INTERNATIONAL STANDARD

ISO 16463

First edition
2004-06-01

Polycrystalline diamond inserts, tipped — Dimensions, types

Plaquettes brasées en diamant polycristallin — Dimensions, types

Reference number
ISO 16463:2004(E)

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

Contents

Page

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 16463 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

Polycrystalline diamond inserts, tipped — Dimensions, types

1 Scope

This International Standard applies to inserts with insert shapes in accordance with ISO 883 and ISO 6987, tipped with polycrystalline diamond (DP).

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

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

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

ISO 6987, *Indexable hard material inserts with rounded corners, with partly cylindrical fixing hole — Dimensions*

3 Insert shapes and design

3.1 Insert shapes

Triangular (T), square (S), rhombic 80° (C), 55° (D) and 35° (V) and trigon (W).

3.2 Normal clearance, α_n

Normal clearance 5° (B), 7° (C), 11° (P) and 20° (E).

3.3 Cutting edge corner

Inserts for turning with corner radius r_ε 0,2 mm; 0,4 mm; 0,8 mm; 1,2 mm and 1,6 mm.

Inserts for milling with wiper edge.

NOTE The design of non-tipped corners is optional.

3.4 Tolerance class

Tolerance class in accordance with ISO 1832 shall be applied. In Tables 1 to 10 this position is shown with a dot (•).

3.5 Design of cutting edges

Any design shall be indicated in the designation, see ISO 1832.

3.6 Insert type

The styles of tipped cutting edges in accordance with ISO 1832 shall be applied.

4 Designation

4.1 General

The designation of inserts tipped with polycrystalline diamond (DP) is based on ISO 1832. The letter symbol for the cutting edge condition and the letter symbol for the insert type shall be indicated in the designation in each case.

Designations contained in Clauses 4.2 and 4.3 are examples of use of designations in accordance with ISO 1832.

4.2 Designation of a tipped insert for turning

Designation of a rhombic insert with included angle ε_r = 55° (D), normal clearance α_n = 7° (C), with tolerance class G, without chip breakers and with fixing hole (W), with side length l = 11,6 mm (11), thickness s = 3,97 mm (T3), corner radius r_ε = 0,8 mm (08), with sharp cutting edges (F), tipped — one sided — one corner (A), long (L), cutting material in accordance with ISO 513 (e.g. DP05):

Insert DCGW 11T308F — AL — DP05 — ...

NOTE DP05 is optional in accordance with ISO 1832, designation symbol 13.

4.3 Designation of a tipped insert for milling

Designation of a square insert (S) with normal clearance α_n = 11° (P), with tolerance class G, without chip breakers and with fixing hole (W), with side length l = 12,7 mm (12), thickness s = 4,76 mm (04), cutting edge angle κ_r = 75° (E), normal clearance at wiper edge α = 15° (D), right-hand type (R), tipped — one sided — one corner (A), long (L), cutting material in accordance with ISO 513 (e.g. DP05):

Insert SPGW 1204EDR — AL — DP05 — ...

NOTE DP05 is optional in accordance with ISO 1832, designation symbol 13.

5 Dimensions

5.1 Insert shape T with fixing hole (inserts for turning)

See Figure 1 and Table 1.

NOTE For the dimensions of l_1, see Table 11.

