
International Standard



3365

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

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

Second edition — 1985-08-01

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UDC 621.914.025.7

Ref. No. ISO 3365-1985 (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 3365 was prepared by Technical Committee ISO/TC 29, *Small tools*.

ISO 3365 was first published in two parts: ISO 3365/1-1977 and ISO 3365/2-1980. This second edition cancels and replaces both parts of the first edition, of which it constitutes a technical revision.

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

1 Scope and field of application

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 References

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

ISO 883, *Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions.*

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

ISO 3364, *Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical 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:

- 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.

Table 17 gives the range of dimensions of 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 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.

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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 manufacture and measuring may be different, the nominal value of dimension m may vary from one manufacturer to another within a range of $\pm 0,05$ 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

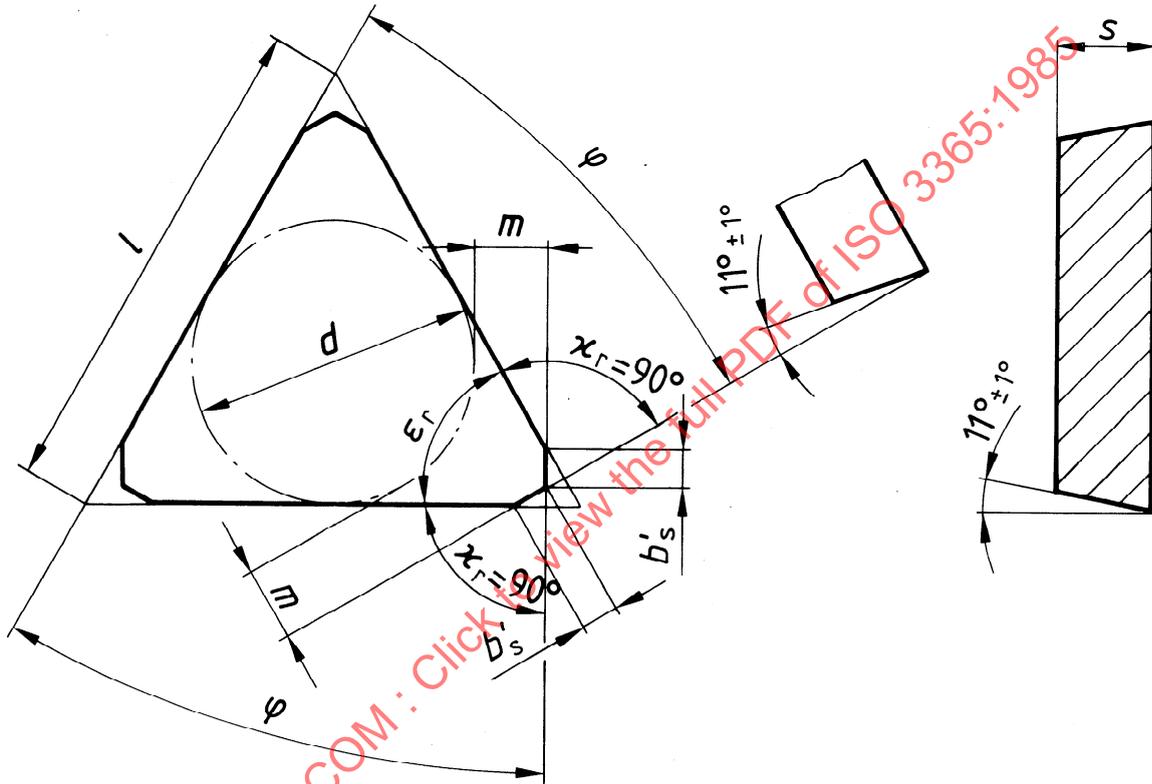


Table 1

Values in millimetres

Insert			l	d	s	m	b'_s	ϵ_r	ψ
			\approx	1)	1)	1)	\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	4,76	3,55	1,3		

1) Tolerances in accordance with ISO 1832. See annex A.

