BS EN 4620:2010

Aerospace series — Inserts, MJ threads, self-locking, with self broaching keys — Design standard

ICS 49.030.30

National foreword

This British Standard is the UK implementation of EN 4620:2010.

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.

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 2010

ISBN 978 0 580 56030 9

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4620

March 2010

ICS 49.030.30

English Version

Aerospace series - Inserts, MJ threads, self-locking, with self-broaching keys - Design standard

Série aérospatiale - Douilles filetées, à filetage MJ, à freinage interne, à clavettes auto-brochantes - Norme de conception

Luft- und Raumfahrt - Gewindeeinsätze, MJ-Gewinden, selbstsichernd, mit selbsträumenden Stiften - Konstruktionsnorm

This European Standard was approved by CEN on 9 January 2010.

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, Croatia, 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: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 4620:2010: E

Contents

Page

Foreword

This document (EN 4620:2010) 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 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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, 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.

1 Scope

This standard specifies the applications and installation hole dimensions for EN standard, self-locking, self-broaching key, MJ thread inserts and provisions for component salvage, 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 4619, *Aerospace series — Inserts, MJ threads, self-locking, with self-broaching keys — Installation and removal procedure*

EN 4621, *Aerospace series — Inserts, MJ threads, self-locking, self-broaching keys — Technical specification*

ISO 5855-1, *Aerospace — MJ threads — Part 1: General requirements*

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts*

3 Design

NOTE Typical examples of installed inserts are shown in Figures 1 and 2.

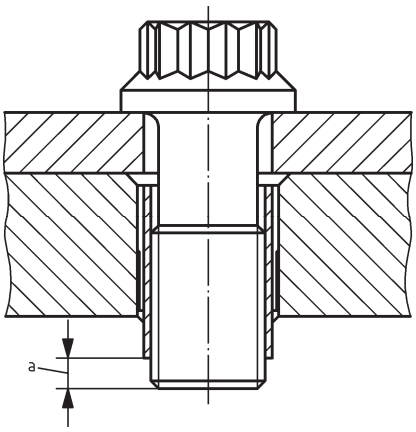
3.1 The threaded self-locking inserts may be used in tapped blind holes and tapped through holes. The minimum flange thickness dimensions K given in Tables 3 to 5 are less than the insert length. When using these minimum flange thicknesses, protrusion of the inserts will occur (see Figure 5, footnote [a]). Designers shall therefore ensure that the inserts do not protrude into an abutment face or foul any other adjacent features.

3.2 The installed insert is compatible with MJ threaded bolts to ISO 5855-2.

3.3 The minimum selected bolt length shall ensure full thread engagement with the insert (see Figures 1 and 2).

3.4 These screw thread inserts may be used in aluminium alloys and in harder materials, such as heat resistant steels and titanium alloys.

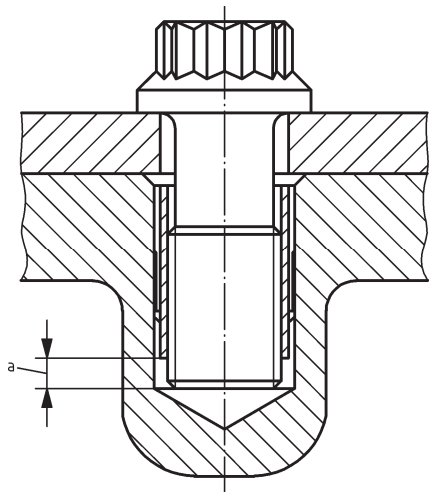
3.5 During the design of the fitted flange, overall dimensions of the tools shall be taken into account as specified in EN 4619.



Key

a 1,5 pitches minimum

Figure 1



Key

a 1,5 pitches minimum

Figure 2

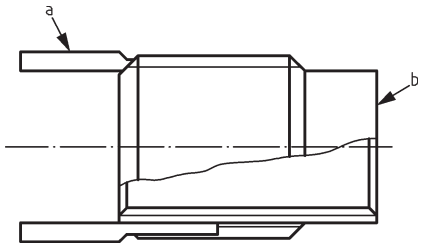
4 Use

4.1 General

A self-locking, self-broaching key insert as shown in Figure 3 is a sleeve of metal, which is threaded both, internally and externally, with two or more self-broaching keys.

