INTERNATIONAL STANDARD

ISO 525

Fifth edition
2020-10

Bonded abrasive products — Shape types, designation and marking

Produits abrasifs agglomérés — Types de forme, désignation et marquage

Reference number
ISO 525:2020(E)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 5, *Grinding wheels and abrasives*.

This fifth edition cancels and replaces the fourth edition (ISO 525:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

— title corrected to be more precise: "Bonded abrasive products – Shape types, designation and marking";

— scope corrected by deleting bullet point d) for dimensions, limit deviations and tolerances as well as permissible unbalance; requirements for dimensions, limit deviations and tolerances were never specified in ISO 525 but in ISO 13942;

— type of citation of ISO 603, ISO 13942 and ISO 6103 revised to be informative;

— Table 1: symbols revised;

— Table 2: shape types and their designations revised in order to better fit together in terms of language;

— Table 2: addition of new shape types 18B and 18P;

— Table 2: addition of more subtypes to shape types 31, 52, 54 and 90 in accordance with the respective part(s) of ISO 603;

— revision of profiles in 4.2 as well as addition of further profiles;

— former subclauses 5.1, 5.2 and 5.3 deleted;

— former subclause 5.4 revised and moved to be Clause 5;

— revision of Table 3 "Specification" and the following subclauses explaining the elements of Table 3;

— reintroduction of the designation from the edition of 1999 as new Clause 6;

— revision of Clause 7 “Marking”.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Bonded abrasive products — Shape types, designation and marking

1 Scope

This document is applicable for bonded abrasive products in general.

NOTE 1 Bonded abrasive products are e.g. grinding wheels, segments, sticks and stones.

This document specifies:

a) ISO type number and shape;

b) dimensional symbols;

c) standard profiles;

d) specification;

e) designation;

f) marking requirements.

NOTE 2 This document is general and is complemented by ISO 603 (all parts) that is applicable for dimensions, by ISO 6103 that is applicable for permissible unbalance and by ISO 13942 that is applicable for limit deviations and tolerances.

This document is not applicable for superabrasive products and coated abrasive products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 8486 (all parts), *Bonded abrasives — Determination and designation of grain size distribution*

3 Terms, definitions and symbols

3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.2 Symbols

For symbols see Table 1.

Table 1 — Symbols

Symbol	Definition
A	Smallest width of a trapezoidal segment
B	Width of a segment, stick or stone
C	Thickness of a segment, stick or stone
D	Outside diameter of abrasive products
E	Thickness at bore of cup, dish, saucer, recessed and relieved grinding wheels and depressed centre grinding and cutting-off wheels
F	Depth of the 1st recess
G	Depth of the 2nd recess
H	Bore diameter of abrasive products
H_t	Thread diameter of grinding wheels and cup, dish, saucer grinding wheels and cones, plugs and balls with threaded insert
J	Smallest diameter of taper cup, dish and saucer grinding wheels, tapered and hubbed grinding wheels and depressed centre grinding and cutting-off wheels
K	Internal diameter of the recess of taper cup, dish and saucer grinding wheels, relieved grinding wheels and depressed centre grinding and cutting-off wheels
L	Length of a segment, stick or stone
L_1	Length of a thread bore of grinding wheels, cones, plugs and balls with threaded insert
L_2	Length of the spindle from the end to entry into the mounted point or wheel
M	Elevation of the depressed centre
N	Depth of the relief
P	Recessed diameter
R	Radius of the recess in the grinding wheel or radius of cylindrical plug with curved or ball end
R_o	Outer radius of a curved segment
R_i	Inner radius of a curved segment
S_d	Diameter of the spindle in a mounted point or wheel
T	Overall thickness
T_1	Length of the cylindrical part of a grinding plug
U	Smallest thickness of tapered and hubbed grinding wheels, dish and saucer grinding wheels and depressed centre grinding and cutting-off wheels
V	Profile angle[a]
W	Rim width of cup, cylinder and dish grinding wheels
X	Thickness of application specific profile[a]
➔	Symbolizes the grinding face of bonded abrasive products.

[a] For wheel profiles, see 4.2.

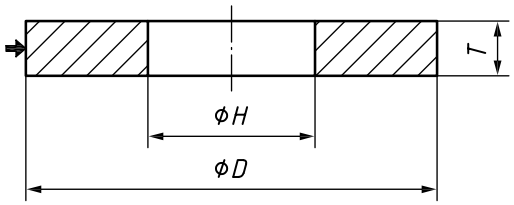
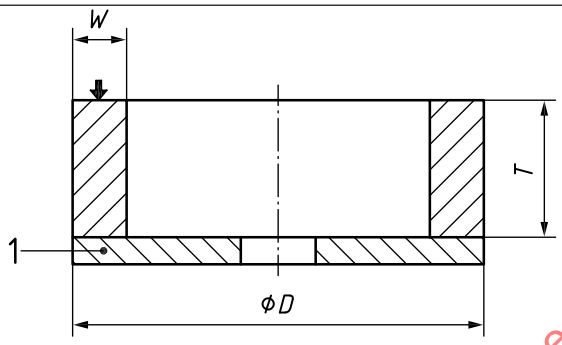
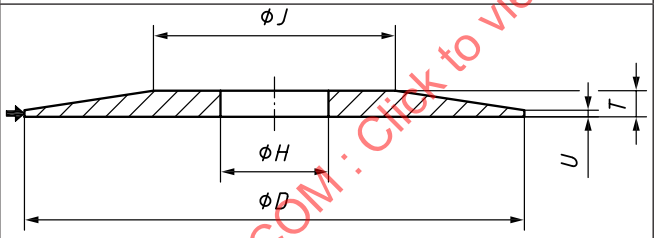
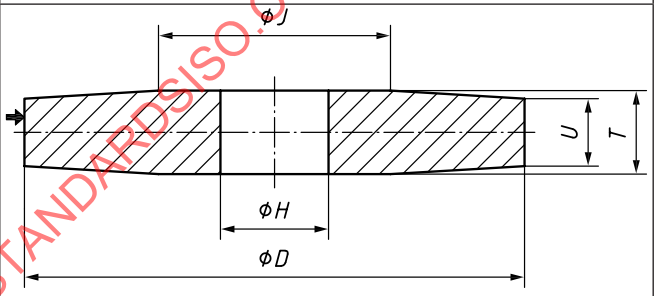
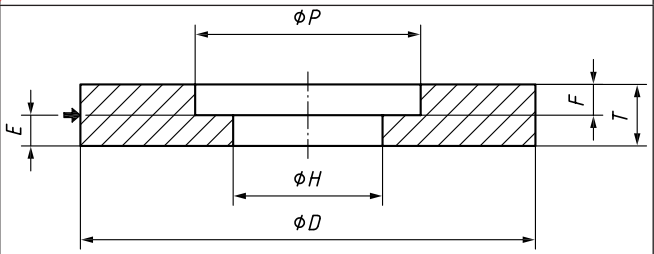
4 Shape types

