
INTERNATIONAL STANDARD



883

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

Indexable (throwaway) carbide inserts without fixation hole — Dimensions

Plaquettes amovibles en carbures métalliques, sans trou de fixation — Dimensions

Second edition — 1976-12-15

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

This second edition of International Standard ISO 883 was drawn up by Technical Committee ISO/TC 29, *Small tools*. It was submitted directly to the ISO Council, in accordance with clause 6.12.1 of the Directives for the technical work of ISO.

This second edition cancels and replaces the first edition (ISO 883-1975), which had been approved by the Member Bodies of the following countries :

Australia	Hungary	Portugal
Austria	India	South Africa, Rep. of
Belgium	Israel	Spain
Brazil	Italy	Sweden
Chile	Korea, Rep. of	Switzerland
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
France	Norway	
Germany	Poland	

The Member Bodies of the following countries had expressed disapproval of the document on technical grounds :

U.S.A.
U.S.S.R.

Indexable (throwaway) carbide inserts without fixation hole – Dimensions

0 INTRODUCTION

This International Standard should be considered as the logical continuation of ISO 242, *Carbide tips for brazing on turning tools*, which deals only with inserts intended to be fixed on the shanks of tools by brazing.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensions of indexable (throwaway) carbide inserts, without fixation hole, of triangular and square shape.

It applies only to inserts intended to be mounted mechanically, and not by brazing, on the shanks of tools.

The types of throwaway inserts are as follows :

- 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 

Owing to the fact that they have no normal clearance, the TN and SN inserts, intended for tools with negative normal rake, are reversible, the cutting edge of either face may be used indifferently.

The TP and SP inserts, intended for tools with positive normal rake, can, on the other hand, be effective only through the cutting edges of their greater face and they are not reversible.

As regards precision, throwaway inserts should be machined in one of the two classes of tolerances U or G according to ISO 1832.

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 (throwaway) inserts – Designation – Code of symbolization*.¹⁾

ISO 3286, *Single-point cutting tools – Corner radius*.

ISO 3364, *Indexable (throwaway) carbide inserts with cylindrical fixation holes – Dimensions*.²⁾

3 INTERCHANGEABILITY

3.1 Inches-millimetres interchangeability

This International Standard includes two series of tables, one in millimetres, the other in inches; the values given ensure strict interchangeability, whichever system of units is used.

As regards the verification of dimension m , this interchangeability has been obtained by direct conversion into millimetres of the nominal value in inches, calculated from the nominal values, in inches, of the radius r_e , the diameter d or the length l .

3.2 Interchangeability with "ceramic" inserts

Pending the preparation of an International Standard concerning "ceramic" indexable (throwaway) inserts, it is recommended, with a view to interchangeability, that these inserts be given the same nominal dimensions l and the same radii r_e as the carbide inserts of this International Standard.

1) At present at the stage of draft. (Revision of ISO/R 1832-1971.)

2) At present at the stage of draft.

4 DESIGNATION AND MARKING

The designation for the indexable (throwaway) carbide inserts covered by this International Standard conforms to ISO 1832.

4.1 Designation

The designation of an indexable (throwaway) insert consists of at least seven symbols of designation :

- letter symbol for identifying insert shape;
- letter symbol for identifying normal clearance;
- letter symbol for indicating tolerance class;
- letter symbol for indicating chip breakers and/or for fixing;
- number symbol for identifying insert size;
- number symbol for identifying insert thickness;

- number symbol for identifying corner configuration (the size of the corner radius).

In addition to these symbols, indication may be given of

- either the symbol of the group of application, as shown in ISO 513;
- or the commercial designation of carbide grade;
- or both.

4.2 Marking

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

- number symbol for identifying corner configuration (the size of the corner radius);
- symbol of the group of application or commercial designation of the carbide grade (or even both, if possible, on large inserts).

