

ISO/TC 29/SC 9

Secretariat: DIN

Voting begins  
on: 2015-10-18

Voting terminates  
on: 2015-12-18

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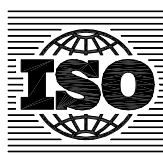
## Indexable hardmetal (carbide) inserts with wiper edges, without fixing hole — Dimensions

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

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ISO/FDIS 3365:2015(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 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

This third edition cancels and replaces the second edition (ISO 3365:1985), of which it constitutes a minor revision.

The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with defined cutting edges, cutting items*.

# Indexable hardmetal (carbide) inserts with wiper edges, without fixing hole — Dimensions

## 1 Scope

This International Standard specifies the dimensions of indexable hardmetal (carbide) inserts with wiper edges, without fixing hole. These inserts are primarily intended to be mounted on milling cutters by top or wedge clamping.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for 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 inserts

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

— TP ... PPN

symmetrical triangular inserts with 11° normal clearance, 90° cutting edge angle, and 11° wiper edge normal clearance;

— TP ... PDR; TP ... PDL

asymmetrical triangular inserts with chamfered corners, 11° normal clearance, 90° cutting edge angle, and 15° wiper edge normal clearance;

— TE ... PER; TE ... PEL

asymmetrical triangular inserts with chamfered corners, 20° normal clearance, 90° cutting edge angle, and 20° wiper edge normal clearance;

— SN ... ENN

symmetrical square insert with chamfered corners, 0° normal clearance, 75° cutting edge angle, and 0° wiper edge normal clearance;

— SP ... EDR; SP ... EDL

asymmetrical square insert with chamfered corners, 11° normal clearance, 75° cutting edge angle, and 15° wiper edge normal clearance;

— SN ... ANN

symmetrical square insert with 0° normal clearance, 45° cutting edge angle, and 0° wiper edge normal clearance;

— SE... EER; SE... EEL

asymmetrical square insert with 20° normal clearance, 75° cutting edge angle, and 20° wiper edge normal clearance.

Inserts with wiper edges, without fixing hole, are standardized only without chip breakers.

## 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 with 0° and 11° normal clearance (TP, SN, and SP)  
tolerance classes A, C, and K, where class C is used mainly for coated inserts;
- b) inserts with 20° normal clearance (TE and SE)  
tolerance class C.

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

Other tolerances are included in the diagrams and tables with the insert dimensions in [Clause 7](#).

### 4.2 Dimensions *m*

Dimension *m* specified in the tables refers to a theoretically perfect insert. In practice, as the points on which the inserts are located in both manufacturing and measuring may be different, the nominal value of dimension *m* may vary from one manufacturer to another within a range of ± 0,05 mm. Nevertheless, for inserts of the same manufacturer, dimension *m* shall comply with the tolerances in accordance with ISO 1832 (see [Annex A](#)).

## 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

The choice of the more common dimensions is restricted to the specifications given in [Tables 1](#) to [12](#). It is strongly recommended that these standard inserts be used wherever possible.

### 7.1 Triangular inserts

#### 7.1.1 Symmetrical triangular inserts with 90° cutting edge angle, 11° normal clearance, and 11° wiper edge normal clearance

