BS ISO 3364:2011

BSI Standards Publication

Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of ISO 3364:2011. It supersedes BS4193-3:1997 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 69414 1

ICS 25.100.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2012.

Amendments issued since publication

Date	Text affected

BS ISO 3364:2011

INTERNATIONAL STANDARD

ISO 3364

Fourth edition
2011-12-15

Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions

Plaquettes amovibles en métaux-durs (carbures métalliques) avec arrondi de pointe et trou de fixation cylindrique — Dimensions

Reference number
ISO 3364:2011(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3364 was prepared by Technical Committee 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 3364:1997), which has been technically revised.

INTERNATIONAL STANDARD ISO 3364:2011(E)

Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions

1 Scope

This International Standard specifies the dimensions of indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole and with 0° normal clearance. These inserts are primarily intended to be mounted by top and hole clamping or by hole clamping alone on turning and boring tools.

2 Normative references

The following referenced documents are indispensable for the application of this document. 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) insert specified in this International Standard are the following:

— TN: triangular inserts, with 0° normal clearance;

— SN: square inserts, with 0° normal clearance;

— CN: rhombic inserts, with 0° normal clearance and 80° included angle;

— DN: rhombic inserts, with 0° normal clearance and 55° included angle;

— WN: hexagonal (trigon) inserts, with 0° normal clearance and 80° included angle;

— VN: rhombic inserts, with 0° normal clearance and 35° included angle.

Inserts covered by this International Standard are standardized with chip breakers on both faces, with chip breakers on one face only and with no ship breakers at all.

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 B.1 gives the range of sizes for these inserts.

4 Interchangeability

4.1 Tolerances

Indexable hard metal (carbide) inserts specified in this International Standard are provided in tolerance classes in accordance with ISO 1832.

Other tolerances are given, either in Table 1 for hole dimensions, or in Tables 2 to 7 for insert dimensions.

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) for inserts with chip breakers on one face only and Figure 1 c) for inserts with chip breakers on both faces.

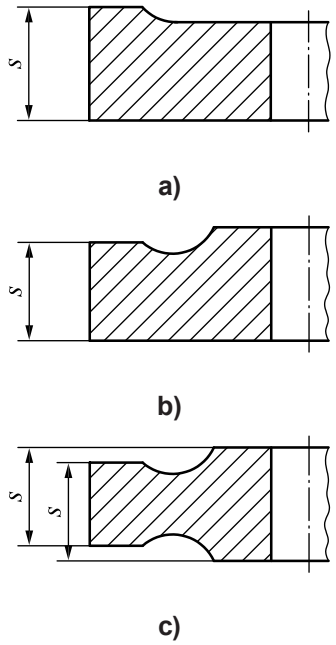


Figure 1 — Thickness of inserts with chip breakers

In order to guarantee interchangeability when mounting the insert, the diameter, d_1, of the fixing hole is related to the diameter, d, of the inscribed circle of the insert according to Table 1.

Table 1 — Fixing hole

Dimensions in millimetres

d		6,35	9,525	12,7	15,875	19,05	25,4
d_1	± 0,08	2,26	3,81	5,16	6,35	7,94	9,12

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 symbols, at least, shall be marked on the insert itself (except where this is 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

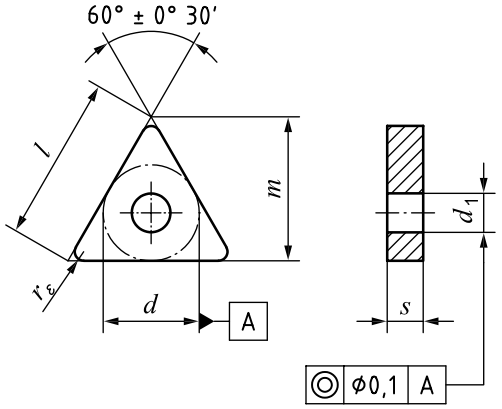
Annex B indicates the methods of measuring the dimension, m, of the indexable inserts covered by this International Standard.

