

Indexable hard material inserts with rounded corners, with partly cylindrical fixing hole — Dimensions

ICS 25.100.01

National foreword

This British Standard reproduces verbatim ISO 6987:1998 and implements it as the UK national standard. It supersedes BS 4193-13:1984 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools, tips and inserts for cutting applications, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, page ii, pages 1 to 21 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date	Comments
10418 Corrigendum	February 1999	Indicated by a sideline in the margin

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INTERNATIONAL STANDARD

**ISO
6987**

First edition
1998-07-01

Indexable hard material inserts with rounded corners, with partly cylindrical fixing hole — Dimensions

*Plaquettes amovibles en matériaux durs avec arrondi de pointe et trou
de fixation partiellement cylindrique — Dimensions*



Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6987 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This first edition of ISO 6987 cancels and replaces the ISO 6987-1:1983, ISO 6987-2:1990 and ISO/TR 6987-3:1990, which have been technically revised.

Annex A, Annex B and Annex C form an integral part of this International Standard. Annex D is for information only.

Descriptors: Tools, cutting tools, inserts, form specifications, dimensions, designation, marking, interchangeability, dimensional measurements.

1 Scope

This International Standard specifies the dimensions of hard material inserts with rounded corners, and with a partly cylindrical fixing hole. These inserts are primarily intended to be mounted on turning and boring tools by a countersunk head screw or any other fixing element, such as a pin lock.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 513:1991, *Application of hard cutting materials for machining by chip removal — Designation of the main groups of chip removal and groups of application*.

ISO 1832:1991, *Indexable inserts for cutting tools — Designation*.

3 Types of insert

The types of indexable hard material insert specified in this International Standard are the following:

- TC: triangular inserts, with 7° normal clearance;
- TP: triangular inserts, with 11° normal clearance;
- SC: square inserts, with 7° normal clearance;
- SP: square inserts, with 11° normal clearance;
- CC: rhombic inserts, with 7° normal clearance and 80° included angle;
- CP: rhombic inserts, with 11° normal clearance and 80° included angle;
- DC: rhombic inserts, with 7° normal clearance and 55° included angle;
- VB: rhombic inserts, with 5° normal clearance and 35° included angle;
- VC: rhombic inserts, with 7° normal clearance and 35° included angle;
- RC: round inserts, with 7° normal clearance;
- RP: round inserts, with 11° normal clearance;
- WC: hexagonal (trigon) inserts, with 7° normal clearance and 80° included angle.

Inserts dealt with in this International Standard are standardized with chip breakers on the face (designated by letter T) and without chip breakers (designated by letter W).

At present, neither the shape nor the dimensions of chip breakers are standardized. Thus, if necessary, special features have to be explained with a diagram or additional specifications.

Table C.1 to Table C.4 give the range of sizes for these inserts.

4 Interchangeability

4.1 Tolerances

The indexable hard material inserts which are the subject of this International Standard are provided in tolerance class M and for VC-shape inserts also in tolerance class G in accordance with ISO 1832.

The values of tolerance class G are in accordance with 4.3 of ISO 1832:1991, and the values of tolerance class M are given in Annex A.

Other tolerances are included in Table 1 for hole dimensions and in Table 3 to Table 12 for insert dimensions.

4.2 Thickness *s* of inserts with chip breakers

The thickness *s* of inserts with chip breakers is defined as the distance between the cutting edge at the corner and the supporting surface of the insert; see Figure 1.

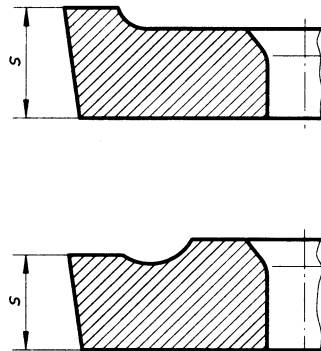


Figure 1

4.3 Fixing hole

In order to guarantee interchangeability when mounting the insert by a countersunk head screw having a head taper angle between 40° and 60° , the form of the hole is partly cylindrical and its dimensions are related to the diameter of the inscribed circle of the insert. Figure 2 and Table 1 give the elements of definition of the fixing hole.

The position of point P is given by diameter d_2 (Table 1), the distance t , measured from the cutting edge at the corner, and dimension c , measured from the upper face.

The ranges of dimensions t and c are as follows:

$$0,05 d_1 \leq t \leq 0,3 d_1$$

and

$$0,15 d_1 \leq c \leq 0,3 d_1$$

These dimensions take into account three cases: indexable inserts with upper faces below the cutting edges [Figure 2a)]; with upper faces on the same level as the cutting edges [Figure 2b)]; with upper faces above the cutting edges [Figure 2c)].