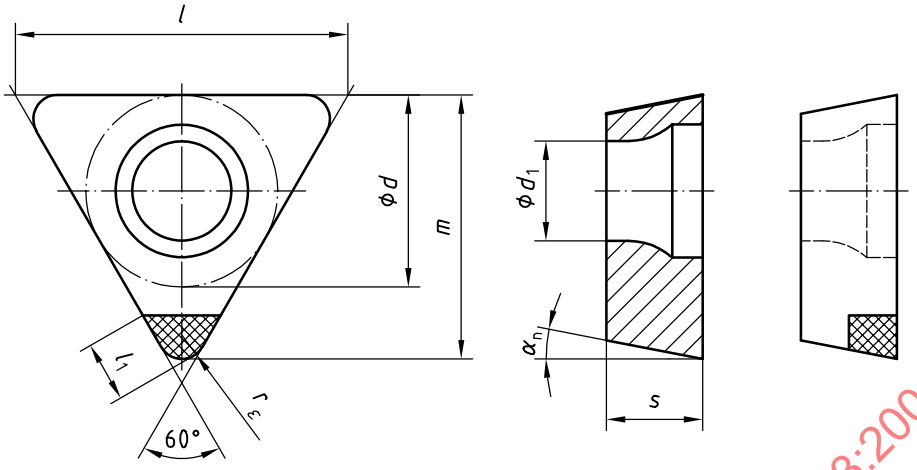


Figure 1

Table 1

Designation	d	d_1	l ≈	m	s	α_n	r_ε
TC•W 09 02 02F	5,56	2,5	9,63	8,137	2,38	7°	0,2
TC•W 09 02 04F	5,56	2,5	9,63	7,943	2,38	7°	0,4
TC•W 09 02 08F	5,56	2,5	9,63	7,541	2,38	7°	0,8
TC•W 11 02 02F	6,35	2,8	11,0	9,322	2,38	7°	0,2
TC•W 11 02 04F	6,35	2,8	11,0	9,128	2,38	7°	0,4
TC•W 11 02 08F	6,35	2,8	11,0	8,731	2,38	7°	0,8
TC•W 11 03 02F	6,35	2,8	11,0	9,327	3,18	7°	0,2
TC•W 11 03 04F	6,35	2,8	11,0	9,128	3,18	7°	0,4
TC•W 11 03 08F	6,35	2,8	11,0	8,731	3,18	7°	0,8
TC•W 16 T3 02F	9,525	4,4	16,5	14,084	3,97	7°	0,2
TC•W 16 T3 04F	9,525	4,4	16,5	13,891	3,97	7°	0,4
TC•W 16 T3 08F	9,525	4,4	16,5	13,494	3,97	7°	0,8
TC•W 16 T3 12F	9,525	4,4	16,5	13,097	3,97	7°	1,2
TC•W 16 T3 16F	9,525	4,4	16,5	12,700	3,97	7°	1,6
TC•W 22 04 04F	12,7	5,5	22,0	18,653	4,76	7°	0,4
TC•W 22 04 08F	12,7	5,5	22,0	18,256	4,76	7°	0,8
TC•W 22 04 12F	12,7	5,5	22,0	17,859	4,76	7°	1,2
TC•W 22 04 16F	12,7	5,5	22,0	17,462	4,76	7°	1,6
TP•W 09 02 02F	5,56	2,5	9,63	8,137	2,38	11°	0,2
TP•W 09 02 04F	5,56	2,5	9,63	7,943	2,38	11°	0,4
TP•W 09 02 08F	5,56	2,5	9,63	7,541	2,38	11°	0,8
TP•W 11 02 02F	6,35	2,8	11,0	9,322	2,38	11°	0,2
TP•W 11 02 04F	6,35	2,8	11,0	9,128	2,38	11°	0,4
TP•W 11 02 08F	6,35	2,8	11,0	9,322	2,38	11°	0,8
TP•W 11 03 02F	6,35	3,3	11,0	9,327	3,18	11°	0,2
TP•W 11 03 04F	6,35	3,3	11,0	9,128	3,18	11°	0,4
TP•W 11 03 08F	6,35	3,3	11,0	8,731	3,18	11°	0,8
TP•W 13 03 02F	7,938	3,4	13,7	11,708	3,18	11°	0,2
TP•W 13 03 04F	7,938	3,4	13,7	11,509	3,18	11°	0,4
TP•W 13 03 08F	7,938	3,4	13,7	11,112	3,18	11°	0,8
TP•W 16 T3 04F	9,525	4,4	16,5	13,891	3,97	11°	0,4
TP•W 16 T3 08F	9,525	4,4	16,5	13,494	3,97	11°	0,8
TP•W 16 T3 12F	9,525	4,4	16,5	13,097	3,97	11°	1,2
TP•W 16 T3 16F	9,525	4,4	16,5	12,700	3,97	11°	1,6

5.2 Insert shape T without fixing hole (inserts for turning)

See Figure 2 and Table 2.

NOTE For the dimensions of l_1, see Table 11.

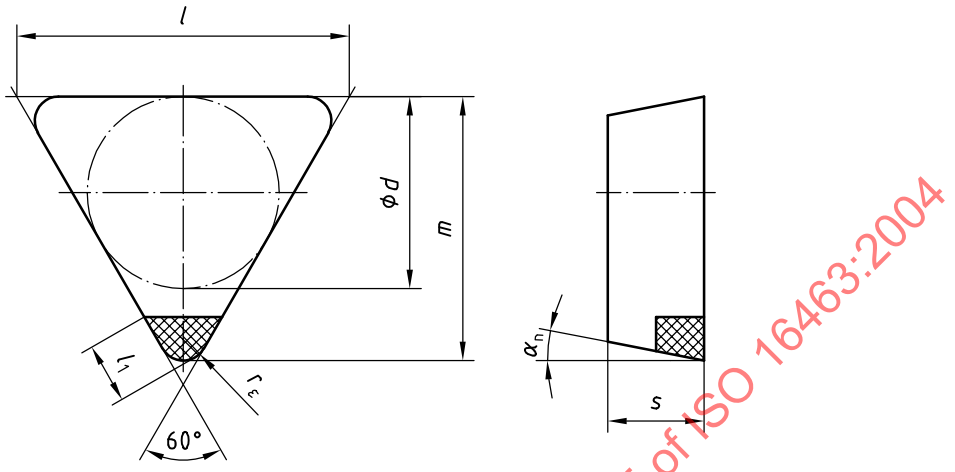


Figure 2

Table 2

Designation	d	l ≈	m	s	α_n	r_ε
TP•N 09 02 02F	5,556	9,62	8,136	2,38	11°	0,2
TP•N 09 02 04F	5,556	9,62	7,938	2,38	11°	0,4
TP•N 09 02 08F	5,556	9,62	7,541	2,38	11°	0,8
TP•N 11 03 02F	6,35	11,0	9,327	3,18	11°	0,2
TP•N 11 03 04F	6,35	11,0	9,128	3,18	11°	0,4
TP•N 11 03 08F	6,35	11,0	8,731	3,18	11°	0,8
TP•N 16 03 02F	9,525	16,5	14,089	3,18	11°	0,2
TP•N 16 03 04F	9,525	16,5	13,891	3,18	11°	0,4
TP•N 16 03 08F	9,525	16,5	13,494	3,18	11°	0,8

5.3 Insert shape S with fixing hole (inserts for turning)

See Figure 3 and Table 3.

NOTE For the dimensions of l_1, see Table 11.