These inserts are screwed into tapped holes (see 5.1) and are fixed by broaching the keys into the thread of the component (see Figures 1 and 2) thus preventing the insert moving during the installation or removal of a bolt.

The self-locking zone of these inserts is positioned at the opposite side from the key side.



Key

a Keys to be broached into the thread of the parent component

b Formed out-of-round to achieve self-locking feature

Figure 3

4.2 Performance

The inserts according to EN 4621 have a minimum performance of 25 re-uses at ambient temperature and five re-uses after baking at the maximum operating temperature given on the product standard.

The self-locking torque values for the inserts are given in Table 1. These are the values required to achieve the minimum re-usability performance at ambient temperature in accordance with the technical specification of the inserts.

Table 1

Bolt thread diameter	Self-locking torque Nm	
	min.	max.
MJ5×0,8	0,25	2
MJ6×1	0,35	3,2
MJ7×1	0,5	4,6
MJ8×1	0,65	6
MJ10×1,25	1,2	9,5

4.3 Installation restrictions

In applications where it is necessary to pass items through the installed insert, care shall be taken to ensure that such items do not foul the locking feature of the insert. The maximum diameter X that can be passed through the insert is illustrated in Figure 4 and dimensions are given in Table 2.

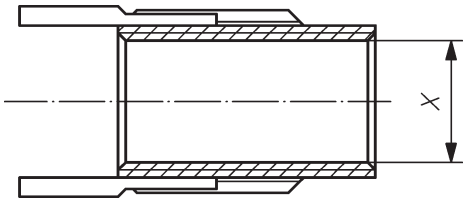


Figure 4

Table 2

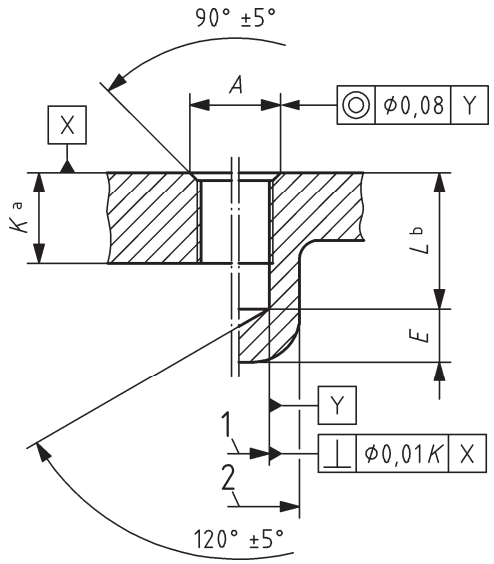
Dimensions in millimetres

Bolt thread diameter	Diameter X max.
MJ5×0,8	3,2
MJ6×1	3,7
MJ7×1	4,5
MJ8×1	5,3
MJ10×1,25	6,7

5 Required characteristics – Installation hole

See Figure 5 and Tables 3 to 6.

Dimensions in millimetres



Key

1 Pitch diameter

2 Boss diameter

[a] K allows total installation of the threaded part of the insert with 0,75 mm under-flush max. The locking feature of the insert may protrude.

[b] L min. $\geq K + 5$ pitches. Allows automatic tapping.

Figure 5

Table 3 — Codified dimensions of holes for normal size inserts

Dimensions in millimetres

Diameter code	Bolt thread diameter [a, b]	Installation hole diameter [a]	*A* +0,2 0	*K* min.	*L* min.
050-0	MJ5×0,8	MJ9×1-4H5H	10	7,5	14
060-0	MJ6×1	MJ10×1-4H5H	11	9	16,5
070-0	MJ7×1	MJ11×1-4H5H	12	10,5	18
080-0	MJ8×1	MJ12×1-4H5H	13	12	20
100-0	MJ10×1,25	MJ14×1-4H5H	15	14,5	23

[a] According to ISO 5855-1.

[b] According to ISO 5855-2.