5 RECOMMENDED DIMENSIONS FOR THE METRIC SERIES

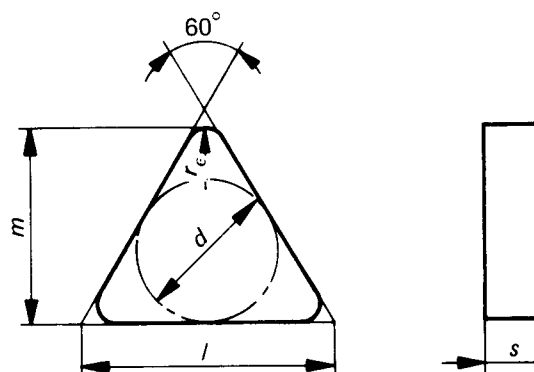
5.1 Triangular inserts with 0° normal clearance for tools with negative normal rake (symbol TN)

TABLE 1 – Class U

Dimensions in millimetres

Designation	l nom.	d tol.	s $\pm 0,13$	$m^{1)}$ tol.	r_e $\pm 0,10$
TNUN110304	11,0	6,35	3,18	9,128	0,4
TNUN110308				8,731	0,8
TNUN160408	16,5	9,525	4,76	13,494	0,8
TNUN160412				13,097	1,2
TNUN220412	22,0	12,70	4,76	17,859	1,2
TNUN220416				17,463	1,6

TABLE 2 – Class G

Dimensions in millimetres

Designation	l nom.	d $\pm 0,025$	s $\pm 0,13$	$m^{1)}$ $\pm 0,025$	r_e $\pm 0,10$
TNGN110304	11,0	6,35	3,18	9,128	0,4
TNGN160408	16,5	9,525	4,76	13,494	0,8
TNGN160412				13,097	1,2
TNGN220412	22,0	12,70	4,76	17,859	1,2

1) For the measurement of dimension m see annex A.

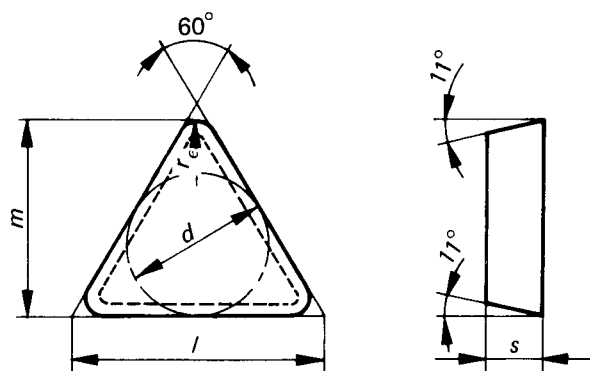
5.2 Triangular inserts with 11° normal clearance for tools with positive normal rake (symbol TP)

TABLE 3 — Class U

Dimensions in millimetres

Designation	l nom.	d tol.	s $\pm 0,13$	$m^{1)}$ tol.	r_e $\pm 0,10$
TPUN160308	16,5	9,525	3,18	13,494	0,8
TPUN160312				13,097	1,2
TPUN220412	22,0	12,70	4,76	17,859	1,2
TPUN220416				17,463	1,6

TABLE 4 — Class G

Dimensions in millimetres

Designation	l nom.	d $\pm 0,025$	s $\pm 0,13$	$m^{1)}$ $\pm 0,025$	r_e $\pm 0,10$
TPGN160308	16,5	9,525	3,18	13,494	0,8
TPGN160312				13,097	1,2
TPGN220412	22,0	12,70	4,76	17,859	1,2

1) For the measurement of dimension m see annex A.

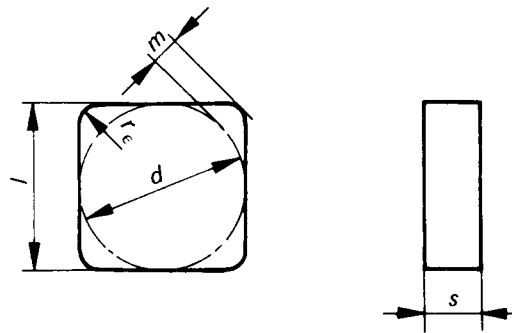
5.3 Square inserts with 0° normal clearance for tools with negative normal rake (symbol SN)

TABLE 5 – Class U

Dimensions in millimetres

Designation	$l = d$		s	$m^{1)}$		r_{ϵ}
		tol.	$\pm 0,13$		tol.	$\pm 0,10$
SNUN090304	9,525	$\pm 0,08$	3,18	1,808	$\pm 0,13$	0,4
SNUN090308				1,644		0,8
SNUN120408	12,70	$\pm 0,13$	4,76	2,301	$\pm 0,20$	0,8
SNUN120412				2,137		1,2
SNUN150412	15,875	$\pm 0,18$	4,76	2,795	$\pm 0,27$	1,2
SNUN150416				2,630		1,6
SNUN190412	19,05		4,76	3,452		1,2
SNUN190416				3,288		1,6

TABLE 6 – Class G

Dimensions in millimetres

Designation	$l = d$ $\pm 0,025$	s $\pm 0,13$	$m^{1)}$ $\pm 0,025$	r_e $\pm 0,10$
SNGN090308	9,525	3,18	1,644	0,8
SNGN120408	12,70	4,76	2,301	0,8
SNGN120412			2,137	1,2

1) For the measurement of dimension m see annex A.

