
International Standard



883

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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

Third edition — 1985-07-15

ITeH STANDARD PREVIEW
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ISO 883:1985

<https://standards.iteh.ai/catalog/standards/sist/95441b50-526c-431a-909f-c8914e59783d/iso-883-1985>

UDC 621.9.025.7

Ref. No. ISO 883-1985 (E)

Descriptors : tools, cutting tools, carbide tools, inserts, dimensions, designation, marking.

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 883 was prepared by Technical Committee ISO/TC 29, *Small tools*.

ISO 883 was first published in 1975. This third edition cancels and replaces the second edition, of which it constitutes a technical revision.

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

1 Scope and field of application

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.

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

Table 4 gives the ranges of sizes for these inserts.

2 References

ISO 513, *Application of carbides for machining by chip removal — Designation of the main groups of chip removal and groups of application.*

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

ISO 3364, *Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions.*

ISO 3365, *Indexable hardmetal (carbide) inserts with wiper edges, without fixing hole — Dimensions.*

ISO 6987/1, *Indexable hardmetal (carbide) inserts with rounded corners, with partly cylindrical fixing hole — Part 1: Dimensions of inserts with 7 degrees normal clearance.*

3 Types of inserts

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;

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.

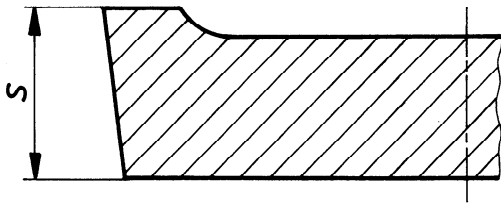
Inserts with chip breakers and tolerance class G are second preference (see annex C).

The values of the tolerances in accordance with ISO 1832 are given in annex A.

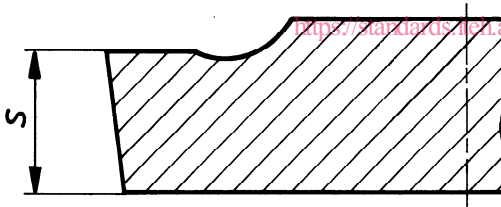
Other tolerances are given in tables 1 and 2.

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 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, according to 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

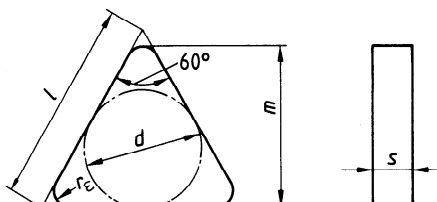
Annex B indicates the methods of measuring the dimension m of the indexable inserts covered by this International Standard.

7 Recommended dimensions

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 non-shaded portions of table 4 (second preference). Dimensions represented by the shaded portions of this table are not recommended.

7.1 Triangular inserts

**TNUN
TNGN**
0° normal clearance,
without chip breakers



**TPUN
TPGN**
11° normal clearance,
without chip breakers

TPMR
11° normal clearance,
with chip breakers



Table 1 – Dimensions of triangular inserts

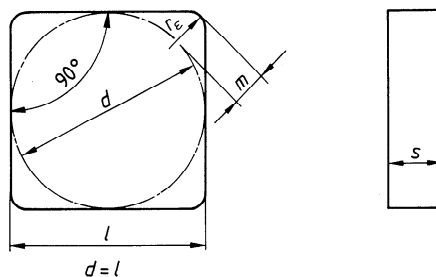
Values in millimetres

| Insert | | | | | l ≈ | d 1) | s 1) | m 1) | r_e ± 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 | — | — | — | | | 22,0 | 12,70 | 4,76 | 13,494 | 0,8 |
| TNUN 160412 | TNGN 160412 | — | — | — | | | | | | 13,097 | 1,2 |
| — | — | TPUN 220408 | — | — | 18,256 | 0,8 | | | | | |
| TNUN 220412 | TNGN 220412 | TPUN 220412 | TPGN 220412 | — | | | | | 17,859 | 1,2 | |
| TNUN 220416 | — | TPUN 220416 | — | — | | | | | 17,463 | 1,6 | |

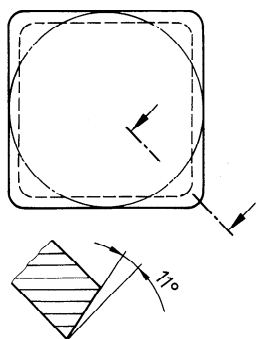
1) Tolerances according to ISO 1832. See annex A.