7 Recommended dimensions

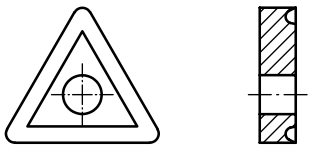
7.1 General

The choice of the more common dimensions is restricted to the specifications given in Tables 2 to 7. It is strongly recommended that these standard inserts be used wherever possible (first preference). Where other inserts are specially required, insert dimensions shall be selected from the non-shaded portions of Table B.1 (second preference). Inserts corresponding to dimensions represented by the shaded portions of this table are not recommended.

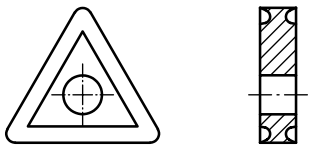
7.2 Triangular inserts



a) TN.A without chip breakers



b) TN.M with chip breakers on one face only



c) TN.G with chip breakers on both faces

Figure 2 — Triangular inserts

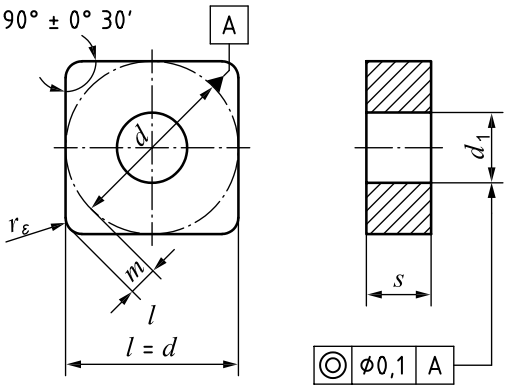
Table 2 — Dimensions of triangular inserts

Dimensions in millimetres

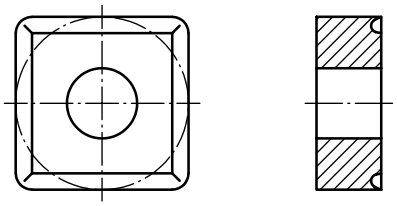
Insert			l ≈	d[a]	s[a]	m[a]	r_ε ± 0,1	d_1 ± 0,08
TN.A160404	—	**TN.G160404**	16,5	9,525	4,76	13,891	0,4	3,81
TN.A160408	**TN.M160408**	**TN.G160408**				13,494	0,8	
TN.A160412	**TN.M160412**	**TN.G160412**				13,097	1,2	
TN.A220408	**TN.M220408**	**TN.G220408**	22	12,7	4,76	18,256	0,8	5,16
TN.A220412	**TN.M220412**	**TN.G220412**				17,859	1,2	
TN.A220416	**TN.M220416**	**TN.G220416**				17,463	1,6	
—	**TN.M270612**	—	27,5	15,875	6,35	22,622	1,2	6,35
—	**TN.M270616**	—				22,225	1,6	

[a] Tolerances in accordance with ISO 1832.

