

BS EN 6105:2016



BSI Standards Publication

# Aerospace series — Stud with shoulder

**National foreword**

This British Standard is the UK implementation of EN 6105:2016.

The UK participation in its preparation was entrusted to Technical Committee ACE/12, Aerospace fasteners and fastening systems.

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.

© The British Standards Institution 2016.  
Published by BSI Standards Limited 2016

ISBN 978 0 580 92622 8

ICS 49.030.20

**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 September 2016.

**Amendments/corrigenda issued since publication**

Date	Text affected
------	---------------

---

EUROPEAN STANDARD

**EN 6105**

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2016

ICS 49.030.20

English Version

**Aerospace series - Stud with shoulder**

Série aérospatiale - Axe à épaulement

Luft- und Raumfahrt - Verschlussbolzen mit Bund

This European Standard was approved by CEN on 11 March 2016.

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



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

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

<b>Contents</b>		<b>Page</b>
<b>European foreword</b> .....		<b>3</b>
<b>1</b>	<b>Scope</b> .....	<b>4</b>
<b>2</b>	<b>Normative references</b> .....	<b>4</b>
<b>3</b>	<b>Requirements</b> .....	<b>5</b>
<b>3.1</b>	<b>Configuration, dimensions, tolerances and mass</b> .....	<b>5</b>
<b>3.2</b>	<b>Material and surface treatment</b> .....	<b>6</b>
<b>3.3</b>	<b>Mechanical characteristics</b> .....	<b>7</b>
<b>3.3.1</b>	<b>General</b> .....	<b>7</b>
<b>3.3.2</b>	<b>Static values</b> .....	<b>7</b>
<b>3.3.3</b>	<b>Installation torque</b> .....	<b>7</b>
<b>3.4</b>	<b>Operating temperature</b> .....	<b>7</b>
<b>4</b>	<b>Designation</b> .....	<b>7</b>
<b>5</b>	<b>Marking</b> .....	<b>7</b>
<b>6</b>	<b>Technical specification</b> .....	<b>7</b>
<b>7</b>	<b>Example of installation</b> .....	<b>8</b>

## European foreword

This document (EN 6105:2016) 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 March 2017, and conflicting national standards shall be withdrawn at the latest by March 2017.

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

## 1 Scope

This European Standard specifies the dimensions, tolerances, required characteristics and mass of a stud for use in fuselage interior equipment and structural applications. This standard shall be used in conjunction with retaining washer per EN6090A01 (conform to EN 6090) and receptacles per EN 6092 or EN 6093.

## 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 2424, *Aerospace series — Marking of aerospace products*

EN 2516, *Aerospace series — Passivation of corrosion resistant steels and decontamination of nickel base alloys*

EN 4318, *Aerospace series — Heat resisting alloy FE-PA2601 (X6NiCrTiMoV26-15) — Solution treated and precipitation treated — bar and section,  $D_e \leq 100$  mm,  $R_m \geq 960$  MPa<sup>1)</sup>*

EN 6090, *Aerospace series — Washer, retaining<sup>1)</sup>*

EN 6092, *Aerospace series — Receptacle, floating, double lug<sup>1)</sup>*

EN 6093, *Aerospace series — Receptacle, floating, single lug<sup>1)</sup>*

EN 6094, *Aerospace series — Washer, spring, countersunk<sup>1)</sup>*

EN 6095, *Aerospace series — Rotary fasteners — Structural and non-structural applications — Technical specification<sup>1)</sup>*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

SAE-AMS 2700, *Passivation of corrosion resistant steels<sup>2)</sup>*

SAE-AMS 5629, *Steel, corrosion-resistant, bars, wire, forgings, rings and extrusions, 13Cr — 8.0Ni — 2.2Mo — 1.1Al, vacuum induction plus consumable electrode melted, solution heat treated, precipitation hardenable<sup>2)</sup>*

SAE-AMS 5737, *Steel, corrosion and heat-resistant, bars, wire, forgings and tubing 15Cr — 25.5Ni — 1.2Mo — 2.1Ti — 0.006B — 0.30V, consumable electrode melted, 1 650 °F (899 °C) solution and precipitation heat treated<sup>2)</sup>*

SAE-AS 8879, *Screw threads, UNJ profile, inch controlled radius root with increased minor diameter<sup>2)</sup>*

MIL-DTL-83488, *Coating, aluminum, high purity<sup>3)</sup>*

MIL-S-7742, *Screw threads, standard, optimum selected series: general specification for<sup>3)</sup>*

NASM 33781, *Recess, Offset cruciform, dimensions of recess, gage and driver for<sup>4)</sup>*

---

<sup>1)</sup> Published as ASD Prestandard at the date of publication of this standard.