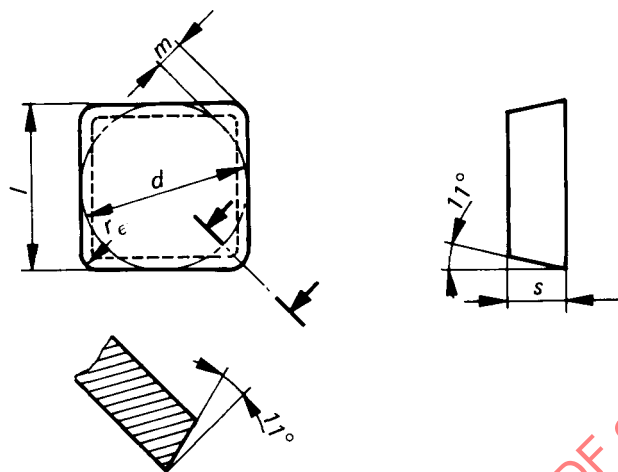
5.4 Square inserts with 11° normal clearance for tools with positive normal rake (symbol SP)

TABLE 7 — Class U

Dimensions in millimetres

Designation	$l = d$	tol.	s	$m^{1)}$	tol.	r_ϵ
SPUN120308	12,70	$\pm 0,13$	3,18	2,301	$\pm 0,20$	0,8
SPUN120312		$\pm 0,13$		2,137		1,2
SPUN190416	19,05	$\pm 0,18$	4,76	3,288	$\pm 0,27$	1,6

TABLE 8 — Class G

Dimensions in millimetres

Designation	$l = d$	s	$m^{1)}$	r_ϵ
	$\pm 0,025$	$\pm 0,13$	$\pm 0,025$	$\pm 0,10$
SPGN120308	12,70	3,18	2,301	0,8
SPGN120312			2,137	1,2

1) For the measurement of dimension m see annex A.

6 RECOMMENDED DIMENSIONS FOR THE INCH SERIES

6.1 Triangular inserts with 0° normal clearance for tools with negative normal rake (symbol TN)

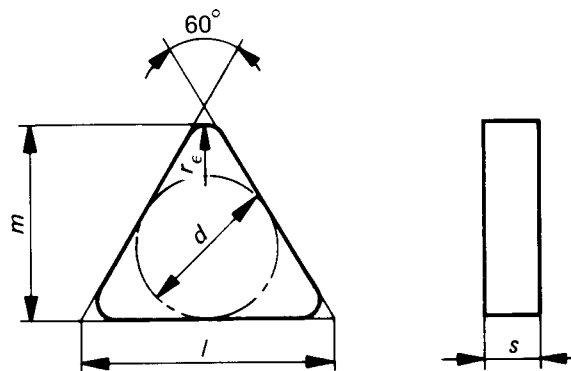


TABLE 9 – Class U

Dimensions in inches

Designation	l nom.	d tol.	s ± 0.005	$m^{1)}$ tol.	r_e ± 0.004
TNUN221	0.43	0.250	0.125 0	0.359 4	0.015 6
TNUN222				0.343 8	0.031 3
TNUN332	0.65	0.375	0.187 5	0.531 3	0.031 3
TNUN333				0.515 6	0.046 9
TNUN433	0.87	0.500	0.187 5	0.703 1	0.046 9
TNUN434				0.687 5	0.062 5

TABLE 10 – Class G

Dimensions in inches

Designation	l nom.	d ± 0.001	s ± 0.005	$m^{1)}$ ± 0.001	r_e ± 0.004
TNGN221	0.43	0.250	0.125 0	0.359 4	0.015 6
TNGN332	0.65	0.375	0.187 5	0.531 3	0.031 3
TNGN333				0.515 6	0.046 9
TNGN433	0.87	0.500	0.187 5	0.703 1	0.046 9

1) For the measurement of dimension m see annex A.