Table 2

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

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.

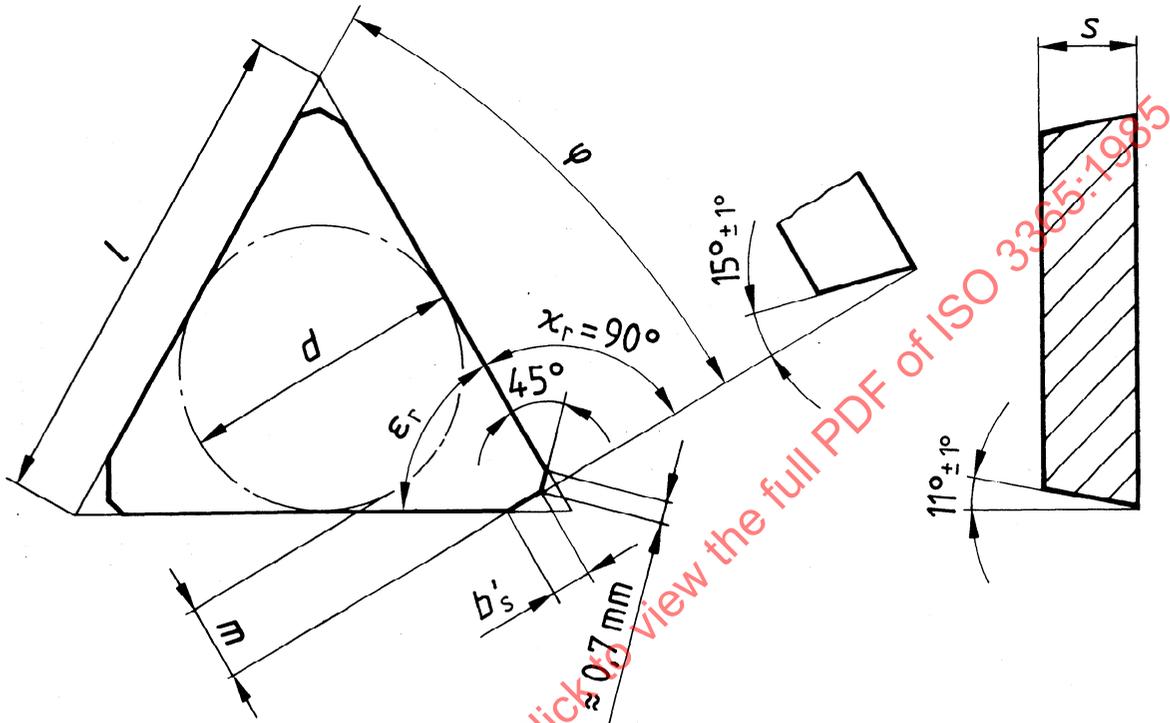


Table 3

Values in millimetres

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

1) Tolerances in accordance with ISO 1832. See annex A.

Table 4

Tolerance class	Tolerances on	
	ϵ_r	φ
A	$\pm 8'$	$+ 15'$
C		0
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.