4.1 Designation of shape types

Shape type number, shape type name and dimensions shall be in accordance with Table 2.

NOTE It is not compulsory to follow the dimensions given in the International Standards listed in the right column of Table 2 in order to fulfil the requirements of this document.

Table 2 — Shape type names and dimensions

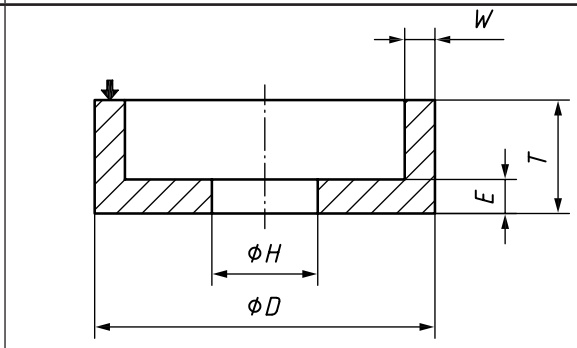
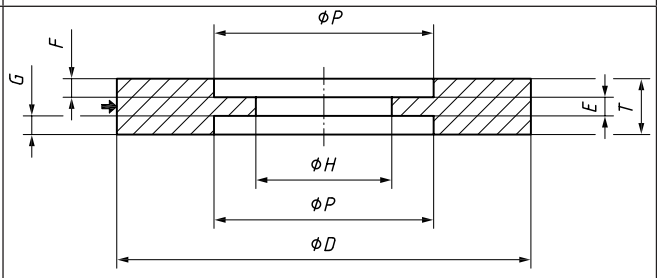
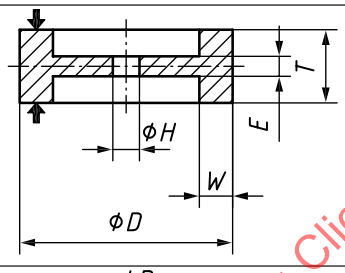
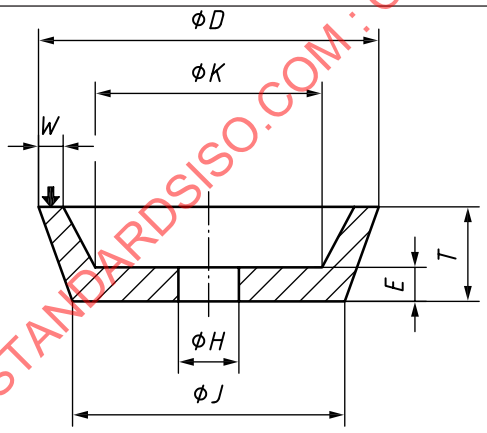
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
1		Straight grinding wheel Profile[a] $D \times T \times H$	ISO 603-1 ISO 603-2 ISO 603-3 ISO 603-4 ISO 603-6 ISO 603-7 ISO 603-8 ISO 603-9 ISO 603-12 ISO 603-18
2	 **Key** 1 back-plate	Cylinder grinding wheel, cemented or clamped to a back-plate $D \times T \times W$	ISO 603-5
3		Grinding wheel, tapered on one side $D/J \times T/U \times H$	ISO 603-6
4		Grinding wheel, tapered on both sides $D \times T/U \times H$	ISO 603-12
5		Grinding wheel, recessed on one side Profile[a] $D \times T \times H - P \times F$	ISO 603-1 ISO 603-2 ISO 603-3 ISO 603-4 ISO 603-6 ISO 603-7

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
6		Straight cup grinding wheel $D \times T \times H - W \times E$	ISO 603-5 ISO 603-6 ISO 603-7 ISO 603-13 ISO 603-14 ISO 603-18
7		Grinding wheel, recessed on both sides Profile[a] $D \times T \times H - P \times F/G$	ISO 603-1 ISO 603-2 ISO 603-4 ISO 603-6
9		Double cup grinding wheel $D \times T \times H - W \times E$	–
11		Taper cup grinding wheel $D/J \times T \times H - W \times E$	ISO 603-6 ISO 603-14

