

BS EN 6094:2016



BSI Standards Publication

# Aerospace series — Washer, spring, countersunk

**National foreword**

This British Standard is the UK implementation of EN 6094:2016.

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.

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EUROPEAN STANDARD

**EN 6094**

NORME EUROPÉENNE

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August 2016

ICS 49.030.50

English Version

**Aerospace series - Washer, spring, countersunk**

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<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>4</b>	<b>Designation</b> .....	<b>6</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>7</b>
<b>Bibliography</b> .....		<b>8</b>

## European foreword

This document (EN 6094:2016) 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of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

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## 1 Scope

This European Standard specifies the dimensions, tolerances, required characteristics and mass of a countersunk spring washer for use in fuselage interior equipment and structural applications.

## 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 2540, *Aerospace series — Steel FE-PM3902 (X7CrNiAl17-7) air melted, solution treated and precipitation hardened — Sheet and strip,  $a \leq 6$  mm,  $1240$  MPa  $\leq R_m \leq 1450$  MPa<sup>1)</sup>*

EN 6088, *Aerospace series — Stud<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 6095, *Aerospace series — Rotary fasteners — Structural and non-structural applications — Technical specification<sup>1)</sup>*

EN 6105, *Aerospace series — Stud with shoulder<sup>1)</sup>*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

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>*

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

<sup>2)</sup> Published by: Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA.

### 3 Requirements

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

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

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.

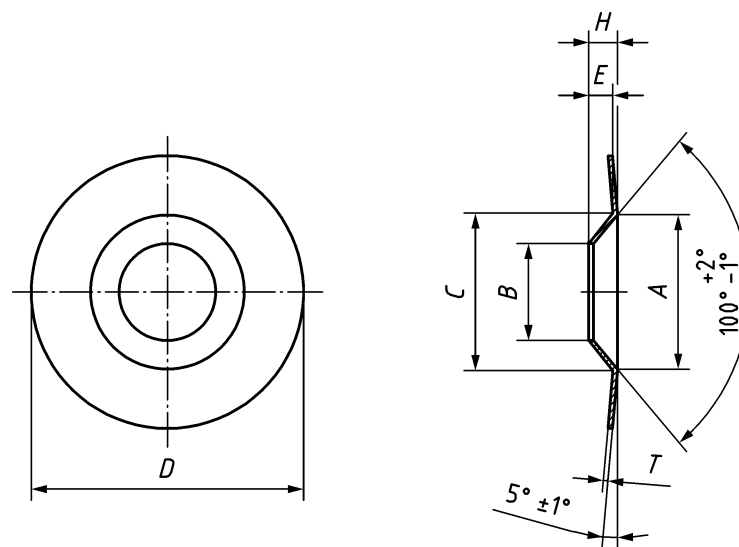


Figure 1 — Configuration

Table 1 — Dimensions and mass

Size code	$\varnothing A$ $\pm 0,14$	$\varnothing B$ $\pm 0,25$	$\varnothing C$ (Ref.)	$\varnothing D$ $\pm 0,25$	$E$ (Ref.)	$H$ (Ref.)	$T$ $\pm 0,06$	Mass (Ref.) kg/1 000 pieces
16	10,16	6,40	10,57	15,88	1,4	2,1	0,64	0,83
18	10,20		10,20	18,00	1,3	1,6	0,30	0,49
19	10,87		11,14	19,05	1,8	2,19	0,41	0,86

### 3.2 Material and surface treatment

See Table 2.

**Table 2 — Material and surface treatment**

Size code	Material	Tensile strength MPa	Surface treatment
16	Corrosion resistant steel 1.4310 per EN10088-2	1 100 – 1 300	Passivated per AMS 2700 or EN 2516
18	Steel FE-PM3902 (X7CrNiAl17-7) per EN2540 or equivalent	1 160 min.	
19	Corrosion resistant steel 1.4310 per EN10088-2	1 100 – 1 300	

### 3.3 Static values

The washer shall be capable to withstand the loads given in Table 3 without permanent deformation.