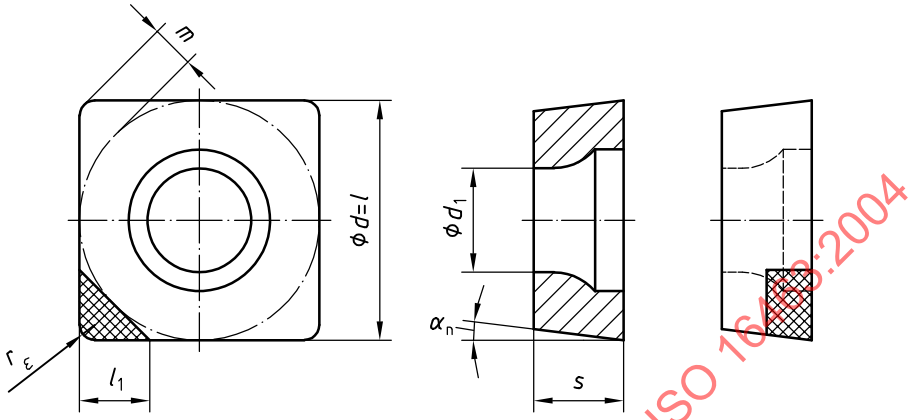


Figure 3

Table 3

Designation	d	d_1	$l \approx$	m	s	α_n	r_ε
SC•W 09 T3 04F	9,525	4,4	9,525	1,808	3,97	7°	0,4
SC•W 09 T3 08F	9,525	4,4	9,525	1,644	3,97	7°	0,8
SC•W 09 T3 12F	9,525	4,4	9,525	1,479	3,97	7°	1,2
SC•W 12 04 04F	12,7	5,5	12,7	2,466	4,76	7°	0,4
SC•W 12 04 08F	12,7	5,5	12,7	2,301	4,76	7°	0,8
SC•W 12 04 12F	12,7	5,5	12,7	2,137	4,76	7°	1,2
SC•W 12 04 16F	12,7	5,5	12,7	1,973	4,76	7°	1,6
SP•W 09 T3 02F	9,525	4,4	9,525	1,889	3,97	11°	0,2
SP•W 09 T3 04F	9,525	4,4	9,525	1,808	3,97	11°	0,4
SP•W 09 T3 08F	9,525	4,4	9,525	1,644	3,97	11°	0,8
SP•W 09 T3 12F	9,525	4,4	9,525	1,479	3,97	11°	1,2
SP•W 12 04 04F	12,7	5,5	12,7	2,466	4,76	11°	0,4
SP•W 12 04 08F	12,7	5,5	12,7	2,301	4,76	11°	0,8
SP•W 12 04 12F	12,7	5,5	12,7	2,137	4,76	11°	1,2
SP•W 12 04 16F	12,7	5,5	12,7	1,973	4,76	11°	1,6

5.4 Insert shape S without fixing hole (inserts for turning)

See Figure 4 and Table 4.

NOTE For the dimensions of l_1, see Table 11.

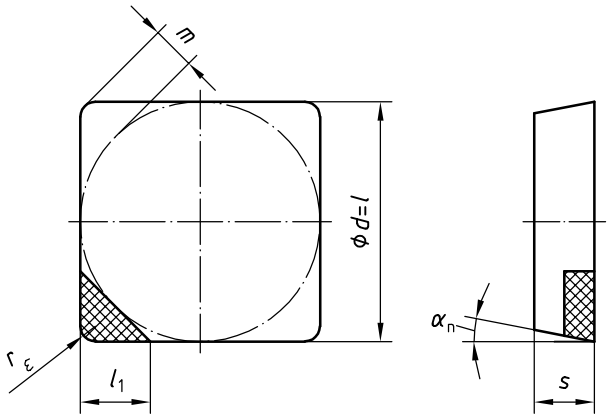


Figure 4

Table 4

Designation	d	l ≈	m	s	α_n	r_ε
SP•N 09 03 02F	9,525	9,5	1,890	3,18	11°	0,2
SP•N 09 03 04F	9,525	9,5	1,808	3,18	11°	0,4
SP•N 09 03 08F	9,525	9,5	1,644	3,18	11°	0,8
SP•N 12 03 02F	12,7	12,7	2,548	3,18	11°	0,2
SP•N 12 03 04F	12,7	12,7	2,466	3,18	11°	0,4
SP•N 12 03 08F	12,7	12,7	2,301	3,18	11°	0,8

5.5 Insert shape C with fixing hole (inserts for turning)

See Figure 5 and Table 5.

NOTE For the dimensions of l_1, see Table 11.