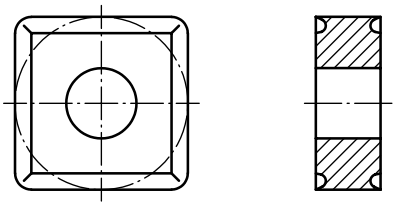
7.3 Square inserts



a) SN.A without chip breakers



b) SN.M with chip breakers on one face only



c) SN.G with chip breakers on both faces

Figure 3 — Square inserts

Table 3 — Dimensions of square inserts

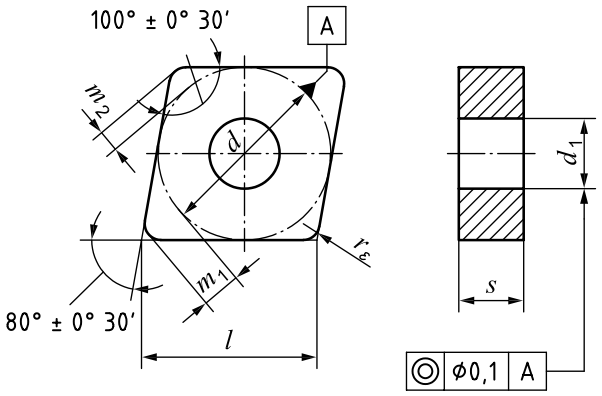
Dimensions in millimetres

Insert			d[ab]	s[a]	m[a]	r_ε ± 0,1	d_1 ± 0,08
—	**SN.M090304**	**SN.G090304**	9,525	3,18	1,808	0,4	3,81
—	**SN.M090308**	**SN.G090308**			1,644	0,8	
—	—	**SN.G120404**	12,7	4,76	2,466	0,4	5,16
SN.A120408	**SN.M120408**	**SN.G120408**			2,301	0,8	
SN.A120412	**SN.M120412**	**SN.G120412**			2,137	1,2	
—	**SN.M150608**	**SN.G150608**	15,875	6,35	2,959	0,8	6,35
—	**SN.M150612**	**SN.G150612**			2,795	1,2	
SN.A190612	**SN.M190612**	**SN.G190612**	19,05	6,35	3,452	1,2	7,94
SN.A190616	**SN.M190616**	**SN.G190616**			3,288	1,6	
SN.A250724	**SN.M250724**	**SN.G250724**	25,4	7,94	4,274	2,4	9,12

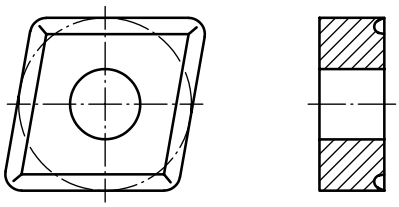
[a] Tolerances in accordance with ISO 1832.

[b] $d = l$.

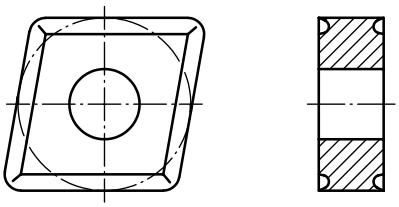
7.4 Rhombic inserts with 80° included angle



a) CN.A without chip breakers



b) CN.N with chip breakers on one face only



c) CN.G with chip breakers on both faces

Figure 4 — Rhombic inserts with 80° includes angle

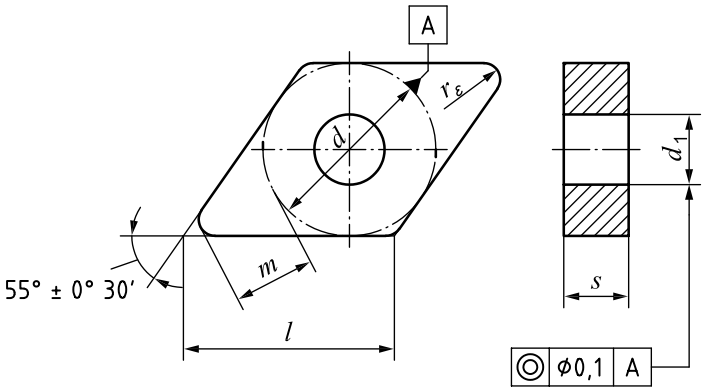
Table 4 — Dimensions of rhombic inserts with 80° included angle

Dimensions in millimetres

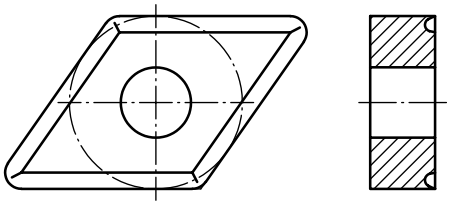
Insert			l ≈	d^a	s^a	$m_1{}^a$	$m_2{}^a$	r_ε ± 0,1	d_1 ± 0,08
—	—	**CN.G120404**	12,9	12,7	4,76	3,308	1,818	0,4	5,16
CN.A120408	**CN.M120408**	**CN.G120408**				3,088	1,697	0,8	
CN.A120412	**CN.M120412**	**CN.G120412**				2,867	1,576	1,2	
—	**CN.M160608**	**CN.G160608**	16,1	15,875	6,35	3,97	2,182	0,8	6,35
—	**CN.M160612**	**CN.G160612**				3,479	2,061	1,2	
—	—	**CN.G190608**	19,3	19,05	6,35	4,852	2,667	0,8	7,94
CN.A190612	**CN.M190612**	**CN.G190612**				4,632	2,545	1,2	
CN.A190616	**CN.M190616**	**CN.G190616**				4,411	2,424	1,6	

[a] Tolerances in accordance with ISO 1832.

