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**Aeronavtika - Jeklo X3CrNiMoAl13-8-2 (1.4534) - Topilno žarjeno in izločevalno utrjeno -  $1400 \leq R_m \leq 1550$  MPa - Izkovki - De  $\leq 100$  mm**

Aerospace series - Steel FE-PM67 - Solution annealed and precipitation hardened -  $1400 \leq R_m \leq 1550$  MPa - Forgings - De  $\leq 100$  mm

luft- und Raumfahrt - Stahl FE-PM67 - Lösungsgeglüht mit abschrecken und ausgehärtet -  $1400 \leq R_m \leq 1550$  MPa - Schmiedestücke - De  $\leq 100$  mm

Série aérospatiale - Acier FE-PM67 - Hypertrempe et durci par précipitation -  $1400 \leq R_m \leq 1550$  MPa - Pièces forgées ou matricées - De  $\leq 100$  mm

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**Ta slovenski standard je istoveten z: EN 3486:2019**

**ICS:**

49.025.10	Jekla	Steels
77.140.85	Železni in jekleni kovani izdelki	Iron and steel forgings

**SIST EN 3486:2020****en,fr,de**

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EUROPEAN STANDARD

EN 3486

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2019

ICS 49.025.10

English Version

**Aerospace series - Steel X3CrNiMoAl13-8-2 (1.4534) -  
Solution annealed and precipitation hardened -  $1\ 400 \leq$   
 $R_m \leq 1\ 550$  MPa - Forgings -  $De \leq 100$  mm**

Série aérospatiale - Acier X3CrNiMoAl13-8-2 (1.4534) -  
Recuit de mise en solution et durci par précipitation -  $1\ 400 \leq R_m \leq 1\ 550$  MPa - Pièces forgées ou matricées -  
 $De \leq 100$  mm

uft- und Raumfahrt - Stahl X3CrNiMoAl13-8-2 (1.4534)  
- Dösungsgeglüht mit abschrecken und ausgehärtet -  $1\ 400 \leq R_m \leq 1\ 550$  MPa - Schmiedestücke -  $De \leq 100$   
mm

This European Standard was approved by CEN on 22 April 2019.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 3486:2019) 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 June 2020, and conflicting national standards shall be withdrawn at the latest by June 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 3486:2019 (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 4500-005.

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## 1 Scope

This document specifies the requirements relating to:

Steel X3CrNiMoAl13-8-2 (1.4534)  
Solution annealed and precipitation hardened  
 $1\ 400 \leq R_m \leq 1\ 550$  MPa  
Forgings  
 $D_e \leq 100$  mm

for aerospace applications.

ASD-STAN designation: FE-PM67.

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

EN 3359, *Aerospace series — Steel FE-PM1503 (X3CrNiMoAl13-8-2) — Vacuum induction melted and consumable electrode remelted, softened, forging stock  $a$  or  $D \leq 300$  mm*

## 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:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Requirements

See Table 1.

## EN 3486:2019 (E)

Table 1 — Requirements for Steel X3CrNiMoAl13-8-2 (1.4534)

1	Material designation		Steel X3CrNiMoAl13-8-2 (1.4534)								
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Fe
		min.	-	-	-	-	-	12,25	2,00	7,50	Rem.
		max.	0,05	0,10	0,10	0,010	0,008	13,25	2,50	8,50	
3	Method of melting		Vacuum melted and consumable electrode remelted								
4.1	Form		Forgings								
4.2	Method of production		Forged from forging stock EN 3359								
4.3	Limit dimension(s)	mm	$D_e \leq 100$								
5	Technical specification		EN 2157-3								

6.1	Delivery condition	Solution annealed	Solution annealed and precipitation hardened
	Heat treatment	$\theta = 925 \text{ °C}/t \geq 30 \text{ min/AC}$ or OQ	$\theta = 925 \text{ °C}/t \geq 30 \text{ min/AC}$ or OQ + $530 \leq \theta \leq 550 \text{ °C}/t = 4 \text{ h/AC}$
6.2	Delivery condition code	W	U
7	Use condition	Solution annealed and precipitation hardened	As delivered
	Heat treatment	Delivery condition + $530 \leq \theta \leq 550 \text{ °C}/t = 4 \text{ h/AC}$	

## Characteristics

8.1	Test sample(s)		-	
8.2	Test piece(s)		-	
8.3	Heat treatment		In the use condition	
9	Dimensions concerned	mm	$\leq 100$	
10	Thickness of cladding on each face	%	-	
11	Direction of test piece		L or LT in accordance with EN 2157-3	
12	Temperature	$\theta$	°C	
13	Proof stress	$R_{p0,2}$	MPa*	
14	Strength	$R_m$	MPa*	
15	Elongation	A	%	
16	Reduction of area	Z	%	
17	Hardness		$43 \leq \text{HRC} \leq 47$ (for information)	
18	Shear strength	$R_c$	MPa*	
19	Bending	k	-	
20	Impact strength		-	
21	Temperature	$\theta$	°C	
22	Time		h	
23	Stress	$\sigma_a$	MPa*	
24	Elongation	a	%	
25	Rupture stress	$\sigma_R$	MPa*	
26	Elongation at rupture	A	%	
27	Notes (see line 98)		*	



97	Designation	-	-
98	Notes	-	<sup>*)</sup> 1 MPa = 1 N/mm <sup>2</sup> .
99	Typical use	-	-
100	-	Product qualification	-
			Qualification programme to be agreed between manufacturer and purchaser.

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