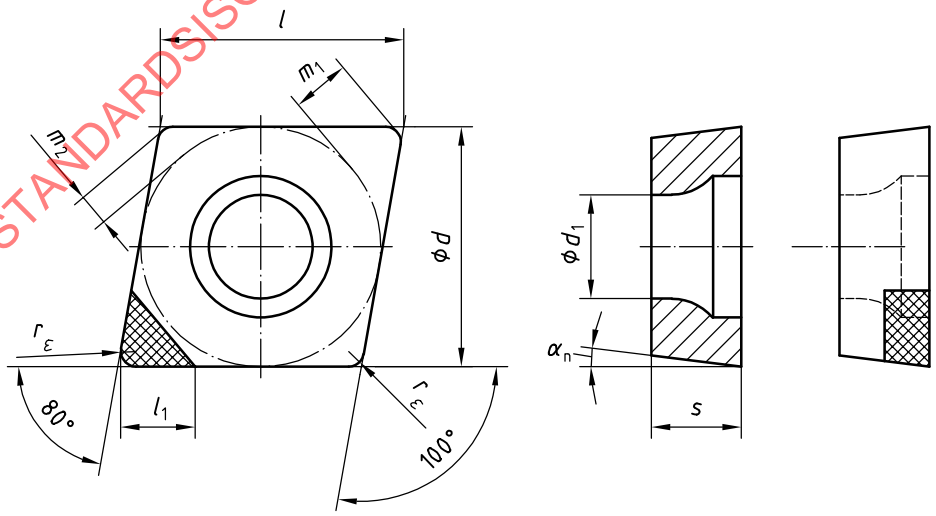


Figure 5

Table 5

Designation	d	d_1	$l \approx$	m_1	m_2	s	α_n	r_ε
CC•W 05 02 02F	5,56	2,5	5,64	1,432	0,787	2,38	7°	0,2
CC•W 05 02 04F	5,56	2,5	5,64	1,324	0,728	2,38	7°	0,4
CC•W 06 02 02F	6,35	2,8	6,45	1,652	0,908	2,38	7°	0,2
CC•W 06 02 04F	6,35	2,8	6,45	1,544	0,848	2,38	7°	0,4
CC•W 06 02 08F	6,35	2,8	6,45	1,323	0,727	2,38	7°	0,8
CC•W 08 03 02F	7,938	3,4	8,06	2,093	1,150	3,18	7°	0,2
CC•W 08 03 04F	7,938	3,4	8,06	1,986	1,091	3,18	7°	0,4
CC•W 08 03 08F	7,938	3,4	8,06	1,764	0,970	3,18	7°	0,8
CC•W 08 03 12F	7,938	3,4	8,06	1,544	0,848	3,18	7°	1,2
CC•W 09 T3 04F	9,525	4,4	9,67	2,426	1,333	3,97	7°	0,4
CC•W 09 T3 08F	9,525	4,4	9,67	2,206	1,212	3,97	7°	0,8
CC•W 09 T3 12F	9,525	4,4	9,67	1,985	1,091	3,97	7°	1,2
CC•W 12 04 04F	12,7	5,5	12,9	3,308	1,818	4,76	7°	0,4
CC•W 12 04 08F	12,7	5,5	12,9	3,088	1,697	4,76	7°	0,8
CC•W 12 04 12F	12,7	5,5	12,9	2,867	1,576	4,76	7°	1,2
CC•W 12 04 16F	12,7	5,5	12,9	2,647	1,455	4,76	7°	1,6
CP•W 05 02 02F	5,56	2,5	5,64	1,432	0,787	2,38	11°	0,2
CP•W 05 02 04F	5,56	2,5	5,64	1,324	0,728	2,38	11°	0,4
CP•W 06 02 02F	6,35	2,8	6,45	1,652	0,908	2,38	11°	0,2
CP•W 06 02 04F	6,35	2,8	6,45	1,544	0,848	2,38	11°	0,4
CP•W 06 02 08F	6,35	2,8	6,45	1,323	0,727	2,38	11°	0,8
CP•W 08 03 02F	7,938	3,4	8,06	2,093	1,150	3,18	11°	0,2
CP•W 08 03 04F	7,938	3,4	8,06	1,986	1,091	3,18	11°	0,4
CP•W 08 03 08F	7,938	3,4	8,06	1,764	0,970	3,18	11°	0,8
CP•W 08 03 12F	7,938	3,4	8,06	1,544	0,848	3,18	11°	1,2
CP•W 09 03 02F	9,525	4,4	9,67	2,534	1,392	3,18	11°	0,2
CP•W 09 03 04F	9,525	4,4	9,67	2,426	1,333	3,18	11°	0,4
CP•W 09 03 08F	9,525	4,4	9,67	2,206	1,212	3,18	11°	0,8
CP•W 09 03 12F	9,525	4,4	9,67	1,985	1,091	3,18	11°	1,2
CP•W 09 T3 02F	9,525	4,4	9,67	2,426	1,333	3,97	11°	0,2
CP•W 09 T3 04F	9,525	4,4	9,67	2,426	1,333	3,97	11°	0,4
CP•W 09 T3 08F	9,525	4,4	9,67	2,206	1,212	3,97	11°	0,8
CP•W 09 T3 12F	9,525	4,4	9,67	1,985	1,091	3,97	11°	1,2
CP•W 12 04 04F	12,7	5,5	12,9	3,088	1,818	4,76	11°	0,4
CP•W 12 04 08F	12,7	5,5	12,9	3,308	1,697	4,76	11°	0,8
CP•W 12 04 12F	12,7	5,5	12,9	2,867	1,576	4,76	11°	1,2
CP•W 12 04 16F	12,7	5,5	12,9	2,647	1,455	4,76	11°	1,6

5.6 Insert shape D with fixing hole (inserts for turning)

See Figure 6 and Table 6.