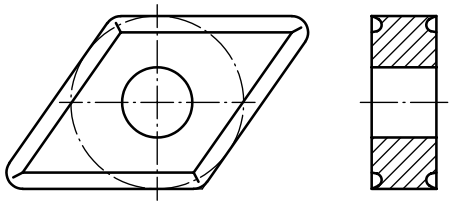
7.5 Rhombic inserts with 55° included angle



a) DN.A inserts without chip breakers



b) DN.M with chip breakers on one face only



c) DN.G with chip breakers on both faces

Figure 5 — Rhombic inserts with 55° included angle

Table 5 — Dimensions of rhombic inserts with 55° included angle

Dimensions in millimetres

Insert			l ≈	d^a	s^a	m^a	r_ε ± 0,1	d_1 ± 0,08
DN.A150604	—	**DN.G150604**	15,5	12,7	6,35	6,939	0,4	5,16
DN.A150608	**DN.M150608**	**DN.G150608**				6,477	0,8	
DN.A150612	**DN.M150612**	**DN.G150612**				6,014	1,2	
DN.A150616	**DN.M150616**	**DN.G150616**				5,552	1,6	

[a] Tolerances in accordance with ISO 1832.

7.6 Hexagonal (trigon) inserts with 80° included angle

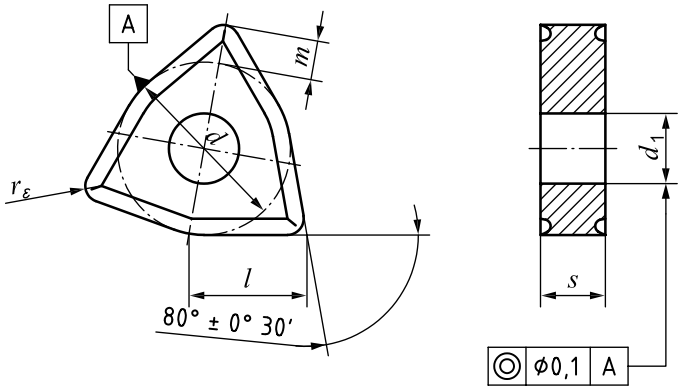


Figure 6 — WN.G with chip breakers on both faces

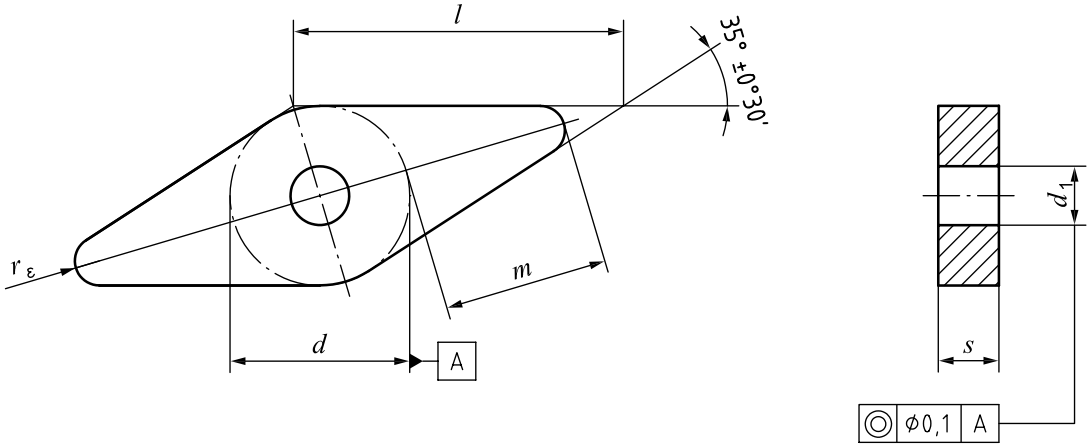
Table 6 — Dimensions of hexagonal or trigon inserts with 80° included angle