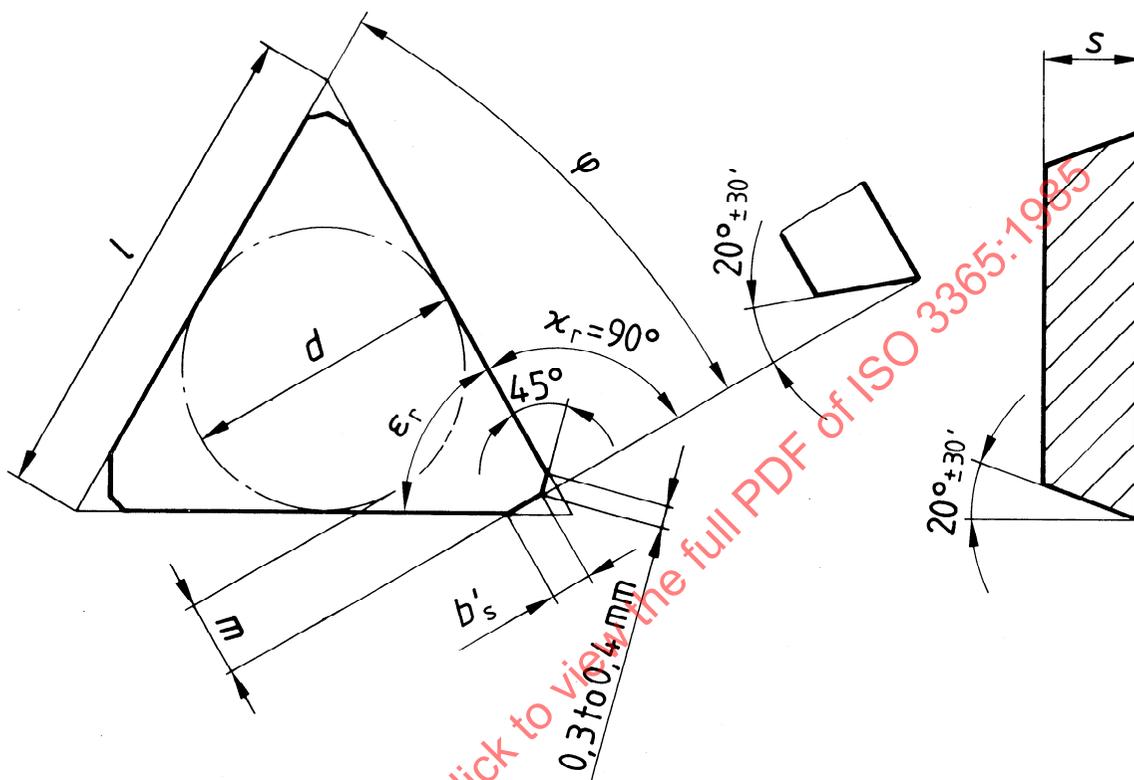


Table 5

Values in millimetres

Insert	l ≈	d 1)	s 1)	m 1)	b'_s ≈	ϵ_r ± 8'	ϕ +5' 0
TECN1603 PER TECN1603 PEL	16,5	9,525	3,175	2,19	2,0	60°	30°

