

**Aerospace series —
Steel FE-PL1507
(40CrMoV12) —
Remelted, hardened
and tempered, forgings
 $D_e \leq 50$ mm,
 $1\ 250$ MPa \leq
 $R_m \leq 1\ 400$ MPa**

ICS 49.025.10

National foreword

This British Standard is the UK implementation of EN 4098:2007.

The UK participation in its preparation was entrusted by Technical Committee ACE/61, Metallic materials for aerospace purposes, to Panel ACE/61/-/15, Steels.

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

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English Version

**Aerospace series - Steel FE-PL1507 (40CrMoV12) - Remelted,
hardened and tempered, forgings $De \leq 50$ mm, $1\ 250$ MPa $\leq R_m$
 $\leq 1\ 400$ MPa**

Série aéronautique - Acier FE-PL1507 (40CrMoV12) -
Refondu, durci par trempe et revenu, pièces forgées et
pièces matriquées $De \leq 50$ mm, $1\ 250$ MPa $\leq R_m \leq 1\ 400$
MPa

Luft- und Raumfahrt - Stahl FE-PL1507 (40CrMoV12) -
Umgeschmolzen, gehärtet und angelassen, Gesenk- und
Freiformschmiedestücke $De \leq 50$ mm, $1\ 250$ MPa $\leq R_m \leq 1$
400 MPa

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Foreword

This document (EN 4098:2007) 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.

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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 4500-5.

1 Scope

This standard specifies the requirements relating to:

Steel FE-PL1507 (40CrMoV12) — Remelted, hardened and tempered, forgings $D_e \leq 50$ mm,
 $1\,250\text{ MPa} \leq R_m \leq 1\,400\text{ MPa}$

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 2157-3, *Aerospace series — Steel — Forging stock and forgings — Technical specification — Part 3: Pre-production and production forgings*

EN 3971, *Aerospace series — Steel FE-PL 1507 (40CrMoV12), consumable electrode remelted, annealed — Forging stock, a or D ≤ 350 mm*

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

EN 4436, *Aerospace series — Steel — Test methods — Determination of δ ferrite content¹⁾*

EN 4500-5, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 5: Specific rules for steels¹⁾*

¹⁾ Published as ASD prestandard at the date of publication of this standard.

1	Material designation		Steel FE-PL1507 (40CrMoV12)										
2	Chemical composition %	Element	C	Si	Mn	P ^a	S	Cr	Mo	Ni	Sn ^a	V	Fe
		min.	0,35	0,10	0,40	–	–	3,00	0,80	–	–	0,15	Base
		max.	0,43	0,35	0,70	0,015	0,010	3,50	1,10	0,30	0,025	0,25	
3	Method of melting		Consumable electrode remelted										
4.1	Form		Forgings										
4.2	Method of production		Forged from forging stock EN 3971										
4.3	Limit dimension(s)	mm	$D_e \leq 50$										
5	Technical specification		EN 2157-3										

6.1	Delivery condition		Normalized and annealed				Hardened and tempered			
	Heat treatment		910 °C / AC + 750 °C / AC or OQ				920 °C ≤ θ ≤ 940 °C / OQ + θ ≥ 600 °C / OQ or AQ			
6.2	Delivery condition code		A				U			
7	Use condition		Hardened and tempered				Delivery condition			
	Heat treatment		920 °C ≤ θ ≤ 940 °C / OQ + θ ≥ 600 °C / OQ or AQ				–			

Characteristics

8.1	Test sample(s)		See EN 2157-3										
8.2	Test piece(s)		See EN 2157-3										
8.3	Heat treatment		Normalized and annealed				Use condition						
9	Dimensions concerned	mm	–				$D_e \leq 50$						
10	Thickness of cladding on each face	%	–				–						
11	Direction of test piece		–				L						
12	Temperature	θ	°C	Ambient				Ambient					
13	Proof stress	$R_{p0,2}$	MPa	–				≥ 1 030					
14	T Strength	R_m	MPa	–				1 250 ≤ R_m ≤ 1 400					
15	Elongation	A	%	–				≥ 10					
16	Reduction of area	Z	%	–				≥ 35					
17	Hardness		≤ 277 HB				375 ≤ HB ≤ 401						
18	Shear strength	R_c	MPa	–				–					
19	Bending	k	–	–				–					
20	Impact strength		–				KV ≥ 30 J; Notch direction T ^{b c}						
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, c										

34	Grain size	–	See EN 2157-3
		2	First article
		7	$G \geq 7$
44	External defects	–	See EN 2157-3
51	Macrostructure (Grain flow)	–	See EN 2157-3
		2	First article
82	Batch uniformity	–	See EN 2157-3
95	Marking inspection	–	See EN 2157-3
96	Dimensional inspection	–	See EN 2157-3
98	Notes	–	<p>^a $P + Sn \leq 0,025$</p> <p>^b Value after blank nitriding: $500\text{ °C} \pm 10\text{ °C} / t = 24\text{ h}$. The "capability clause" applies.</p> <p>^c IZOD is optional test and shall achieve 20 Ft. lbf minimum.</p>
99	Typical use	–	Low alloy general purpose steel; suitable for nitriding

100	–	Product qualification	–	Qualification programme to be agreed between manufacturer and purchaser.
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