Load direction is outlined in Figure 2.

NOTE Size code 19 must not be used in combination with quick release fastener system EN 6088, EN 6092, EN 6093 and EN 6105.

**Table 3 — Static values**

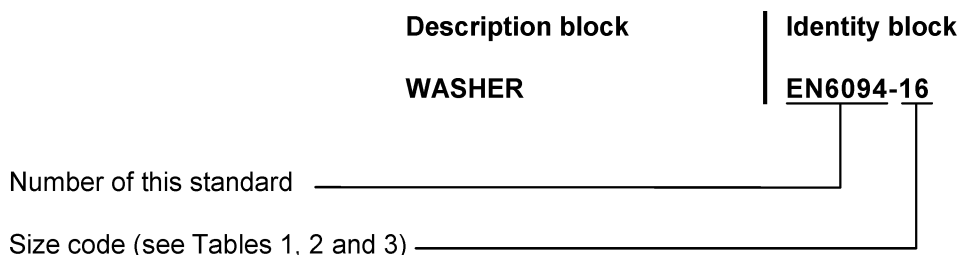
Size code	Minimum pre-load N
16	3 000
18	
19	2 000

### 3.4 Operating temperature

This washer 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

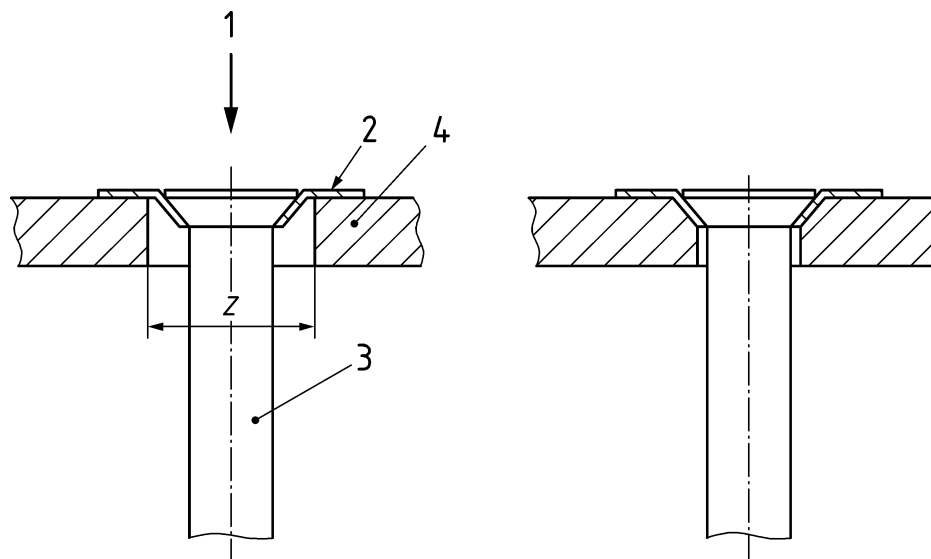
EN 2424, style G.

## 6 Technical specification

EN 6095.

## 7 Example of installation

See Figure 2 and Table 4.



### Key

- 1 Pre-load
- 2 Washer EN 6094 (installed condition)
- 3 Stud EN 6088 or EN 6105
- 4 Panel

Figure 2 — Example of installation

Table 4 — Installation hole sizes

Size code	$\varnothing Z$
16	$10,8 \pm 0,1$
18	$10,5 \pm 0,1$
19	$11,4 \pm 0,1$

## Bibliography

- [1] EN 6089, *Aerospace series — Washer, retaining, for usage with stud EN 6088*<sup>3)</sup>
- [2] EN 6090, *Aerospace series — Washer, retaining*<sup>3)</sup>
- [3] EN 6091, *Aerospace series — Circlip*<sup>3)</sup>

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<sup>3)</sup> Published as ASD Prestandard at the date of publication of this standard.



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