1) 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

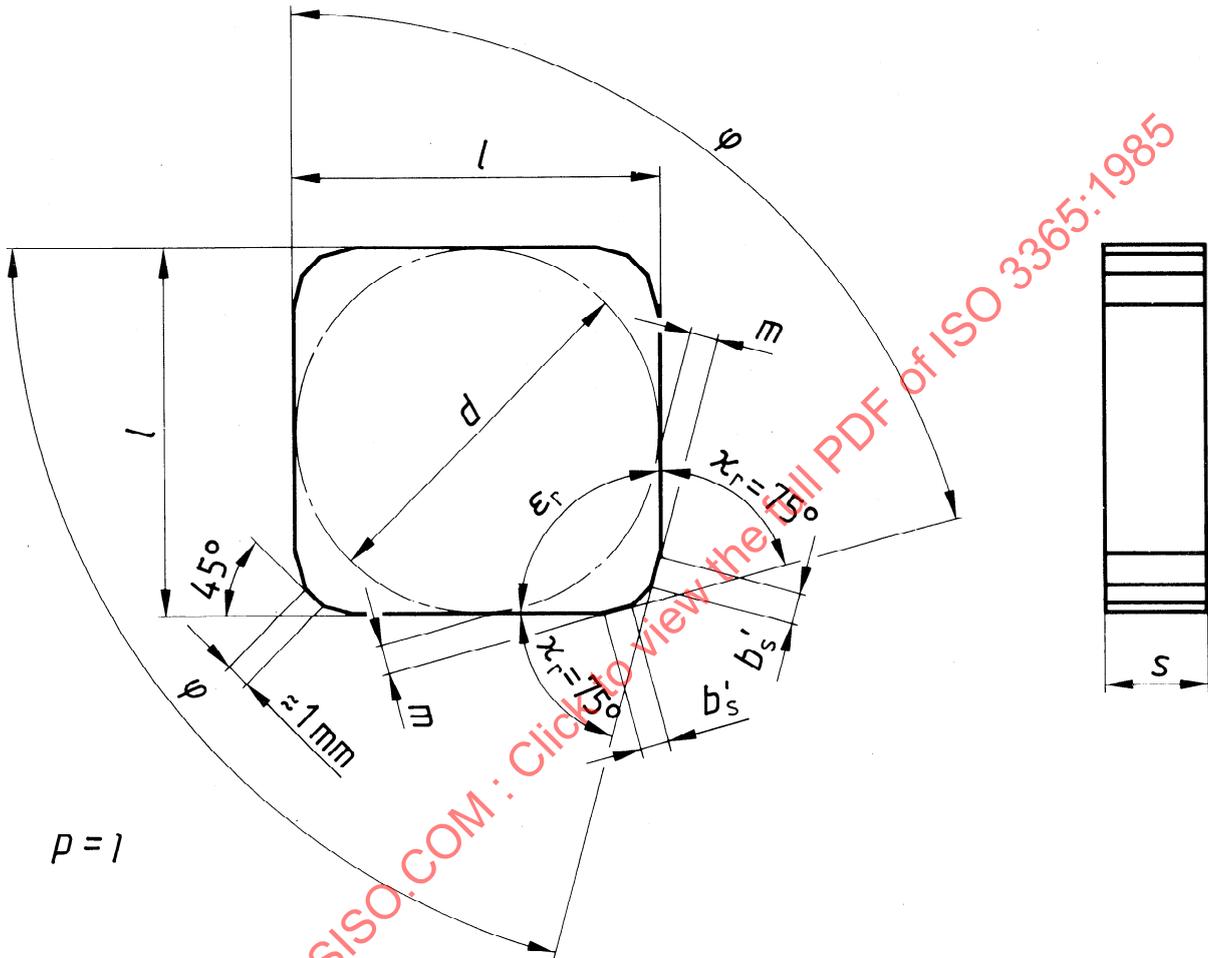


Table 6

Values in millimetres

Insert			d	s	m	b' _s	ε _r	φ
			1)	1)	1)			
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 ²⁾	1,30	2,0		

1) Tolerances in accordance with ISO 1832. See annex A.

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

Table 7

Tolerance class	Tolerances on	
	ε _r	φ
A	± 8'	+ 15'
C		0
K	± 30'	+ 30'
		0

7.2.2 Asymmetrical square inserts with chamfered corner, 75° cutting edge angle, 11° normal clearance and 15° wiper edge normal clearance

SPAN ED.
 SPCN ED.
 SPKN ED.