7.2 Square inserts

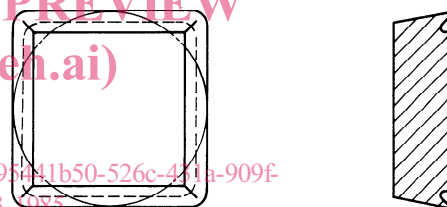
**SNUN
SNGN**
0° normal clearance,
without chip breakers



**SPUN
SPGN**
11° normal clearance,
without chip breakers



SPMR
11° normal clearance,
with chip breakers



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Table 2 – Dimensions of square inserts

Values in millimetres

| Insert | | | | | <i>d</i> 1), 2) | <i>s</i> 1) | <i>m</i> 1) | <i>r_e</i> ± 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 | — | — | — | | 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 | | 3,452 | 1,2 |
| SNUN 190416 | — | SPUN 190416 | — | — | | | 3,288 | 1,6 |

1) Tolerances according to ISO 1832. See annex A.

2) $d = l$

Annex A

Tolerances for d , m , and s

(Extract from ISO 1832.)

Table 3 – Tolerances for d , m and s ¹⁾

Values in millimetres

| Insert | | Tolerances for class | | | | | |
|--|--------|----------------------|--------|---------|---------|--------|--------|
| Designation | d | U on | | G on | | M on | |
| | | d | m | d | m | d | m |
| 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 | — | — |

1) Tolerance for s in all tolerance classes: ± 0,13

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Annex B

Method of measurement of "m" dimension

(This annex forms an integral part of the 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 2 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.

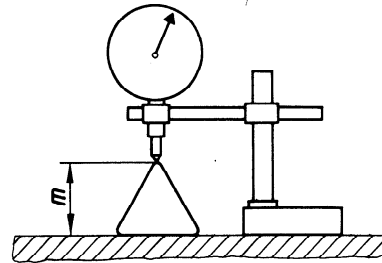


Figure 2

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 3 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.

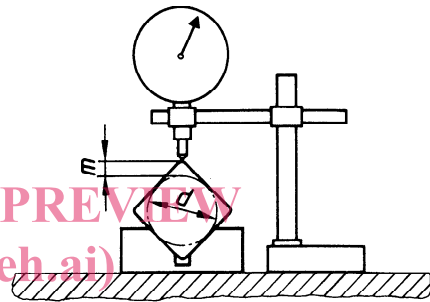


Figure 3

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Annex C

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

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Table 4 — Range of sizes

Values in millimetres

| d | Normal clearance α_n | Tolerance class | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|-----------------------------|----------------------------|-----|------------------------|-----|----------------------------|-----------|------------------------|-----|----------------------------|-----|------------------------|--|----------------------------|-----|------------------------|-----|----------------------------|--|-----|-----|-----|-----|--|--|--|
| | | U | | | | | | G | | | | | | M | | | | | | | | | | | | |
| | | without chip breakers (N) | | with chip breakers (N) | | without chip breakers (N) | | with chip breakers (N) | | without chip breakers (N) | | with chip breakers (N) | | without chip breakers (N) | | with chip breakers (N) | | | | | | | | | | |
| Designation | | Corner radius r_ϵ | | Designation | | Corner radius r_ϵ | | Designation | | Corner radius r_ϵ | | Designation | | Corner radius r_ϵ | | Designation | | Corner radius r_ϵ | | | | | | | | |
| | | 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 | + | | | | | | | | | | | | | | | | | | |
| | | TNUN 1603 | | | | | TNGN 1603 | | | | | | | | | | | | | | | | | | | |
| | | TNUN 1604 | | | + | | TNGN 1604 | | | + | | | | | | | | | | | | | | | | |
| | | TNUN 2204 | | | | + | TNGN 2204 | | | | + | | | | | | | | | | | | | | | |
| 6,35 | 11° | TPUN 1103 | + | | | | TPGN 1103 | + | | | | | | | | | | | | | | | | | | |
| | | TPUN 1603 | + | | | | TPGN 1603 | | | | | | | | | | | | | | | | | | | |
| | | TPUN 2204 | | | | + | TPGN 2204 | | | | | | | | | | | | | | | | | | | |
| | | SNUN 0903 | + | | | | SNGN 0903 | | | | + | | | | | | | | | | | | | | | |
| 12,7 | 0° | SNUN 1203 | | | | | SNGN 1203 | | | | | | | | | | | | | | | | | | | |
| | | SNUN 1204 | | | | + | SNGN 1204 | | | | + | | | | | | | | | | | | | | | |
| | | SNUN 1504 | | | | + | SNGN 1504 | | | | | | | | | | | | | | | | | | | |
| | | SNUN 1904 | | | | + | SNGN 1904 | | | | | | | | | | | | | | | | | | | |
| 9,525 | 11° | SPUN 0903 | + | | | | SPGN 0903 | | | | | | | | | | | | | | | | | | | |
| | | SPUN 1203 | + | | | | SPGN 1203 | | | | + | | | | | | | | | | | | | | | |
| | | SPUN 1504 | | | | | SPGN 1504 | | | | | | | | | | | | | | | | | | | |
| | | SPUN 1904 | | | | | SPGN 1904 | | | | | | | | | | | | | | | | | | | |

- + First preference in this International Standard (see tables 1 and 2).
- Non shaded squares: second preference; not covered by this International Standard.
- Shaded squares: inserts not recommended.