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

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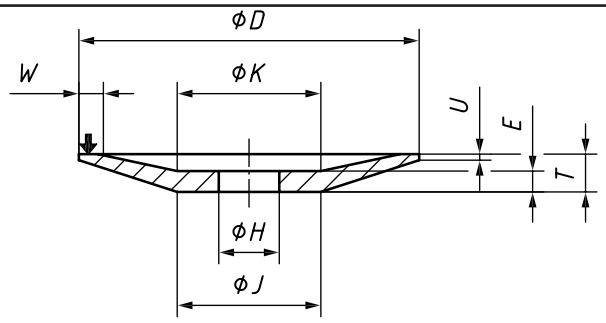
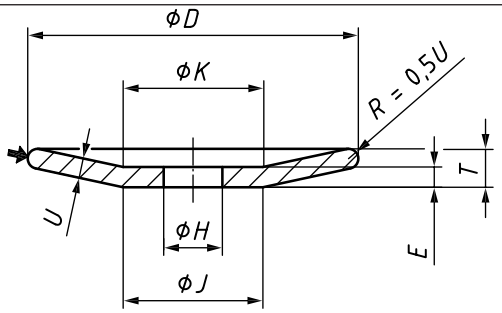
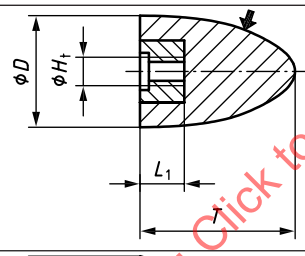
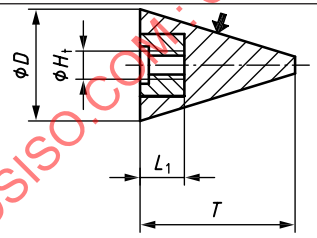
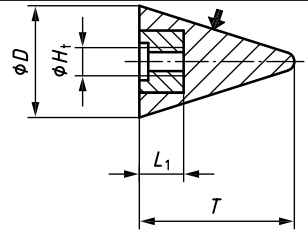
Table 2 *(continued)*

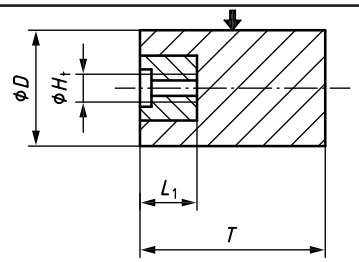
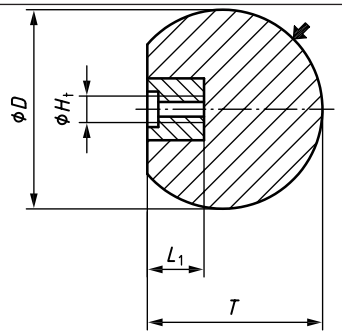
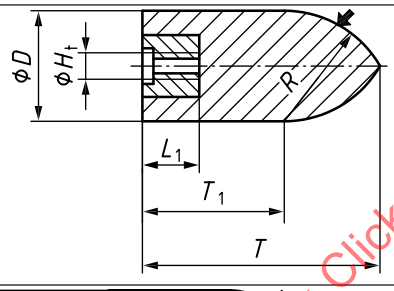
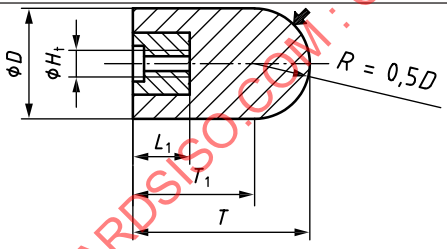
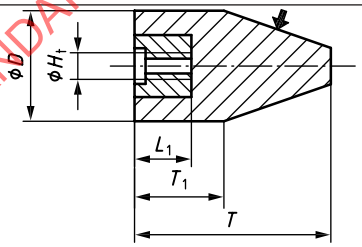
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
12		Dish grinding wheel $D/J \times T/U \times H - W \times E$	ISO 603-6
13		Saucer grinding wheel $D/J \times T/U \times H - K$	–
16		Tapered grinding cone, curved, with threaded insert $D \times T - H \times L$	ISO 603-12
17		Tapered grinding cone, flat tip, with threaded insert $D \times T - H \times L$	ISO 603-12[c]
17R		Tapered grinding cone, round tip, with threaded insert $D \times T - H \times L$	ISO 603-12[c]

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
18		Cylindrical grinding plug, with threaded insert $D \times T - H \times L$	ISO 603-12
18B		Grinding ball, with threaded insert $D \times T - H_t \times L_1$	ISO 603-12[c]
18P		Cylindrical grinding plug, curved end, pointed tip, with threaded insert $D \times T/T_1 - H_t \times L_1$	ISO 603-12[c]
18R		Cylindrical grinding plug, ball end, with threaded insert $D \times T/T_1 - H_t \times L_1$	ISO 603-12
19		Cylindrical grinding plug, conical end, flat tip, with threaded insert $D \times T/T_1 - H_t \times L_1$	ISO 603-12