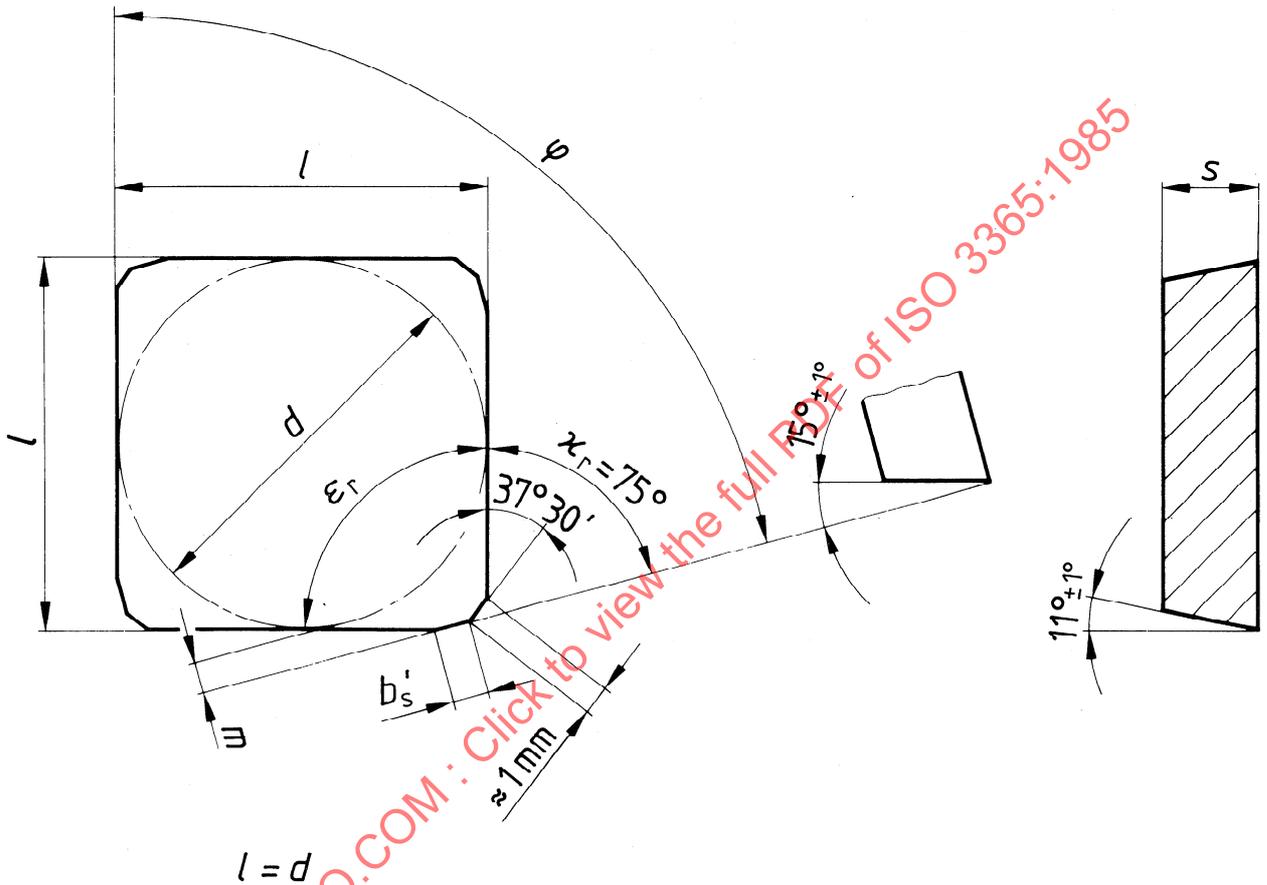


Table 8

Values in millimetres

Insert			d	s	m	b'_s	ϵ_r	φ
			1)	1)	1)	\approx		
SPAN1203 EDR SPAN1203 EDL	SPCN1203 EDR SPCN1203 EDL	SPKN1203 EDR SPKN1203 EDL	12,70	3,175	0,90	1,4	90°	75°
SPAN1504 EDR SPAN1504 EDL	SPCN1504 EDR SPCN1504 EDL	SPKN1504 EDR SPKN1504 EDL	15,875	4,76	1,25			

1) Tolerances in accordance with ISO 1832. See annex A.

