

BS ISO 5609-5:2012



BSI Standards Publication

Tool holders for internal turning with cylindrical shank for indexable inserts

Part 5: Style U

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National foreword

This British Standard is the UK implementation of ISO 5609-5:2012. Together with BS ISO 5609-1:2012, BS ISO 5609-2:2012, BS ISO 5609-3:2012, BS ISO 5609-4:2012 and BS ISO 5609-6:2012, it supersedes BS 4193-18:1999, which is withdrawn.

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

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5609-5

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**Tool holders for internal turning
with cylindrical shank for indexable
inserts —**

**Part 5:
Style U**

*Porte-plaquette de tournage intérieur à queue cylindrique pour
plaquettes amovibles —*

Partie 5: Forme U



Reference number
ISO 5609-5:2012(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.

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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 5609-5 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This first edition of ISO 5609-5, together with ISO 5609-1, ISO 5609-2, ISO 5609-3, ISO 5609-4 and ISO 5609-6, cancels and replaces ISO 5609:1998, which has been technically revised.

ISO 5609 consists of the following parts, under the general title *Tool holders for internal turning with cylindrical shank for indexable inserts*:

Part 1: Designation, styles, dimensions and calculation for corrections

Part 2: Style F

Part 3: Style K

Part 4: Style L

Part 5: Style U

Part 6: Style Q

Tool holders for internal turning with cylindrical shank for indexable inserts —

Part 5: Style U

1 Scope

This part of ISO 5609 specifies the characteristics of tool holders for internal turning with cylindrical shank, style U, i. e. with reduced shank and cutting edge angle $\kappa_r = 93^\circ$.

These tool holders are primarily intended for indexable inserts made of hardmetal, ceramic or other cutting materials to be mounted by clamping and to be used for internal turning operations.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5609-1, *Tool holders for internal turning with cylindrical shank for indexable inserts — Part 1: Designation, styles, dimensions and calculation for corrections*

3 Dimensions

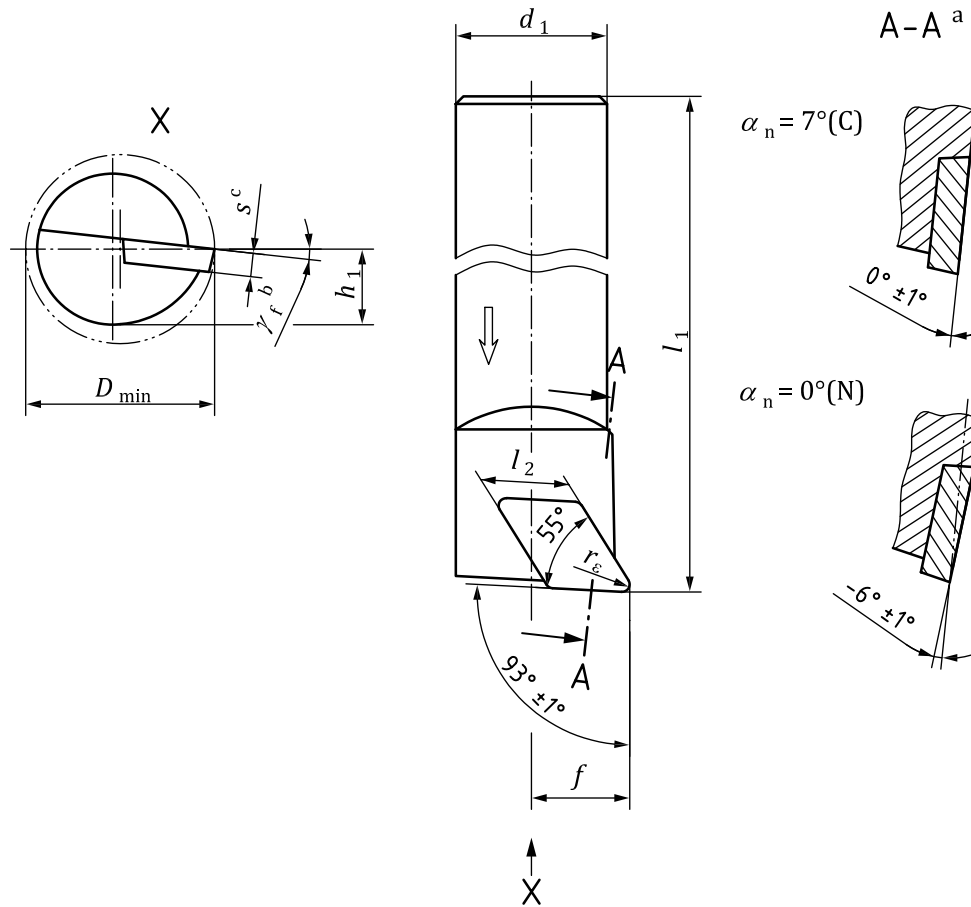
3.1 General

The symbols for dimensions shown in the figures/illustrations in the tables of this part of ISO 5609 and the corresponding preferred symbols of properties defined in ISO 13399 (all parts) are in accordance with Table A.1 of ISO 5609-1:2012.

The tool holders need not comply with the pictorial representation; only the dimensions given shall be observed.

The determination of dimensions f and l_1 and explanation of the designation code for tool holders are given in ISO 5609-1.

3.2 Tool holder, style U, for rhombic indexable insert, shape D



NOTE This figure shows a right-hand tool holder (R); left-hand tool holder (L) laterally reversed.

a Orthogonal rake angle, γ_o , with indexable insert for:

— $\alpha_n = 7^\circ$ (C);

— $\alpha_n = 0^\circ$ (N).

b γ_f is dependent on D_{\min} and the indexable insert.

c See Table 1.

Figure 1 — Tool holder, style U, for rhombic indexable insert, shape D

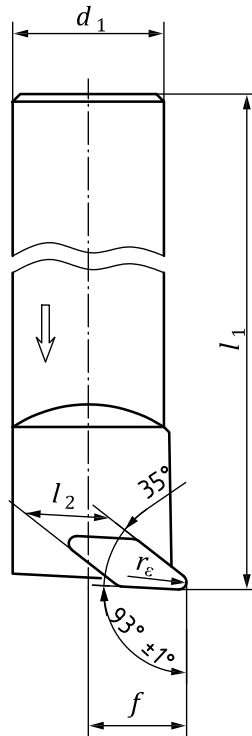
Table 1 —

Dimensions in millimetres

Symbol ^a	d_1	l_1	l_2	f	D_{\min}	s^b
	g7	k16	≈	$\begin{matrix} 0 \\ -0,25 \end{matrix}$		
• 12K — SDUCR 07 • 12K — SDUCL 07	12	125	7,75	9	16	2,38
• 16M — SDUCR 07 • 16M — SDUCL 07	16	150	7,75	11	20	2,38
• 20Q — SDUCR 11 • 20Q — SDUCL 11	20	180	11,6	13	25	3,97
• 25R — SDUCR 11 • 25R — SDUCL 11	25	200	11,6	17	32	3,97
• 32S — SDUCR 15 • 32S — SDUCL 15	32	250	15,5	22	40	4,76
• 32S — PDUNR 15 • 32S — PDUNL 15						6,35
• 40T — SDUCR 15 • 40T — SDUCL 15	40	300	15,5	27	50	4,76
• 40T — PDUNR 15 • 40T — PDUNL 15						6,35
• 50U — SDUCR 15 • 50U — SDUCL 15	50	350	15,5	35	63	4,76
• 50U — PDUNR 15 • 50U — PDUNL 15						6,35
• 60V — SDUCR 15 • 60V — SDUCL 15	60	400	15,5	43	80	4,76
• 60V — PDUNR 15 • 60V — PDUNL 15						6,35
^a For supplementary symbol, see 6.1. ^b For indexable insert thickness without shim, if any, see 6.4.						

3.3 Tool holder, style U, for rhombic indexable insert, shape V

For other dimensions and details, see Figure 1.



NOTE This figure shows a right-hand tool holder (R); left-hand tool holder (L) laterally reversed.

Figure 2 — Tool holder, style U, for rhombic indexable insert, shape V

Table 2 —

Dimensions in millimetres

Symbol ^a	d_1	l_1	l_2	f	D_{\min}	s^b
	g7	k16	≈	$\begin{matrix} 0 \\ -0,25 \end{matrix}$		
· 16M — + VU ++ 11 · 16M — + VU ++ 11	16	150	11,1	11	20	2,38
· 20Q — + VU ++ 11 · 20Q — + VU ++ 11	20	180	11,1	13	25	3,97
· 20Q — + VU ++ 13 · 20Q — + VU ++ 13	20	180	13,8	13	25	3,97
· 25R — + VU ++ 13 · 25R — + VU ++ 13	25	200	13,8	17	32	3,97
· 32S — + VU ++ 16 · 32S — + VU ++ 16	32	250	16,6	22	40	4,76

^a For supplementary symbol, see 6.1.
^b For indexable insert thickness without shim, if any, see 6.4.
+ This is left to the manufacturer's discretion.

4 Designation

A tool holder in accordance with this part of ISO 5609 shall be designated by:

- a) "Tool holder";

- b) reference to this part of ISO 5609, i.e. ISO 5609-5;
- c) additional designation symbol, as specified in ISO 5609-1:2012, Clause 4;

EXAMPLE 1 Tool holder for internal turning with cylindrical shank with solid steel tool with lubrication hole (A), diameter $d_1 = 32$ mm (32), length $l_1 = 250$ mm (S), for hole clamping (P) rhombic indexable insert with included angle $\varepsilon_r = 55^\circ$ (D), style U (U), for indexable insert normal clearance $\alpha_n = 0^\circ$ (N), right-hand type (R), for cutting edge length $l_2 = 15,5$ mm (15) and round shank without flats is designated as follows:

Tool holder ISO 5609-5 - A32S - PDUNR 15 - 10

EXAMPLE 2 Tool holder for internal turning with cylindrical shank with solid steel tool with lubrication hole (A), diameter $d_1 = 20$ mm (20), length $l_1 = 180$ mm (Q), for screw clamping through hole (S) rhombic indexable insert with included angle $\varepsilon_r = 35^\circ$ (V), style U (U), for indexable insert normal clearance $\alpha_n = 7^\circ$ (C), right-hand type (R), for cutting edge length $l_2 = 13$ mm (13) and round shank without 4 flats is designated as follows:

Tool holder ISO 5609-5 - A20Q - SVUCR 13 - 41

5 Material

Tool holders for internal turning with cylindrical shank in accordance with this part of ISO 5609 shall be made from

- steel with a tensile strength of a least 1 000 N/mm²,
- hardmetal (carbide) tool with brazed steel head, or
- heavy metal tool.

The material is left to the manufacturer's discretion.

6 Design

6.1 Type of tool

Tool holders for internal turning with cylindrical shank in accordance with this part of ISO 5609 are designed

- with or without lubrication hole;
- with or without antivibration device.

The design of the type of tool is left to the manufacturer's discretion.

6.2 Type of mounting

Standard design of tool holders with indexable insert shall be mounted in accordance with Tables 1 and 2. Other types of mounting may be at the manufacturer's discretion or upon agreement. The letter symbol in the designation (symbol 4) shall then be replaced by the respective symbol for the chosen or agreed type of mounting.

For the modified type of mounting deviating from Tables 1 and 2 the relevant insert thickness shall also be considered.

6.3 Corner radius r_ε

Tool holders with cylindrical shank in accordance with this part of ISO 5609 may be equipped with indexable inserts with cutting edge lengths, l_2 , as specified in Tables 1 and 2 and any corner radius r_ε .

The values for f and l_1 given in Tables 1 and 2 apply to tool holders with indexable inserts having corner radii, r_ε , in accordance with Table 3.

Table 3 —
 Dimensions in millimetres

l_2	r_ϵ
7,75	0,4
11,1	0,8
11,6	
13,8	
15,5	
16,6	
NOTE The values given for r_ϵ are nominal values. The accurate values converted from the Imperial (inch) dimensions are 0,397 mm and 0,794 mm.	

For indexable inserts with corner radii, r_ϵ , other than those specified in Table 3, the dimensions for f and l_1 shall be determined in accordance with ISO 5609-1.

The tolerances on f and l_1 refer to dimensions measured with master indexable insert and master shim, if any.

6.4 Thickness, s , of insert

The values for thickness, s , given in Tables 1 and 2 apply to indexable inserts without shim and for the standard design of tool holders.

For tool holders for indexable inserts with thicknesses deviating from the specified values, the thickness shall be indicated when ordering or upon delivery (in the handbook).

7 Extent of delivery

Tool holders shall be delivered complete with clamping device but without indexable insert(s).

8 Marking

Tool holders with cylindrical shank shall be marked with the letter symbol and the name or trademark of the manufacturer.

Additional marking may be at the manufacturer's discretion or upon agreement.

Deviations in marking shall be upon agreement.

The general reference to this part of ISO 5609 (i.e. ISO 5609-5) shall be given on the packaging.

Bibliography

- [1] ISO 1832, *Indexable inserts for cutting tools — Designation*
- [2] ISO 13399 (all parts), *Cutting tool data representation and exchange*

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