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

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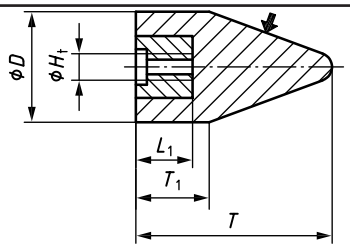
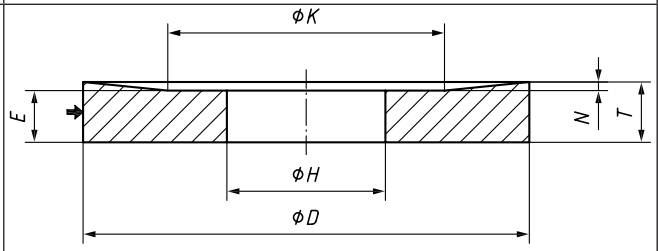
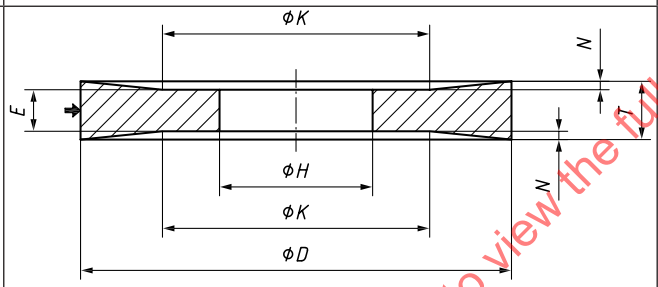
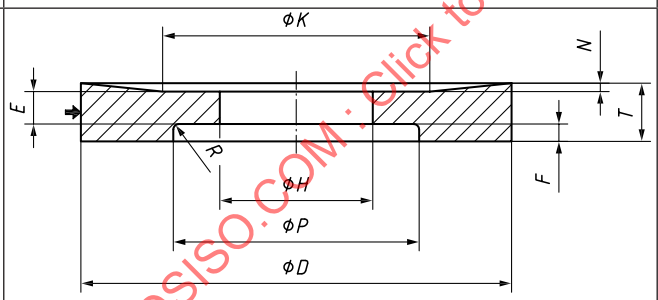
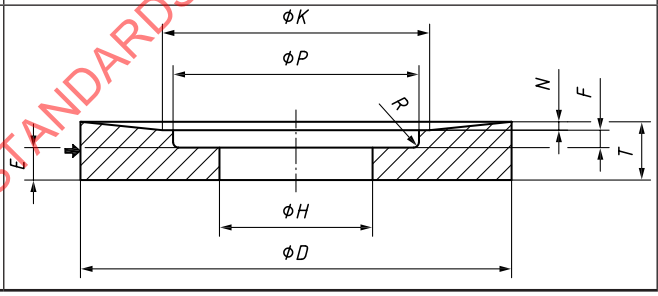
Table 2 *(continued)*

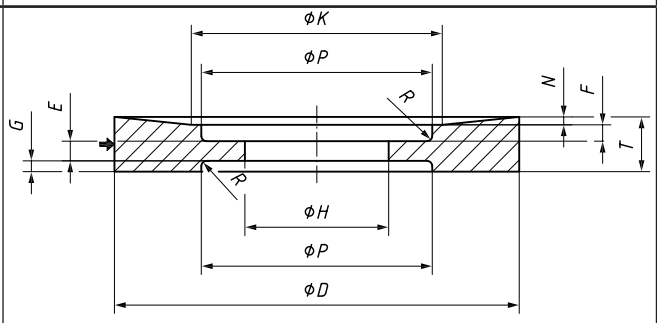
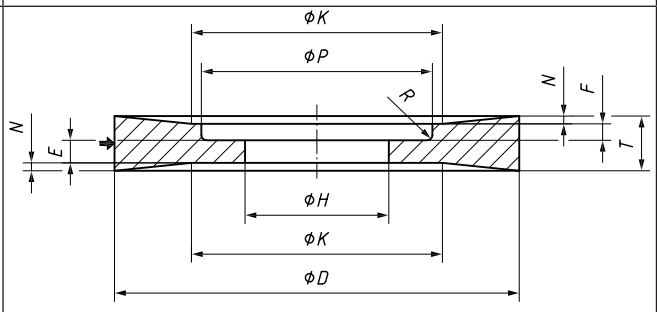
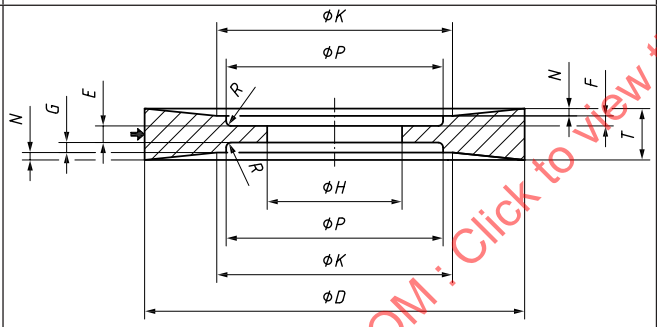
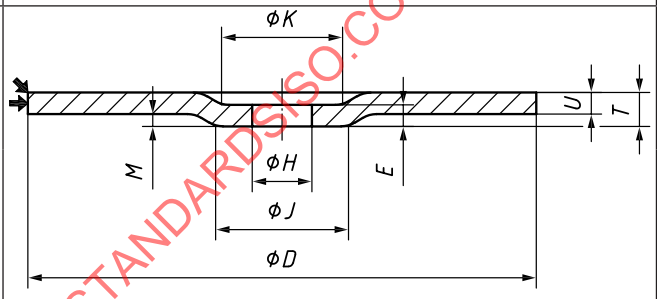
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
19R		Cylindrical grinding plug, conical end, round tip, with threaded insert $D \times T/T_1 - H_t \times L_1$	ISO 603-12[c]
20		Grinding wheel, relieved on one side $D \times T \times H - K \times E/N$	ISO 603-1 ISO 603-4
21		Grinding wheel, relieved on both sides $D \times T \times H - K \times E/N$	ISO 603-1 ISO 603-4
22		Grinding wheel, relieved on one side, recessed on the other side $D \times T \times H - P \times F - K \times E/N$	ISO 603-1 ISO 603-4
23		Grinding wheel, relieved and recessed on one side $D \times T \times H - P \times F - K \times E/N$	ISO 603-1 ISO 603-4