<sup>2)</sup> Published by: SAE International, 400 Commonwealth Drive, Warrendale, P.A., 15096-0001, USA

<sup>3)</sup> Published by: Department of Defense (DoD), the Pentagon, Washington, D.C., 20307, USA

<sup>4)</sup> Published by: Aerospace Industries Association of America, (AIA), 1250 Eye Street, N.W., Washington, D.C. 20005-3924, USA

### 3 Requirements

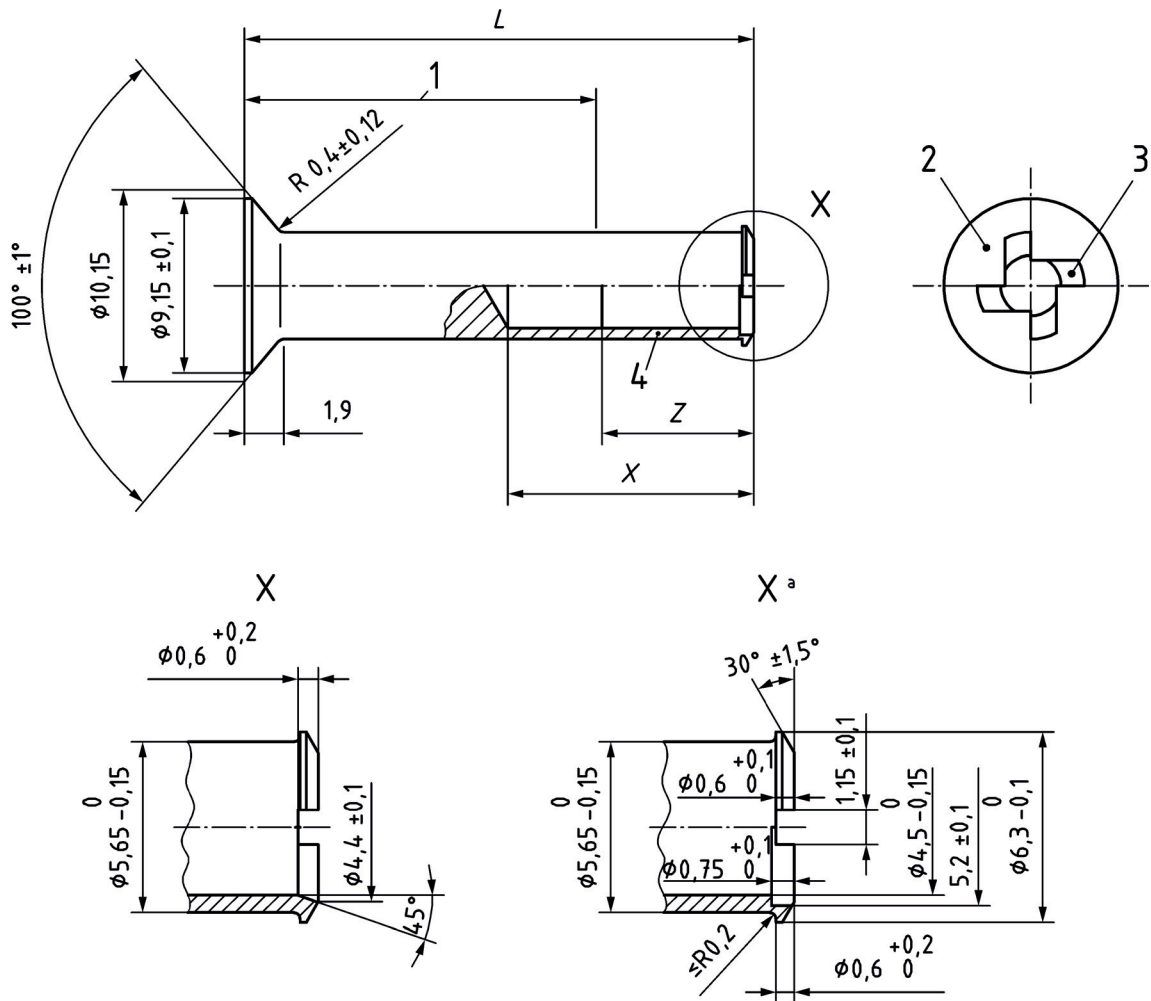
#### 3.1 Configuration, dimensions, tolerances and mass

The configuration, dimensions, tolerances and mass shall conform to Figure 1 and Table 2.

