

BS ISO 883:2013



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Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions

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National foreword

This British Standard is the UK implementation of ISO 883:2013. It supersedes BS 4193-2:1986 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

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

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**Indexable hardmetal (carbide) inserts
with rounded corners, without fixing
hole — Dimensions**

*Plaquettes amovibles en métaux-durs (carbures métalliques) avec
arrondi de pointe, sans trou de fixation — Dimensions*



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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This fourth edition cancels and replaces the third edition (ISO 883:1985), of which it constitutes a minor revision.

Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions

1 Scope

This International Standard specifies the dimensions of indexable hardmetal (carbide) inserts with rounded corners, without fixing hole and with normal clearance of 0° and 11°. These inserts are primarily intended to be mounted, by top clamping, on turning and boring tools.

2 Normative references

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

ISO 513, *Classification and application of hard cutting materials for metal removal with defined cutting edges — Designation of the main groups and groups of application*

ISO 1832, *Indexable inserts for cutting tools — Designation*

3 Types of insert

The types of indexable hardmetal (carbide) inserts specified in this International Standard are the following:

- TN: triangular inserts, with 0° normal clearance;
- TP: triangular inserts, with 11° normal clearance;
- SN: square inserts, with 0° normal clearance;
- SP: square inserts, with 11° normal clearance.

Inserts with 0° normal clearance (TN and SN) are standardized only without chip breakers. Inserts with 11° normal clearance (TP and SP) are provided with and without chip breakers.

At the time of publication, neither the shape nor the dimensions of chip breakers are standardized. Thus, if necessary, special features shall be explained by means of a diagram or additional specifications.

[Table C.1](#) gives the ranges of sizes for these inserts.

4 Interchangeability

4.1 Tolerances

Indexable hardmetal (carbide) inserts specified in this International Standard are, provided in the following tolerance classes, in accordance with ISO 1832:

- a) inserts without chip breakers: tolerance classes U and G;
- b) inserts with chip breakers: tolerance class M.

Inserts with chip breakers and tolerance class G are second preference (see [Annex C](#)).

The values of the tolerances in accordance with ISO 1832 are given in [Annex A](#).

Other tolerances are given in [Tables 1](#) and [2](#).

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 opposing supporting surface of the insert; see [Figure 1 a\)](#) and [1 b\)](#).

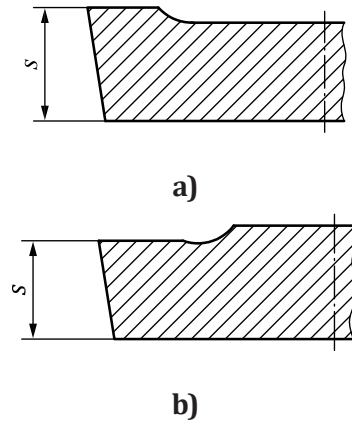


Figure 1

5 Designation and marking

5.1 Designation

The designation of the indexable hardmetal (carbide) inserts complying with 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 hardmetal (carbide) grade.

5.2 Marking

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

- symbol of the group of application, or commercial designation of the hardmetal (carbide) 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

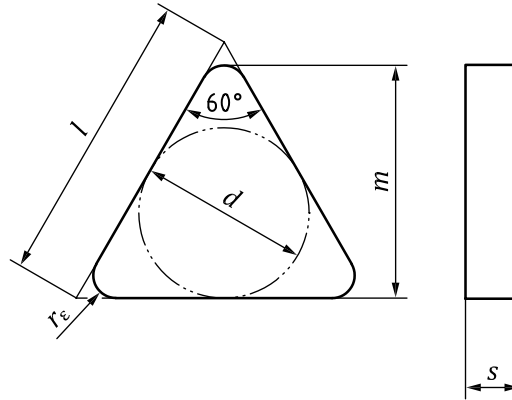
7.1 General

The choice of the more common dimensions is restricted to the specifications given in [Tables 1](#) and [2](#). It is strongly recommended that these standard inserts be used wherever possible (first preference). When other inserts are specially required, insert dimensions shall be selected from the unshaded

portions/squares (blank cells) of [Table C.1](#) (second preference). Dimensions represented by the shaded portions/squares (shaded cells) of [Table C.1](#) are not recommended.

7.2 Triangular inserts

See [Figure 2](#), [Figure 3](#) and [Figure 4](#).