Dimensions in millimetres

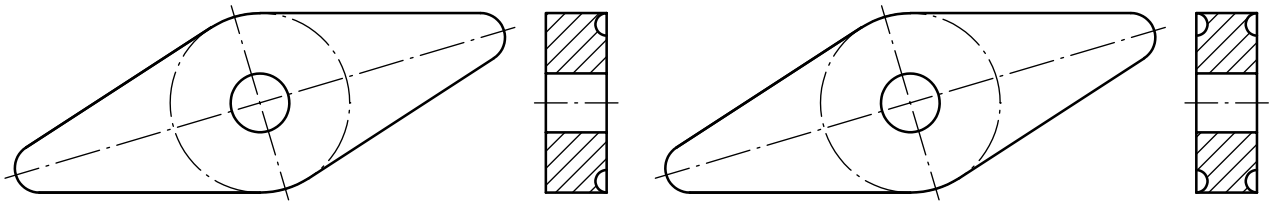
Insert	l ≈	d^a	s^a	m^a	r_ε ± 0,1	d_1 ± 0,08
WN.G060404	6,5	9,525	4,76	2,426	0,4	3,81
WN.G060408				2,205	0,8	
WN.G080404	8,7	12,7	4,76	3,308	0,4	5,16
WN.G080404				3,087	0,8	
WN.G080412				2,867	1,2	

[a] Tolerances in accordance with ISO 1832.

7.7 Rhombic inserts with 35° included angle



a) VN.A inserts without chip breakers



b) VN.M inserts with chip breakers on one face only

c) VN.G inserts with chip breakers on both faces

Figure 7 — Rhombic inserts with 35° included angle

Table 7 — Dimensions of Rhombic inserts with 35° included angle

Dimensions in millimetres

Insert				l ≈	d	s	m	r_ε ± 0,1	d_1 ± 0,08
—	—	**VN.G160402**		16,6	9,525	4,76	10,66	0,2	3,81
VN.A160404	**VN.M160404**	**VN.G160404**					10,152	0,4	
VN.A160408	**VN.M160408**	**VN.G160408**					9,229	0,8	
VN.A160412	—	**VN.G160412**					8,285	1,2	
—		**VN.G220404**	—	22,1	12,7		13,837	0,4	5,16
VN.A220408	—	**VN.G220408**					12,907	0,8	
VN.A220412	—	**VN.G220412**					11,976	1,2	
VN.A220416	—	**VN.G220416**					11,046	1,6	

Annex A
(normative)

Methods of measurement of m dimension

A.1 Triangular inserts

Dimension m is related to the side opposite the corner which is being measured. The insert shall be placed on a surface plate as shown in Figure A.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 reading of the error when applied to the insert to be measured.

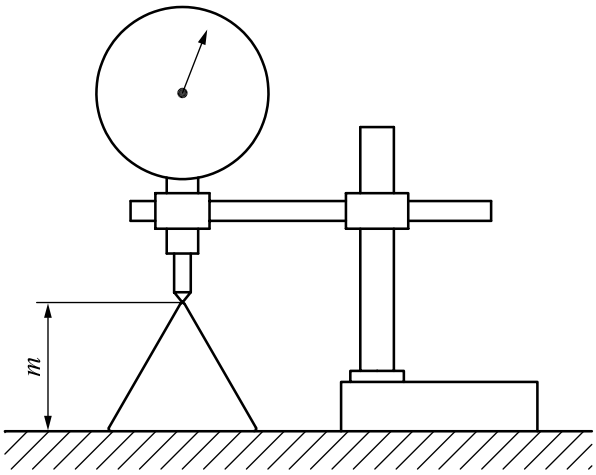


Figure A.1 — Triangular insert

A.2 Square inserts

Dimension m shall be checked with 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 shall be mounted on a 90° V-block as shown in Figure A.2 and checked by means of a dial gauge which shall be zeroed to dimension m by means of a roller with the aid of a gauge block. The dial gauge gives a direct reading of the error when applied to the inserts being measured. The roller has a tolerance of $\pm$ 0,002 mm.