Table 4 — Codified dimensions of holes for first repair size inserts

Dimensions in millimetres

Diameter code	Bolt thread diameter [a, b]	Thread hole thread diameter [a]	*A* +0,2 0	*K* min.	*L* min.
050-1	MJ5×0,8	MJ10×1-4H5H	11	7,5	14
060-1	MJ6×1	MJ11×1-4H5H	12	9	16,5
070-1	MJ7×1	MJ12×1-4H5H	13	10,5	18
080-1	MJ8×1	MJS13×1-4H5H	14	12	20
100-1	MJ10×1,25	MJ15×1-4H5H	16	14,5	23

[a] According to ISO 5855-1.

[b] According to ISO 5855-2 except MJS13×1 (see EN 4619).

Table 5 — Codified dimensions of holes for second repair size inserts

Dimensions in millimetres

Diameter code	Bolt thread diameter [a, b]	Thread hole thread diameter [a]	*A* +0,2 0	*K* min.	*L* min.
050-2	MJ5×0,8	MJ11×1-4H5H	12	7,5	14
060-2	MJ6×1	MJ12×1-4H5H	13	9	16,5
070-2	MJ7×1	MJS13×1-4H5H	14	10,5	18
080-2	MJ8×1	MJ14×1-4H5H	15	12	20
100-2	MJ10×1,25	MJ16×1-4H5H	17	14,5	23

[a] According to ISO 5855-1.

[b] According to ISO 5855-2 except MJS13×1 (see EN 4619).

Table 6 — Minimal dimensions for bosses

Dimensions in millimetres

	Without provision for repair		With provision for one repair		With provision for two repairs	
Bolt thread diameter	*E* [a] min.	*G* [b] min.	*E* [a] min.	*G* [b] min.	*E* [a] min.	*G* [b] min.
MJ5×0,8	4,6	15,3	4,9	17	5,3	18,7
MJ6×1	4,9	17	5,3	18,7	5,7	20,4
MJ7×1	5,3	18,7	5,7	20,4	6,0	22,1
MJ8×1	5,7	20,4	6,0	22,1	6,5	23,8
MJ10×1,25	6,4	23,8	6,8	25,5	7,2	27,2

[a] *E* min. allows a minimum thickness equal to about 1,5 mm.

[b] *G* min. allows a minimum diameter equal to about 1,7 times the nominal installation thread diameter.

6 Installation

According to EN 4619.

Inserts shall be installed between 0,25 mm and 0,75 mm below the surface of the component.

7 Provisions for component salvage

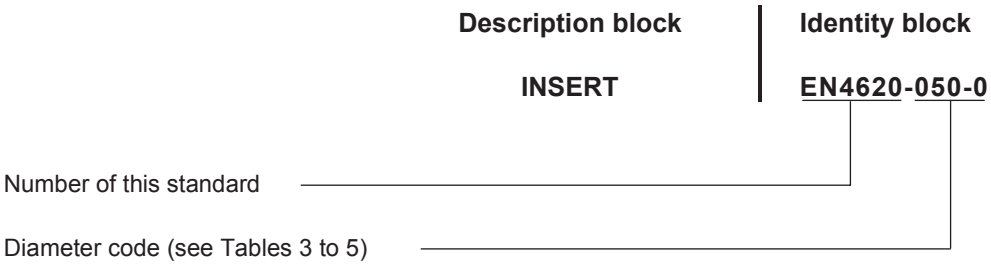
When inserts are selected for a design, consideration shall be given to the feasibility of component salvage, where the original hole could be damaged during the manufacture, or where the hole is machined out of the position.

Before provision is made for component salvage, consideration shall be given to component cost/mass requirements, e.g. for an inexpensive component salvage may not be an economic proposition, where as an expensive component may necessitate salvage. Where provision for salvage is made, the component will be heavier, because of the increase in wall thickness around the tapped holes.

In the event of component salvage action, hole preparation, repair size insert selection and installation shall be in accordance with EN 4619.

8 Designation

EXAMPLE



NOTE The last digit corresponds to:
Size code:
0 = Normal size;
1 = First repair size;
2 = Second repair size.