TPAN ... PPN

TPCN ... PPN

TPKN ... PPN

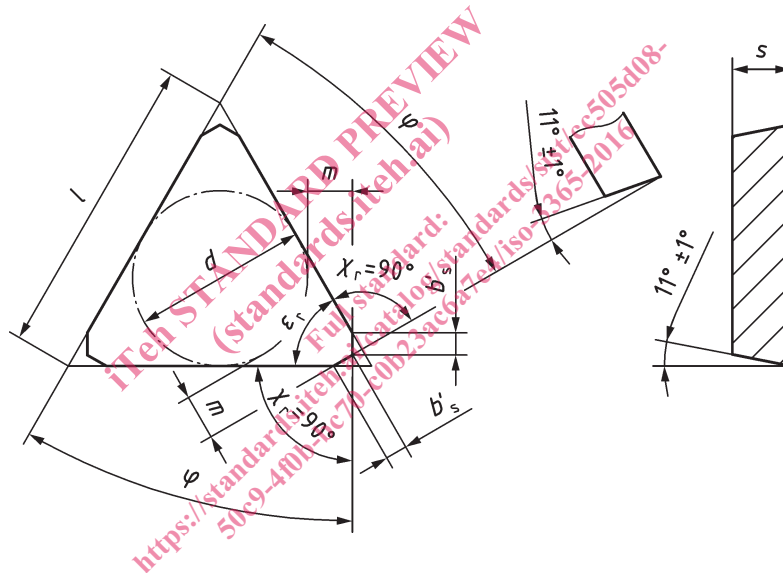


Figure 1

Table 1

Values in millimetres

Insert			$l$	$d^a$	$s^a$	$m^a$	$b'_s$	$\epsilon_r$	$\varphi$
			$\approx$				$\approx$		
TPAN1103 PPN	TPCN1103 PPN	TPKN1103 PPN	11,0	6,35	3,175	1,72	0,7	60°	30°
TPAN1603 PPN	TPCN1603 PPN	TPKN1603 PPN	16,5	9,525		2,45	1,2		
TPAN2204 PPN	TPCN2204 PPN	TPKN2204 PPN	22,0	12,70		3,55	1,3		

<sup>a</sup> Tolerances in accordance with ISO 1832. See [Annex A](#).

Table 2

Tolerance class	Tolerances on	
	$\epsilon_r$	$\varphi$
A	$\pm 8'$	$+ \begin{matrix} 15' \\ 0 \end{matrix}$
C		
K	$\pm 30'$	$+ \begin{matrix} 30' \\ 0 \end{matrix}$

7.1.2 Asymmetrical triangular inserts with chamfered corners, 90° cutting edge angle, 11° normal clearance, and 15° wiper edge normal clearance

TPAN ... PD.

TPCN ... PD.

TPKN ... PD.

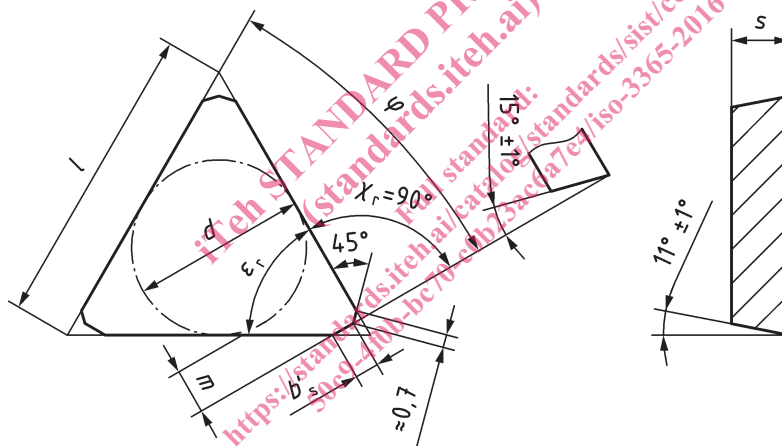


Figure 2

Table 3

Values in millimetres

Insert			$l$	$d^a$	$s^a$	$m^a$	$b'_s$	$\epsilon_r$	$\varphi$
			$\approx$				$\approx$		
TPAN1603 PDR	TPCN1603 PDR	TPKN1603 PDR	16,5	9,525	3,175	2,45	1,3	60°	30°
TPAN1603 PDL	TPCN1603 PDL	TPKN1603 PDL							
TPAN2204 PDR	TPCN2204 PDR	TPKN2204 PDR	22,0	12,70	4,76	3,55	1,4		
TPAN2204 PDL	TPCN2204 PDL	TPKN2204 PDL							

<sup>a</sup> Tolerances in accordance with ISO 1832. See Annex A.



Table 4

Tolerance class	Tolerances on	
	$\epsilon_r$	$\varphi$
A	$\pm 8'$	$+15'$ 0
C		
K	$\pm 30'$	$+30'$ 0

7.1.3 Asymmetrical triangular inserts with chamfered corners, 90° cutting edge angle, 20° normal clearance, and 20° wiper edge normal clearance

TECN ... PE.