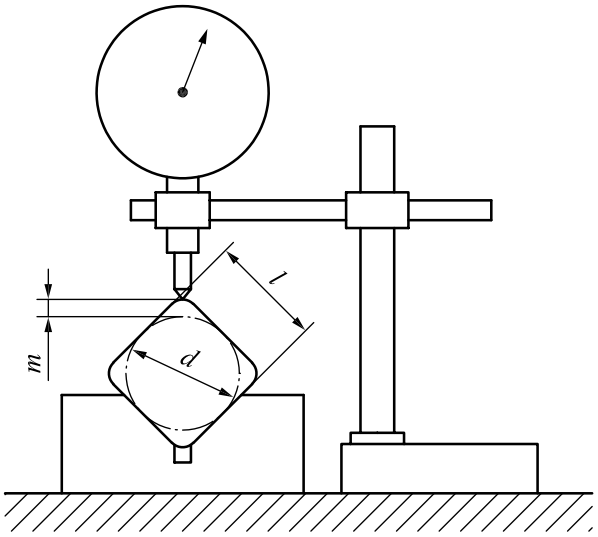


Figure A.2 — Square insert

A.3 Rhombic inserts

Dimension m, m_1 or m_2 shall be checked with reference to the diameter, d, of a precision roller, where d corresponds to the nominal size of the inscribed circle of the insert. The insert shall be mounted on a 35°, 55°, 80° or 100° V-block, as shown in Figure A.3, and checked by means of a dial gauge which shall be zeroed to dimension m, m_1 or m_2 by means of a roller with the aid of a gauge block. The dial 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.

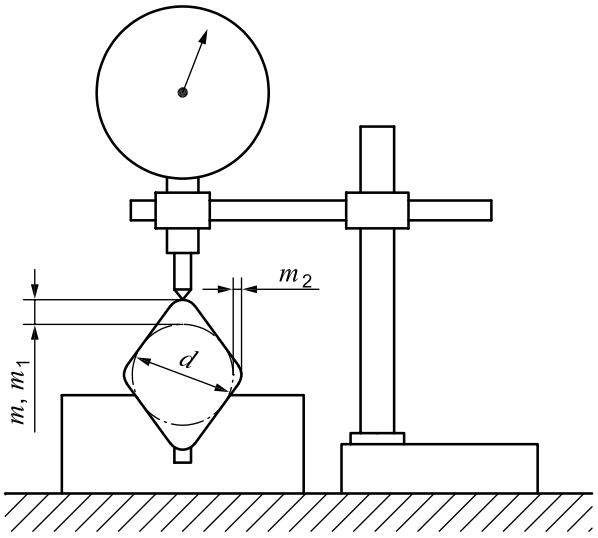


Figure A.3 — Rhombic insert

A.4 Round inserts

Diameter, d, shall be measured with a micrometer or similar device.

A.5 Hexagonal inserts

Dimension m shall be checked with reference to the diameter, d, of a precision roller, where d corresponds to the nominal size of the inscribed circle of the insert. The insert shall be mounted on a 160° V-block, as shown

in Figure A.4, and checked by means of a dial gauge which shall be zeroed to dimension m by means of a roller with the aid of a gauge block. The dial then gives a direct reading of the error when applied to the inserts being measured. The roller has a tolerance of $\pm$ 0,002 mm.

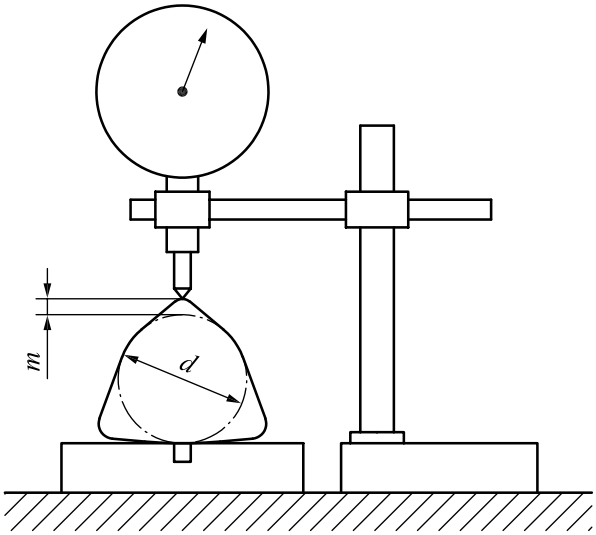


Figure A.4 — Hexagonal insert

Annex B
(normative)

Range of sizes of inserts with rounded corners with cylindrical fixing hole, with shapes covered by this International Standard