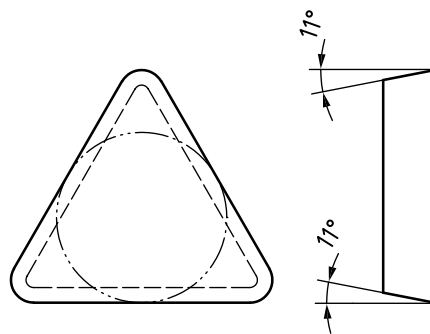


TNUN

TNGN

0° normal clearance,
 without chip breakers

Figure 2

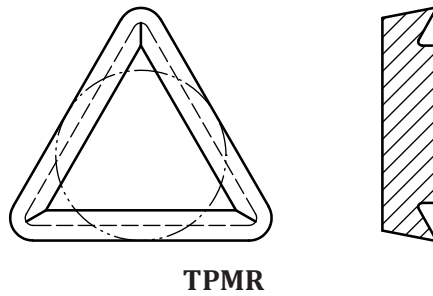


TPUN

TPGN

11° normal clearance,
 without chip breakers

Figure 3



11° normal clearance, with chip breakers

Figure 4

Table 1 — Dimensions of triangular inserts

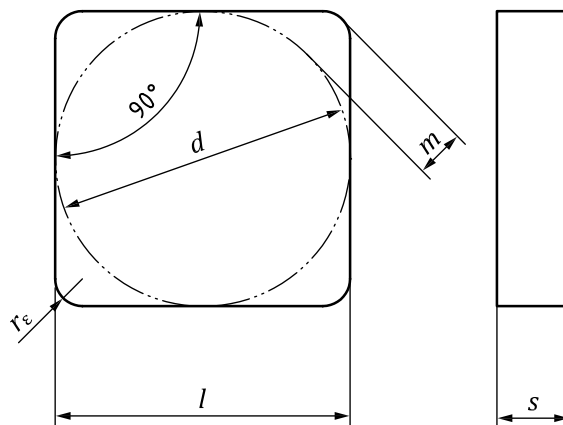
Dimensions in millimetres

Insert					l \approx	d^a	s^a	m^a	r_ϵ $\pm 0,10$
TNUN 110304	TNGN 110304	TPUN 110304	TPGN 110304	TPMR 110304	11,0	6,35	3,18	9,128	0,4
TNUN 110308	-	TPUN 110308	-	TPMR 110308				8,731	0,8
-	-	TPUN 160304	-	TPMR 160304	16,5	9,525		13,891	0,4
-	-	TPUN 160308	TPGN 160308	TPMR 160308				13,494	0,8
-	-	TPUN 160312	TPGN 160312	TPMR 160312			13,097	1,2	
TNUN 160408	TNGN 160408	-	-	-			13,494	0,8	
TNUN 160412	TNGN 160412	-	-	-	13,097	1,2			
-	-	TPUN 220408	-	-	22,0	12,70	4,76	18,256	0,8
TNUN 220412	TNGN 220412	TPUN 220412	TPGN 220412	-				17,859	1,2
TNUN 220416	-	TPUN 220416	-	-				17,463	1,6

^a Tolerances in accordance with ISO 1832. See [Annex A](#).

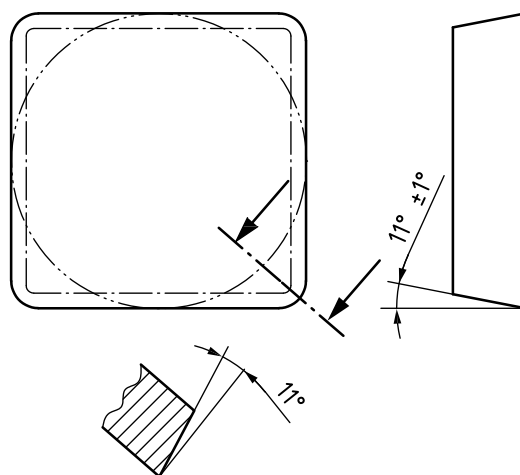
7.3 Square inserts

See [Figure 5](#), [Figure 6](#) and [Figure 7](#).



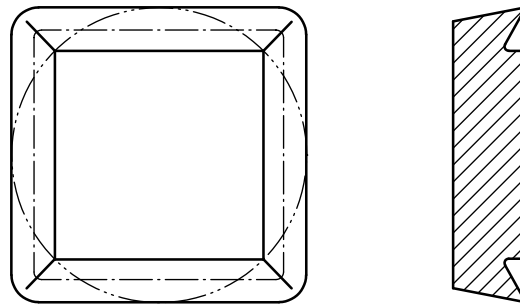
SNUN
SNGN
0° normal clearance,
without chip breakers

Figure 5



SPUN
SPGN
11° normal clearance,
without chip breakers

Figure 6



SPMR

11° normal clearance,
 with chip breakers

Figure 7

Table 2 — Dimensions of square inserts

Dimensions in millimetres

Insert					$d^{a\ b}$	s^a	m^a	r_ϵ $\pm 0,10$
SNUN 090304	-	SPUN 090304	-	SPMR 090304	9,525	3,18	1,808	0,4
SNUN 090308	SNGN 090308	SPUN 090308	-	SPMR 090308			1,644	0,8
-	-	SPUN 120304	-	SPMR 120304	12,70	3,18	2,466	0,4
-	-	SPUN 120308	SPGN 120308	SPMR 120308			2,301	0,8
-	-	SPUN 120312	SPGN 120312	SPMR 120312			2,137	1,2
SNUN 120408	SNGN 120408	-	-	-			2,301	0,8
SNUN 120412	SNGN 120412	-	-	-			2,137	1,2
SNUN 150412	-	-	-	-	15,875	4,76	2,795	1,2
SNUN 150416	-	-	-	-			2,630	1,6
SNUN 190412	-	-	-	-	19,05	4,76	3,452	1,2
SNUN 190416	-	SPUN 190416	-	-			3,288	1,6

^a Tolerances in accordance with ISO 1832. See [Annex A](#).

^b $d = l$

Annex A (informative)

Tolerances for *d*, *m* and *s*

NOTE This annex is an extract of ISO 1832.

Table A.1 — Tolerances for *d*, *m* and *s*^a

Dimensions in millimetres

Insert		Tolerance for class					
		U on		G on		M on	
Designation	<i>d</i>	<i>d</i>	<i>m</i>	<i>d</i>	<i>m</i>	<i>d</i>	<i>m</i>
TN... 11... TP... 11...	6,35	± 0,08	± 0,13	± 0,025	± 0,025	± 0,05	± 0,08
TN... 16... TP... 16... SN... 09... SP... 09...	9,525	± 0,08	± 0,13	± 0,025	± 0,025	± 0,05	± 0,08
TN... 22... TP... 22... SN... 12... SP... 12...	12,70	± 0,13	± 0,20	± 0,025	± 0,025	± 0,08	± 0,13
SN... 15...	15,875	± 0,18	± 0,27	± 0,025	± 0,025	–	–
SN... 19... SP... 19...	19,05	± 0,18	± 0,27	± 0,025	± 0,025	–	–

^a Tolerance for *s* in all tolerance classes: ±0,13.

Annex B (informative)

Method of measurement of “ m ” dimension

NOTE This annex forms an integral part of this International Standard.

B.1 Triangular inserts

Dimension m is related to the side opposite the corner that is to be measured. The insert is placed on a surface plate, as shown in [Figure B.1](#), and checked by means of a dial gauge zeroed with the aid of a gauge block corresponding to dimension m . The dial gauge then gives a direct reading of the error when applied to the inserts to be measured.

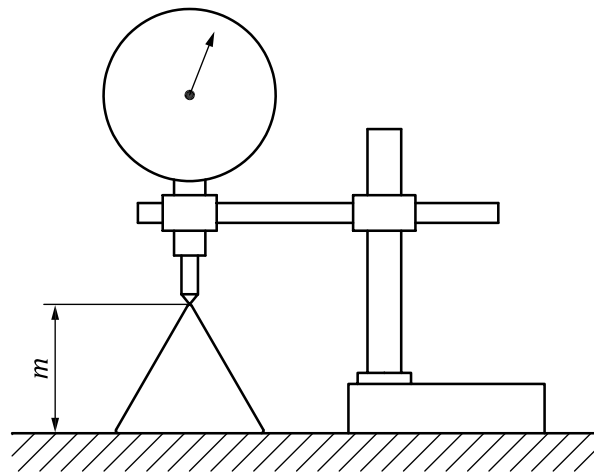


Figure B.1

B.2 Square inserts

Dimension m is checked by reference to the diameter d of a precision roller, where d corresponds to the nominal diameter of the inscribed circle of the insert. The insert is mounted on a 90° vee-block, as shown in [Figure B.2](#), and checked by means of a dial gauge which has been zeroed to dimension m by means of a roller with the aid of a gauge block. The dial gauge then gives a direct reading of the error when applied to the inserts to be measured. The roller has a tolerance of $\pm 0,002$ mm.

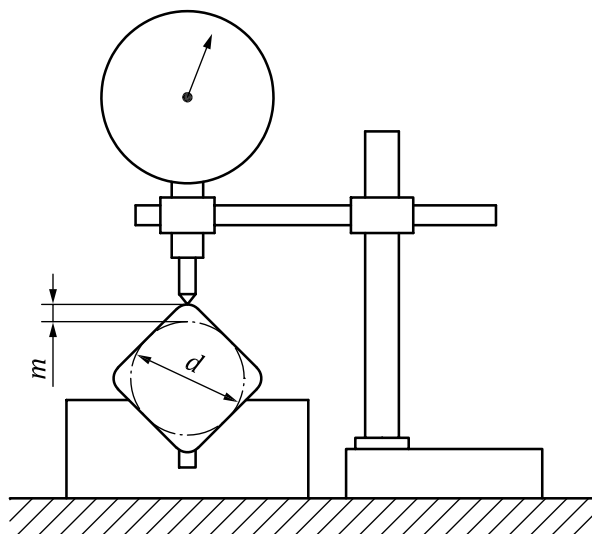


Figure B.2

Annex C (informative)

Inserts with rounded corners without fixing hole, with shapes covered by this International Standard

Table C.1 — Range of sizes

Dimensions in millimetres

<i>d</i>	Normal clearance α_n	Tolerance class															
		U				G				M							
		without chip breakers (N)				without chip breakers (N)				with chip breakers on the face (R)				with chip breakers on the face (R)			
		Designation		Corner radius r_e		Designation		Corner radius r_e		Designation		Corner radius r_e		Designation		Corner radius r_e	
		0,4	0,8	1,2	1,6	0,4	0,8	1,2	1,6	0,4	0,8	1,2	1,6	0,4	0,8	1,2	1,6
6,35		TNUN 1103	+			TNGN 1103	+			TPGR 1103				TPMR 1103	+		
9,525	0°	TNUN 1603				TNGN 1603				TPGR 1603				TPMR 1603	+		+
		TNUN 1604		+		TNGN 1604		+		TPGR 2204				TPMR 2204			
12,7		TNUN 2204		+	+	TNGN 2204				TPGR 2204				TPMR 2204			
6,35		TPUN 1103	+	+		TPGN 1103	+			SNGN 0903		+					
9,525	11°	TPUN 1603	+	+	+	TPGN 1603		+		SNGN 1203							
12,7		TPUN 2204		+	+	TPGN 2204		+		SNGN 1204							
9,525		SNUN 0903	+	+		SNGN 0903				SNGN 1504							
		SNUN 1203				SNGN 1203				SNGN 1904							
12,7	0°	SNUN 1204		+		SNGN 1204		+		SPGN 0903				SPGR 0903			+
15,875		SNUN 1504		+	+	SNGN 1504				SPGN 1203		+		SPGR 1203			+
19,05		SNUN 1904		+	+	SNGN 1904				SPGN 1504				SPGR 1504			
9,525		SPUN 0903	+	+		SPGN 0903				SPGN 1904				SPGR 1904			
12,7	11°	SPUN 1203	+	+	+	SPGN 1203		+									
15,875		SPUN 1504				SPGN 1504											
19,05		SPUN 1904			+	SPGN 1904											

+ First preference in this International Standard (see Tables 1 and 2).

Unshaded (blank) cells/squares: second preference; not covered by this International Standard.

Shaded cells/squares: inserts not recommended.

Annex D (informative)

Relationship between designations in this International Standard and ISO 13399 (all parts)

For the relationship between designations in this International Standard and preferred symbols according to ISO 13399 (all parts), see [Table A.1](#).

Table D.1 — Relationship between designations in this International Standard and the ISO 13399 series

Symbol in ISO 883 (this International Standard)	Reference in ISO 883 (this International Standard)	Property name the ISO 13399 series	Symbol the ISO 13399 series	Reference the ISO 13399 series
d	7.2, Table 1 7.3, Table 2	Inscribed circle diameter	IC	ISO/TS 13399-2 71CE7A96D9F7D
l	7.2, Table 1 7.3, Table 2	Cutting edge length	L	ISO/TS 13399-2 71DD6C95DA49B
m	7.2, Table 1 7.3, Table 2	m-dimension	M	ISO/TS 13399-2 71CE7AA0972DB
r_{ϵ}	7.2, Table 1 7.3, Table 2	Corner radius	RE	ISO/TS 13399-2 71DD6C8ACA503
s	4.2 7.2, Table 1 7.3, Table 2	Insert thickness	S	ISO/TS 13399-2 71CE7A9F5308C

Bibliography

- [1] ISO 13399 (all parts), *Cutting tool data representation and exchange*

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