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

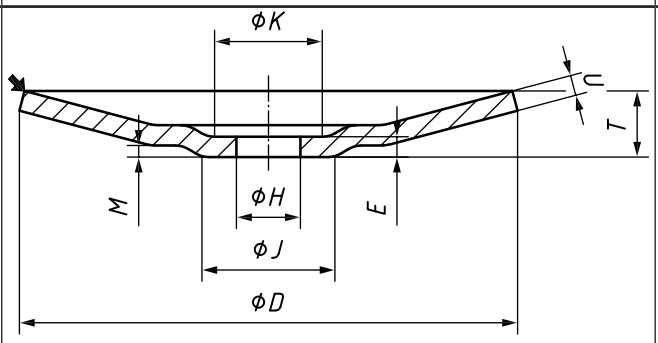
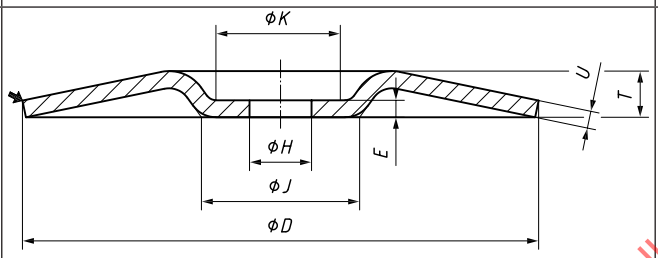
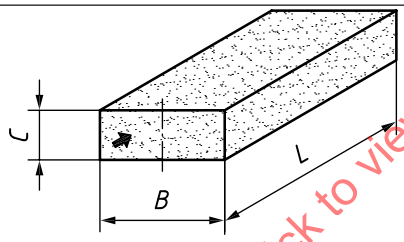
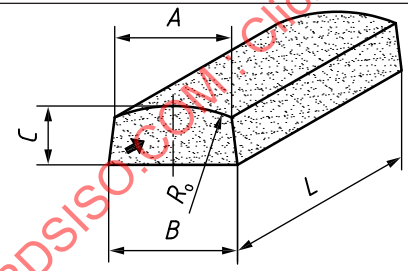
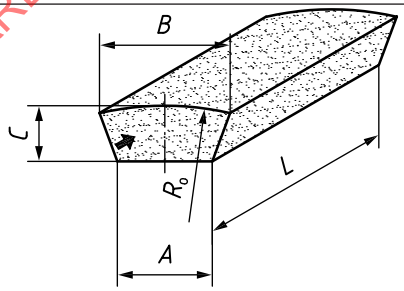
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
24		Grinding wheel, relieved and recessed on one side, recessed on the other side $D \times T \times H - P \times F/G - K \times E/N$	ISO 603-1 ISO 603-4
25		Grinding wheel, relieved and recessed on one side, relieved on the other side $D \times T \times H - P \times F - K \times E/N$	ISO 603-1 ISO 603-4
26		Grinding wheel, relieved and recessed on both sides $D \times T \times H - P \times F/G - K \times E/N$	ISO 603-1 ISO 603-4
27		Depressed centre wheel for grinding or grinding/cutting-off $D \times U \times H$ NOTE: Wheel only for cutting-off, see shape type 42.	ISO 603-14

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

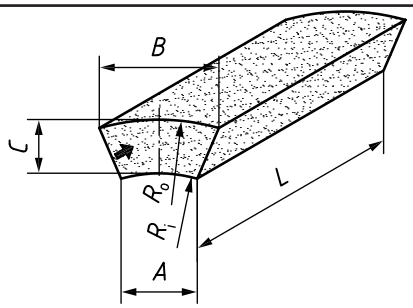
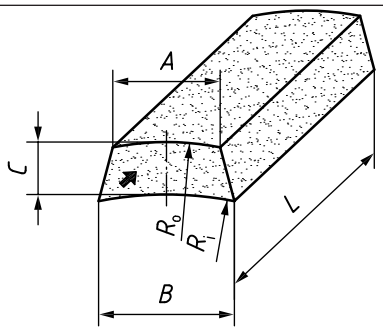
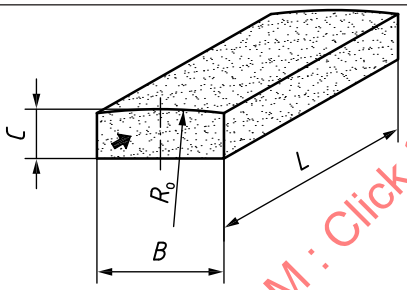
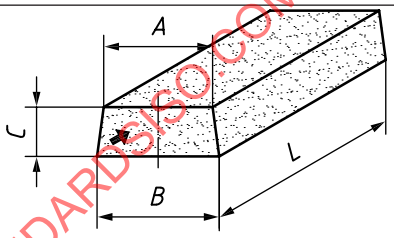
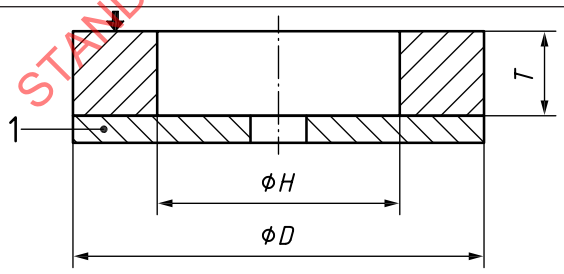
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
28		Depressed centre grinding wheel, concave shape $D \times U \times H$	ISO 603-14
29		Depressed centre grinding wheel, convex shape $D \times U \times H$	ISO 603-14[c]
31A		Grinding segment, rectangular shape $B \times C \times L$	ISO 603-5[c]
31B		Grinding segment, trapezoidal shape, with outer radius $B/A \times C \times R_o \times L$	ISO 603-5[c]
31C		Grinding segment, with outer radius $B/A \times C \times R_o \times L$	ISO 603-5[c]

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

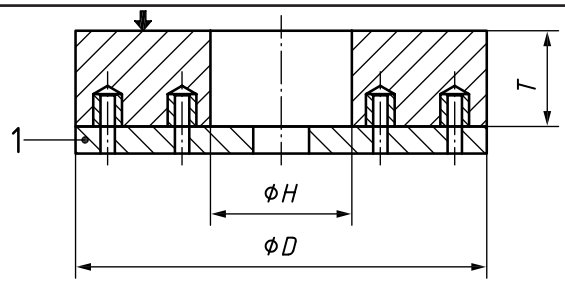
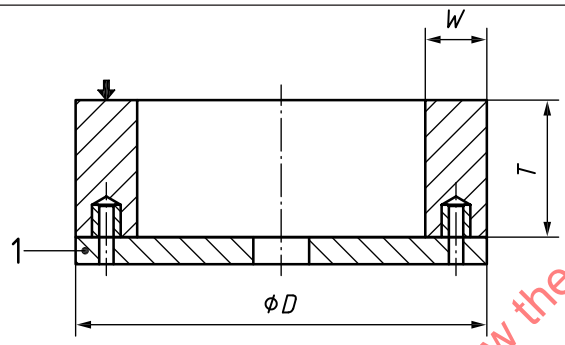
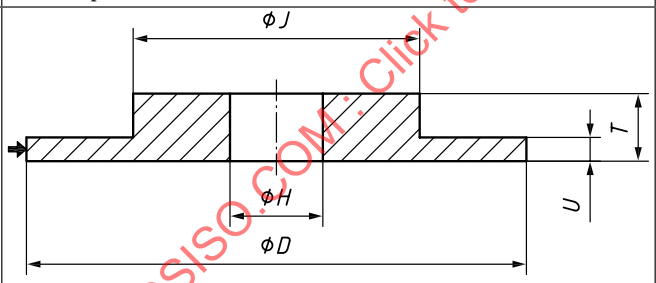
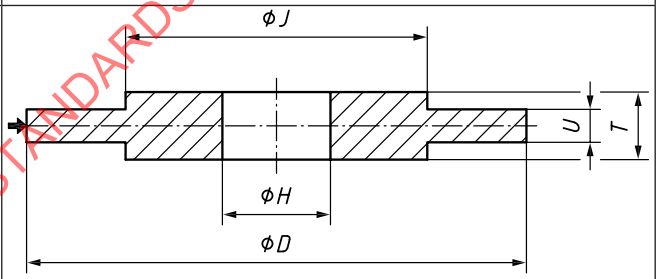
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
31D		Grinding segment, with outer and inner radius $B/A \times C \times R_o/R_i \times L$	ISO 603-5[c]
31E		Grinding segment, trapezoidal shape, with outer and inner radius $B/A \times C \times R_o/R_i \times L$	ISO 603-5[c]
31F		Grinding segment, rectangular shape, with outer radius $B \times C \times R_o \times L$	ISO 603-5[c]
31G		Grinding segment, trapezoidal shape $B/A \times C \times L$	ISO 603-5[c]
35	 **Key** 1 back-plate	Disc grinding wheel, cemented or clamped to a back-plate $D \times T \times H$	ISO 603-5 ISO 603-7 ISO 603-13 ISO 603-18

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

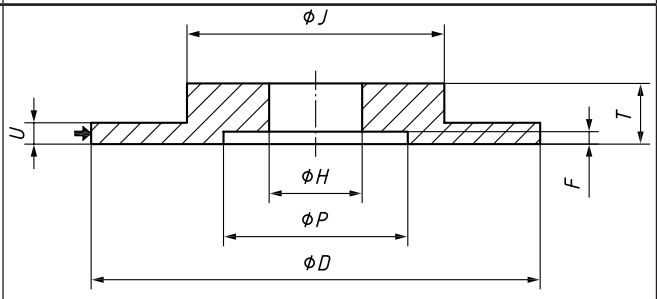
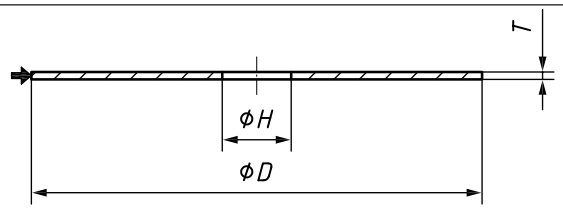
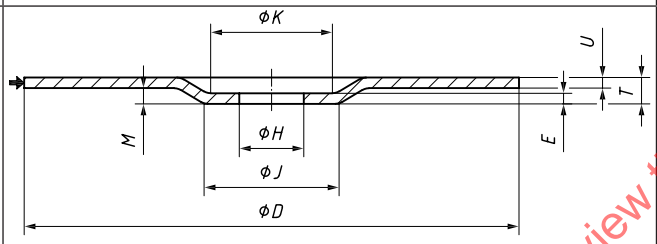
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
36	 **Key** 1 back-plate	Disc grinding wheel, fixed to a back-plate with inserted nuts Inserts[b] $D \times T \times H$	ISO 603-5 ISO 603-7 ISO 603-13
37	 **Key** 1 back-plate	Cylinder grinding wheel, fixed to a back-plate with inserted nuts Inserts[b] $D \times T \times W$	ISO 603-5 ISO 603-7
38		Single hubbed grinding wheel Profile[a] $D/J \times T/U \times H$	ISO 603-1 ISO 603-4
39		Double hubbed grinding wheel Profile[a] $D/J \times T/U \times H$	ISO 603-1 ISO 603-4