Table B.1 — Range of sizes

Dimensions in millimetres

d	Without chip breakers (A)							With chip breakers on one face only (M)						With chip breakers on both faces (G)						
	Designation	Corner radius, r_ε						Designation	Corner radius, r_ε					Designation	Corner radius, r_ε					
		$\frac{d}{2}$	0,4	0,8	1,2	1,6	2,4		0,4	0,8	1,2	1,6	2,4		$\frac{d}{2}$	0,4	0,8	1,2	1,6	2,4
6,35	TN.A1103	—						TN.M1103						TN.G1103	—					
9,525	TN.A1603							TN.M1603						TN.G1603						
	TN.A1604		+	+	+			TN.M1604		+	+			TN.G1604		+	+	+		
12,7	TN.A2204			+	+	+		TN.M2204		+	+	+		TN.G2204			+	+	+	
15,875	TN.A2706							TN.M2706			+	+		TN.G2706						
19,05	TN.A3309							TN.M3309						TN.G3309						
9,525	SN.A0903	—						SN.M0903	+	+				SN.G0903	—	+	+			
12,7	SN.A1203							SN.M1203						SN.G1203						
	SN.A1204			+	+			SN.M1204		+	+			SN.G1204		+	+	+		
15,875	SN.A1504							SN.M1504						SN.G1504						
	SN.A1506							SN.M1506		+	+			SN.G1506			+	+		
19,05	SN.A1906				+	+		SN.M1906			+	+		SN.G1906				+	+	
25,4	SN.A2507						+	SN.M2507					+	SN.G2507						+
	SN.A2509							SN.M2509						SN.G2509						
12,7	CN.A1204	—		+	+			CN.M1204		+	+			CN.G1204	—	+	+	+		
15,875	CN.A1606							CN.M1606		+	+			CN.G1606			+	+		
19,05	CN.A1906				+	+		CN.M1906			+	+		CN.G1906			+	+	+	
25,4	CN.A2509							CN.M2509						CN.G2509						
12,7	DN.A1504	—						DN.M1504						DN.G1504	—					
	DN.A1506		+	+	+	+		DN.M1506		+	+	+		DN.G1506		+	+	+	+	
15,875	DN.A1906							DN.M1906						DN.G1906						
9,525														WN.G0604	—	+	+			
12,7														WN.G0804		+	+	+		
9,525	VN.A1604									+	+			VN.G1604	—	+	+	+		
12,7	VN.A2204										+	+		VN.G2204			+	+	+	

+	First preference in this International Standard (see Tables 2 to 7).
	Non-shaded squares: second preference; not covered by this International Standard.
	Shaded squares: inserts not recommended.

Annex C
(informative)

Relationship between designations in this International Standard and the ISO 13399 series

C.1 Relationship between designations

For the relationship between designations in this International Standard and preferred symbols according to the ISO 13399 series, see Table C.1.

Table C.1 — Relationship between designations in this International Standard and the ISO 13399 series

Symbol in International Standard (ISO 3364)	Reference in International Standard (ISO 3364)	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
—	Clause 3	Insert shape code	SC	ISO/TS 13399-2 71CE7A9F0C79F
d	Tables 2, 3, 4, 5, 6, 7	Inscribed circle diameter	IC	ISO/TS 13399-2 71CE7A96D9F7D
d_1	Tables 2, 3, 4, 5, 6, 7	Fixing hole diameter	D1	ISO/TS 13399-2 71CE7A968C8FE
l	Tables 2, 3, 4, 5, 6, 7	Cutting edge length	L	ISO/TS 13399-2 71DD6C95DA49B
m	Tables 2, 3, 5, 6, 7	m-dimension	M	ISO/TS 13399-2 71CE7AA0972DB
m_1	Table 4	m-dimension	M	ISO/TS 13399-2 71CE7AA0972DB
m_2	Table 4	m2-dimension	M2	ISO/TS 13399-2 71CE7AA05C819
r_ε	Tables 2, 3, 4, 5, 6, 7	Corner radius	RE	ISO/TS 13399-2 71DD6C8ACA503
s	Tables 2, 3, 4, 5, 6, 7	Insert thickness	S	ISO/TS 13399-2 71CE7A9F5308C

Bibliography

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

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

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

ICS 25.100.01

Price based on 14 pages

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™