The dimensions of t and c shall be satisfied in all 3 cases.

The diameter d_1 of the cylindrical part of the hole is given in Table 1.

The part of the profile between d_1 and P is left at the manufacturer's discretion but shall satisfy the following requirements:

- the use of screws with head taper angle β between 40° and 60° shall be possible;
- the angle of the tangent theoretical taper at point P has the value $\varphi \geq 65^\circ$;
- the distance between the contact line with a screw having 40° head taper angle and the contact line with a screw having 60° head taper angle shall be as small as possible.

The part of the profile above point P is left at the manufacturer's discretion.

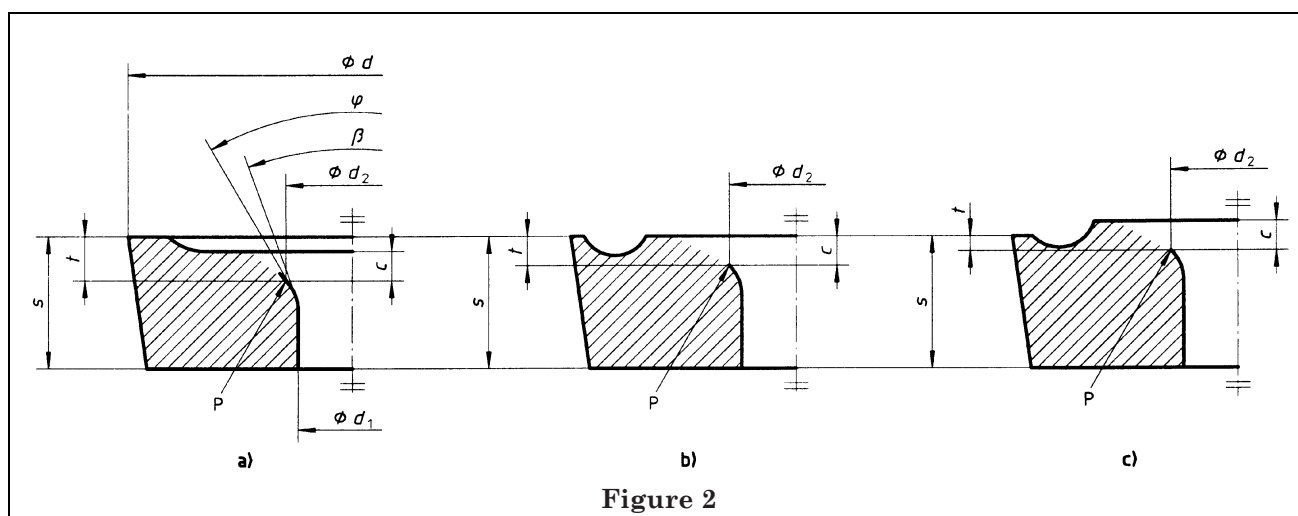


Table 1 — Dimensions of the hole

Dimensions in millimetres

d	for insert shape	T, S, C, D, V, W	4,76	5,56	6,35	7,94	9,525	12,7	15,875	19,05	25,4	—
	R		—	—	6	8	10/12	—	16	20	25	32
d_1	JS13		2,15	2,5	2,8	3,4	4,4	5,5	5,5	6,5	8,6	8,6
d_2	JS13		2,7	3,3	3,75	4,5	6	7,5	7,5	9	12	12

5 Designation and marking

5.1 Designation

The designation of the indexable hard material inserts which form the subject of this International Standard shall conform to ISO 1832.

In addition to this designation, one or both of the following may be indicated:

- the symbol of the group of application, in accordance with ISO 513;
- the commercial designation of the hard material grade.

5.2 Marking

The following symbol, at least, shall be marked on the insert itself (except when this would be difficult to carry out on small inserts):

- symbol of the group of application, or commercial designation of the hard material grade (or both, if possible, on large inserts).

6 Measurement

Annex B indicates the methods of measuring the dimension m of the indexable inserts covered by this International Standard.

7 Recommended dimensions

The choice of the more common dimensions is restricted to the values given in Table 3 to Table 12. It is strongly recommended that these standard inserts be used wherever possible (first preference). When other inserts are required, their dimensions shall be selected from the non-shaded areas of Table C.1 to Table C.4 (second preference). Inserts having dimensions given in the shaded areas of this table are not recommended.

NOTE The m -dimensions are calculated using the exact values of the corner radius r_c given in Table 2, rounded to the third decimal place.