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

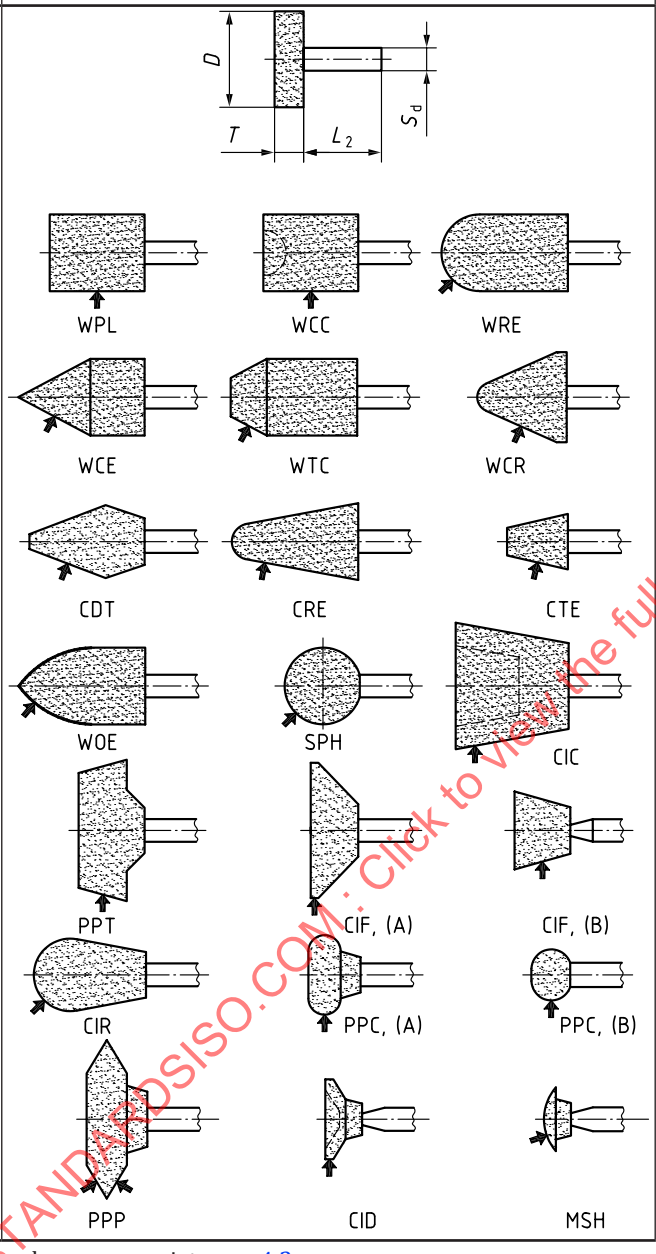
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
40		Grinding wheel, hubbed on one side, recessed on the other side *D*/*J* × *T*/*U* × *H* – *P* × *F*	–
41		Flat cutting-off wheel *D* × *T* × *H*	ISO 603-15 ISO 603-16
42		Depressed centre cutting-off wheel *D* × *U* × *H*	ISO 603-15 ISO 603-16

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

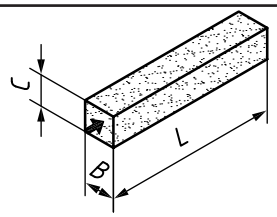
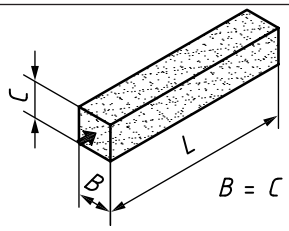
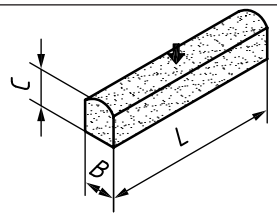
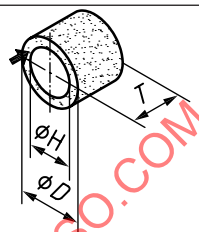
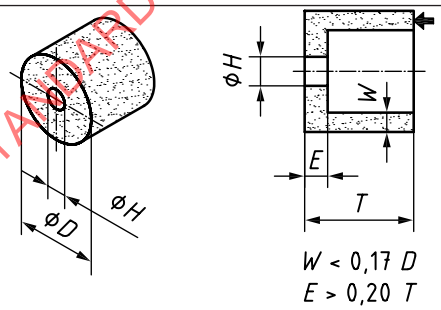
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
52		Mounted points and wheels $D \times T - S_d \times L_2$	ISO 603-17

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

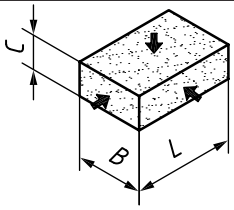
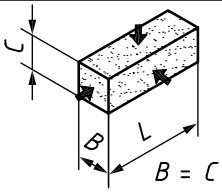
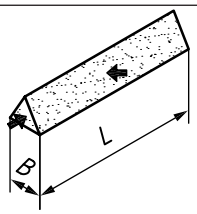
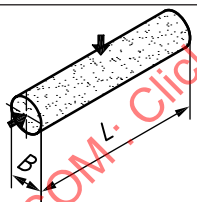
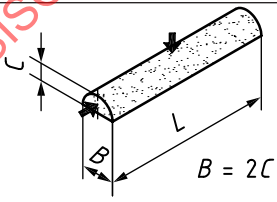
Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
54	 Subtype 5410	Honing stones $B \times C \times L$	ISO 603-10
	 Subtype 5411		
	 Subtype 5412		
	 Subtype 5420	Honing stones $D \times T \times H$	
	 Subtype 5421	Honing stones $D \times T \times H - W \times E$	

[a] Profile, where appropriate, see 4.2.

[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

Table 2 *(continued)*

Shape type number	Illustration	Shape type name and dimensions	International Standard reference number
90	 Subtype 9010	Sticks and stones $B \times C \times L$	ISO 603-11
	 Subtype 9011		
	 Subtype 9020		
	 Subtype 9030		
	 Subtype 9040		

[a] Profile, where appropriate, see 4.2.