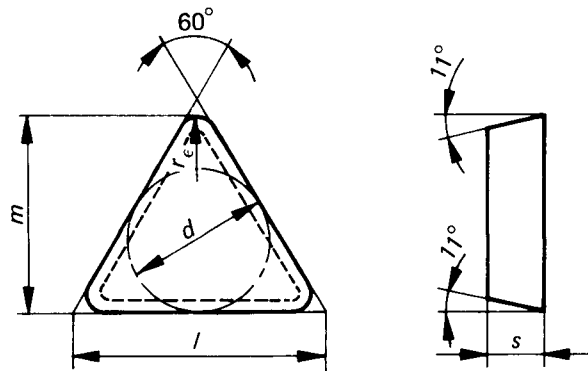
6.2 Triangular inserts with 11° normal clearance for tools with positive normal rake (symbol TP)

TABLE 11 — Class U

Dimensions in inches

Designation	l nom.	d tol.	s ± 0.005	$m^{1)}$ tol.	r_e ± 0.004
TPUN322	0.65	0.375	0.125 0	0.531 3	0.031 3
TPUN323				0.515 6	0.046 9
TPUN433	0.87	0.500	0.187 5	0.703 1	0.046 9
TPUN434				0.687 5	0.062 5

TABLE 12 — Class G

Dimensions in inches

Designation	l nom.	d ± 0.001	s ± 0.005	$m^{1)}$ ± 0.001	r_e ± 0.004
TPGN322	0.65	0.375	0.125 0	0.531 3	0.031 3
TPGN323				0.515 6	0.046 9
TPGN433	0.87	0.500	0.187 5	0.703 1	0.046 9

1) For the measurement of dimension m see annex A.

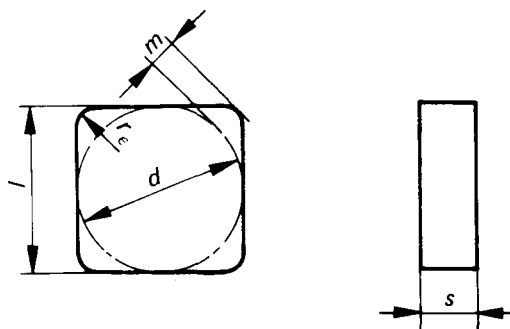
6.3 Square inserts with 0° normal clearance for tools with negative normal rake (symbol SN)

TABLE 13 — Class U

Dimensions in inches

Designation	$l = d$ tol.	s ± 0.005	$m^{1)}$ tol.	r_e ± 0.004
SNUN321	0.375	± 0.003	0.071 2	0.015 6
SNUN322			0.064 7	0.031 3
SNUN432	0.500	± 0.005	0.090 6	0.031 3
SNUN433			0.084 1	0.046 9
SNUN533	0.625	± 0.007	0.110 0	0.046 9
SNUN534			0.103 6	0.062 5
SNUN633	0.750	0.187 5	0.135 9	0.046 9
SNUN634			0.129 4	0.062 5

TABLE 14 — Class G

Dimensions in inches

Designation	$l = d$ ± 0.001	s ± 0.005	$m^{1)}$ ± 0.001	r_e ± 0.004
SNGN322	0.375	0.125 0	0.064 7	0.031 3
SNGN432	0.500	0.187 5	0.090 6	0.031 3
SNGN433			0.084 1	0.046 9

1) For the measurement of dimension m see annex A.

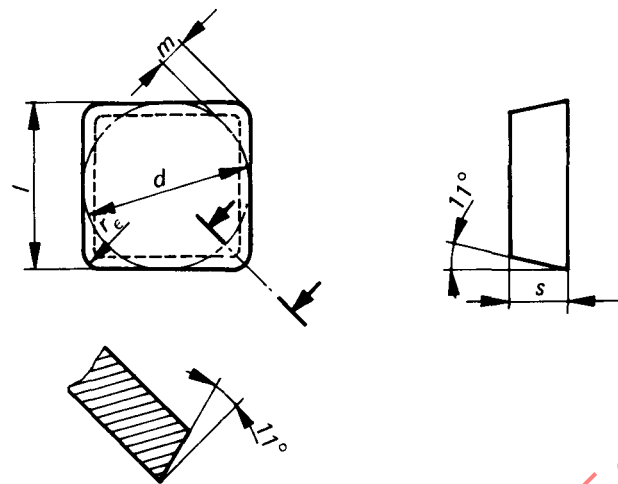
6.4 Square inserts with 11° normal clearance for tools with positive normal rake (symbol SP)

