

**Aerospace series —
Steel FE-PL1505
(15CrMoV6) — Air
melted — Hardened and
tempered — Plate —
6 mm < a ≤ 20 mm —
1 080 MPa ≤ Rm
≤ 1 280 MPa**

The European Standard EN 3525:2007 has the status of a
British Standard

ICS 49.025.10

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 3525:2007.

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 ACE/61/-/15 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.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2007

© BSI 2007

ISBN 978 0 580 50557 7

Amendments issued since publication

Amd. No.	Date	Comments

English Version

**Aerospace series - Steel FE-PL1505 (15CrMoV6) - Air melted -
Hardened and tempered - Plate - 6 mm < a ≤ 20 mm - 1 080
MPa ≤ Rm ≤ 1 280 MPa**

Série aéronautique - Acier FE-PL1505 (15CrMoV6) -
Élaboré à l'air - Trempé et revenu - Plaques - 6 mm < a ≤
20 mm - 1 080 MPa ≤ Rm ≤ 1 280 MPa

Luft- und Raumfahrt - Stahl FE-PL1505 (15CrMoV6) -
Lufterschmolzen - Gehärtet und angelassen - Platten - 6
mm < a ≤ 20 mm - 1 080 MPa ≤ Rm ≤ 1 280 MPa

This European Standard was approved by CEN on 5 October 2006.

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 Management Centre 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 CEN Management Centre has the same status as the official versions.

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



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 3525:2007) 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.

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 September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

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

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-PL1505 (15CrMoV6)
Air melted
Hardened and tempered
Plate
 $6 \text{ mm} < a \leq 20 \text{ mm}$
 $1\ 080 \text{ MPa} \leq R_m \leq 1\ 280 \text{ MPa}$

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 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*. ¹⁾

EN 2951, *Aerospace series — Metallic materials — Test method — Micrographic determination of content of non-metallic inclusions*. ¹⁾

EN 4050-4, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 4: Acceptance criteria*. ¹⁾

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

EN 4500-5, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 5: Specific rules for steels*. ¹⁾

EN 4700-1, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 1: Plate, sheet and strip*. ¹⁾

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

EN 3525:2007

1	Material designation		Steel FE-PL1505 (15CrMoV6)								
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	V	Fe
		min.	0,12	–	0,80	–	–	1,25	0,80	0,20	Base
		max.	0,18	0,20	1,10	0,020	0,015	1,50	1,00	0,30	
3	Method of melting		Air melted								
4.1	Form		Plate								
4.2	Method of production		Rolled								
4.3	Limit dimension(s)	mm	$6 < a \leq 20$								
5	Technical specification		EN 4700-1								

6.1	Delivery condition		Softened			Hardened and tempered		
	Heat treatment		–			955 °C ≤ θ ≤ 995 °C / OQ or AC + 595 °C ≤ θ ≤ 645 °C / AC		
6.2	Delivery condition code		A			U		
7	Use condition		Hardened and tempered			Delivery condition		
	Heat treatment		Delivery condition + 955 °C ≤ θ ≤ 995 °C / OQ or AC + 595 °C ≤ θ ≤ 645 °C / AC			–		

Characteristics

8.1	Test sample(s)		See EN 4700-1.								
8.2	Test piece(s)		See EN 4700-1.								
8.3	Heat treatment		Softened			Use condition					
9	Dimensions concerned	mm	$6 < a \leq 12$		$12 < a \leq 20$		$6 < a \leq 20$				
10	Thickness of cladding on each face	%	–		–		–				
11	Direction of test piece		–		–		LT				
12	Temperature	θ	°C		–		Ambient				
13	Proof stress	R _{p0,2}	MPa		–		≥ 930				
14	T Strength	R _m	MPa		–		1 080 ≤ R _m ≤ 1 280				
15	Elongation	A	%		–		≥ 10				
16	Reduction of area	Z	%		–		–				
17	Hardness		HB ≤ 197 or HV ≤ 197		HB ≤ 197 or HV ≤ 197		335 ≤ HV ≤ 382 or 321 ≤ HB ≤ 380				
18	Shear strength	R _c	MPa		–		–				
19	Bending	k	–		0,5; α = 90°		–				
20	Impact strength		–								
21	Temperature	θ	°C		–						
22	Time		h		–						
23	Stress	σ _a	MPa		–						
24	Elongation	a	%		–						
25	Rupture stress	σ _R	MPa		–						
26	Elongation at rupture	A	%		–						
27	Notes (see line 98)		–								

44	External defects	–	See EN 4700-1.
		1	Visual
50	Cleanliness/inclusion content (micro-cleanness)	–	See EN 4700-1.
		1	EN 2951
		7	Category 1
59	Decarburization	–	See EN 4700-1.
61	Internal defects	–	See EN 4700-1.
		1	EN 4050-4
		7	Class 2
95	Marking inspection	–	See EN 4700-1.
96	Dimensional inspection	–	See EN 4700-1.
98	Notes	–	–
99	Typical use	–	–

EN 3525:2007

100	-	Product qualification	-	See EN 2043.
				Qualification programme to be agreed between manufacturer and purchaser.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.
Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001.
Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at <http://www.bsi-global.com>.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.
Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.
Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001.
Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at <http://www.bsi-global.com/bsonline>.

Further information about BSI is available on the BSI website at <http://www.bsi-global.com>.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright & Licensing Manager.
Tel: +44 (0)20 8996 7070. Fax: +44 (0)20 8996 7553.
Email: copyright@bsi-global.com.