

BS EN 2030:2013



BSI Standards Publication

**Aerospace series — Steel
X105CrMo17 (1.3544) —
Hardened and tempered —
Bars — $D_e \leq 150$ mm**

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National foreword

This British Standard is the UK implementation of EN 2030:2013.

The UK participation in its preparation was entrusted to Technical Committee ACE/61/-/15, Steels for Aerospace Purposes.

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

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ISBN 978 0 580 81518 8

ICS 49.025.10

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2013.

Amendments issued since publication

Date	Text affected
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EUROPEAN STANDARD

EN 2030

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2013

ICS 49.025.10

English Version

Aerospace series - Steel X105CrMo17 (1.3544) - Hardened and tempered - Bars - $D_e \leq 150$ mm

Série aérospatiale - Acier X105CrMo17 (1.3544) - Trempé et revenu - Barres - $D_e \leq 150$ mm

Luft- und Raumfahrt - Stahl X105CrMo17 (1.3544) - Gehärtet und Angelassen - Stangen - $D_e \leq 150$ mm

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 2030:2013) 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of an identical text or by endorsement, at the latest by June 2014, and conflicting national standards shall be withdrawn at the latest by June 2014.

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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 4500-003.

1 Scope

This European Standard specifies the requirements relating to:

Steel X105CrMo17 (1.3544)
Hardened and tempered
Bars
 $D_e \leq 150$ mm

for aerospace applications.

NOTE Other common designation:
UNS: S44004,
AISI: 440C, XDBD.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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*

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

EN 4500-003, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 003: Specific rules for heat resisting alloys*

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002: Bar and section*

EN ISO 643, *Steels — Micrographic determination of the apparent grain size (ISO 643:2003)*

1) Published as ASD-STAN Prestandard at the date of publication of this standard. <http://www.asd-stan.org/>

BS EN 2030:2013
EN 2030:2013 (E)

1	Material designation		Steel X105CrMo17 (1.3544)								
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Fe
		min.	0,95	–	–	–	–	16,0	0,35	–	Base
		max.	1,10	1,00	1,00	0,030	0,020	18,0	0,75	0,50	
3	Method of melting		Air melted								
4.1	Form		Bars								
4.2	Method of production		–								
4.3	Limit dimension(s)	mm	$D_e \leq 150$								
5	Technical specification		EN 4700-002								

6.1	Delivery condition		Softened								
	Heat treatment		–								
6.2	Delivery condition code		A								
7	Use condition		Hardened and tempered								
	Heat treatment		Delivery condition $+ 1\ 030\ ^\circ\text{C} \leq \theta \leq 1\ 070\ ^\circ\text{C} / \text{OQ}^a$ $+ \text{temper } \theta \geq 140\ ^\circ\text{C}$								

Characteristics

8.1	Test sample(s)		See EN 4700-002.								
8.2	Test piece(s)		See EN 4700-002.								
8.3	Heat treatment		Delivery condition			Use condition			Reference ^b (See line 29) Section: a = 10 mm		
9	Dimensions concerned	mm	$D_e \leq 150$			$D_e \leq 25^c$			$D_e \leq 150$		
10	Thickness of cladding on each face	%	–								
11	Direction of test piece		–								
12	Temperature	θ	°C		–						
13	Proof stress	$R_{p0,2}$	MPa		–						
14	T Strength	R_m	MPa		–						
15	Elongation	A	%		–						
16	Reduction of area	Z	%		–						
17	Hardness		HBW ≤ 255			HV ≥ 650 HRC $\geq 58^d$			HV ≥ 650 HRC $\geq 58^d$		
18	Shear strength	R_c	MPa		–						
19	Bending	k	–		–						
20	Impact strength	KV	J		–						
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)		a, b, c, d								

29	Reference heat treatment	–	Hardened and tempered 1 030 °C ≤ θ ≤ 1 070 °C / OQ, sub-zero to – 90 °C ≤ θ ≤ – 70 °C + temper 140 °C ≤ θ ≤ 160 °C
30	Microstructure	–	EN 4700-002
		5	Use condition
		7	Carbides shall be fine and non-aligned
44	External defects	–	EN 4700-002
		1	Visual inspection
50	Cleanliness/inclusion content	–	EN 4700-002
		1	See EN 2951.
		7	Category 2
61	Internal defects	–	EN 4700-002
		1	See EN 4050-4.
		7	Category 2
95	Marking inspection	–	EN 4700-002
96	Dimensional inspection	–	EN 4700-002
98	Notes	–	<p>a May be sub-zero treated at – 90 °C ≤ θ ≤ – 70 °C.</p> <p>b Optional test.</p> <p>c For greater diameters the manufacturer and user shall agree minimum hardness values.</p> <p>d Method to be used in case of conflict.</p>
99	Typical use	–	Bearings

100	-	Product qualification	-	-
			Qualification programme to be agreed between manufacturer and purchaser.	
	34	Grain size	-	EN 4700-002
			1	See EN ISO 643.
7			$G \geq 5$	

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