NOTE For the dimensions of l_1, see Table 11.

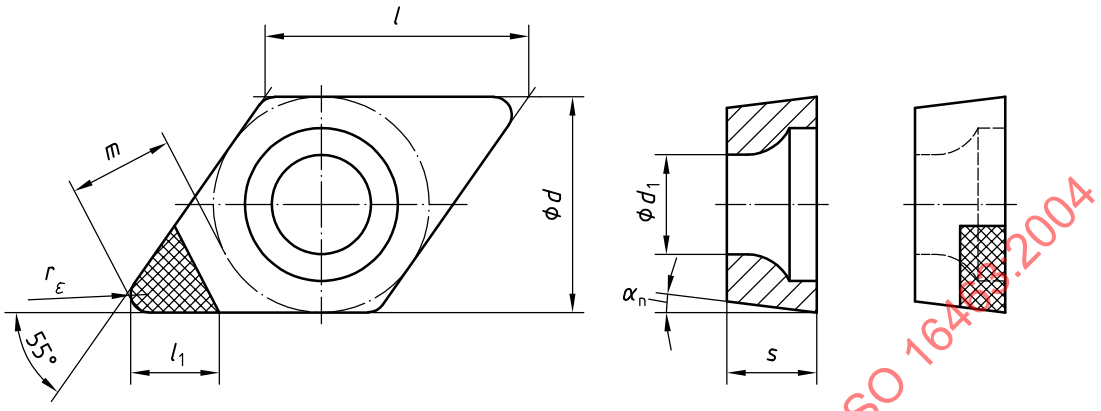


Figure 6

Table 6

Designation	d	d_1	l ≈	m	s	α_n	r_ε
DC•W 07 02 02F	6,35	2,8	7,75	3,464	2,38	7°	0,2
DC•W 07 02 04F	6,35	2,8	7,75	3,238	2,38	7°	0,4
DC•W 07 02 08F	6,35	2,8	7,75	2,776	2,38	7°	0,8
DC•W 11 T3 02F	9,525	4,4	11,6	5,320	3,97	7°	0,2
DC•W 11 T3 04F	9,525	4,4	11,6	5,089	3,97	7°	0,4
DC•W 11 T3 08F	9,525	4,4	11,6	4,626	3,97	7°	0,8
DC•W 11 T3 12F	9,525	4,4	11,6	4,164	3,97	7°	1,2
DP•W 07 02 02F	6,35	2,8	7,75	3,464	2,38	11°	0,2
DP•W 07 02 04F	6,35	2,8	7,75	3,238	2,38	11°	0,4
DP•W 11 T3 04F	9,525	4,4	11,6	5,089	3,97	11°	0,4
DP•W 11 T3 08F	9,525	4,4	11,6	4,626	3,97	11°	0,8

5.7 Insert shape V with fixing hole (inserts for turning)

See Figure 7 and Table 7.

NOTE For the dimensions of l_1, see Table 11.