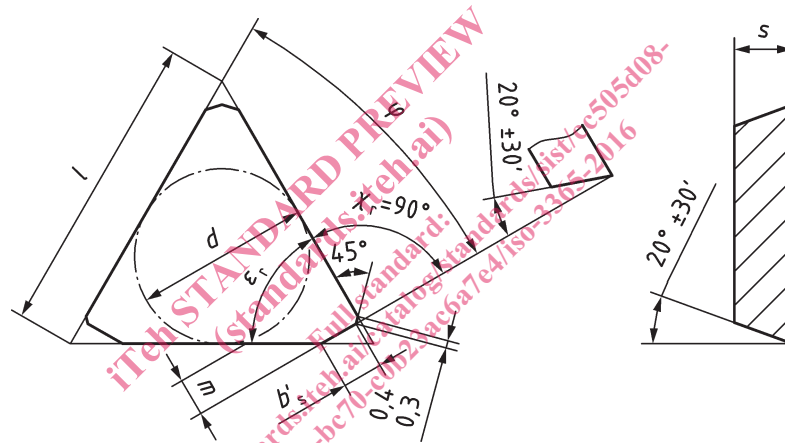


Figure 3

Table 5

Values in millimetres

Insert	$l$ $\approx$	$d^a$	$s^a$	$m^a$	$b'_s$ $\approx$	$\epsilon_r$ $\pm 8'$	$\varphi$ $+15'$ 0
TECN1603 PER TECN1603 PEL	16,5	9,525	3,175	2,19	2,0	60°	30°

<sup>a</sup> Tolerances in accordance with ISO 1832. See [Annex A](#).

7.2 Square inserts

7.2.1 Symmetrical square inserts with chamfered corner, 75° cutting edge angle, 0° normal clearance, and 0° wiper edge normal clearance

SNAN ... ENN

SNCN ... ENN

SNKN ... ENN

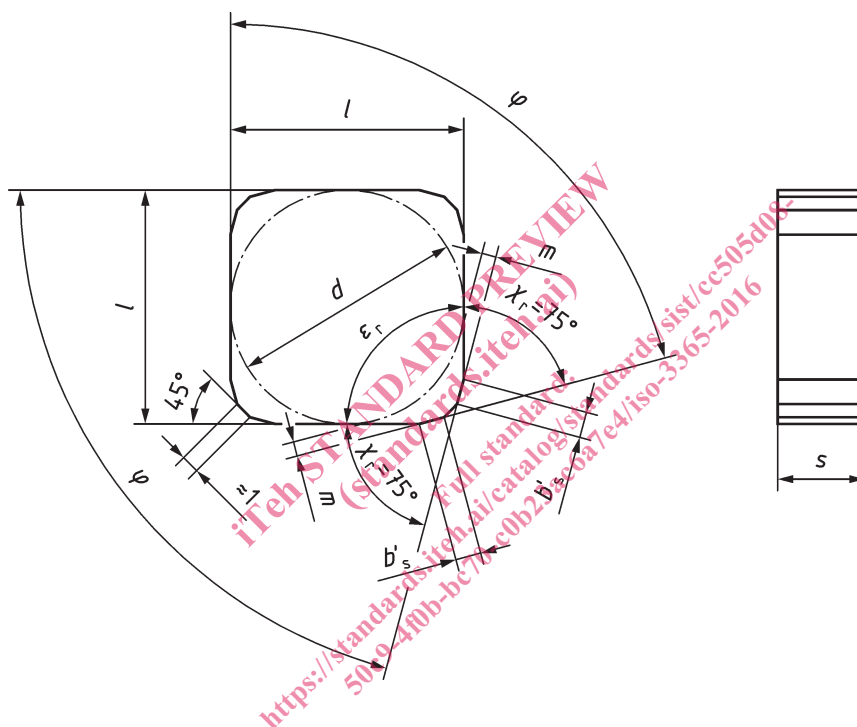


Figure 4

Table 6

Values in millimetres

Insert			$d^a$	$s^a$	$m^a$	$b'_s$ ≈	$\epsilon_r$	$\varphi$
SNAN1204 ENN	SNCN1204 ENN	SNKN1204 ENN	12,70	4,76	0,80	1,4	90°	75°
SNAN1504 ENN	SNCN1504 ENN	SNKN1504 ENN	15,875		1,50			
SNAN1904 ENN	SNCN1904 ENN	SNKN1904 ENN	19,05	4,76 <sup>b</sup>	1,30	2,0		

<sup>a</sup> Tolerances in accordance with ISO 1832. See Annex A.

<sup>b</sup> For national standards, a thickness of 5,56 mm (SN. N1905 ENN) may be used as an alternative to that of 4,76 mm.