Dimensions and tolerances are expressed in millimetres.

Tolerances not specified shall be in accordance with ISO 2768-1. All dimensions and tolerances apply after surface treatment.

All burrs to be removed / sharp edges to be broken.



#### Key

- |   |                       |   |  |
|---|-----------------------|---|--|
| 1 | Grip range            | 3 | Recess no. 10 per NASM33781  |
| 2 | Marking, see Clause 5 | 4 | 0.1640-32UNJC-3B thread per SAE-AS8879, 2 lead or<br>0.1640-32UNC-3B thread per MIL-S-7742, 2 lead |
| a | Optional version      |   |  |

Figure 1 — Configuration, dimensions and tolerances

**Table 1 — Dimensions, tolerances and mass**

Size code	Grip range		<i>L</i> ± 0,25	<i>X</i> min.	<i>Z</i> +2,0 0	Mass (Ref) kg/1 000 pieces
	min.	max.				
010 <sup>a</sup>	3,81	4,59	10,92	8,0	5,0	1,63
015	4,60	6,39	11,71	9,0		1,70
020	6,40	7,35	12,70	9,8		1,83
030	7,36	9,15	14,48	11,4	7,0	2,04
040	9,16	10,90	16,26	12,0	8,0	2,31
050	10,91	12,70	18,03	13,0		2,55
060	12,71	14,50	19,81			2,91
070	14,51	16,25	21,59			3,26
080	16,26	18,00	23,37			3,62
090	18,01	19,80	25,15			3,97
100	19,81	21,60	26,92			4,30
110	21,61	23,38	28,70			4,66
120	23,39	25,16	30,48			5,01
130	25,17	26,93	32,26			5,37
140	26,94	28,72	34,04			5,70
150	28,71	30,50	35,82			6,06
160	30,51	32,29	37,60			6,42

<sup>a</sup> Not for new design

### 3.2 Material and surface treatment

See Table 2.

**Table 2 — Material and surface treatment**

Material	Surface treatment	Finish code
Corrosion resistant steel per SAE-AMS5629 H1050 or corrosion resistant steel per SAE-AMS5737 or heat resisting alloy per EN 4318 or equivalent	Passivated per SAE-AMS2700 or EN 2516	-
	IVD coating per MIL-DTL-83488 type II, class 3	V



### 3.3 Mechanical characteristics

#### 3.3.1 General

All mechanical characteristics are valid in conjunction with receptacles per EN 6092 and EN 6093 only.

#### 3.3.2 Static values

Ultimate tension load: 6 300 N.

NOTE Ultimate tension load of fastening system in combination with receptacle EN 6092 or EN 6093 is 6 000 N.

Ultimate shear load: 9 000 N.

#### 3.3.3 Installation torque

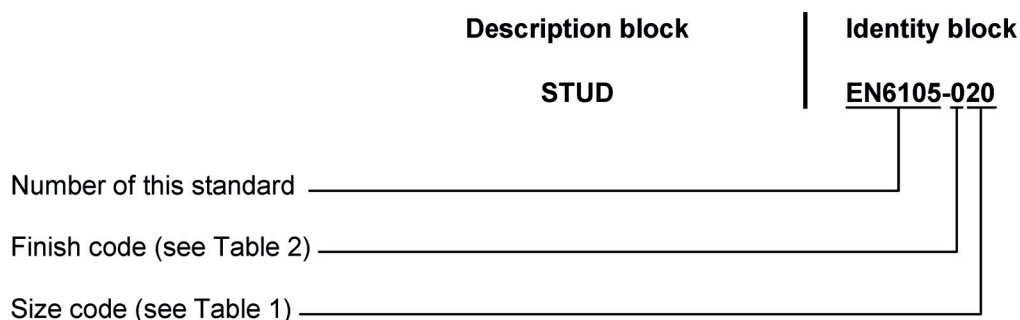
The installation torque with receptacles per EN 6092 and EN 6093 shall be 2,8 Nm to 3,2 Nm.

### 3.4 Operating temperature

This stud shall be used in the temperature range of -55 °C to 150 °C.

## 4 Designation

EXAMPLE



NOTE If necessary, the code I9005 shall be placed between the description block and the identity block.

