ACTION SUPER ABRASIVE SA

CATALOGUE

DIAMOND & CBN WHEEL PRODUCTS

DRESSING MACHINE

ASA

INTRODUCTION

ASA (Action Super Abrasive SA), company founded in 1993, is specialized in the development and production of Diamond and CBN grinding wheels with Resin- (Phenolic and Polyimide), Hybrid- and Metal bonds used for manufacturing cutting tools.

From the very beginning Action Super Abrasive SA has attached a fundamental importance to its production quality and flexibility. Our main goals still lie today in the ability to provide a product from the concept stage to its unit or volume production in a very short delivery period.

Our know-how combined with many years of experience has granted us a big advantage to advise and support our customers in developing specific bonds for each grinding application. The constant improvement of our wheel production machines and a very advanced laboratory ensure highest repeatable quality and reliability in production.

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ORDER DETAILS

The following descriptions are required for processing your enquiries or orders. Furthermore, please also indicate the application of the wheel, used coolant and machine type.

It is important to inform us about the most important criteria required in expected balance between form hold, surface quality and grinding conditions.

EXPLANATION ENGRAVING
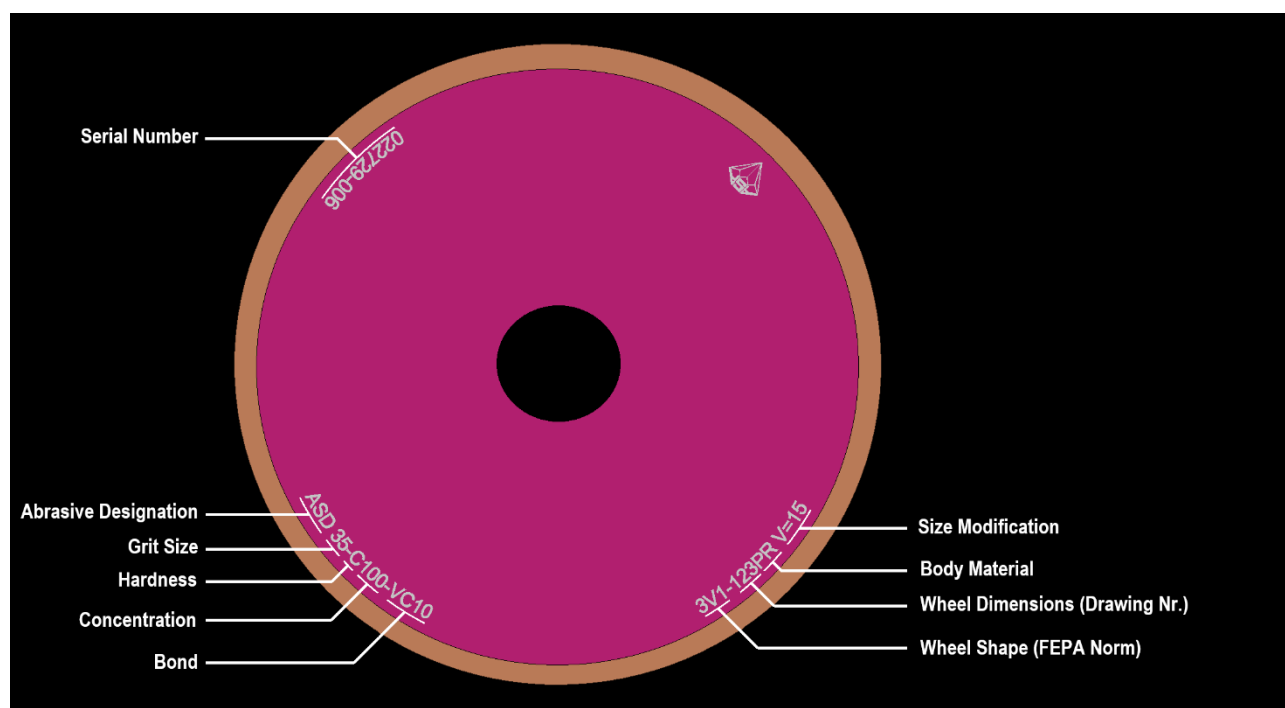
The number following the wheel shape (FEPA), determines all the dimensions of the wheel, also we add additional space regards size modification (e.g.: an angle).

All this information appears on all our documents under description:

022729-006
3V1-123PR V=15   ASD 35-C100-VC10
D150-T8-H31.75-U3-X6-V30

SERIAL NUMBER

The serial number is unique for the traceability of the wheel specifications.

The first part indicates the confirmation number, the second part the indexed number.

ABRASIVE DESIGNATION / DIAMOND

DIAMOND

Diamond is used to grind tools made of non-ferrous metals, non-metallic materials and composites. (Hardness KNOOP 8000-9000).

	DESCRIPTION
SD*	Used in our Polyimide, Hybrid and Phenolic bonds intended for dry grinding. Grit size available from 1 to 35.
ASD*	Its coating helps grit retention in the bonding layer and enhances heat dissipation which assures extended lifetime. Mostly used in our Phenolic bond under lubrication. Grit size available from 15 to 252.
ASD6*	Its coating is specially designed to achieve improved retention in the bond layer for operations under lubrication. Used in our Polyimide and Hybrid bonds. Grit size available from 46 to 252.
DMD	Used in our Metal bonds. Grit size available from 10 to 252.
ASDC	Coated diamond specifically used for dry grinding operations. Grit size available from 46 to 252.
ASDK*	Ideal for grinding difficult materials such as Ceramic and Cermet. Used in our Phenolic, Polyimide and Hybrid bonds. Grit size available from 46 to 252.
ASDS	Specially designed and coated diamond for cut-off wheels. Grit size available from 46 to 252.

ABRASIVE DESIGNATION / CBN

BORAZON

Cubic Boron Nitride (CBN) is used to grind tools made of hardened ferrous metals and super-alloys. (Hardness KNOOP 4600).

	DESCRIPTION
B	Used in our Polyimide, Hybrid and Phenolic bonds. Grit size available from 6 to 10.
CBN*	Its coating helps grit retention in the bonding layer and enhances heat dissipation from the grinding contact point. Used in our Polyimide, Hybrid and Phenolic bonds. Grit size available from 15 to 252.
BM	Used in our Metal bonds. Grit size available from 10 to 252.

SURFACE QUALITY

(Rough measure estimation, depending on the bindings and materials used)

DIAMANT	D7 D10	D15 D20	D25 D30	D46 D54 D64	D76 D91 D107	D126 D151 D181	D252	
	N1	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
Ra (µm)	0,025	0,06	0,12	0,25	0,5	1,0	1,6	3,2
Rt (µm)	0,5	0,5	1,0	2,0	4,0	8.0	12,5	32.0
Rz (µm)	0,18	0,38	0,75	1,6	3,2	6,3	10,0	16,0
	N1	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**
CBN		B10	B15 B20	B30	B46 B54 B64	B76 B91 B107	B151 B181	B252 B301

GRIT SIZES

All our dimensions are engraved according to FEPA standards.

DIAMOND (FEPA)	CBN (FEPA)	MICRON	US MESH
1	-	1-2 µm	14'000
3	-	2-4 µm	8'000
5	-	4-6 µm	6'000
-	6	4-8 µm	3'000
7	-	6-8 µm	2'500
10	10	6-12 µm	1'800
15	15	10-20 µm	1'200
20	20	15-25 µm	1'000
25	25	20-30 µm	800
30	30	22-36 µm	700
35	(40)	30-40 µm	600
46	46	38-45 µm	325/400
54	54	45-53 µm	270/325
64	64	53-63 µm	230/270
76	76	63-75 µm	200/230
91	91	75-90 µm	170/200
107	107	90-106 µm	140/170
126	126	106-125 µm	120/140
151	151	125-150 µm	100/120
181	181	150-180 µm	80/100
252	252	212-250 µm	60/70
301	301	250-300 µm	50/60

HARDNESS OF THE WHEEL

This letter is always placed before the concentration so that we have the option to change the base bond.

LETTER	HARDNESS
L	Soft
N	Middle
C	Hard (with diamond abrasive in concentration 100)
R	Hard (with CBN abrasive in concentration 100)
V	Very Hard

CONCENTRATION

We use the same concentration figures for both abrasive materials that meet internationally accepted standards.

This expresses the weight of the abrasive per cm³. (1carat = 0.2g)

CONCENTRATION	CTS/CM³
25	1.1
50	2.2
75	3.3
100	4.4
125	5.5
150	6.6
175	7.7

BOND / LEGEND

The table below describes the qualitative levels of our binders based on the 3 most referenced criteria among our customers. To meet your specific needs, we can adapt this criteria by flexible variation between concentration and hardness.

	LOW	ACCEPTABLE	MEDIUM	GOOD	EXCELLENT
Cutting power	○○○○	●○○○	●●○○	●●●○	●●●●
Form hold	○○○○	●○○○	●●○○	●●●○	●●●●
Surface Quality	○○○○	●○○○	●●○○	●●●○	●●●●

◈ BOND / PHENOLIC

RESIN PHENOLIC: Used for grinding and re-grinding small to medium batches and low stock removal to achieve best surface finish. Dry grinding possible with variable binders.

BOND	DIAMOND	CBN
B21	-For polishing (flute, end-face). -For micron grit. 🟡⚪⚪⚪ 🔵🔵⚪⚪ 🟢🟢🟢🟢	-For polishing (flute, end-face). -For micron grit. 🟡⚪⚪⚪ 🔵🔵⚪⚪ 🟢🟢🟢🟢
VC10	-Universal bond (end-face). -Dry grinding possible. 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪	-Universal bond (end-face). -Dry grinding possible. 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪
B16	-For surfacing and plunging. 🟡🟡🟡⚪ 🔵🔵⚪⚪ 🟢🟢⚪⚪	-For surfacing and plunging. 🟡🟡🟡⚪ 🔵🔵⚪⚪ 🟢🟢⚪⚪
B25	-For cut-off wheels. 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢⚪⚪	-For cut-off wheels. 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢⚪⚪
BC4	-Universal bond (flute). -Dry grinding possible. -For micron grit. 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪	-Universal bond (flute). -Dry grinding possible. -For micron grit. 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪
BC3	-Same as BC4 but for bigger grit. 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪	-Same as BC4 but for bigger grit. 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢🟢🟢⚪
BC5	-Universal bond (gash). -Dry grinding possible. 🟡🟡🟡⚪ 🔵🔵🔵🔵 🟢🟢⚪⚪	-Universal bond (gash). -Dry grinding possible. 🟡🟡⚪⚪ 🔵🔵🔵🔵 🟢🟢⚪⚪
ADS	-For polishing (watch industry). ⚪⚪⚪⚪ 🔵⚪⚪⚪ 🟢🟢🟢🟢	

BOND / POLYIMIDE

RESIN POLYIMIDE: Used for grinding medium to large batches under lubrication with good surface finish.

BOND	DIAMOND	CBN
BP4	-Universal bond (fluting, gash). 🟡●●○○ 🔵●●●○ 🟢●●○○	-Universal bond (fluting, gash). 🟡●●○○ 🔵●●●○ 🟢●●○○
BP11	-Finish grinding. -For micron grit. 🟡●○○○ 🔵●●○○ 🟢●●●○	-Finish grinding. -For micron grit. 🟡●○○○ 🔵●●○○ 🟢●●●○
BP17	-Super finish grinding. -For micron grit. 🟡●○○○ 🔵●○○○ 🟢●●●●	

BOND / HYBRID

RESIN METAL: Used for grinding large batches due to strong form retention and cutting power, but less surface finish compared to Polyimide.

BOND	DIAMOND	CBN
BPM2A	-For gashing and fluting of micro- and nano-tools. -For micro grit. 🟡●●○○ 🔵●●●● 🟢●●○○	
BPM3	-High stock removal grinding. Very free cutting. 🟡●●●● 🔵●○○○ 🟢●●○○	-High stock removal grinding. Very free cutting. 🟡●●●● 🔵●○○○ 🟢●●○○
BPM5	-High stock removal grinding (End-face). 🟡●●○○ 🔵●●●● 🟢●●○○	-High stock removal grinding (End-face). 🟡●●○○ 🔵●●●● 🟢●●○○
H6 PIRANHA	-High stock removal grinding (flute tool size from ø4 to 8mm). 🟡●●●○ 🔵●●●○ 🟢●●●○	-High stock removal grinding (flute tool size from ø4 to +). 🟡●●●○ 🔵●●●○ 🟢●●●○

BOND / METAL MNG*

METAL: Used for grinding large batches due to its form retention and heat resistance.

BOND	DIAMOND	CBN
MNG1	-Roughing wheel for reducing diameter (Rollomatic NP4, NP5, NP50). 🟡🟡⚪⚪ 🔵🔵🔵🔵 🟢⚪⚪⚪	-Roughing wheel for reducing diameter (Rollomatic NP4, NP5, NP50). 🟡🟡⚪⚪ 🔵🔵🔵🔵 🟢⚪⚪⚪
MNG2	-Cup Wheel (insert). 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢⚪⚪⚪	
MNG4	-For higher material removal than MNG5 bond. 🟡🟡🟡🟡 🔵🔵⚪⚪ 🟢⚪⚪⚪	
MNG5	-For dental tools (flutes). 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢⚪⚪	-For form tools. 🟡🟡⚪⚪ 🔵🔵🔵⚪ 🟢🟢⚪⚪
MNG8	-For form tools. -For micron grit. 🟡⚪⚪⚪ 🔵🔵🔵🔵 🟢🟢⚪⚪	-For form tools. -For micron grit. 🟡⚪⚪⚪ 🔵🔵🔵🔵 🟢🟢⚪⚪

BOND / METAL-VITRIFIED

METAL VITRIFIED: Used for large batches due to its cutting power and heat resistance.

BOND	DIAMOND	CBN
M1 SHARK	-Grinding high stock removal (flute tool size from ø8 to +). 🟡🟡🟡⚪ 🔵🔵🔵⚪ 🟢🟢⚪⚪	

WHEEL SHAPE

The shapes of our wheels are based on the FEPA standards. (European Federation of manufacturers of Abrasive Products.)

All our shapes are detailed from page 16.
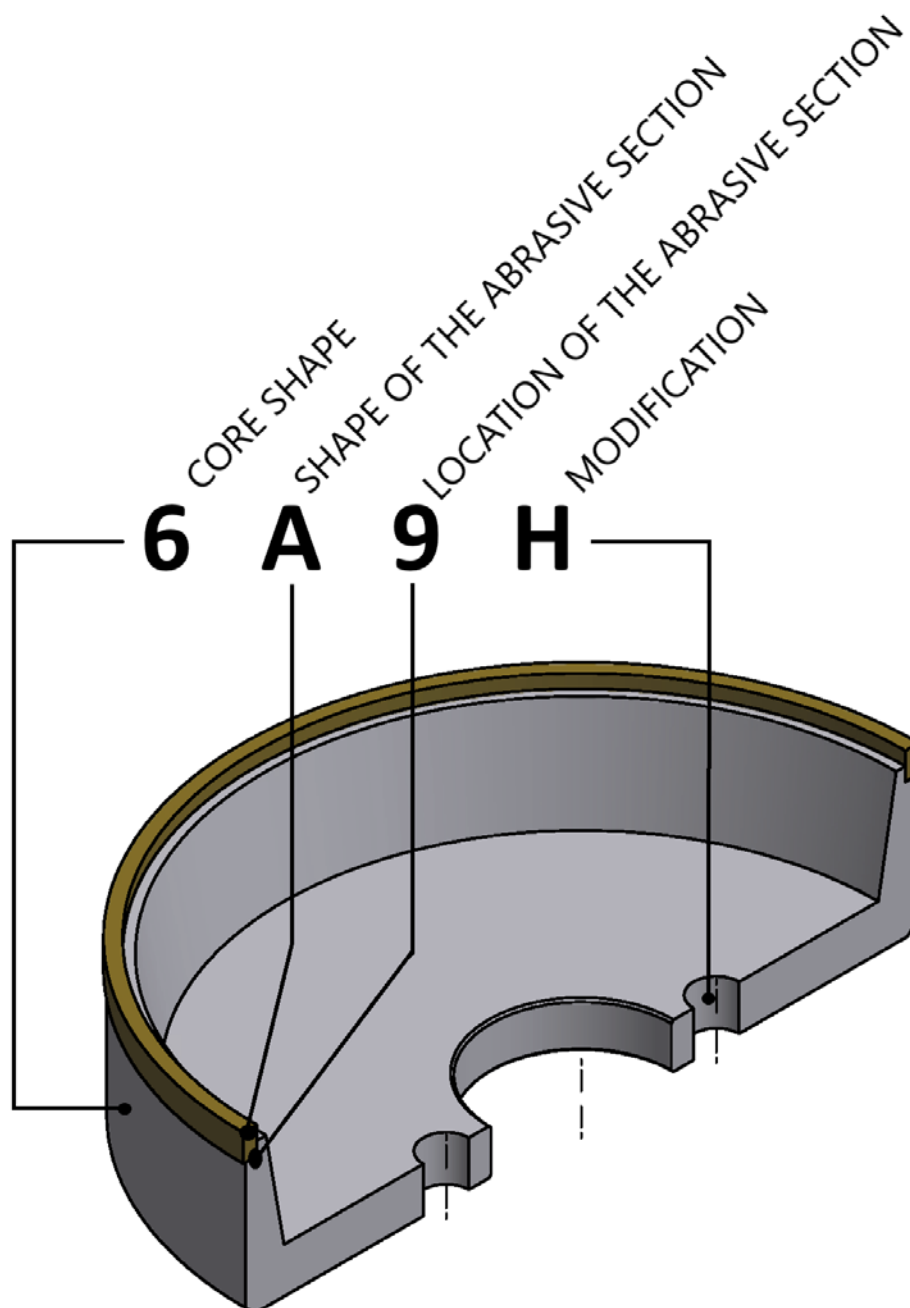
WHEEL DIMENSIONS

The number (drawing number) that follows the shape of the wheel defines all its dimensions.

You can consult the list of all our drawings on our website. www.actionsuper.ch

The dimensions of our grinding wheels are preceded by a letter, which determines a specific dimension of the wheel.

D	Diameter	T_1	Reduced hub thickness
T	Overall thickness	U_1	Reduced thickness of the section
H	Bore	**E**	Thickness at bore
U	Thickness of the section	**K**	Inside recess diameter
X	Depth of the section	**J**	Hub diameter
W	Rim width	**d**	Offset diameter from body
V	Face angle	**S**	Angle of body
A	Angle n°1	**BC**	Bolt circle
B	Angle n°2		
R	Radius		

BODY MATERIAL

The two letters after the drawing number are defining the body type.

The first letter defines the material, while the second defines the type of bond.

AR	Aluminium / phenolic bond
MR	Pressed aluminium (cup wheel) / phenolic bond
PR	Pressed aluminium / phenolic bond
SR	Steel / phenolic bond
AP	Aluminium / polyimide and hybrid bond
CP	Pressed copper / polyimide and hybrid bond
XP	Aluminium and Pressed Copper / polyimide and hybrid bond
AM	Aluminium / metal bond
SM	Steel / metal bond
SH	Steel / metal-vitrified bond

SIZE MODIFICATION

The modification engraved after the drawing number allows us to change a dimension (e.g., angle) without having to create a new drawing number and to profile the wheel according to customer requirements.

ENGRAVING	MODIFICATION
V=15	15.00°
V=105	105.00°
V=45/1	45.00° / 1.00
V=135/1	1.00 / 135.00°
A=15/3 B=60	60.00° / 3.00 / 15.00°
B=10	10.00°
A=10	10.00°
A1=4 A2=3	3.00° / 4.00°
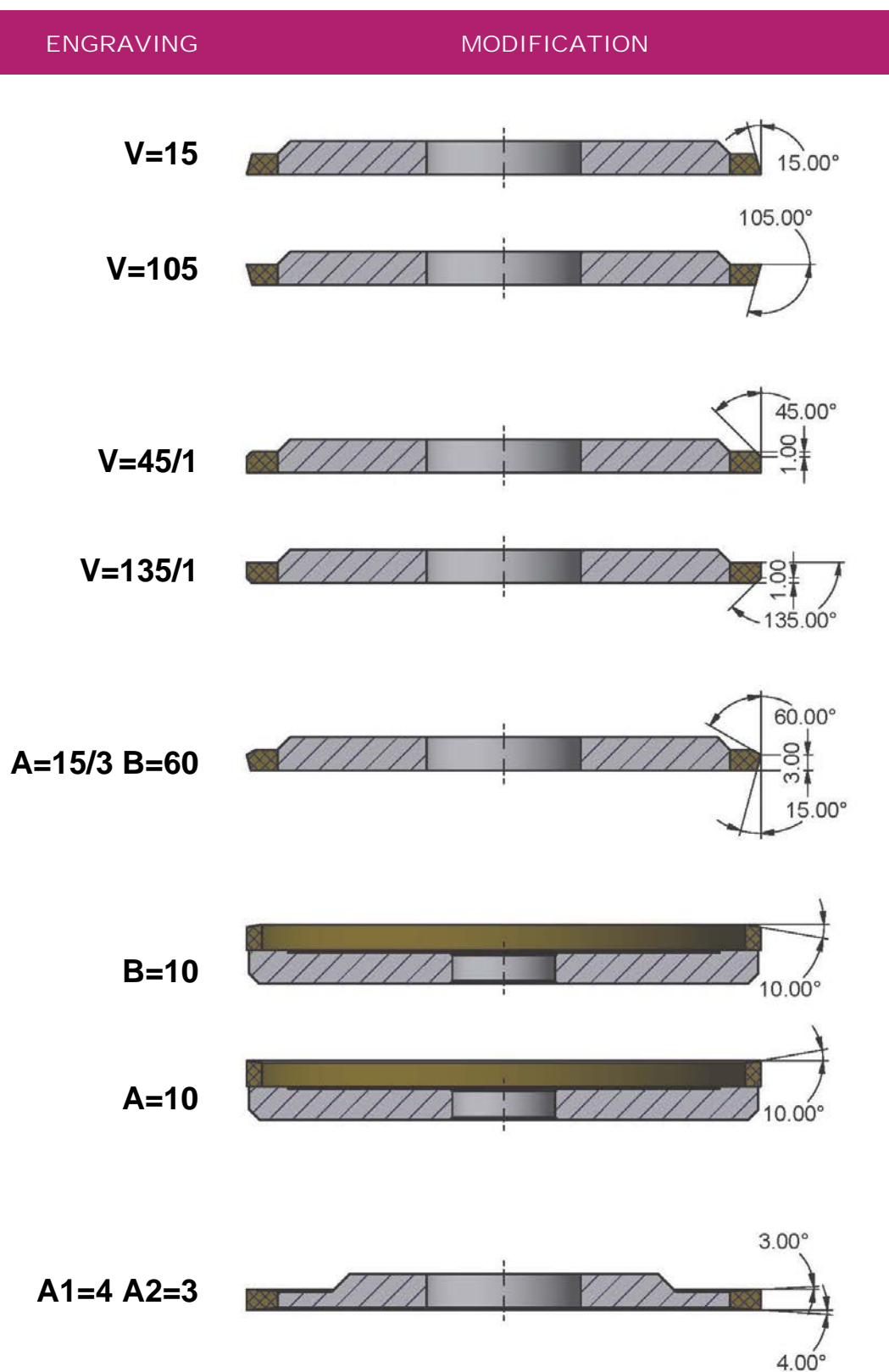
REQUEST FOR QUOTATION

Please copy this page and provide us the required information.

CUSTOMER

Company: _____	**Contact:** _____
Address: _____	**Function:** _____
_____	**Tel.:** _____
Zip Code: _____	**E-Mail:** _____
City: _____	**Country:** _____

SHAPE AND WHEEL'S DIMENSIONS

Please use this field to make a sketch of the grinding wheel:

Shape: _____	**N° :** _____
D : _____	**A :** _____
T : _____	**B :** _____
H : _____	**T_1 :** _____
U : _____	**U_1 :** _____
X : _____	**E :** _____
W : _____	**K :** _____
V : _____	**S :** _____
R : _____	**J :** _____

Sketch

MACHINE

Manufacturer: _____ **Type:** _____

Coolant: _____ **Pressure:** _____ **Bars**

Speed from: _____ **to** _____ ☐ **RPM** **or** ☐ **m/sec**

Feed from: _____ **to** _____ ☐ **mm/min** **or other** ☐ _____

TOOLS TO GRIND

If the drawing of the tool is available, please attach it to the request.

Material: _____ **Grade:** _____

Harness HRC: _____ **Surface Quality Ra:** _____

Variation of the feed during grinding: ☐ **Yes** ☐ **No**

Grinding operation: _____
_____

Total material removal: _____ ☐ **mm** ☐ **mm²** ☐ **mm³**

Depth of cut a_e: _____ **mm** **Number of passes:** _____

Diameter: _____ **mm** **Length:** _____ **mm**

Width: _____ **mm** **Other dimensions:** _____

Other information: _____
_____
_____

◇ DRESSING

To avoid a large stock of dressing wheels, but balanced in compromise, we recommend the following two types of dressing wheels:

For the grit size from 10 to 35, the description of the dressing wheel is defined as:

80C 500 I7 V62A

For the grit size from 46 to 252, the description of the dressing wheel is defined as:

10C 120 KL7V

In cases you are able to allow a large stock of dressing wheels, which all grit sizes representing we recommend the following dressing wheels.

GRITE SIZE	SPECIFICATION	MANUFACTURER
1 to 10	SC9-1000-J12 RE DM	Atlantic GmbH
15 to 25	80C 500 I7 V62A	Stella Keramik GmbH
30 to 46	10C 320 KL7V	Comet Schleiftechnik GmbH
54 to 76	10C 220 KL7V	Comet Schleiftechnik GmbH
91 to 107	10C 120 KL7V	Comet Schleiftechnik GmbH
126 to 252	10C 60 KL7V	Comet Schleiftechnik GmbH

Recommendations for a reliable dressing procedure:

-The dressing machine must be robust and stable without vibrations.

-Dress the wheels under lubricated conditions. (We recommend oil)

-The dressing wheel must be as wide as possible, and larger in diameter than the wheel to be dressed.

-The dressing wheel rotates in the opposite direction of the wheel to be dressed.

-Dressing wheel speed   :   12-15 m/sec (120 mesh)
                                     10-12 m/sec (500 mesh)
                                     8-10 m/sec (1000 mesh)

- Grinding Wheel speed   :   2-4m/sec

-Roughing infeed depth   :   0.01-0.05mm
-Finishing infeed depth   :   0.002-0.02mm

-For grinding wheels with a pointed profile, we recommend using a dressing wheel from a range below than the one recommended. This way it will avoid chipping on your grinding wheel while dressing.

- Dressing wheel feed rate: Consider the diameter and the depth of abrasive rim to be dressed

Large diameter or thin depth abrasive rim = reduce the feed rate.
Small diameter or wide depth abrasive rim = increase the feed rate.

Example, for a wheel with a diameter of 150 and 3mm depth of abrasive rim, the feed rate would be of about 0.5m/min.

SHARPENING

After dressing your grinding wheel, especially if it is dressed dry, the surface of the abrasive rim is blunt. In order to obtain optimum cutting quality, we recommend you treat the grinding wheel first with a carborundum stick before starting the grinding process.

The carborundum stick must be wet (oil) and used on the grinding wheel with same grinding rotation direction and same grinding rotation speed as the applicated operation before the grinding process is started.

TYPE	DESCRIPTION	DIMENSIONS
STICK ASA-N°1	Grit size from 46 to 252	13 x 25 x 102 mm
STICK ASA-N°2	Grit size from 1 to 40	13 x 25 x 102 mm

NOTES

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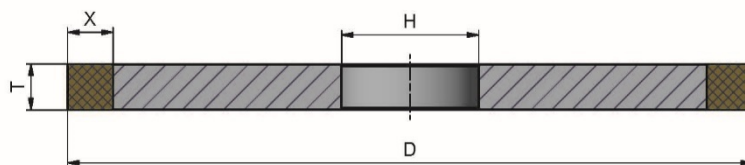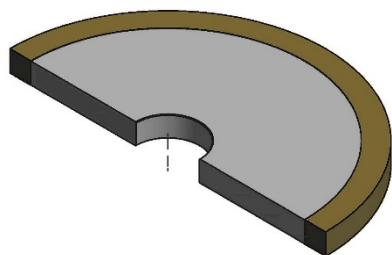
1A1 (shape N°1)

D___-T___-H___-X___

1A1 (shape N°2)

D___-T___-H___-X___-E___-K___ / N°2
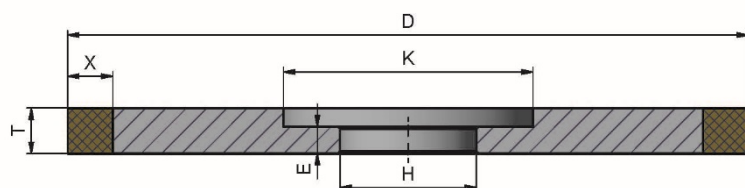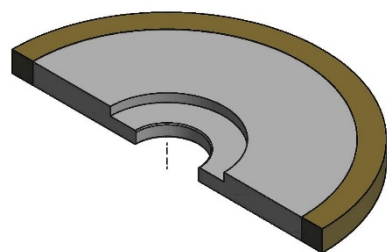
1A1 (shape N°3)

D___-T___-H___-X___-E___-K___ / N°3
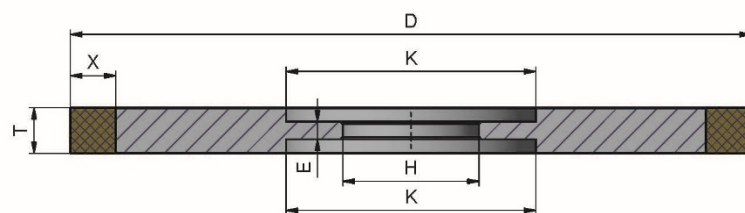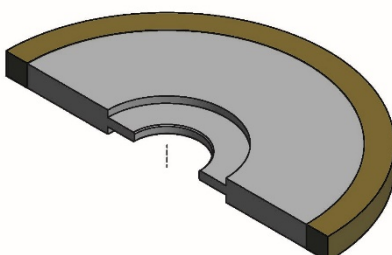
1A1B

D___-T___-H___-X___-BC___
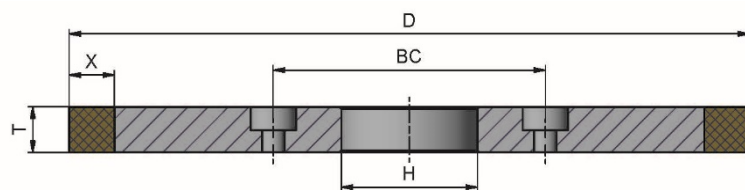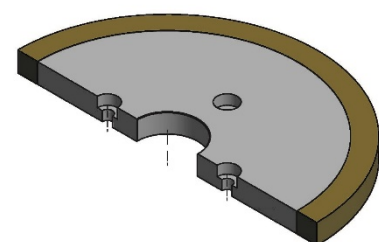
1A1P

D___-T___-H___-X___-E___
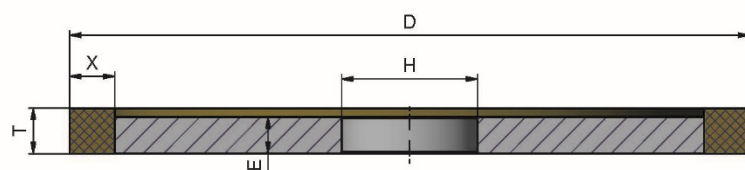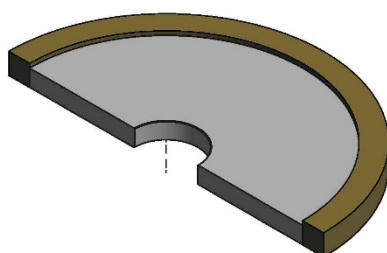
1A1R (shape N°1)

D___-T___-H___-X___-E___
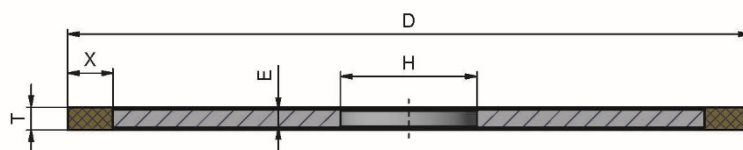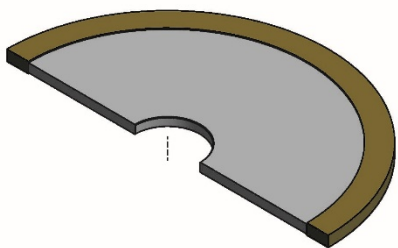
1A1R (shape N°2)

D___-T___-H___-X___-E___-K___ / N°2
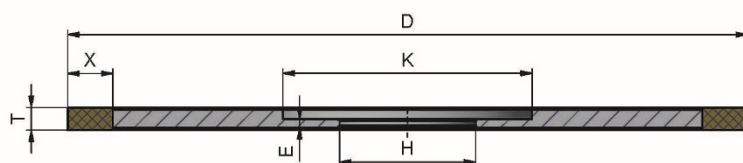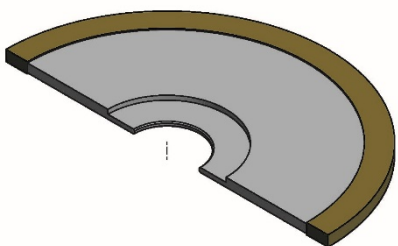
1A1R (shape N°3)

D___-T___-H___-X___-J___ / N°3
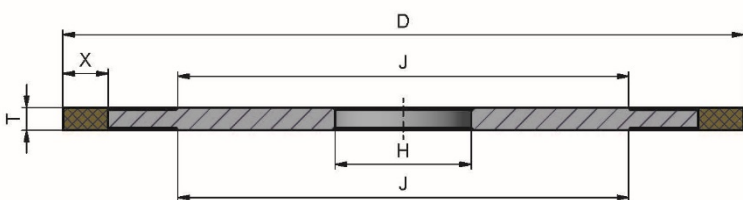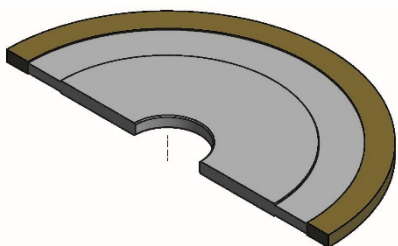
1A8

D___-T___-H___-(X___)
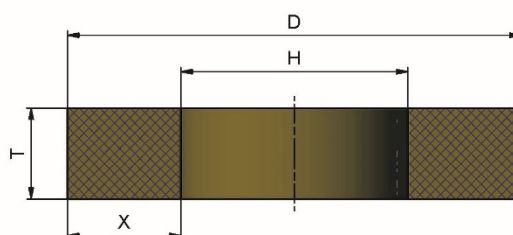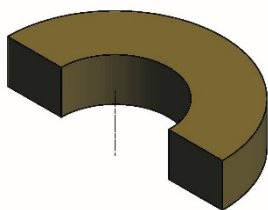
1AA1

D___-T___-H___-X___-T1___
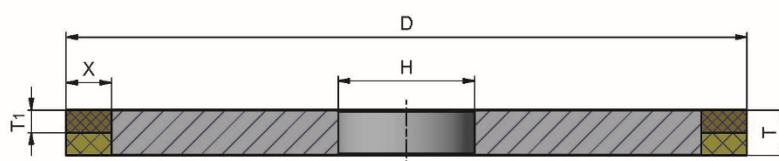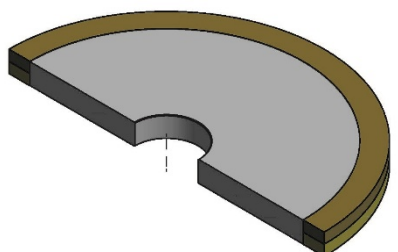
1B1 (shape N°1)

D___-T___-H___-X___-V___
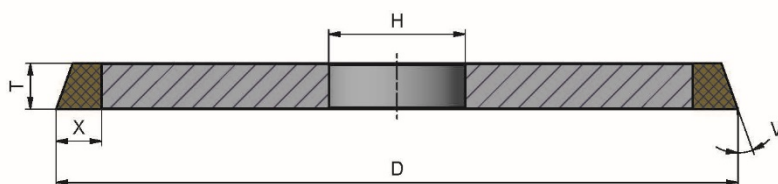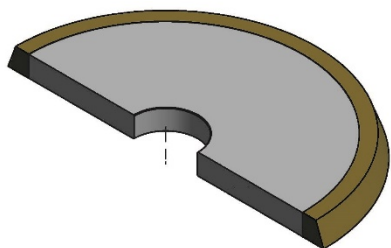
1B1 (shape N°2)

D___-T___-H___-X___-V___-E___-K___ / N°2
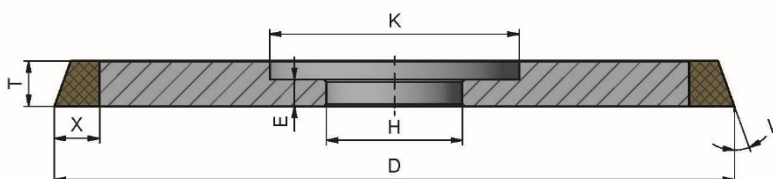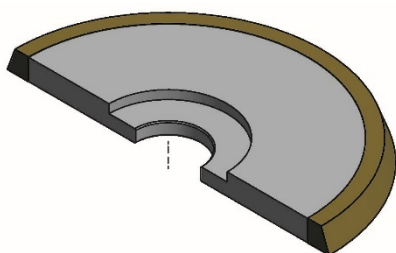
1B1 (shape N°3)

D___-T___-H___-X___-V___-E___-K___ / N°3
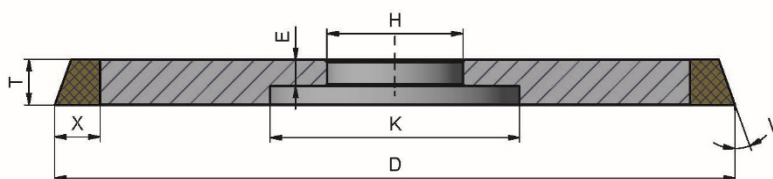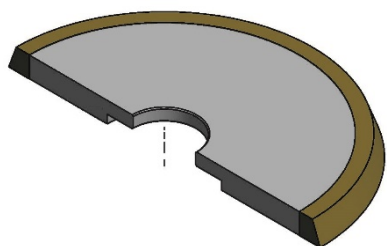
1B1R

D___-T___-H___-X___-V___-E___
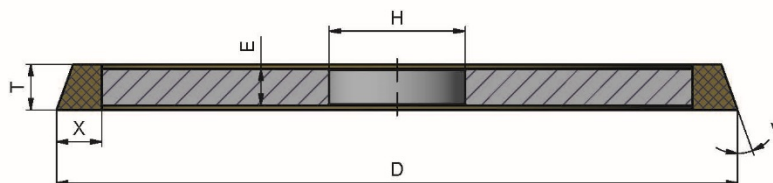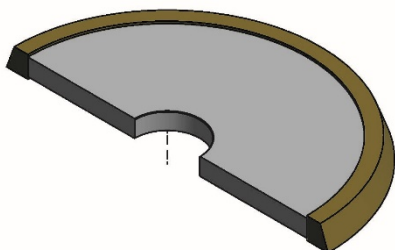
1BF1

D___-T___-H___-X___-V___-R___-T1___
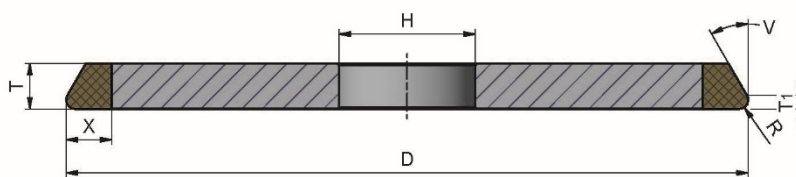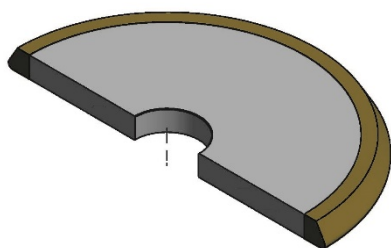
1D1 (shape N°1)

D___-T___-H___-X___-V___T1___
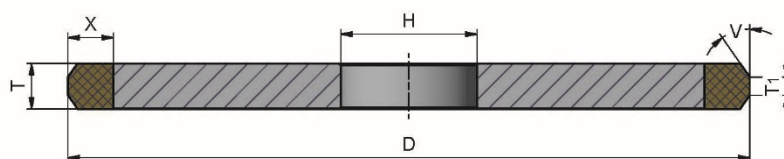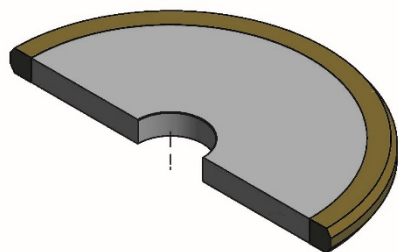
1D1 (shape N°2)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°2
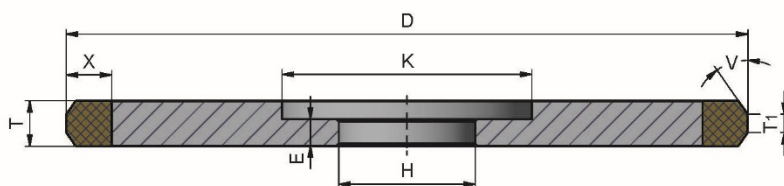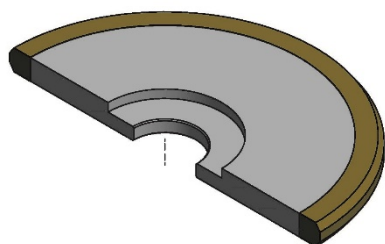
1DD1 (shape N°1)

D___-T___-H___-X___-V___-T1___
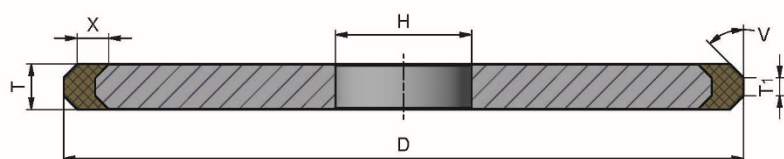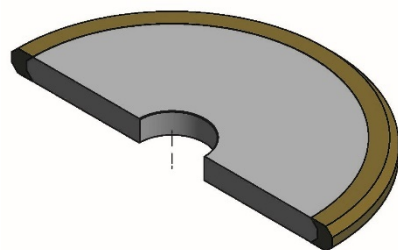
1DD1 (shape N°2)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°2
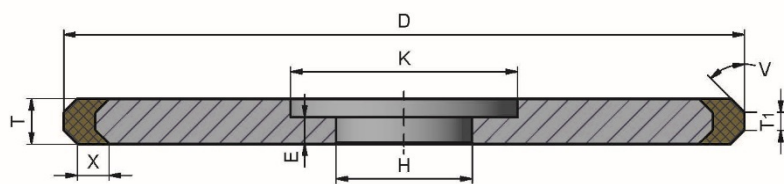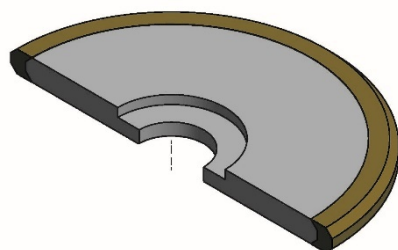
1E1 (shape N°1)

D___-T___-H___-X___-V___
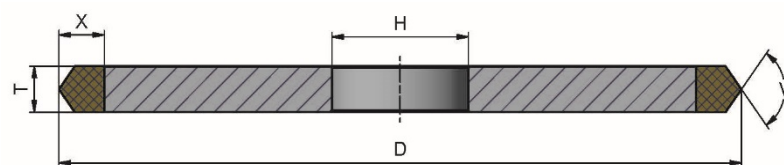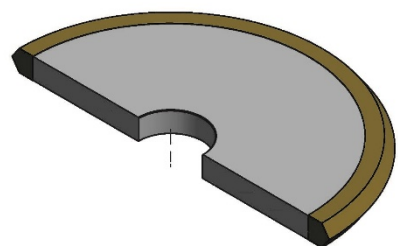
1E1 (shape N°2)

D__-T__-H__-X__-V__-E__-K__ / N°2
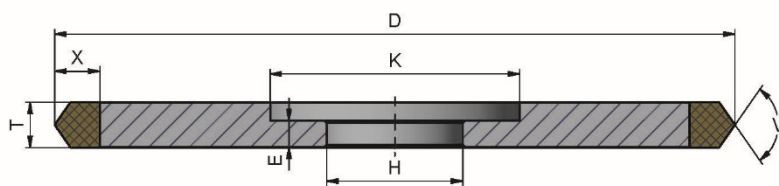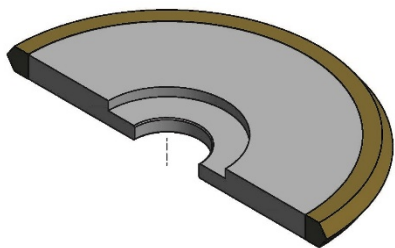
1EE1

D__-T__-H__-X__-V__
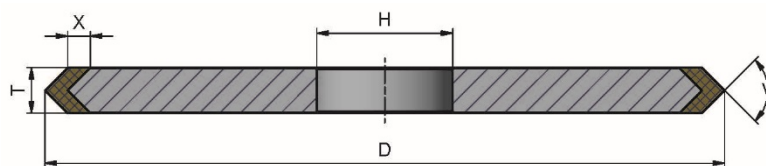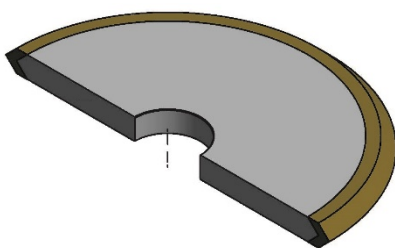
1EF1 (shape N°1)

D__-T__-H__-X__-V__-R__
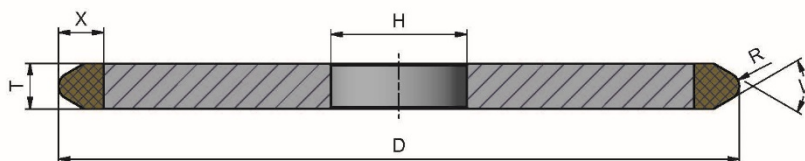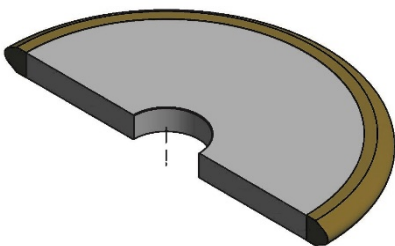
1EF1 (shape N°2)

D__-T__-H__-X__-V__-R__-E__-K__ / N°2
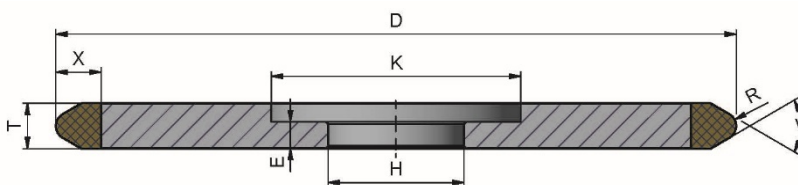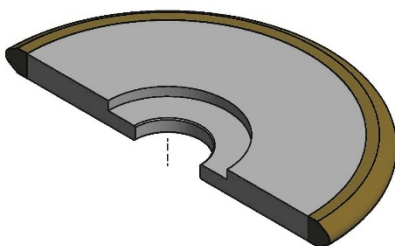
1F1

D__-T__-H__-X__-R__
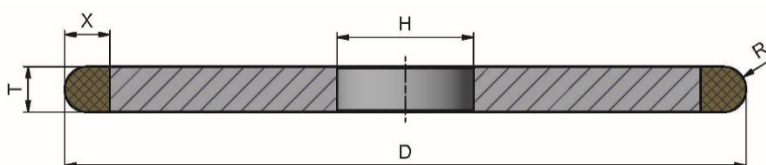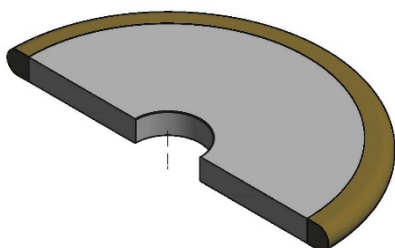
1J1

D___-T___-H___-X___-R___-T1___
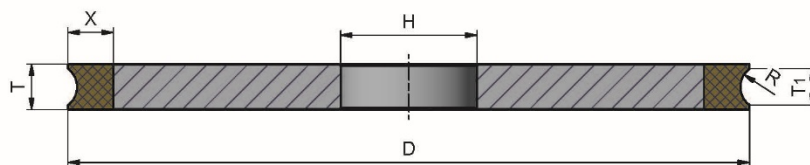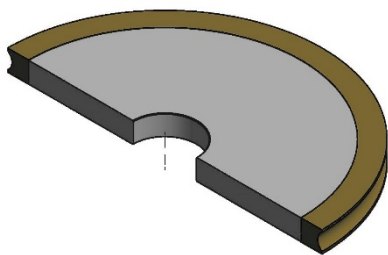
1L1

D___-T___-H___-X___-R___
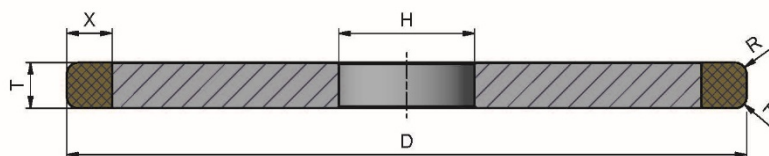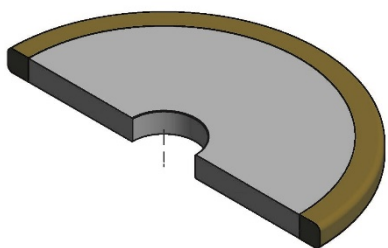
1L1B

D___-T___-H___-X___-R___-BC___
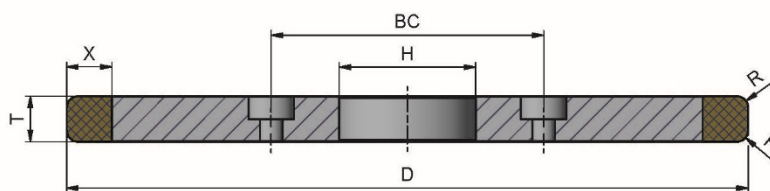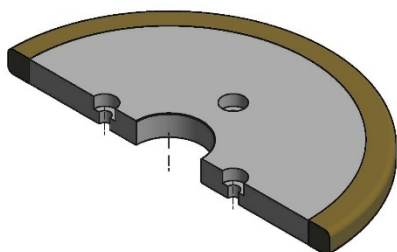
1M1 (shape N°1)

D___-T___-H___-X___-V___-T1___
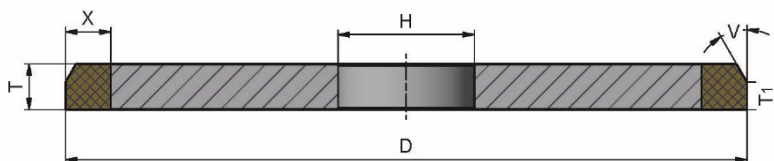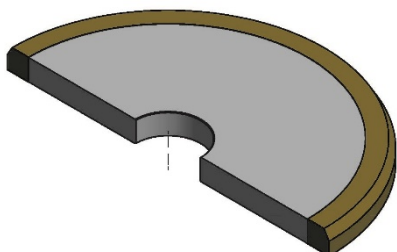
1M1 (shape N°2)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°2
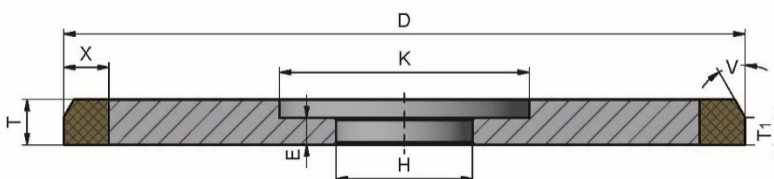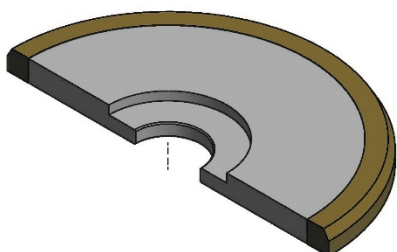
1M1R (shape N°1)

D___-T___-H___-X___-V___-T1___-E___
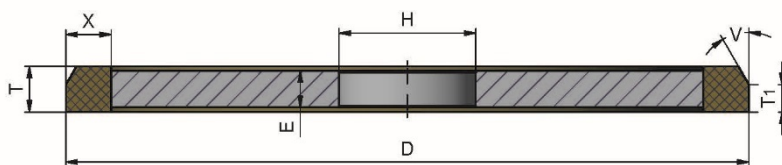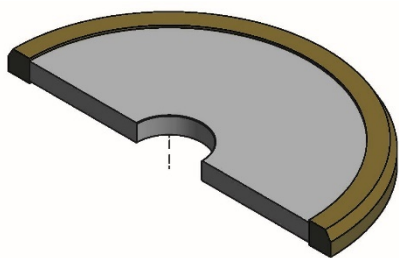
1M1R (shape N°2)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°2
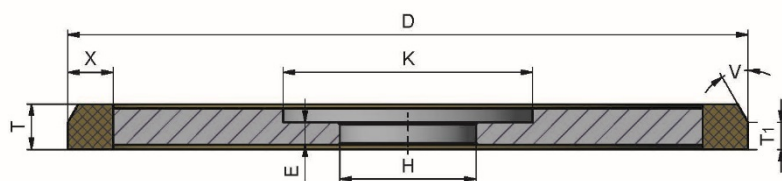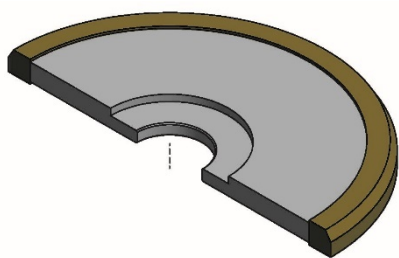
1Q1 (shape N°1)

D___-T___-H___-X___-R___
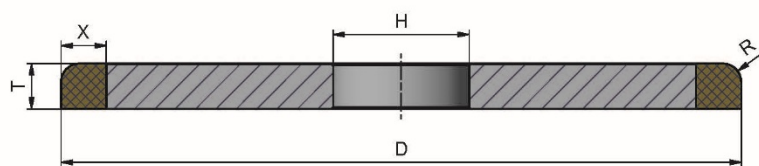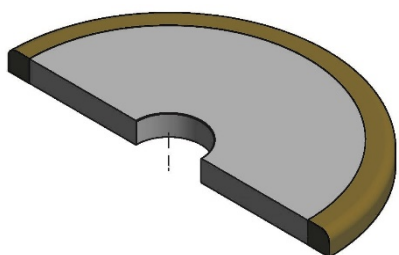
1Q1 (shape N°2)

D___-T___-H___-X___-R___-E___-K___ / N°2
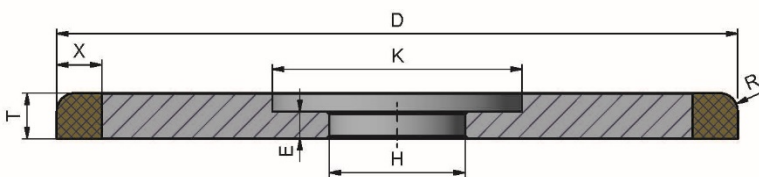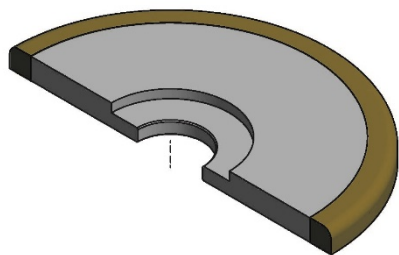
1Q1 (shape N°3)

D___-T___-H___-X___-R___-E___-K___ / N°3
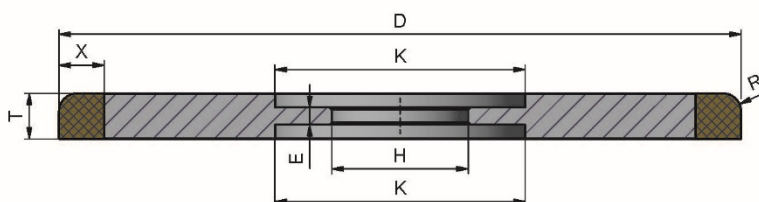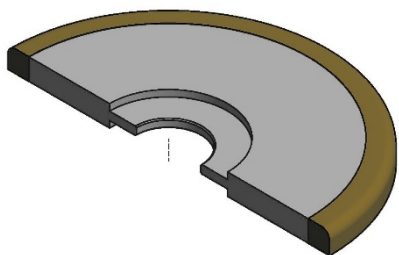
1Q1R (shape N°1)

D___-T___-H___-X___-R___-E___
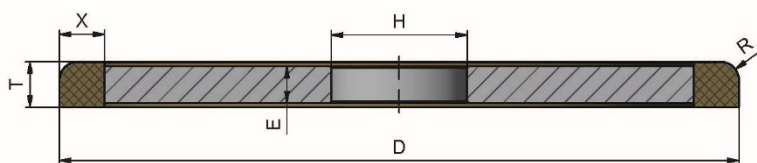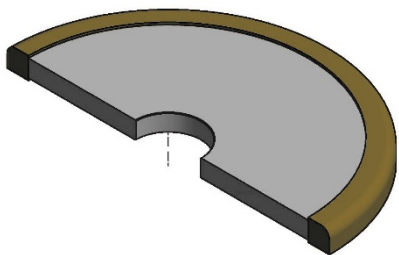
1Q1R (shape N°2)

D___-T__-H__-X__-R__-E__-K__ / N°2
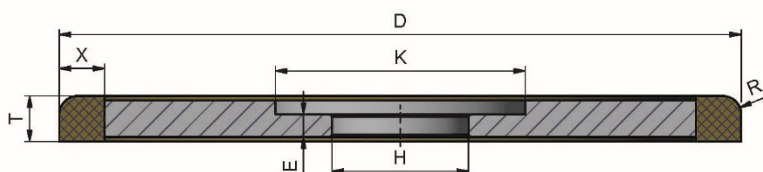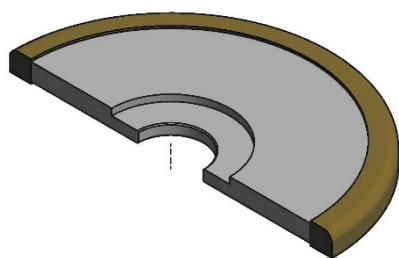
1V1 (shape N°1)

D___-T__-H__-X__-V__
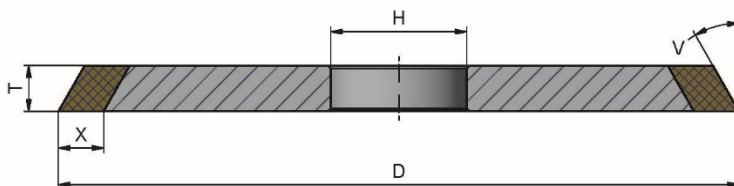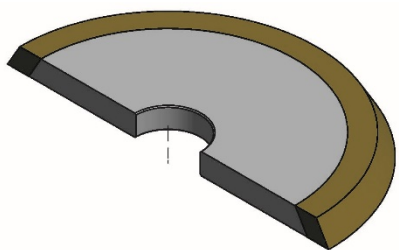
1V1 (shape N°2)

D___-T__-H__-X__-V__-E__-K__ / N°2
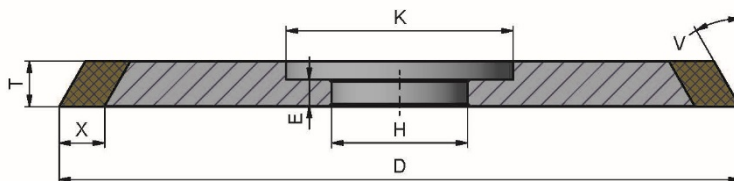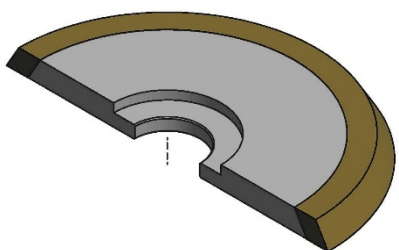
1V1 (shape N°3)

D___-T__-H__-X__-V__-E__-K__ / N°3
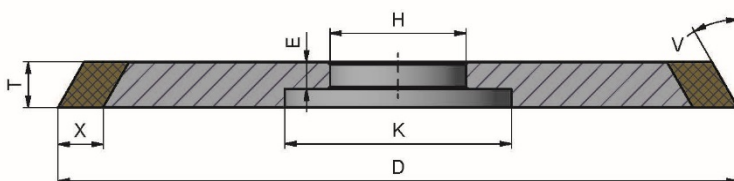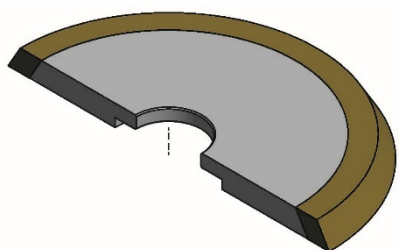
1V5

D___-T___-H___-W___-X___-V___
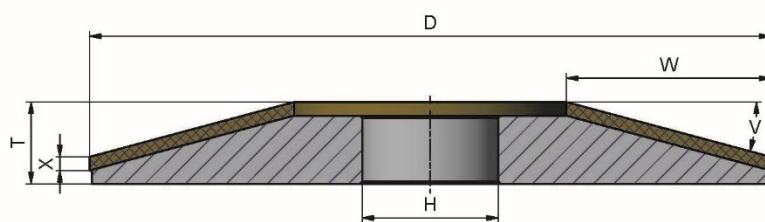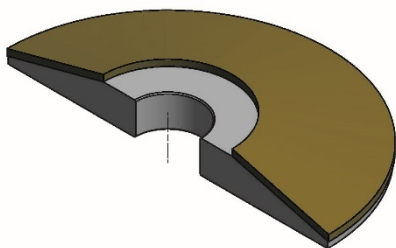
1VF1

D___-T___-H___-X___-V___-R___-T1___
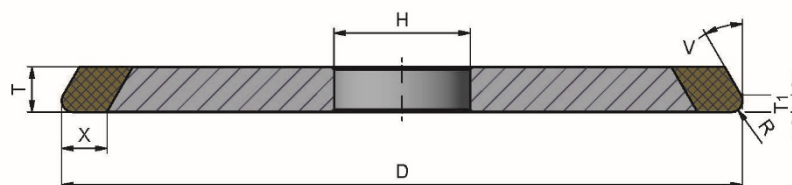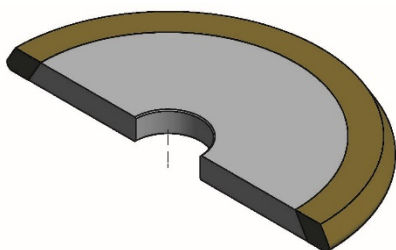
1VL1

D___-T___-H___-X___-V___-R1___-R2___
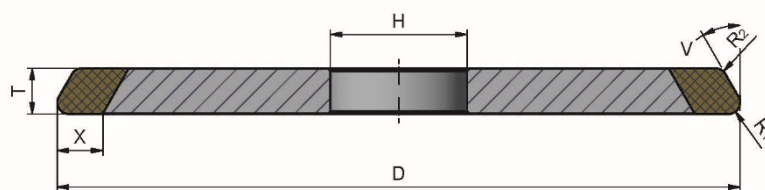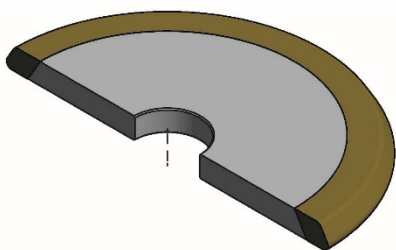
1Y1 (shape N°1)

D___-T___-H___-X___-V___-T1___
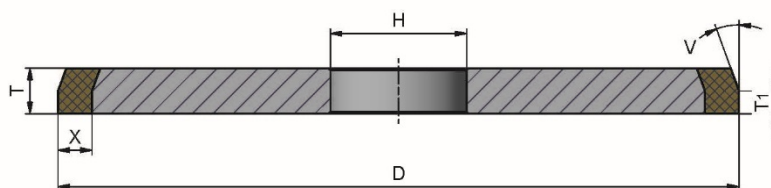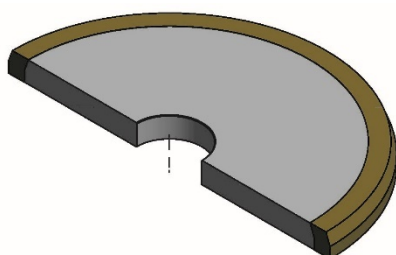
1Y1 (shape N°2)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°2
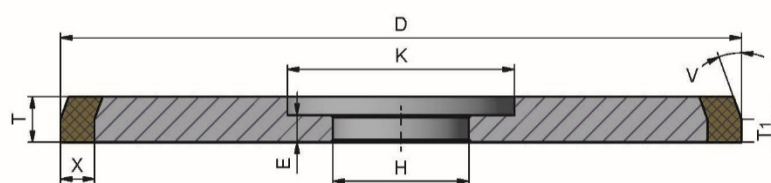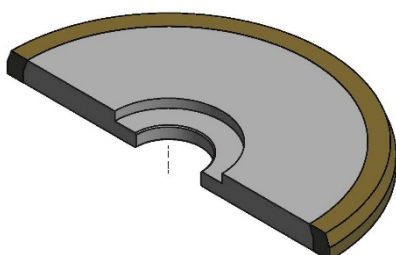
1Y1 (shape N°3)

D___-T___-H___-X___-V___-T1___-E___-K___ / N°3
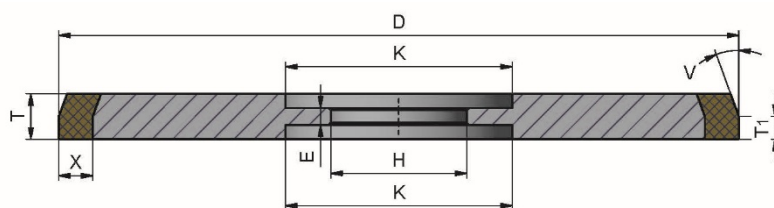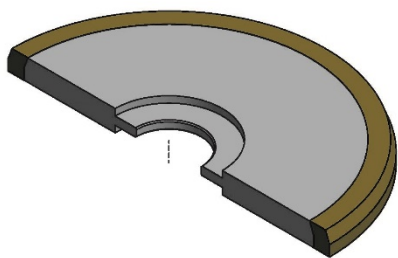
1Y1F (shape N°1)

D___-T___-H___-X___-V___-T1___-R___
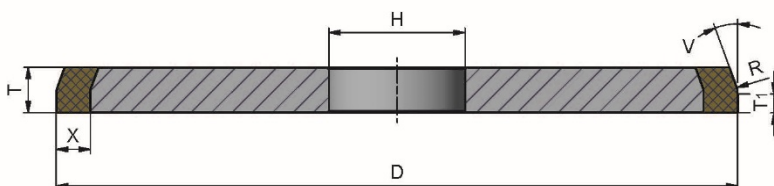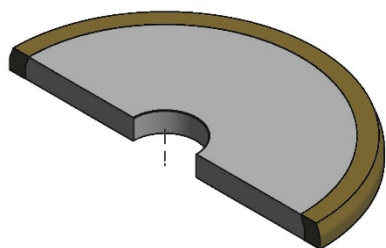
1Y1F (shape N°2)

D___-T___-H___-X___-V___-T1___-R___-E___-K___ / N°2
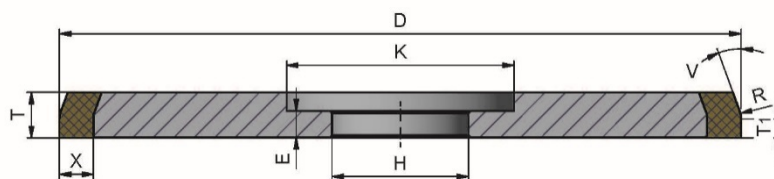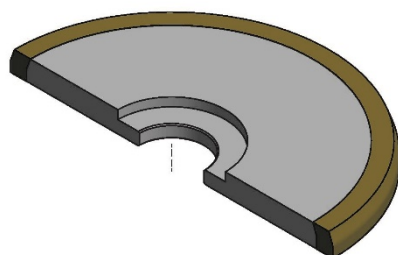
1Y1F (shape N°3)

D___-T___-H___-X___-V___-T1___-R___-E___-K___ / N°3
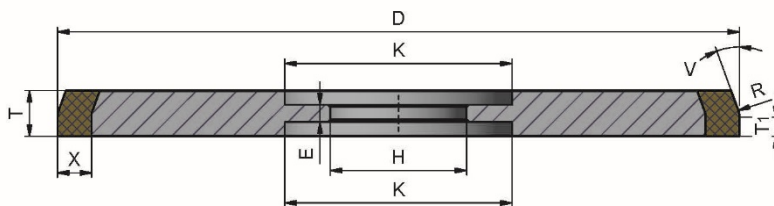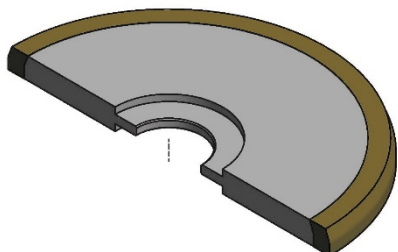
2A2T

D___-T___-H___-W___-X___-BC___
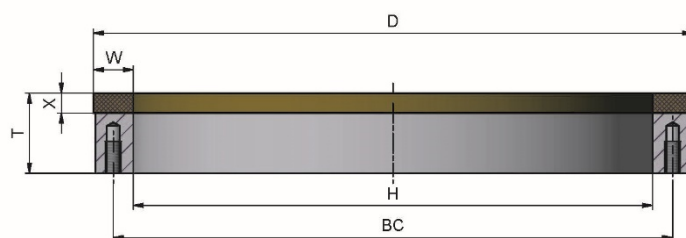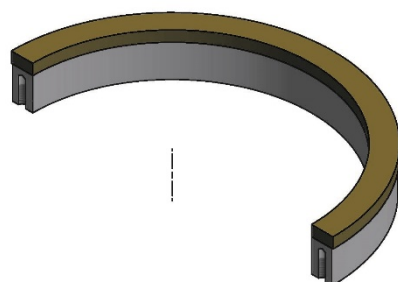
3A1 (shape N°1)

D___-T___-H___-U___-X___
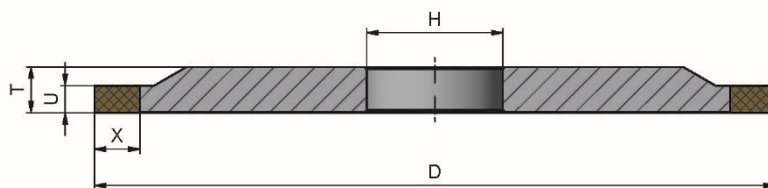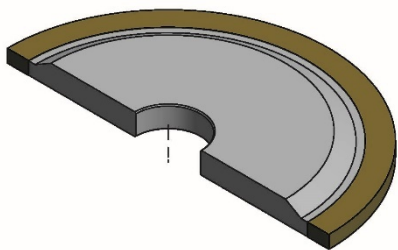
3A1 (shape N°2)

D___-T___-H___-U___-X___-E___-K___ / N°2
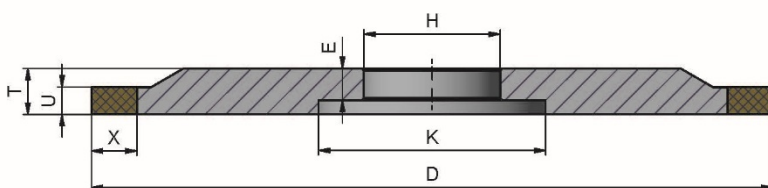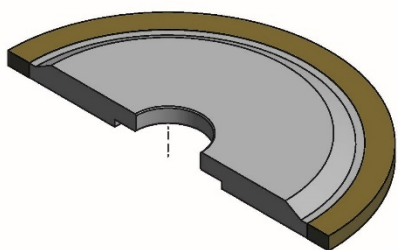
3A1B (shape N°1)

D___-T___-H___-U___-X___-BC___
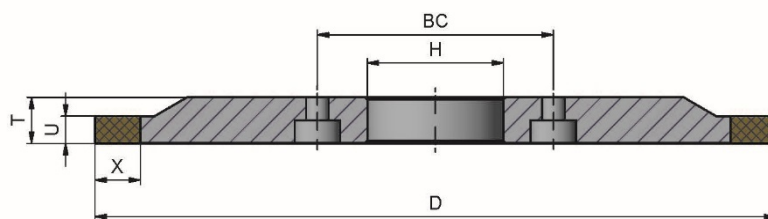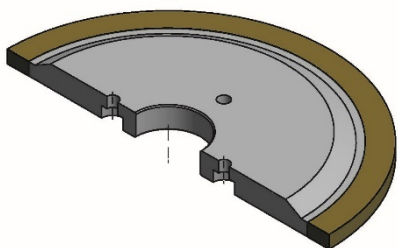
3A1B (shape N°2)

D___-T___-H___-U___-X___-BC___-E___-K___ / N°2
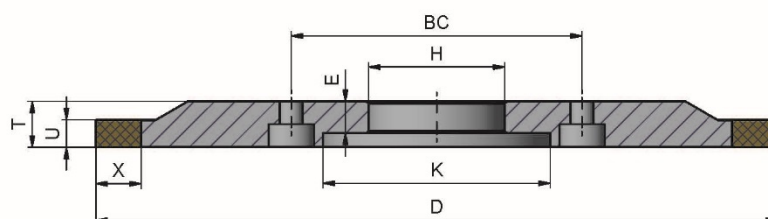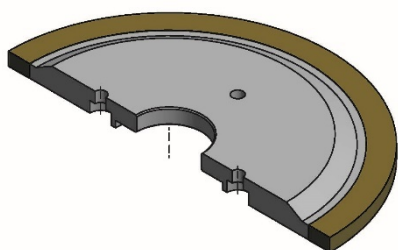
3A1C (shape N°1)

D___-T___-H___-U___-X___-BC___
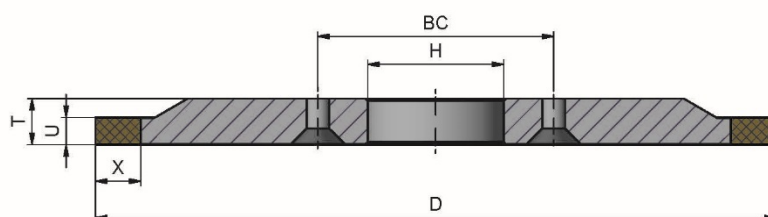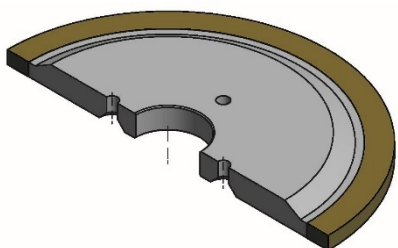
3A1C (shape N°2)

D___-T___-H___-U___-X___-BC___-E___-K___ / N°2
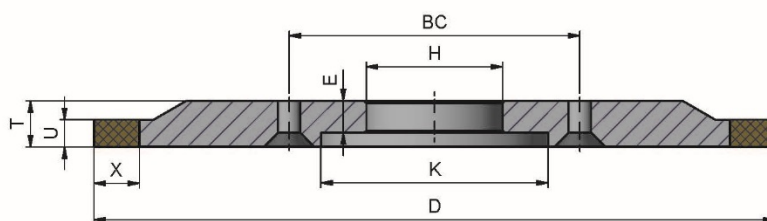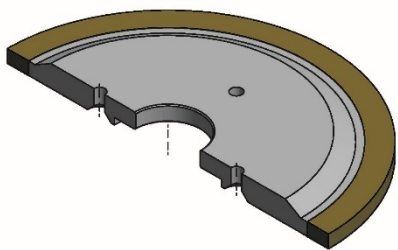
3A1H

D___-T___-H___-U___-X___-BC___
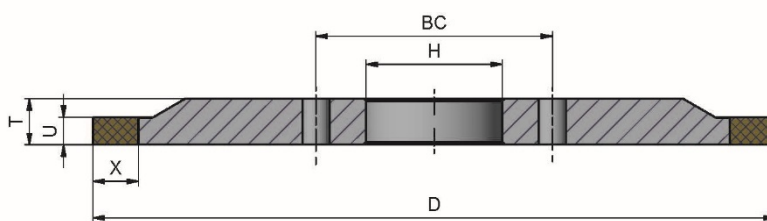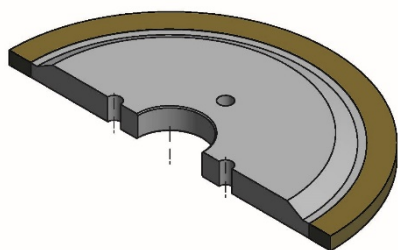
3A1P (shape N°1)

D___-T___-H___-U___-X___-E___
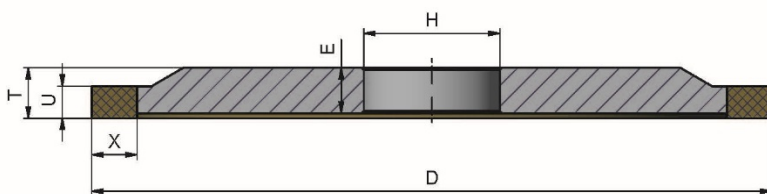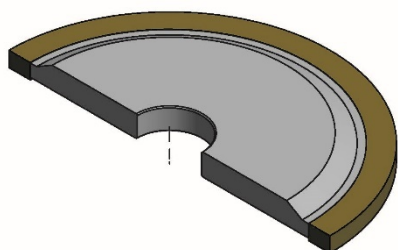
3A1P (shape N°2)

D___-T___-H___-U___-X___-E___-K___ / N°2
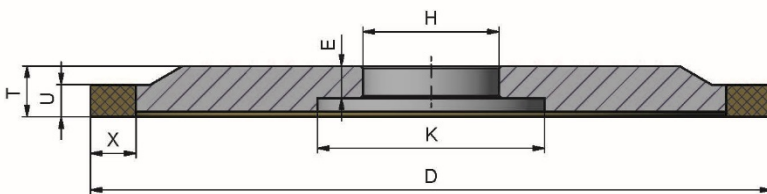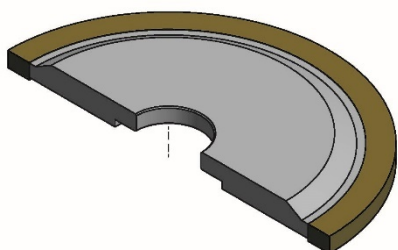
3A1R (shape N°1)

D___-T___-H___-U___-X___-E___
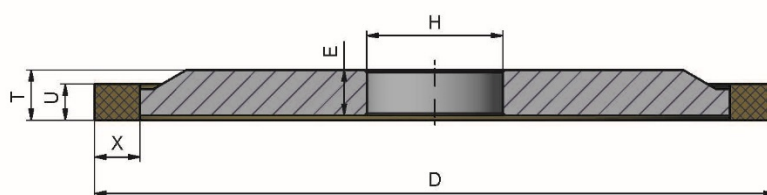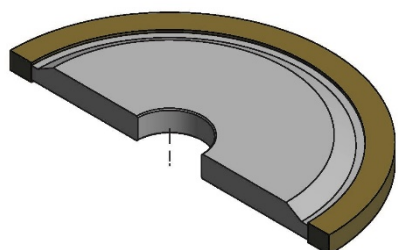
3A1R (shape N°2)

D___-T___-H___-U___-X___-E___-K___ / N°2
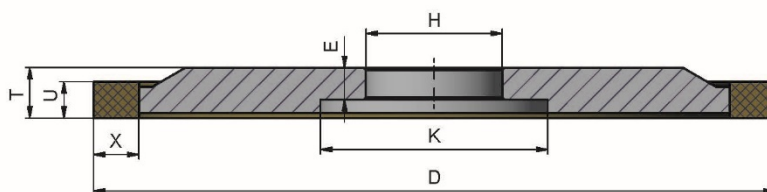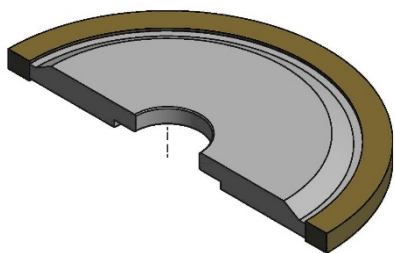
3A1T

D___-T___-H___-U___-X___-BC___
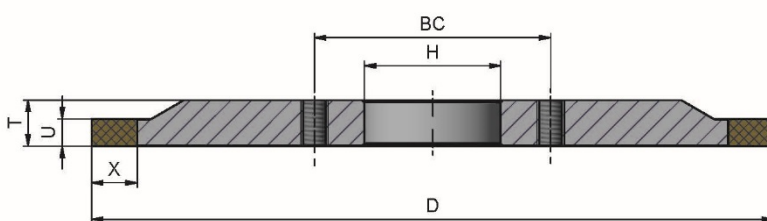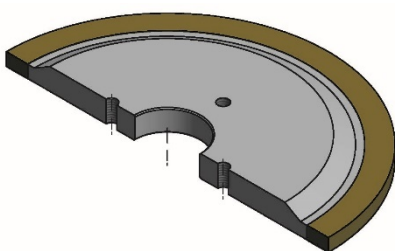
3A9 (shape N°1)

D___-T___-H___-U___-X___-d___
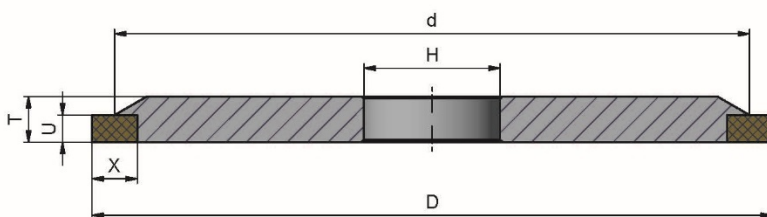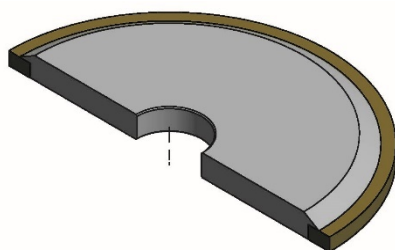
3A9 (shape N°2)

D___-T___-H___-U___-X___-d___-E___-K___ / N°2
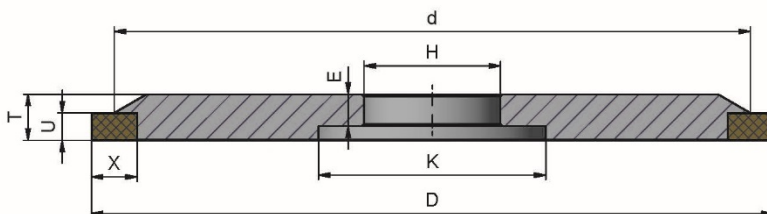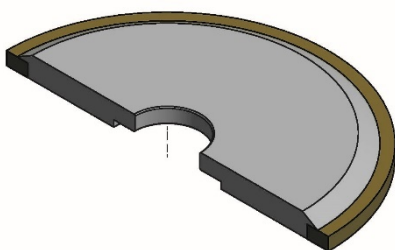
3A9P

D___-T___-H___-U___-X___-E___-d___
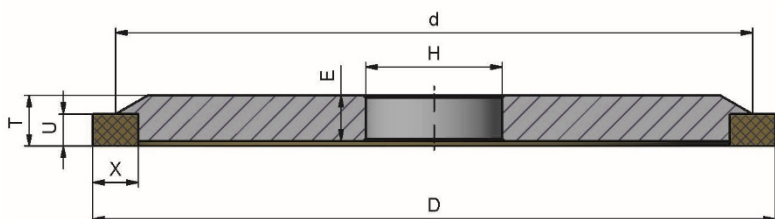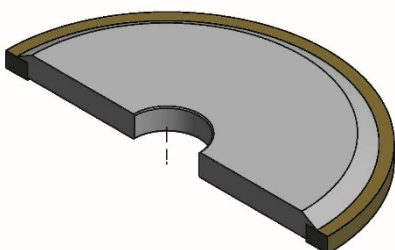
3AA1

D___-T___-H___-U___-X___-U1___
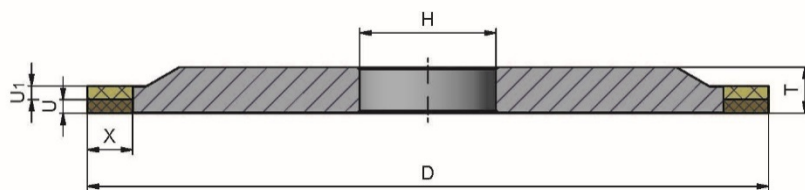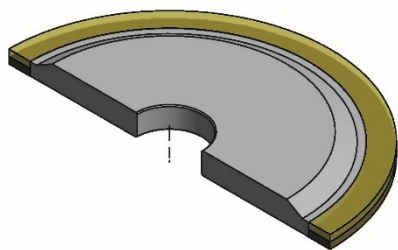
3B1 (shape N°1)

D___-T___-H___-U___-X___-V___
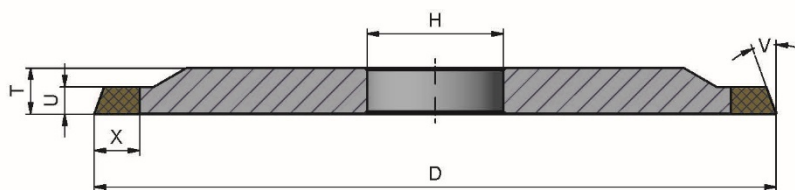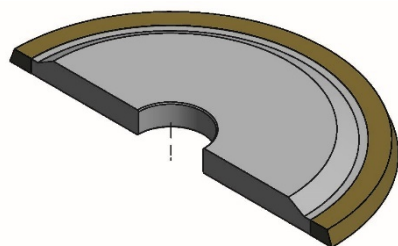
3B1 (shape N°2)

D___-T___-H___-U___-X___-V___-E___K___ / N°2
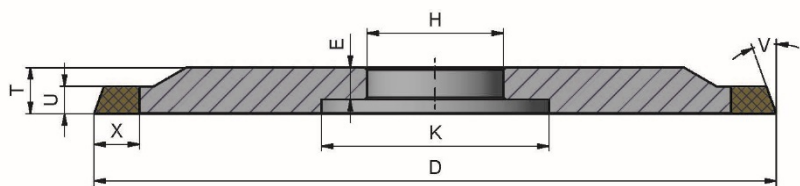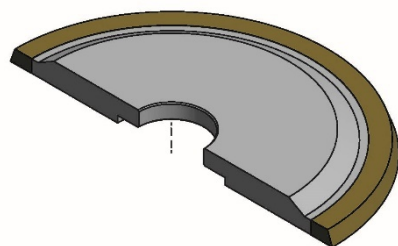
3B1 (shape N°3)

D___-T___-H___-U___-X___-V___ / N°3
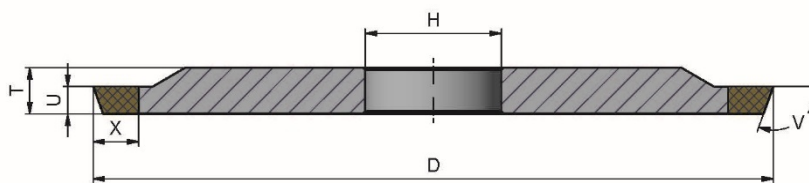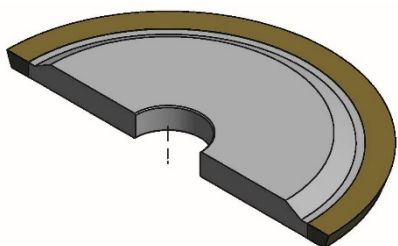
3B1P

D___-T___-H___-U___-X___-V___-E___
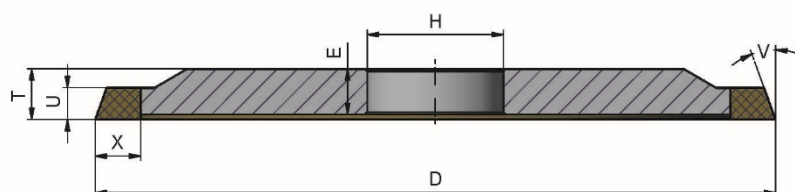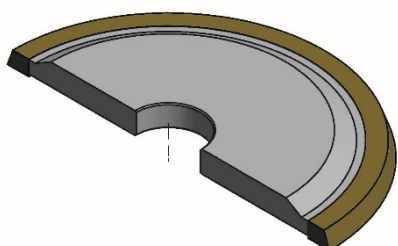
3B9 (shape N°1)

D___-T___-H___-U___-X___-V___-d___
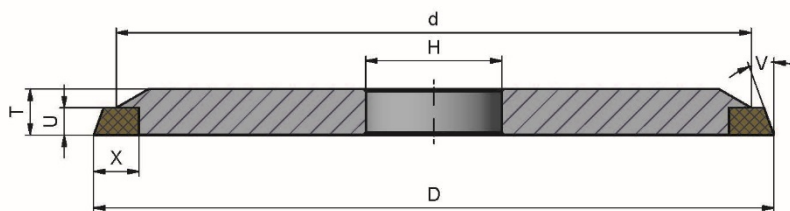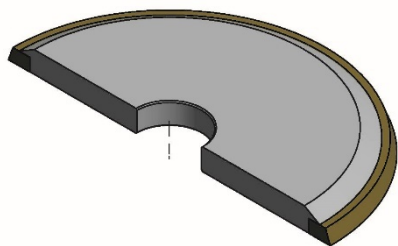
3B9 (shape N°2)

D___-T___-H___-U___-X___-V___-d___-E___-K___ / N°2
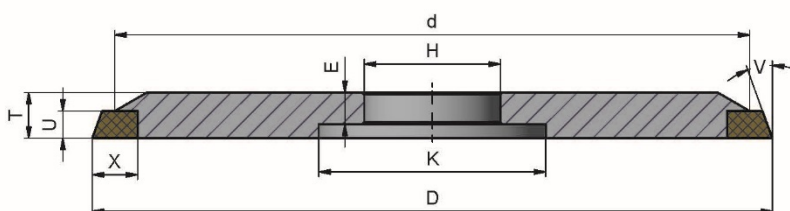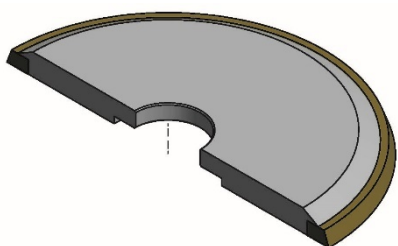
3B9B (shape N°1)

D___-T___-H___-U___-X___-V___-d___-BC___
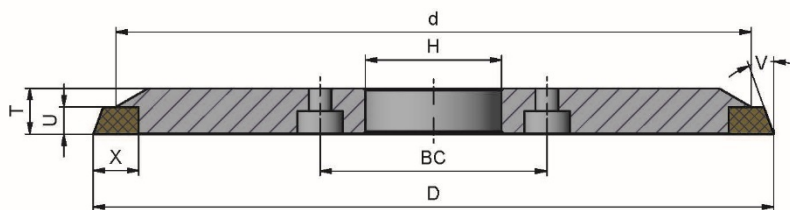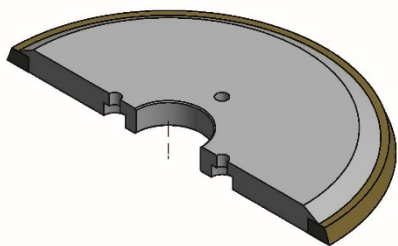
3B9B (shape N°2)

D___-T___-H___-U___-X___-V___-d___-E___-K___-BC___ / N°2
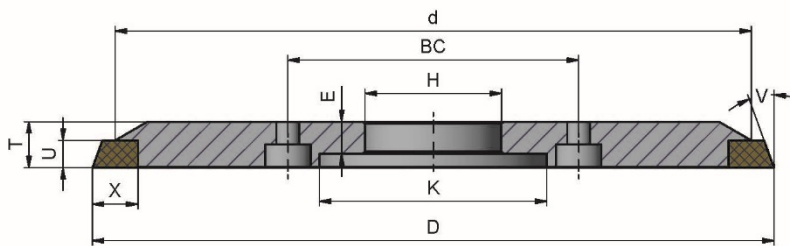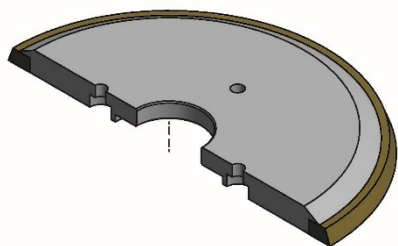
3BF1

D___-T___-H___-U___-X___-V___-R___-U1___
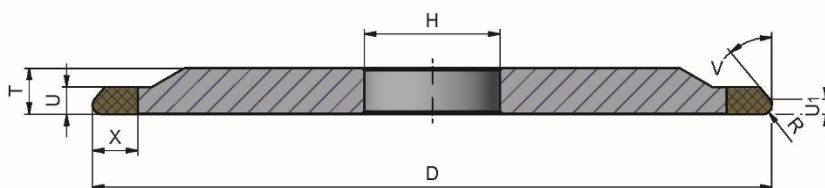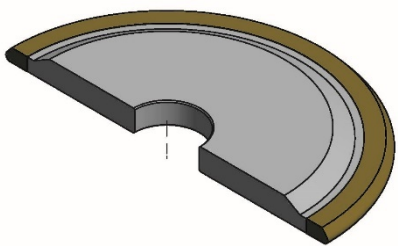
3BF9 (shape N°1)

D___-T___-H___-U___-X___-V___-R___-U1___-d___
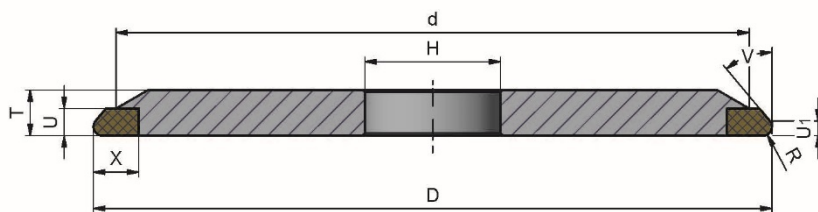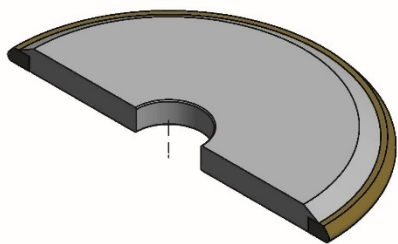
3BF9 (shape N°2)

D___-T___-H___-U___-X___-V___-R___-U1___-d___-E___-K___ / N°2
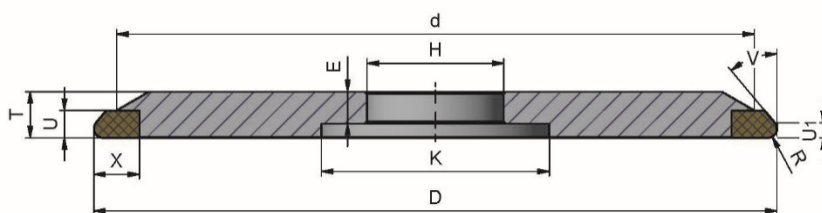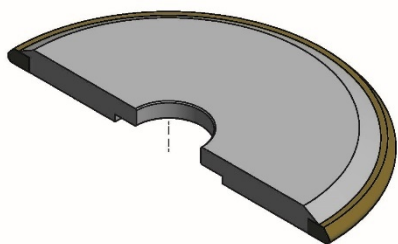
3BT1P

D___-T___-H___-U___-X___-A___-B___-E___
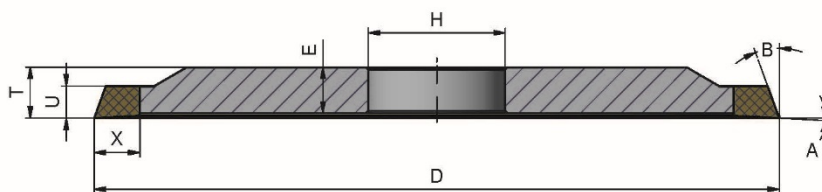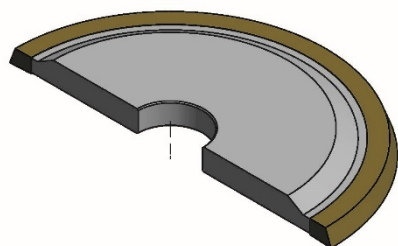
3D1 (shape N°1)

D___-T___-H___-U___-X___-V___-U1___
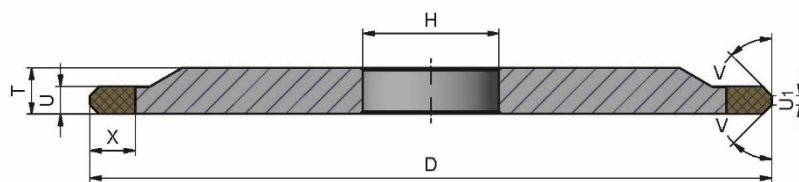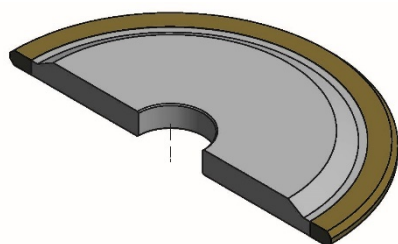
3D1 (shape N°2)

D___-T___-H___-U___-X___-V___-E___-K___-U1___ / N°2
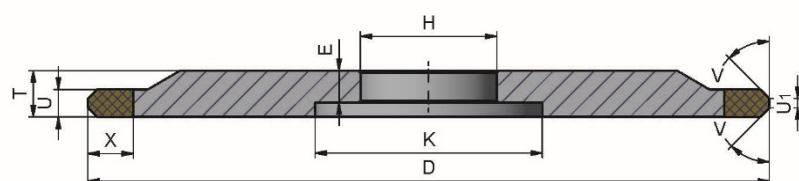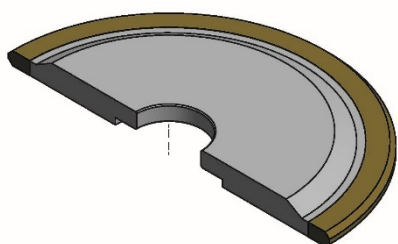
3E1 (shape N°1)

D___-T___-H___-U___-X___-V___
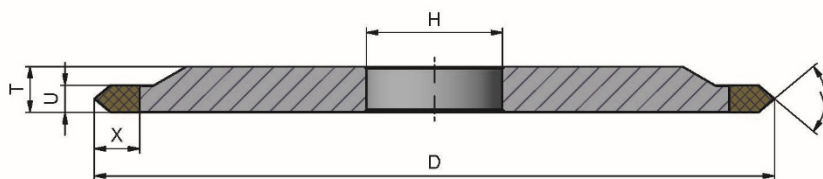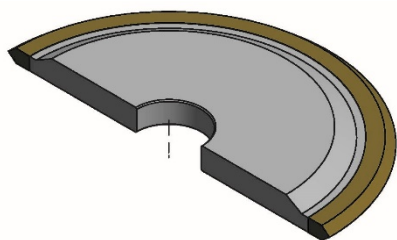
3E1 (shape N°2)

D___-T___-H___-U___-X___-V___-E___-K___ / N°2
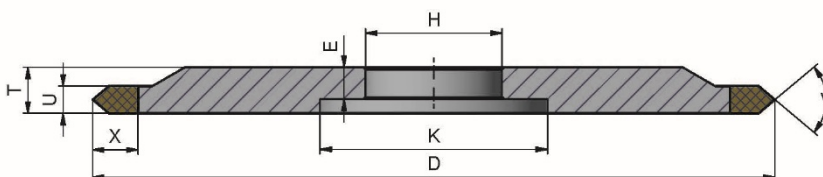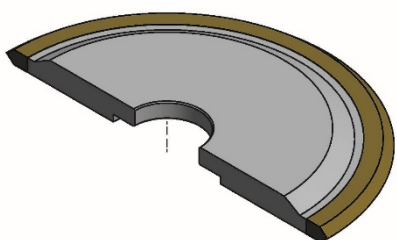
3E1B (shape N°1)

