
61	Internal defects				_	See EN 4800-001		
					1	EN 4050-1		
					7	Class 5 of EN 4050-4		
74	Surface contamination				_	See EN 4800-001		
95	Marking inspection				_	See EN 4800-001		
96	Dimensional inspection				_	See EN 4800-001		
98	Notes				_	1) Determination not required for routine acceptance		
99	Typical use				_	_		
100	–	Product qualification			–	Qualification programme to be agreed between manufacturer and purchaser.		

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