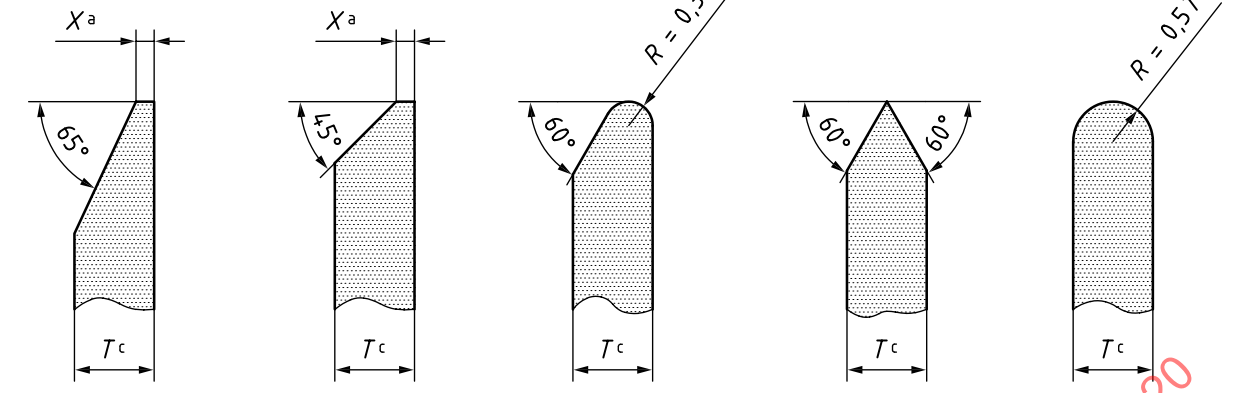
[b] For size and position of inserts, refer to ISO 603-5, ISO 603-7 and ISO 603-13.

[c] This shape type is not yet defined in that specific part of ISO 603 at the time of publication of this document. The shape type may be included in the next revision of the specific part of ISO 603.

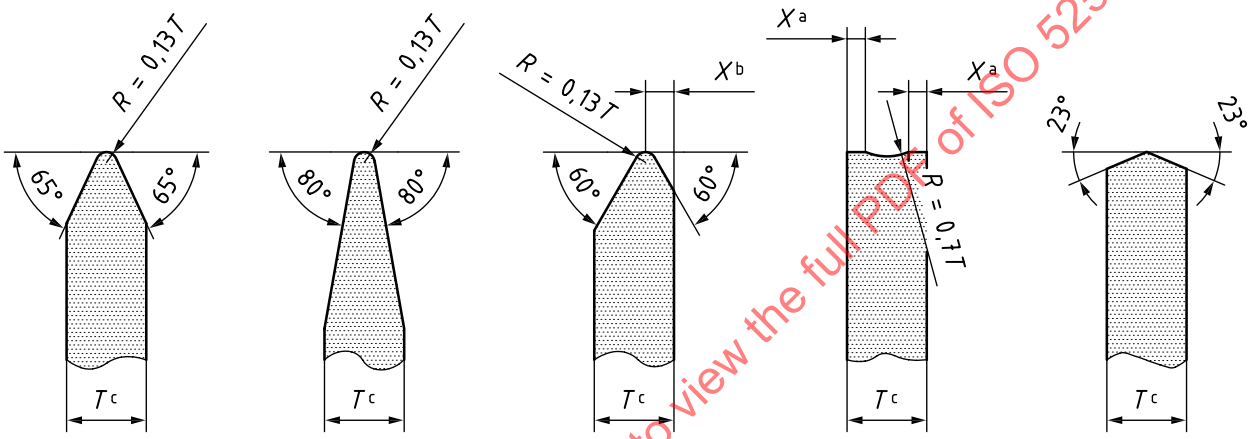
4.2 Profiles

Straight wheels (shape type 1), as well as recessed on one or both sides (shape types 5 and 7) and simple or double hubbed wheels (shape types 38 and 39) can have a profile on their periphery (see Figure 1). Some of these profiles are standardized and are specified by a letter which immediately follows the shape type number.

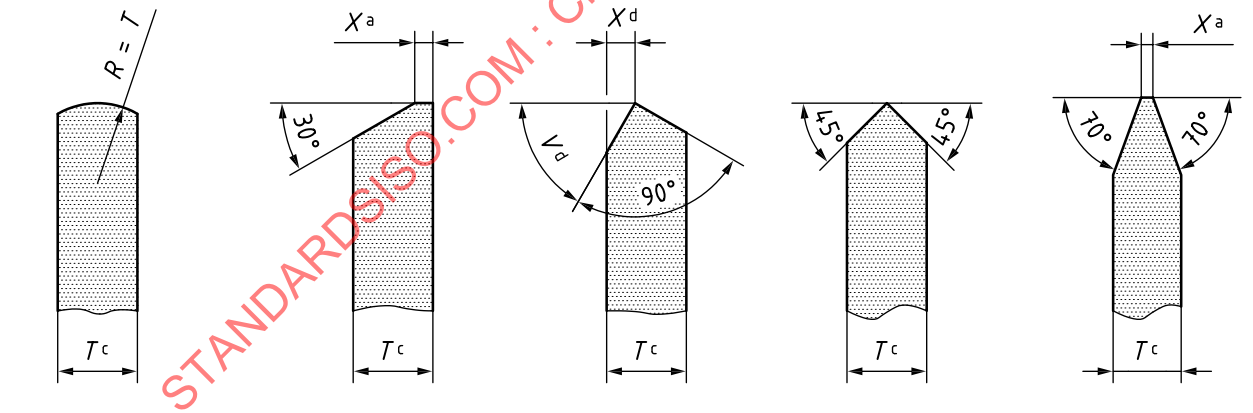
EXAMPLE Shape type 1D or shape type 38K.



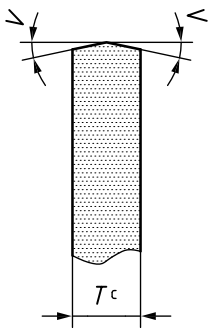
a) B b) C c) D d) E e) F



f) G g) H h) I i) J j) K



k) L l) M m) N n) P o) Q



p) S