TABLE 15 – Class U

Dimensions in inches

Designation	$l = d$ tol.	s ± 0.005	$m^{1)}$ tol.	r_e ± 0.004
SPUN422	0.500 ± 0.005	0.125 0	0.090 6	0.031 3
SPUN423			0.084 1	0.046 9
SPUN634	0.750 ± 0.007	0.187 5	0.129 4 ± 0.011	0.062 5

TABLE 16 – Class G

Dimensions in inches

Designation	$l = d$ ± 0.001	s ± 0.005	$m^{1)}$ ± 0.001	r_e ± 0.004
SPGN422	0.500	0.125 0	0.090 6	0.031 3
SPGN423			0.084 1	0.046 9

1) For the measurement of dimension m see annex A.

ANNEX A

METHOD OF MEASUREMENT

A.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 1 and checked by means of a dial gauge zeroed with the aid of a slip gauge corresponding to dimension m . The dial gauge then gives a direct reading of the error when applied to the actual inserts.

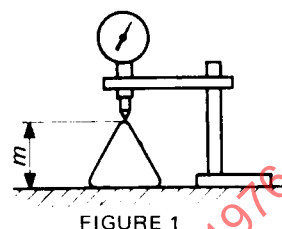


FIGURE 1

A.2 SQUARE INSERTS

Dimension m is checked by reference to the diameter d of a precision roller, where d corresponds to the nominal size l of the insert. The insert is mounted on a 90° vee block as shown in figure 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 slip gauge. The dial gauge then gives a direct reading of the error when applied to the actual inserts. The roller has a tolerance of $\pm 0,002$ mm.

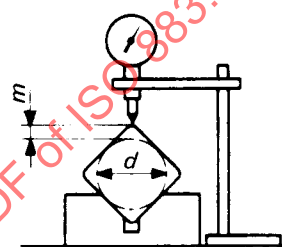


FIGURE 2

ANNEX B

GENERAL TABLE :
COMPREHENSIVE RANGE OF INSERT SIZES

International standardization of throwaway carbide inserts is restricted to the sizes given in tables 1 to 16 in this International Standard.

These sizes, which should meet most normal requirements, have been selected from within a more general framework, given in the general table on the following page, which as shown below, offers a wider choice of radii, together with the possibility of a reduced thickness for certain inserts.

It is strongly recommended that standard inserts be used wherever possible, but where other inserts are specially required, the dimensions should be selected from the unshaded portions of the general table. Dimensions represented by the shaded portions of the general table should not be used.

These additional inserts should have dimensions identical to those of the corresponding ISO inserts, except, of course, for the value of corner radius r_c (and, as a consequence, for the nominal value of m) as well as for the thicknesses of inserts TNUN16 or TNGN16 and SNUN12 or SNGN12 with the thickness symbol 3.

The nominal value of m shall be tabulated, as indicated above, from the nominal values of r_c and l or d , in inches, and rounded off to the fourth decimal place, the result thus obtained being then, if necessary, converted into millimetres. (That conversion is itself rounded off to the third decimal place.)

GENERAL TABLE — Comprehensive range of insert sizes
(Designations applicable in countries using the metric system)

Class U					Class G				
Insert designation (excluding radius and carbide symbols)	Radius symbol				Insert designation (excluding radius and carbide symbols)	Radius symbol			
	04	08	12	16		04	08	12	16
TNUN1103	+	+			TNGN1103	+			
TNUN1603					TNGN1603				
TNUN1604		+	+		TNGN1604		+	+	
TNUN2204			+	+	TNGN2204			+	
TPUN1103					TPGN1103				
TPUN1603		+	+		TPGN1603		+	+	
TPUN2204			+	+	TPGN2204			+	
SNUN0903	+	+			SNGN0903		+		
SNUN1203					SNGN1203				
SNUN1204		+	+		SNGN1204		+	+	
SNUN1504			+	+	SNGN1504				
SNUN1904			+	+	SNGN1904				
SPUN0903					SPGN0903				
SPUN1203		+	+		SPGN1203		+	+	
SPUN1504					SPGN1504				
SPUN1904			+		SPGN1904				



Shaded squares : inserts not considered for standardization.



Non-shaded squares : inserts which may be incorporated in national standards.



The only inserts adopted in this International Standard (see tables 1 to 16).