9 Indication on drawings

9.1 Methods of drawing

Installation hole can be indicated on design drawing in three different manners given hereafter:

A use of standard codification of holes given in chapter "Designation";

B use of standard codification of holes given in chapter "Designation" amended on drawing by different requirements;

C give all dimensions and tolerances of the hole and boss on the drawing.

NOTE – Above method A is recommended.
– In case of boss, it shall be dimensioned on the drawing.

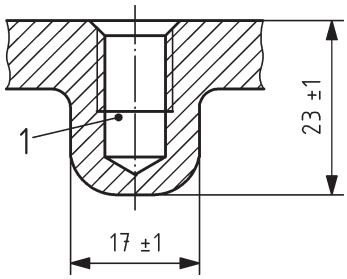
CAUTION — It is important to check that the bolt does not interfere with the bottom of the hole notably when method A is used. In case of possible interference method B or C above shall be used.

With method A, the drilling maximal depth is not limited; it cannot assume minimum thickness of material.

9.2 Examples of definition drawing

See Figures 6 to 8 for design with boss.

Dimensions in millimetres

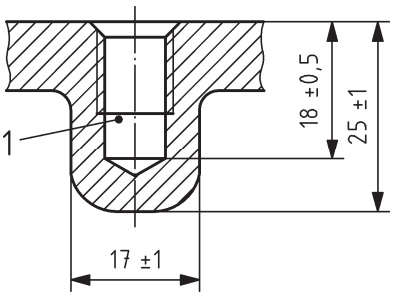


Key

1 Hole to EN 4620-060-0

Figure 6 — Method A

Dimensions in millimetres

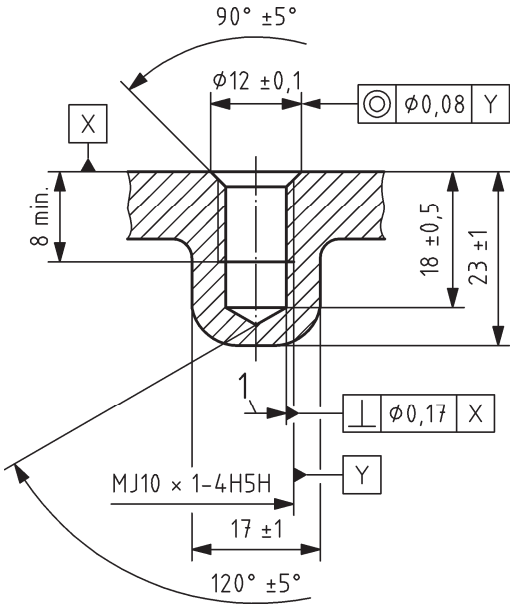


Key

1 Hole to EN 4620-060-0

Figure 7 — Method B

Dimensions in millimetres



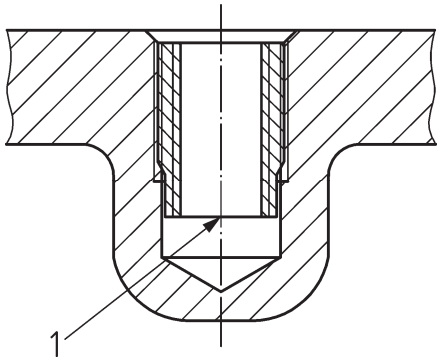
Key

1 Pitch diameter

Figure 8 — Method C

9.3 Example of assembly drawing

See Figure 9.



Key

1 Insert EN 4622-060-0 installed to EN 4619

Figure 9

Lubricant or other product to apply on external thread of the insert shall be specified in the above key when applicable.

Inserts installed in aluminium or magnesium alloy components, for example, should be lightly smeared externally with a suitable compound to prevent galvanic corrosion.

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@bsigroup.com You may also buy directly using a debit/credit card from the BSI Shop on the Website http://www.bsigroup.com/shop

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 Information Centre. Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048 Email: info@bsigroup.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@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsigroup.com/BSOL

Further information about BSI is available on the BSI website at http://www.bsigroup.com.

Copyright

BSI Group
Headquarters 389
Chiswick High Road,
London, W4 4AL, UK
Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/
standards