## 5 Marking

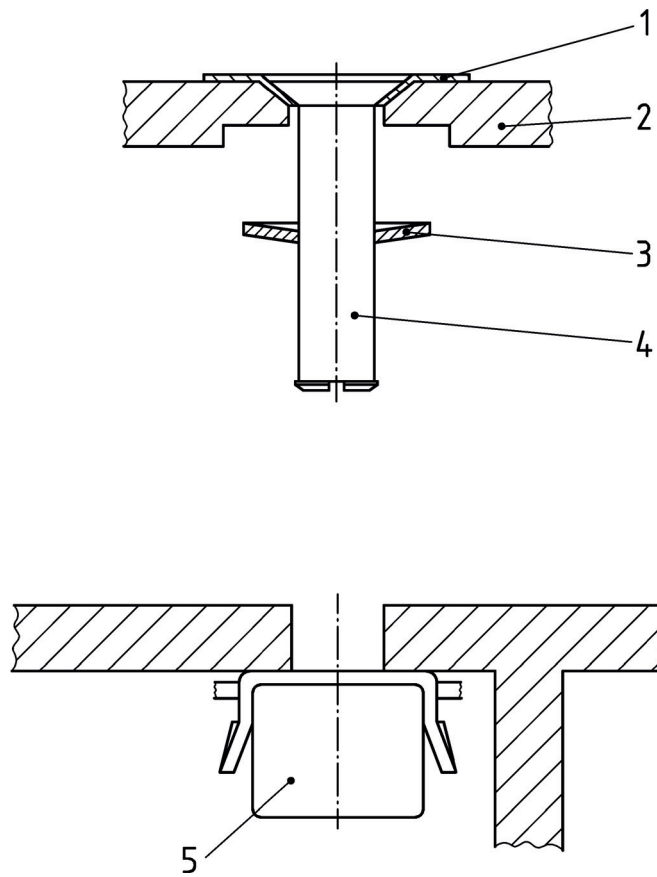
EN 2424, style C.

## 6 Technical specification

EN 6095.

## 7 Example of installation

See Figure 2.



### Key

- 1 Washer EN 6094
- 2 Panel
- 3 Washer EN6090A01
- 4 Stud EN 6105
- 5 Receptacle EN 6092 or EN 6093

**Figure 2 — Example of installation**



# British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

## About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

## Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at [bsigroup.com/standards](http://bsigroup.com/standards) or contacting our Customer Services team or Knowledge Centre.

## Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at [bsigroup.com/shop](http://bsigroup.com/shop), where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

## Copyright in BSI publications

All the content in BSI publications, including British Standards, is the property of and copyrighted by BSI or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use.

Save for the provisions below, you may not transfer, share or disseminate any portion of the standard to any other person. You may not adapt, distribute, commercially exploit, or publicly display the standard or any portion thereof in any manner whatsoever without BSI's prior written consent.

## Storing and using standards

Standards purchased in soft copy format:

- A British Standard purchased in soft copy format is licensed to a sole named user for personal or internal company use only.
- The standard may be stored on more than 1 device provided that it is accessible by the sole named user only and that only 1 copy is accessed at any one time.
- A single paper copy may be printed for personal or internal company use only.

Standards purchased in hard copy format:

- A British Standard purchased in hard copy format is for personal or internal company use only.
- It may not be further reproduced – in any format – to create an additional copy. This includes scanning of the document.

If you need more than 1 copy of the document, or if you wish to share the document on an internal network, you can save money by choosing a subscription product (see 'Subscriptions').

## Reproducing extracts

For permission to reproduce content from BSI publications contact the BSI Copyright & Licensing team.

## Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to [bsigroup.com/subscriptions](http://bsigroup.com/subscriptions).

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

**PLUS** is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit [bsigroup.com/shop](http://bsigroup.com/shop).

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email [subscriptions@bsigroup.com](mailto:subscriptions@bsigroup.com).

## Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

## Useful Contacts

### Customer Services

**Tel:** +44 345 086 9001

**Email (orders):** [orders@bsigroup.com](mailto:orders@bsigroup.com)

**Email (enquiries):** [cservices@bsigroup.com](mailto:cservices@bsigroup.com)

### Subscriptions

**Tel:** +44 345 086 9001

**Email:** [subscriptions@bsigroup.com](mailto:subscriptions@bsigroup.com)

### Knowledge Centre

**Tel:** +44 20 8996 7004

**Email:** [knowledgecentre@bsigroup.com](mailto:knowledgecentre@bsigroup.com)

### Copyright & Licensing

**Tel:** +44 20 8996 7070

**Email:** [copyright@bsigroup.com](mailto:copyright@bsigroup.com)

### BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK