INTERNATIONAL STANDARD

ISO 5611

Third edition
1995-09-01

Cartridges, type A, for indexable inserts — Dimensions

Cartouches du type A, à plaquettes amovibles — Dimensions

Reference number
ISO 5611:1995(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.

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.

International Standard ISO 5611 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This third edition cancels and replaces the second edition (ISO 5611:1989), subclause 4.2 of which has been technically revised.

Annex A of this International Standard is for information only.

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Cartridges, type A, for indexable inserts — Dimensions

1 Scope

This International Standard specifies the general dimensions of type A cartridges for indexable inserts, and specifies preferred cartridges (see clauses 5 and 6).

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3002-1:1982, *Basic quantities in cutting and grinding — Part 1: Geometry of the active part of cutting tools — General terms, reference systems, tool and working angles, chip breakers.*

3 Remarks

The designation of cartridges is dealt with in ISO 5608; however, for cartridges, type A, the symbol CA shall be applied in reference (7) of the code of symbolization, and for cartridges with lengths in accordance with this International Standard, the letter symbol identifying tool length is replaced by a dash.

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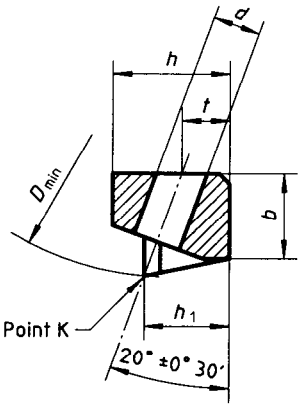
4 Dimensions

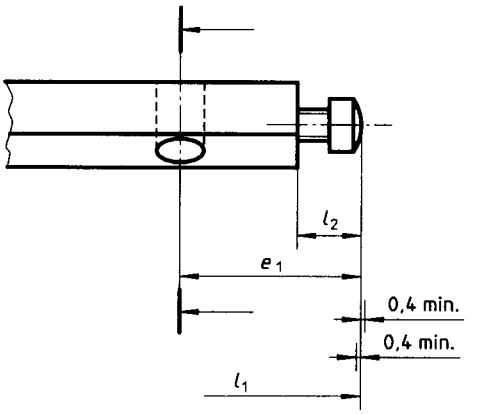
4.1 Shank

The dimensions, in millimetres, given in figure 1 and table 1 apply to shanks of all cartridges styles:

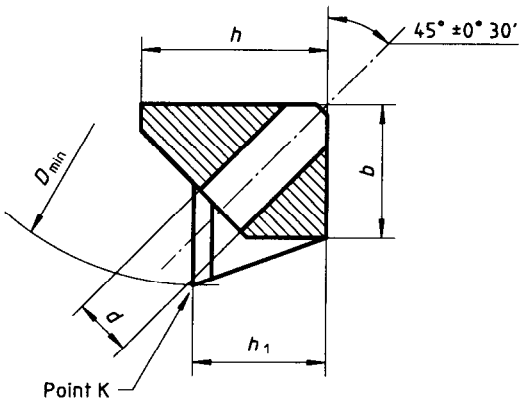
- for cartridges having $h_1 = 6^{1)}, 8^{2)}$, 10 and 12



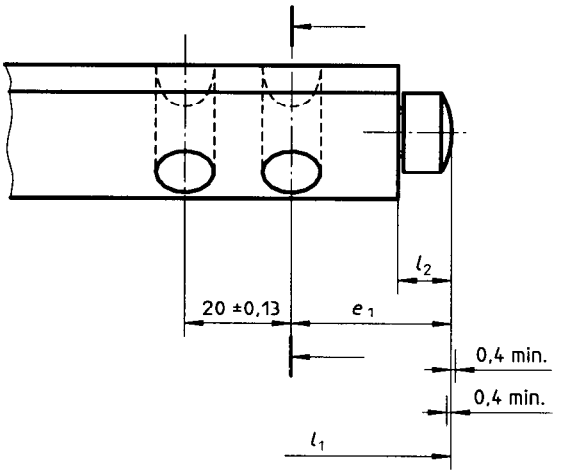
- for cartridges having $h_1 = 6^{1)}, 8^{2)}$, 10, 12, 16 and 20



- for cartridges having $h_1 = 16$, 20 and 25



- for cartridges having $h_1 = 25$



1) Cartridges designed mainly for indexable inserts in accordance with ISO 6987-2.
2) Cartridges designed mainly for indexable inserts in accordance with ISO 6987-1.

Figure 1

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Table 1

h_1 ± 0,08	h max.	b max.	e_1	l_2	t ± 0,13	d	**Fastening screw**
6	8,5	6	12	4,5	3,5	$4\ ^{+0,5}_{0}$	M3,5
8	11	8	17	6	4,5	4,5	M4
10	15	11	20	8	5	7	M6
12	20	16	20	8	6	7	M6
16	25	20	25	8	0	9	M8
20	30	20	30	10	0	9	M8
25	35	25	30	10	0	11	M10

4.2 Identification of dimensions l_1, f and h_1

4.2.1 The length dimension l_1 is the distance from the specified point K (see figures 2 to 5) to the end of the shank, including the adjusting screw length l_2 in its mid position.

Dimension f is the distance between the specified point K and the rear backing surface of the cartridge.

Dimension h_1 is the height to the specified point K.

The values of l_1, f and h_1, as specified in clause 6, are given for cartridges equipped with master inserts having corner radii in accordance with 4.2.3.

4.2.2 The specified point K is defined as follows:

Consider plane P_f (assumed working plane) and P_s (tool cutting edge plane) according to ISO 3002-1 for a selected point on the major cutting edge (for example point of tangency of major cutting edge with inscribed circle).

a) For $\kappa_r \leqslant 90°$, point K is defined as the intersection of plane P_s, a plane parallel to plane P_f tangent to the corner radius and a plane containing the tool face A_γ (see figures 2 and 3).

b) For $\kappa_r > 90°$, point K is defined as the intersection of a plane parallel to plane P_f tangent to the corner radius, a plane perpendicular to plane P_f tangent to the corner radius and a plane containing the tool face A_γ (see figures 4 and 5).

4.2.3 The corner radius r_ε of the master inserts used for the definition of dimensions l_1, f and h_1 is a function of the diameter of the inscribed circle of the insert, as indicated in table 2.

NOTE 1 Dimensions l_1, f and h_1 are based on corner radii r_ε converted from inch values, i.e. r_ε = 0,397 mm, 0,794 mm and 1,191 mm.

Table 2

Dimensions in millimetres

Diameter of the inscribed circle	4,76	5,56	6,35	7,94	9,525	12,7	15,875	19,05
Corner radius r_ε (nominal)	0,4				0,8		1,2	

4.2.4 Cartridges may be equipped with inserts of size in accordance with clause 6 and any corner radius r_ε.

For corner radii r_ε other than those specified in 4.2.3, dimensions l_1 and f shall be corrected by using the values x and y (see figures 2 to 5), which are the distances from the specified point K, as defined in 4.2.2, to the theoretical corner T.

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The new dimensions l_1 and f are found from the differences between x and y corresponding to the corner radius according to 4.2.3, and x and y corresponding to the real corner radius.

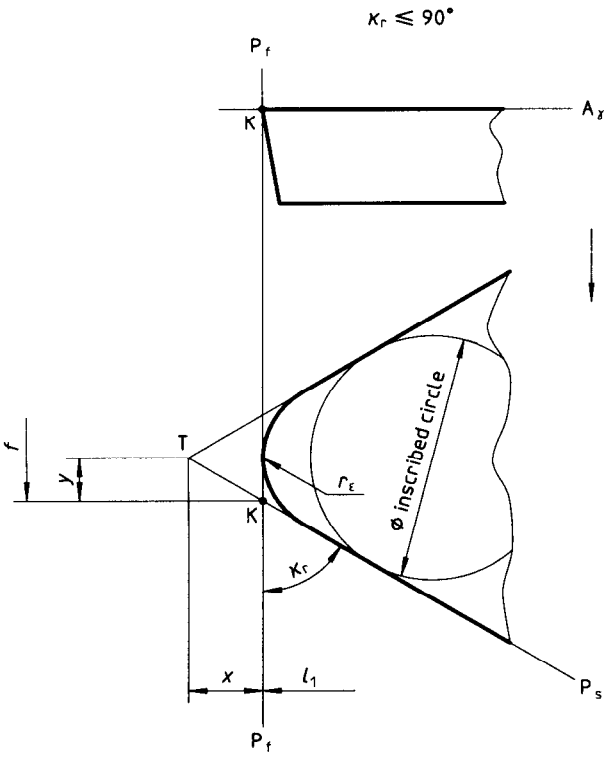

Figure 2

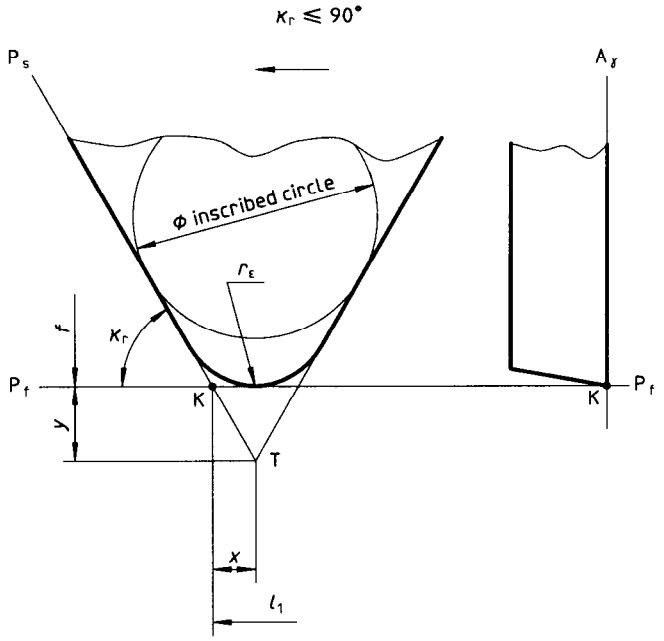

Figure 3

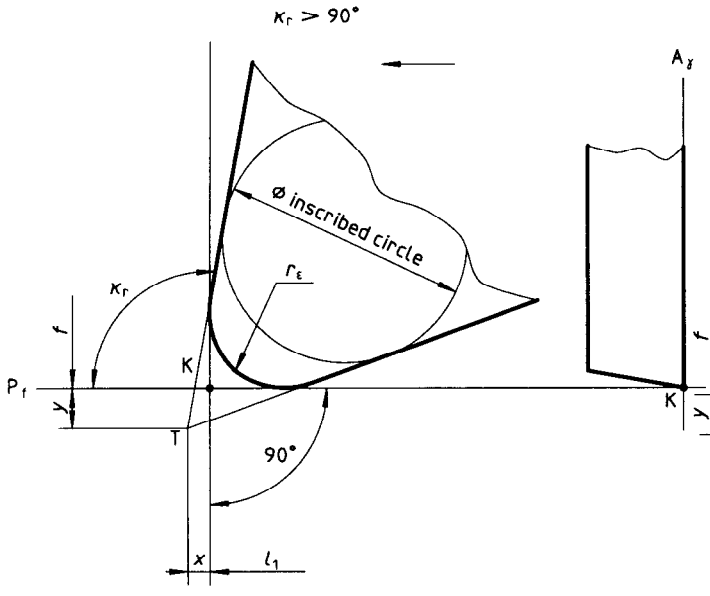

Figure 4

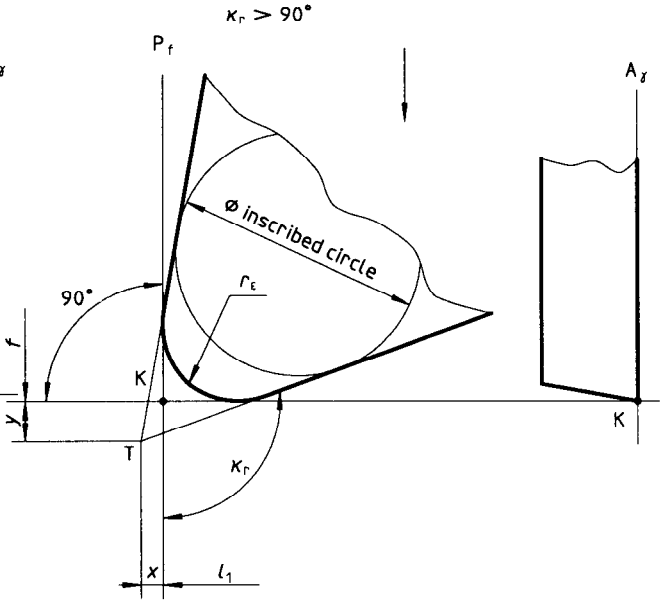

Figure 5

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5 Preferred cartridge styles

5.1 Cartridge styles established by this International Standard are the styles shown in figures 6 to 17. In these figures, right-hand cartridges are shown; left-hand cartridges are symmetrical in their layout.

5.2 The length adjusting screw, as well as the transverse adjusting screw, are at the manufacturer's option; however, dimensions f and l_1 specified in clause 6 shall be respected.

5.3 Cartridges are classified into four families in respect of the working major direction and the corner defined. This allows interchangeability of cartridges within a family.

Family 1

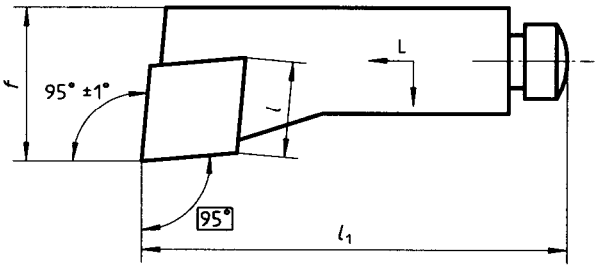

Figure 6

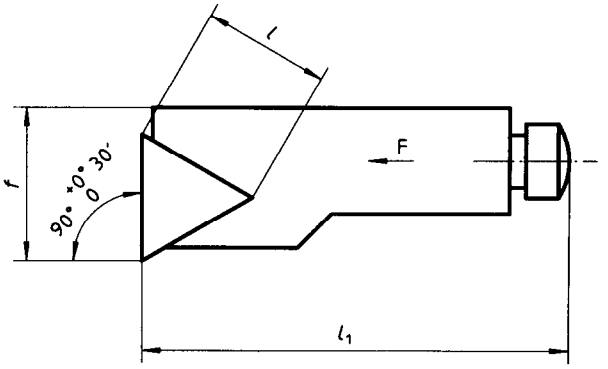

Figure 7

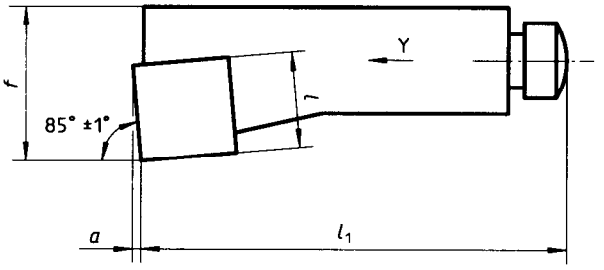

Figure 8

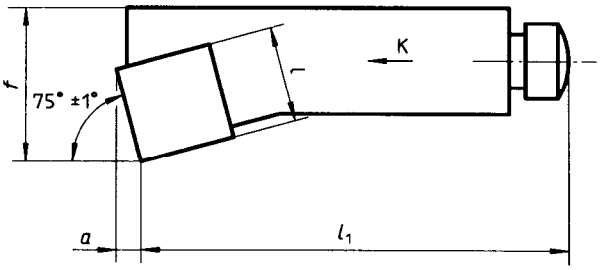

Figure 9

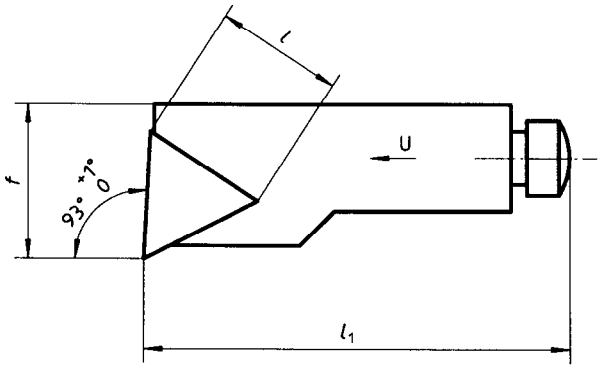

Figure 10

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Family 2

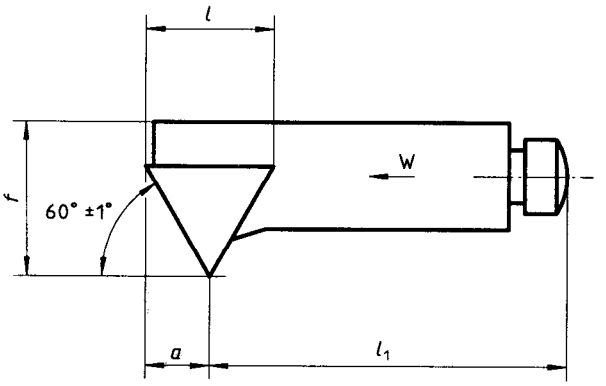

Figure 11

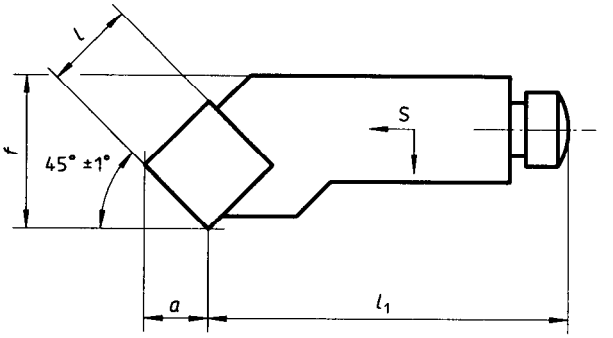

Figure 12

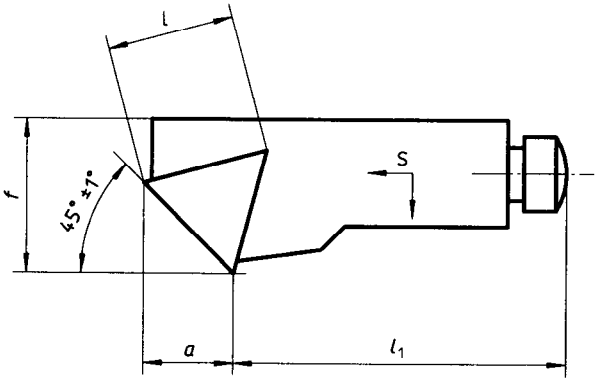

Figure 13

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Family 3

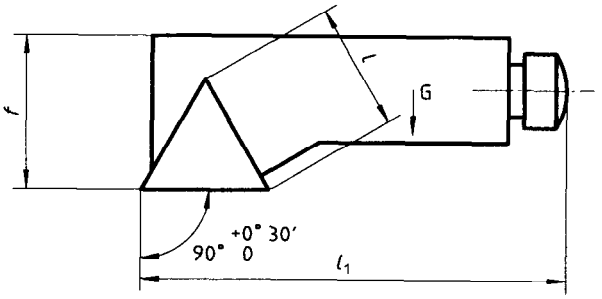

Figure 14

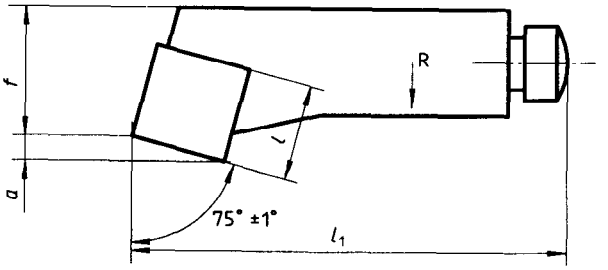

Figure 15

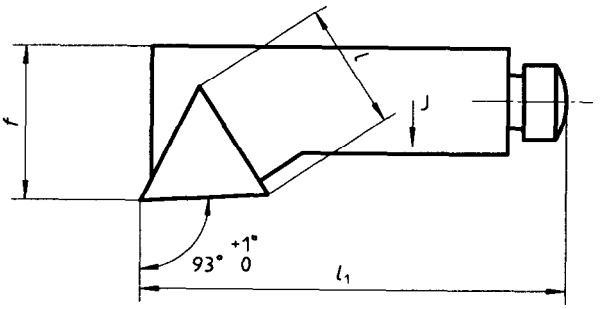

Figure 16

Family 4

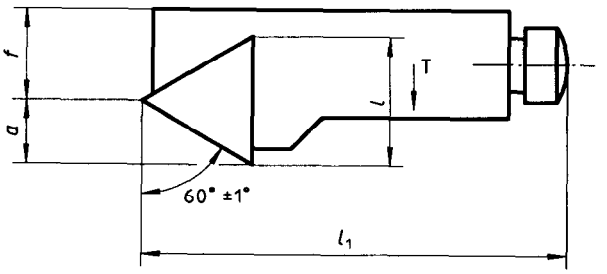

Figure 17

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6 General dimensions

See figures 1 and 6 to 17, and tables 3 and 4.

Table 3

Dimensions in millimetres

h_1 ± 0,08	Insert (designation)					f $^{0}_{-0,08}$		l_1		D_{min}
	Insert shape T △ / S □ / C ▱ for cartridge style					for cartridge style		for cartridge style		
	F, G, J, S, T, U, W	K, R, S, Y	L	F, G, K, R, S, T, W, Y	J, U	F, G, J, K, L, R, S, U, W, Y	T	F, G, J, K, L, R, T, U, Y	S, W	(minimum diameter of bore)
6	—	—	CP..04T1.. CP..0502..	CP..04T1.. CP..0502..	CP..04T1.. CP..0502..	8	5,5	25	21	20
8	09	—	06	06	—	10	6	32	28	25
10	11	09	09	—	—	14	9	50	44	40
12	11	09	09	—	—	20	13	55	47	50
	16	12	12							
16	16	12	12	—	—	25	15	63	53	60
	22	15								
20	22	15	12	—	—	25	15	70	60	70
			16							
25	27	19	19	—	—	32	20	100	87	100

Table 4

Dimensions in millimetres

h_1	**Dimension** a (see figures 8, 9, 11, 12, 13, 15, 17) **for cartridge style**					
	K, R	S with insert shape T △	S with insert shape S □	S with insert shape C ▱	T, W	Y
6	1,1 [1]	—	—	3,1 [1]	2,2 [1]	0,4 [1]
	1,3 [2]	—	—	3,7 [2]	2,6 [2]	0,4 [2]
8	1,6	6,1	—	4,3	4,3 [3] 3 [4]	0,6
10	2,2	7	6,1	—	5	0,8
12	2,2	7	6,1	—	5	0,8
	3,1	10,2	8,3	—	7,2	1
16	3,1	10,2	8,3	—	7,2	1
	3,8	14,1	10,2	—	10	1,3
20	3,8	14,1	10,2	—	10	1,3
25	4,6	17,2	12,5	—	12,2	1,6

1) For insert CP..04T1..
2) For insert CP..0502..
3) With insert shape T △
4) With insert shape C ▱

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Annex A
(informative)

Bibliography

[1] ISO 883:1985, *Indexable hardmetal (carbide) inserts with rounded corners, without fixing hole — Dimensions.*

[2] ISO 3364:1985, *Indexable hardmetal (carbide) inserts with rounded corners, with cylindrical fixing hole — Dimensions.*

[3] ISO 5608:1995, *Turning and copying tool holders and cartridges for indexable inserts — Designation.*

[4] ISO 6987-1:1983, *Indexable hardmetal (carbide) inserts with rounded corners, with partly cylindrical fixing hole — Part 1: Dimensions of inserts with 7 degrees normal clearance.*

[5] ISO 6987-2:1990, *Indexable inserts for cutting tools — Hardmetal (carbide) inserts with rounded corners, with partly cylindrical fixing hole — Part 2: Dimensions of inserts with 11 degrees normal clearance.*

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