Table 9

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

7.2.3 Symmetrical square inserts with 45° cutting edge angle, 0° normal clearance and 0° wiper edge normal clearance

SNAN ANN
 SNCN ANN
 SNKN ANN

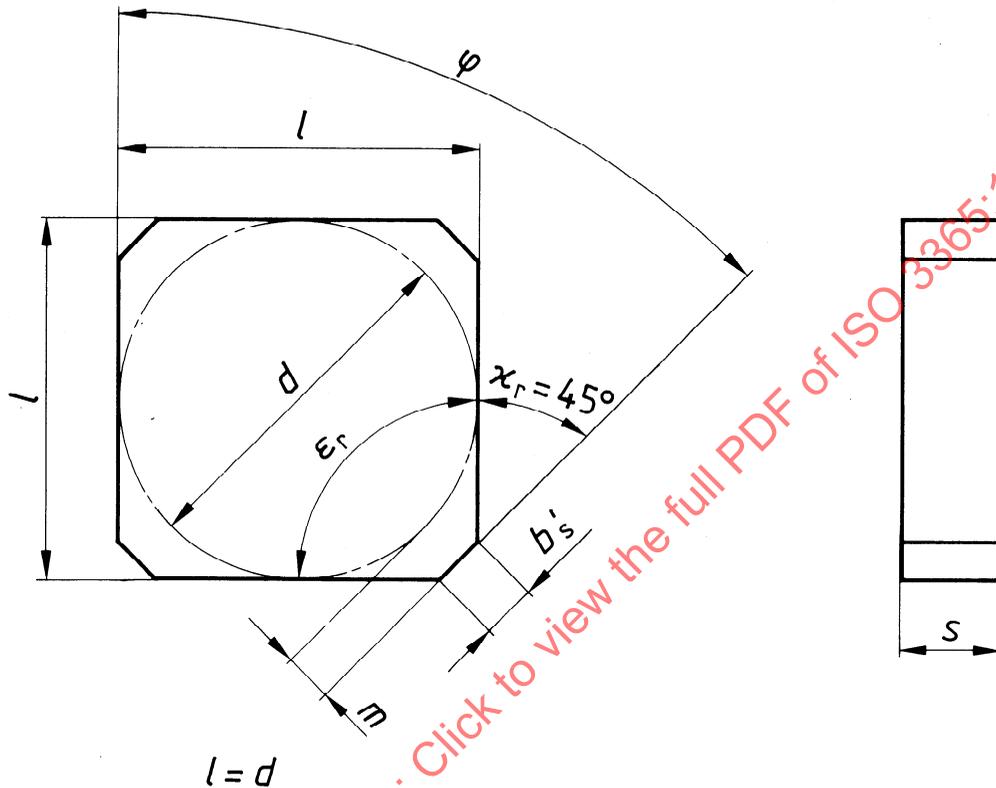


Table 10

Values in millimetres

Insert			d	s	m	b'_s	ϵ_r	φ
			1)	1)	1)	≈		
SNAN1204 ANN	SNCN1204 ANN	SNKN1204 ANN	12,70	4,76	1,60	2,0	90°	45°
SNAN1504 ANN	SNCN1504 ANN	SNKN1504 ANN	15,875		2,00	2,5		
SNAN1904 ANN	SNCN1904 ANN	SNKN1904 ANN	19,05	4,76 ²⁾	2,50	3,0		

1) Tolerances in accordance with ISO 1832. See annex A.

2) For national standards, a thickness of 5,56 mm (SN.M1905 ANN) may be used as an alternative to that of 4,76 mm.

Table 11

Tolerance class	Tolerances on	
	ϵ_r	φ
A	± 8'	± 8'
C		
K	± 30'	± 15'

7.2.4 Asymmetrical square inserts without chamfered corner, 75° cutting edge angle, 20° normal clearance and 20° wiper edge normal clearance

SECN EE.