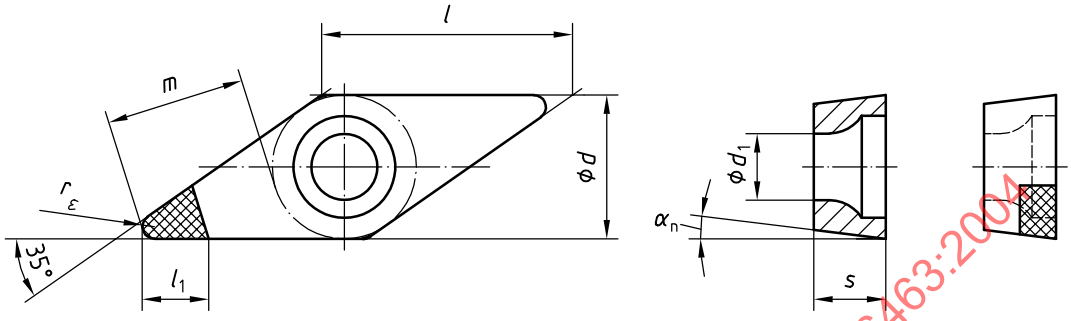


Figure 7

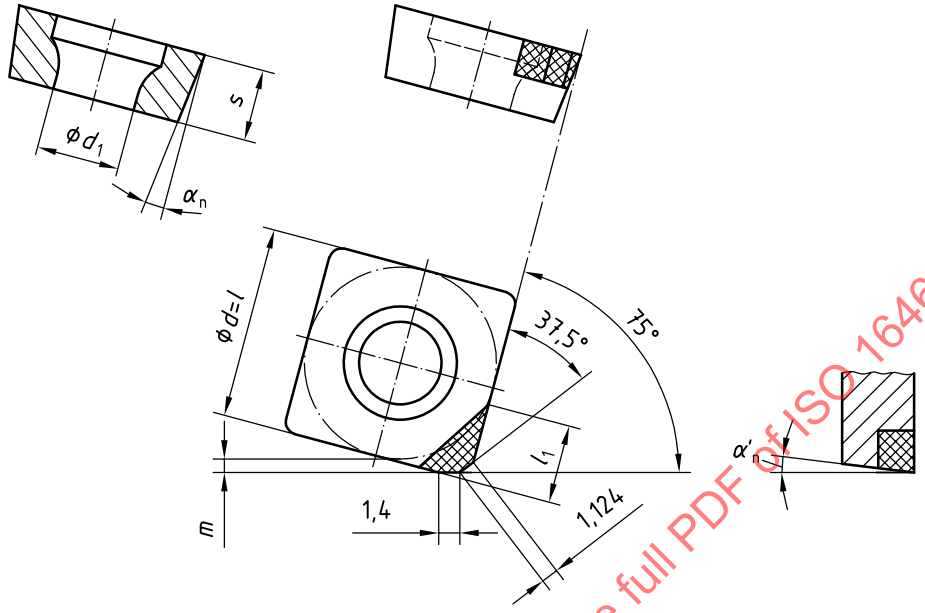
Table 7

Designation	d	d_1	l ≈	m	s	α_n	r_ε
VB•W 16 04 02F	9,525	4,4	16,6	10,603	4,76	5°	0,2
VB•W 16 04 04F	9,525	4,4	16,6	10,152	4,76	5°	0,4
VB•W 16 04 08F	9,525	4,4	16,6	9,229	4,76	5°	0,8
VB•W 16 04 12F	9,525	4,4	16,6	8,306	4,76	5°	1,2
VC•W 11 03 02F	6,35	2,8	11,1	6,911	3,18	7°	0,2
VC•W 11 03 04F	6,35	2,8	11,1	6,460	3,18	7°	0,4
VC•W 11 03 08F	6,35	2,8	11,1	5,537	3,18	7°	0,8
VC•W 16 04 02F	9,525	4,4	16,6	10,603	4,76	7°	0,2
VC•W 16 04 04F	9,525	4,4	16,6	10,154	4,76	7°	0,4
VC•W 16 04 08F	9,525	4,4	16,6	9,231	4,76	7°	0,8
VC•W 16 04 12F	9,525	4,4	16,6	8,308	4,76	7°	1,2

5.8 Insert shape S with fixing hole (inserts for milling)

See Figure 8 and Table 8.

NOTE For the dimensions of l_1, see Table 11.



NOTE Right-hand type is shown in the figure (R).

Figure 8

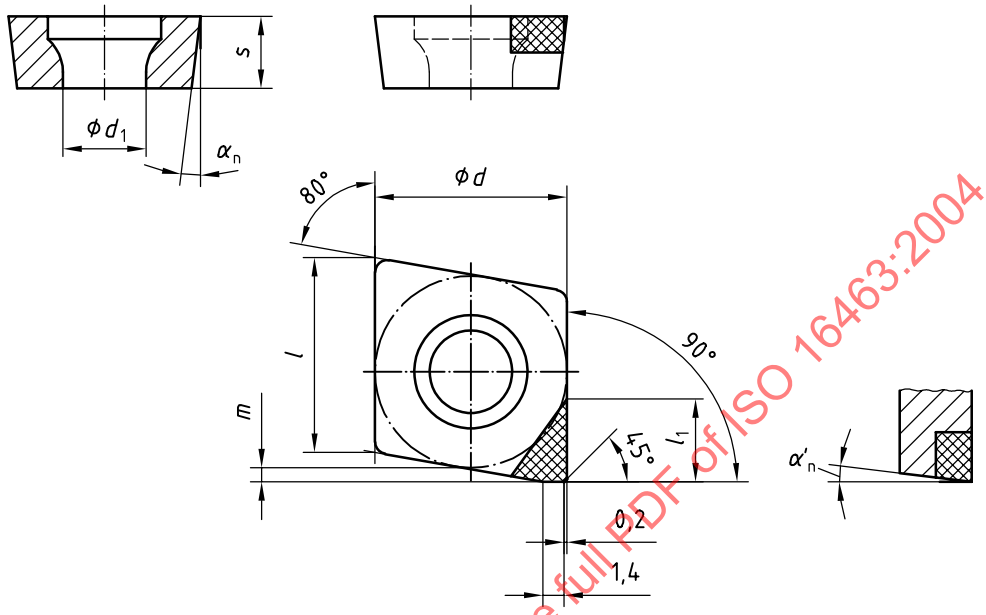
Table 8

Designation	d	d_1	l ≈	m	s	α_n	α'_n
SE•W 09 T3 EER	9,525	4,4	9,525	0,543	3,97	20°	20°
SE•W 09 T3 EEL	9,525	4,4	9,525	0,543	3,97	20°	20°
SP•W 12 04 EDR	12,7	5,5	12,7	0,900	4,76	11°	15°
SP•W 12 04 EDL	12,7	5,5	12,7	0,900	4,76	11°	15°

5.9 Insert shape C with fixing hole (inserts for milling)

See Figure 9 and Table 9.

NOTE For the dimensions of l_1, see Table 11.



NOTE Right-hand type shown in the figure (R).

Figure 9

Table 9

Designation	d	d_1	l ≈	m	s	α_n	α'_n
CE•W 09 T3 PEL	9,525	4,4	9,67	0,631	3,97	20°	20°
CE•W 09 T3 PER	9,525	4,4	9,67	0,631	3,97	20°	20°
CP•W 12 04 PDL	12,7	5,5	12,9	0,936	4,76	11°	15°
CP•W 12 04 PDR	12,7	5,5	12,9	0,936	4,76	11°	15°

5.10 Insert shape W with fixing hole (inserts for turning)

See Figure 10 and Table 10.

NOTE For the dimensions of l_1, see Table 11.

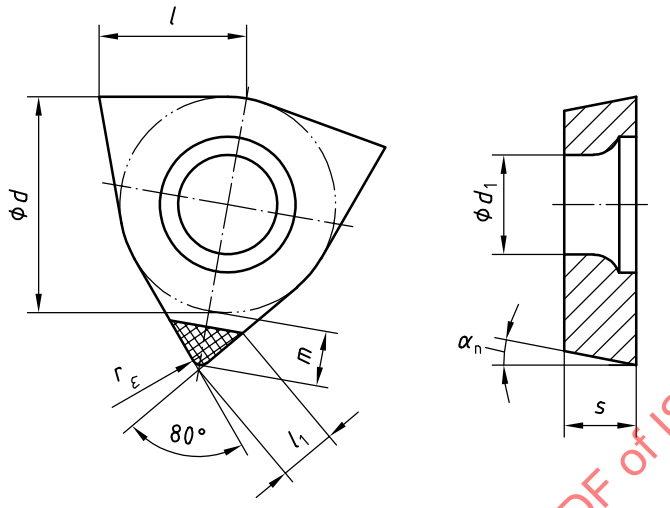


Figure 10

Table 10

Designation	d	d_1	l ≈	m	s	α_n	r_ε
WC•W040202F	6,35	2,8	4,3	1,655	2,38	7°	0,2
WC•W040204F	6,35	2,8	4,3	1,543	2,38	7°	0,4
WC•W06T304F	9,525	4,4	6,5	2,426	3,97	7°	0,4
WC•W06T308F	9,525	4,4	6,5	2,203	3,97	7°	0,8
WP•W040201F	6,35	2,8	4,3	1,710	2,38	11°	0,1
WP•W040202F	6,35	2,8	4,3	1,654	2,38	11°	0,2
WP•W040204F	6,35	2,8	4,3	1,543	2,38	11°	0,4
WP•W060302F	9,525	4,4	6,5	2,537	3,18	11°	0,2
WP•W060304F	9,525	4,4	6,5	2,426	3,18	11°	0,4