INTERNATIONAL STANDARD

**ISO 883**

Fourth edition
2013-09-01

# 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*

Reference number
ISO 883:2013(E)

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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.

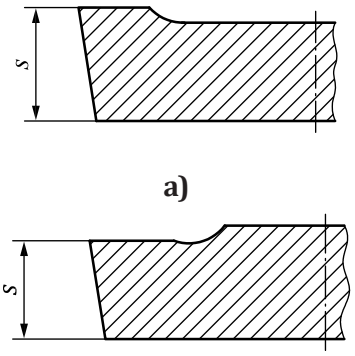
Inserts with chip breakers and tolerance class G are second preference (see Annex C).

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).




**a)**

**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 synnbol, 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

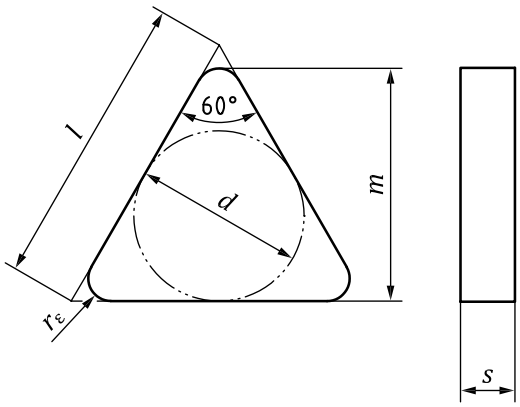
### 7.1 General

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.



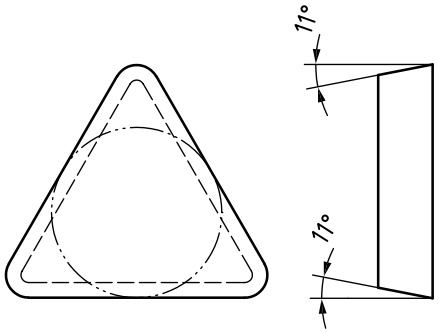

**TNUN**

**TNGN**

**0° normal clearance,**

**without chip breakers**

**Figure 2**



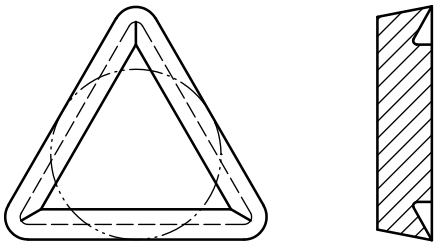

**TPUN**

**TPGN**

**11° normal clearance,**

**without chip breakers**

**Figure 3**



**TPMR**

**11° normal clearance, with chip breakers**

**Figure 4**

**Table 1 — Dimensions of triangular inserts**

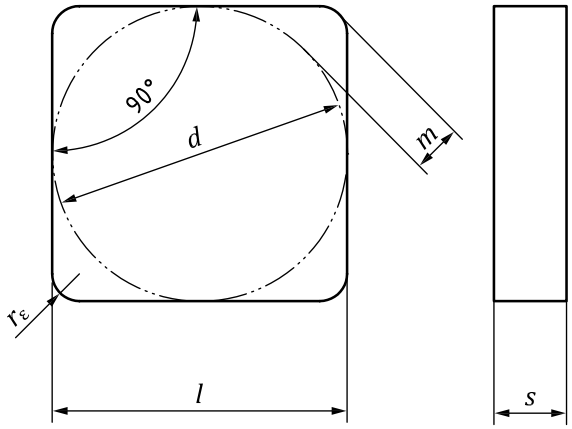
Dimensions in millimetres

| Insert | | | | | $l$ ≈ | $d^a$ | $s^a$ | $m^a$ | $r_\varepsilon$ ± 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** | – | – | – | | | 4,76 | 13,494 | 0,8 |
| **TNUN 160412** | **TNGN 160412** | – | | | | | | 13,097 | 1,2 |
| – | – | **TPUN 220408** | – | – | 22,0 | 12,70 | | 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.



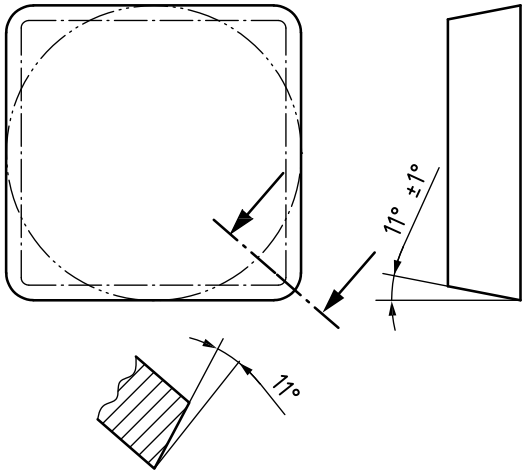

**SNUN**

**SNGN**

**0° normal clearance,**

**without chip breakers**

**Figure 5**



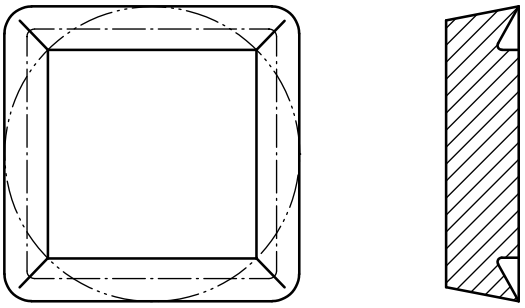

**SPUN**

**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 | | | | | $d^{a\,b}$ | $s^a$ | $m^a$ | $r_\varepsilon$ ± 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 | | 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** | – | – | – | | 4,76 | 2,301 | 0,8 |
| **SNUN 120412** | **SNGN 120412** | | – | | | | 2,137 | 1,2 |
| **SNUN 150412** | – | | – | – | 15,875 | | 2,795 | 1,2 |
| **SNUN 150416** | – | – | – | – | | | 2,630 | 1,6 |
| **SNUN 190412** | – | | – | – | 19,05 | | 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** | *d* | *d* | *m* | *d* | *m* | *d* | *m* |
| **TN... 11...**<br>**TP... 11...** | 6,35 | ± 0,08 | ± 0,13 | ± 0,025 | ± 0,025 | ± 0,05 | ± 0,08 |
| **TN... 16...**<br>**TP... 16...**<br>**SN... 09...**<br>**SP... 09...** | 9,525 | ± 0,08 | ± 0,13 | ± 0,025 | ± 0,025 | ± 0,05 | ± 0,08 |
| **TN... 22...**<br>**TP... 22...**<br>**SN... 12...**<br>**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...**<br>**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.

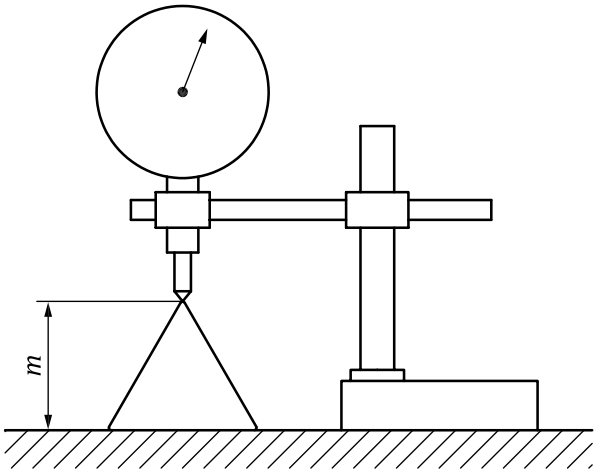



**Figure B.1**

## 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 ±0,002 mm.

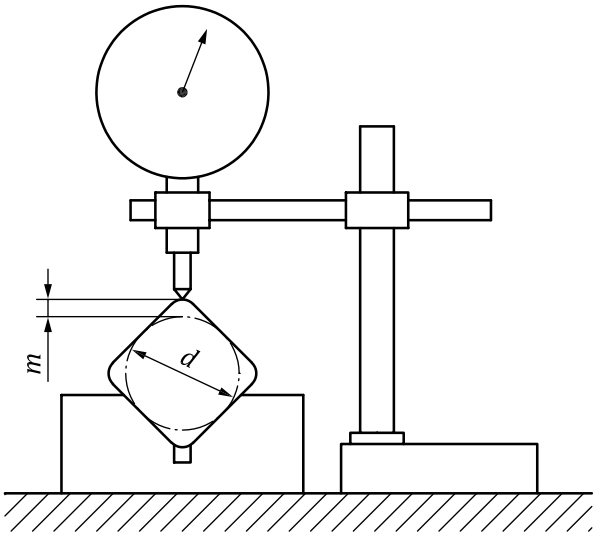



**Figure B.2**

# 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

| $d$ | Normal clearance $\alpha_n$ | Tolerance class: U – Insert: without chip breakers (N) | | | | | Tolerance class: G – Insert: without chip breakers (N) | | | | | Tolerance class: G – Insert: with chip breakers on the face (R) | | | | | Tolerance class: M – Insert: with chip breakers on the face (R) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Designation | Corner radius $r_\varepsilon$ | | | | Designation | Corner radius $r_\varepsilon$ | | | | Designation | Corner radius $r_\varepsilon$ | | | | Designation | Corner radius $r_\varepsilon$ | | | |
| | | | 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 | 0° | TNUN 1103 | + | + | | | TNGN 1103 | + | | | | | | | | | | | | | |
| 9,525 | 0° | TNUN 1603 | | | | | TNGN 1603 | | | | | | | | | | | | | | |
| | 0° | TNUN 1604 | | + | + | | TNGN 1604 | | + | + | | | | | | | | | | | |
| 12,7 | 0° | TNUN 2204 | | | + | + | TNGN 2204 | | | + | | | | | | | | | | | |
| 6,35 | 11° | TPUN 1103 | + | + | | | TPGN 1103 | + | | | | TPGR 1103 | | | | | TPMR 1103 | + | + | | |
| 9,525 | 11° | TPUN 1603 | + | + | + | | TPGN 1603 | | + | + | | TPGR 1603 | | | | | TPMR 1603 | + | + | + | |
| 12,7 | 11° | TPUN 2204 | | + | + | + | TPGN 2204 | | | + | | TPGR 2204 | | | | | TPMR 2204 | | | | |
| 9,525 | 0° | SNUN 0903 | + | + | | | SNGN 0903 | | + | | | | | | | | | | | | |
| 12,7 | 0° | SNUN 1203 | | | | | SNGN 1203 | | | | | | | | | | | | | | |
| | 0° | SNUN 1204 | | + | + | | SNGN 1204 | | + | + | | | | | | | | | | | |
| 15,875 | 0° | SNUN 1504 | | | + | + | SNGN 1504 | | | | | | | | | | | | | | |
| 19,05 | 0° | SNUN 1904 | | | + | + | SNGN 1904 | | | | | | | | | | | | | | |
| 9,525 | 11° | SPUN 0903 | + | + | | | SPGN 0903 | | | | | SPGR 0903 | | | | | SPMR 0903 | + | + | | |
| 12,7 | 11° | SPUN 1203 | + | + | + | | SPGN 1203 | | + | + | | SPGR 1203 | | | | | SPMR 1203 | + | + | + | |
| 15,875 | 11° | SPUN 1504 | | | | | SPGN 1504 | | | | | SPGR 1504 | | | | | SPMR 1504 | | | | |
| 19,05 | 11° | SPUN 1904 | | | | + | SPGN 1904 | | | | | SPGR 1904 | | | | | SPMR 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<br>7.3, Table 2 | Inscribed circle diameter | IC | ISO/TS 13399-2<br>71CE7A96D9F7D |
| *l* | 7.2, Table 1<br>7.3, Table 2 | Cutting edge length | L | ISO/TS 13399-2<br>71DD6C95DA49B |
| *m* | 7.2, Table 1<br>7.3, Table 2 | m-dimension | M | ISO/TS 13399-2<br>71CE7AA0972DB |
| $r_\varepsilon$ | 7.2, Table 1<br>7.3, Table 2 | Corner radius | RE | ISO/TS 13399-2<br>71DD6C8ACA503 |
| *s* | 4.2<br>7.2, Table 1<br>7.3, Table 2 | Insert thickness | S | ISO/TS 13399-2<br>71CE7A9F5308C |

# Bibliography

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

**ICS 25.100.01**

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