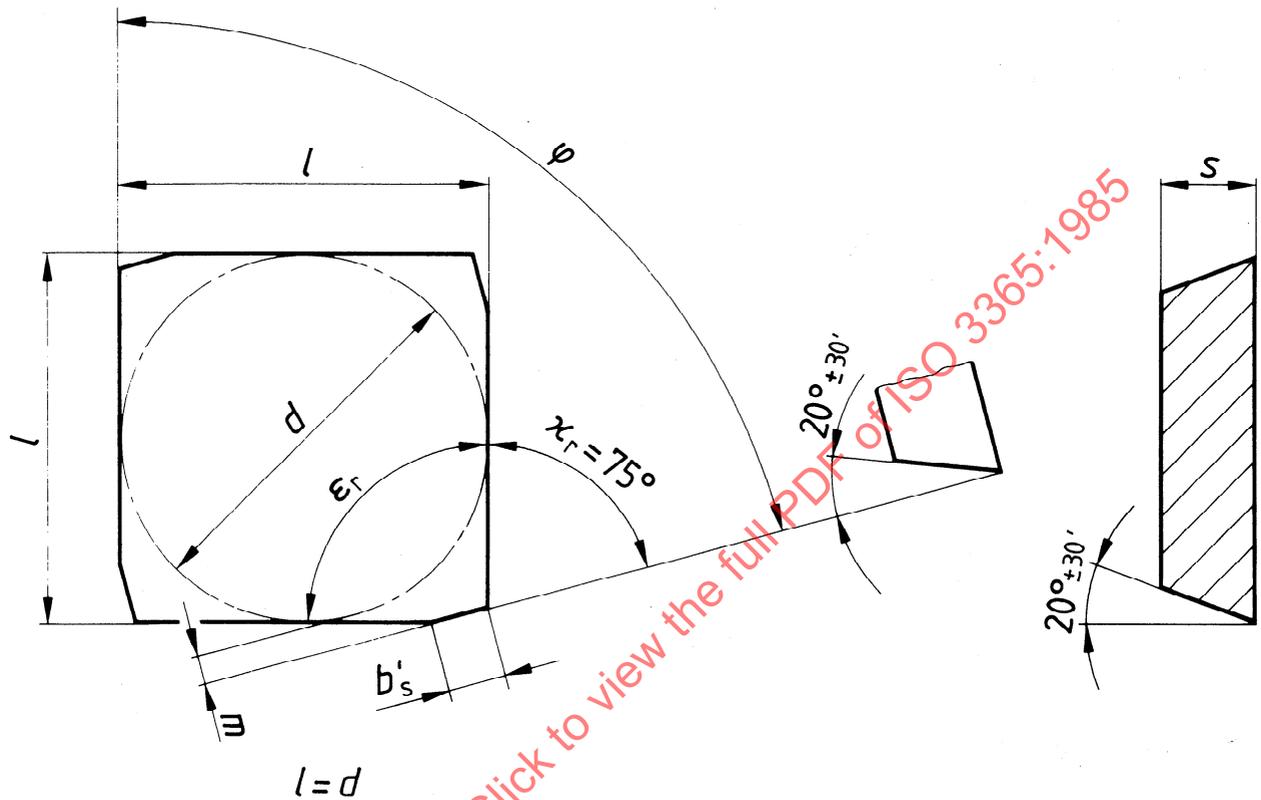


Table 12

Values in millimetres

Insert	d 1)	s 1)	m 1)	b'_s \approx	ϵ_r $\pm 8'$	ϕ $+5'$ 0
SECN1203 EER SECN1203 EEL	12,70	3,175	0,8	2,5	90°	75°

1) Tolerances in accordance with ISO 1832. See annex A.

Annex A

Tolerances for d , m and s

(Extract from ISO 1832.)

A.1 Tolerance class A

Table 13

Values in millimetres

Tolerance for	d	$\pm 0,025$
	m	$\pm 0,005$
	s	$\pm 0,025$

A.2 Tolerance class C

Table 14

Values in millimetres

Tolerance for	d	$\pm 0,025$
	m	$\pm 0,013$
	s	$\pm 0,025$

A.3 Tolerance class K

Table 15

Values in millimetres

Insert		Tolerances for		
Designation	d	d	m	s
T...11....	6,35	$\pm 0,05$	$\pm 0,013$	$\pm 0,025$
T...16....	9,525	$\pm 0,05$		
T...22....	12,70	$\pm 0,08$		
S...12....	15,875	$\pm 0,10$		
S...19....	19,05	$\pm 0,10$		