D___-T___-H___-U___-X___-V___-BC___
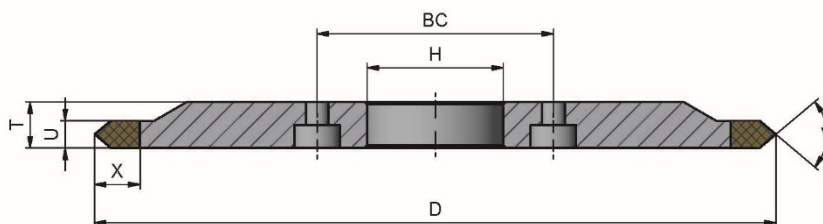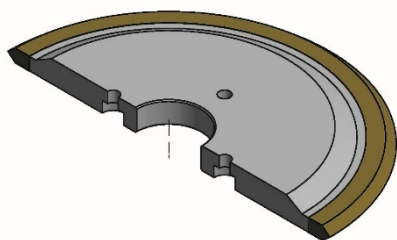
3E1B (shape N°2)

D___-T___-H___-U___-X___-V___-E___-K___-BC___ / N°2
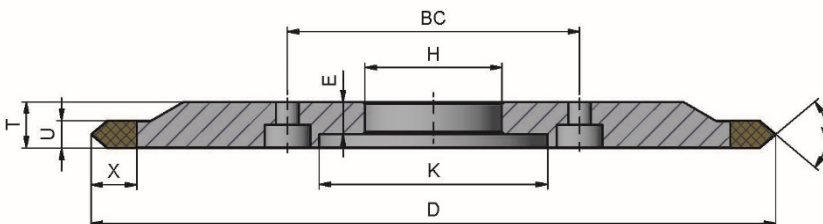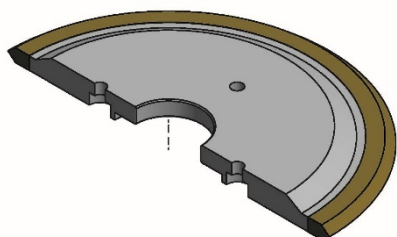
3E9 (shape N°1)

D___-T___-H___-U___-X___-V___-d___
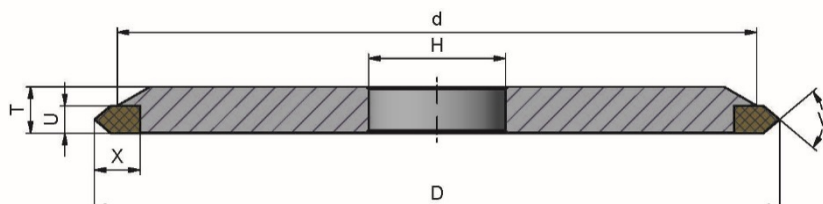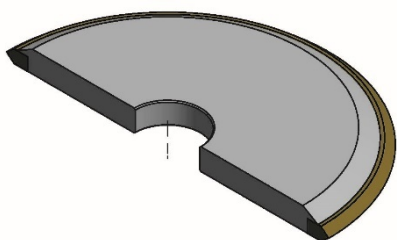
3E9 (shape N°2)

D___-T___-H___-U___-X___-V___-d___-E___-K___ / N°2
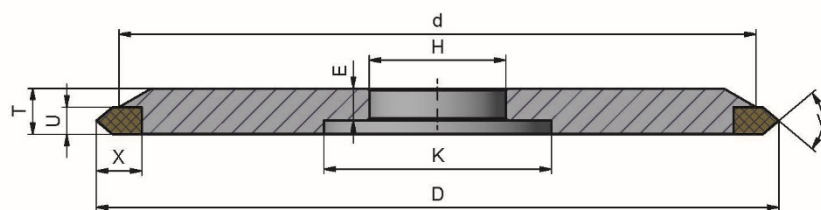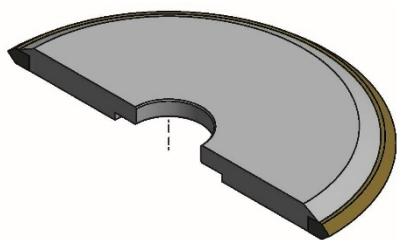
3EF1 (shape N°1)

D___-T___-H___-U___-X___-V___-R___
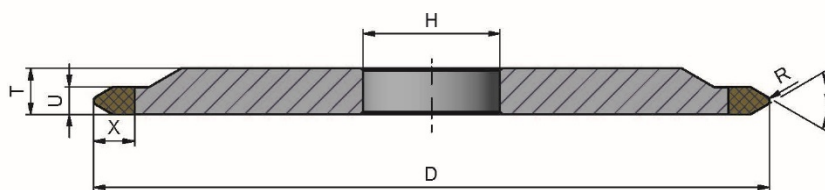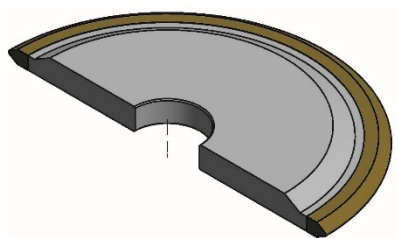
3EF1 (shape N°2)

D___-T___-H___-U___-X___-V___-R___-E___-K___ / N°2
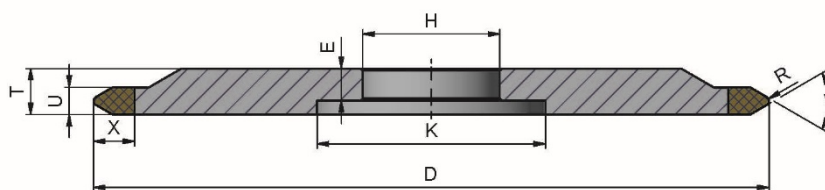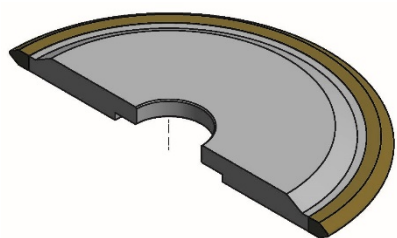
3EF9 (shape N°1)

D___-T___-H___-U___-X___-V___-R___-d___
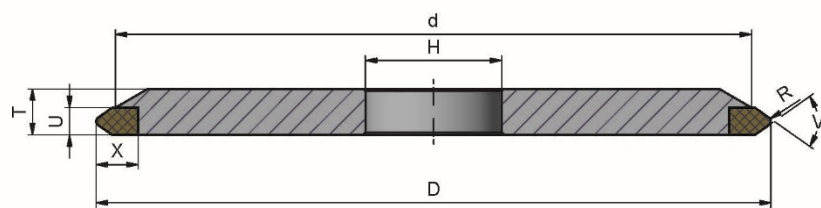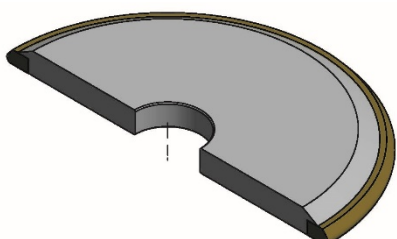
3EF9 (shape N°2)

D___-T___-H___-U___-X___-V___-R___-d___-E___-K___ / N°2
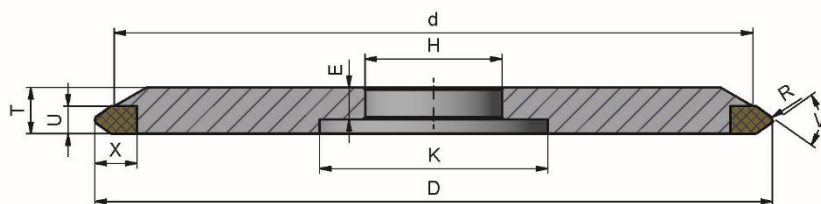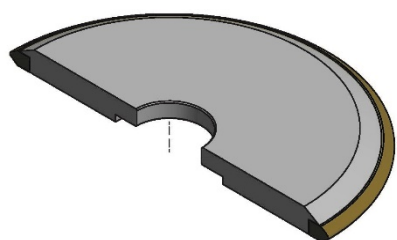
3F1 (shape N°1)

D___-T___-H___-U___-X___-R___
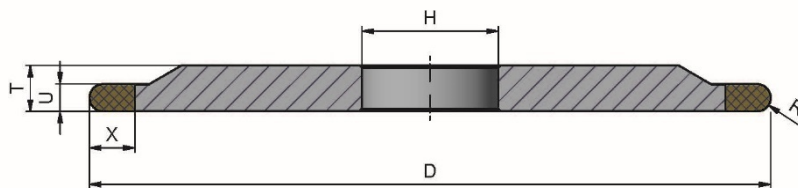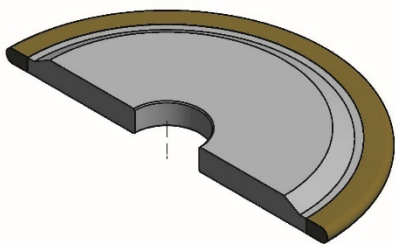
3F1 (shape N°2)

D___-T___-H___-U___-X___-R___-E___-K___ / N°2
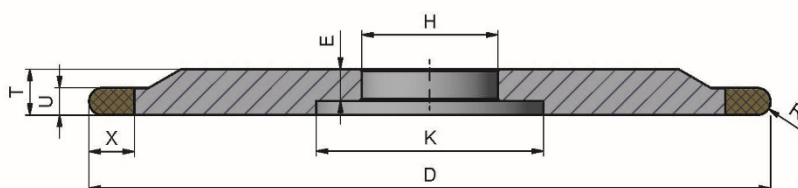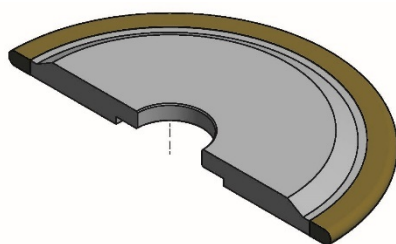
3H1

D___-T___-H___-U___-X___-R___
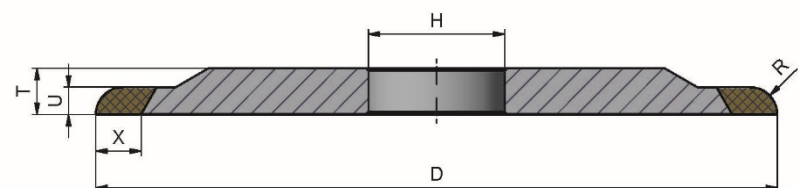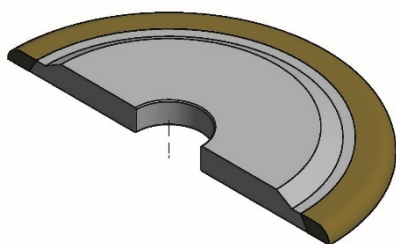
3M1 (shape N°1)

D___-T___-H___-U___-X___-V___-U1___
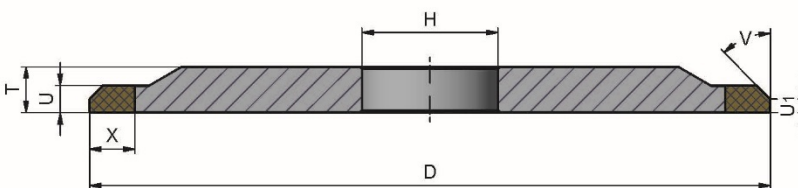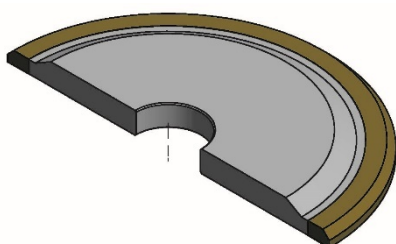
3M1 (shape N°2)

D___-T___-H___-U___-X___-V___-U1___-E___-K___ / N°2
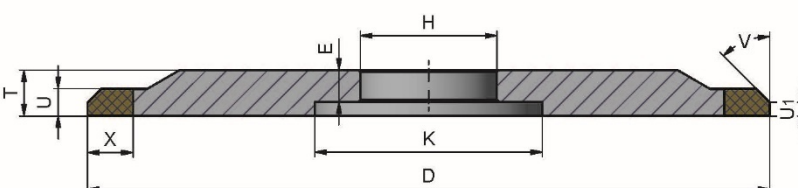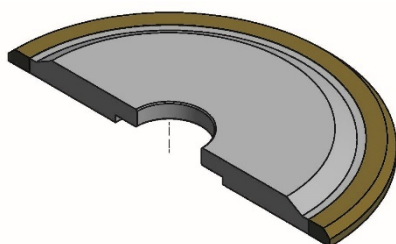
3M1 (shape N°3)

D___-T___-H___-U___-X___-V___-U1___ / N°3
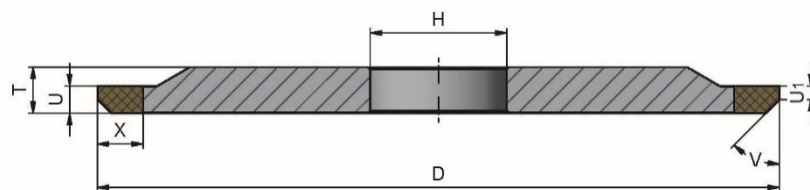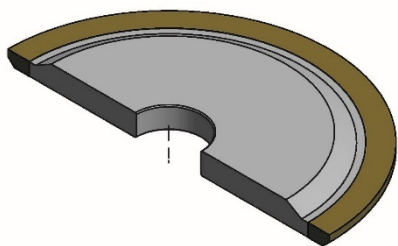
3M1 (shape N°4)

D___-T___-H___-U___-X___-V___-U1___-E___-K___ / N°4
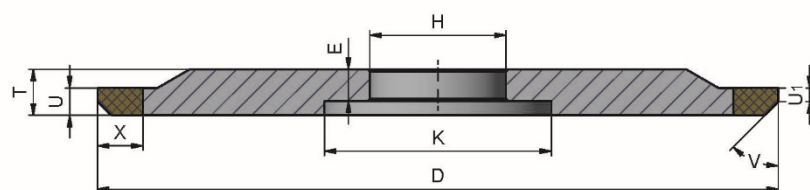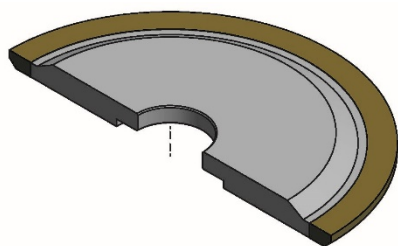
3M9 (shape N°1)

D___-T___-H___-U___-X___-V___-U1___-d___
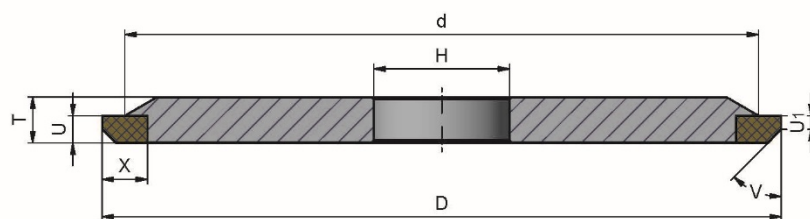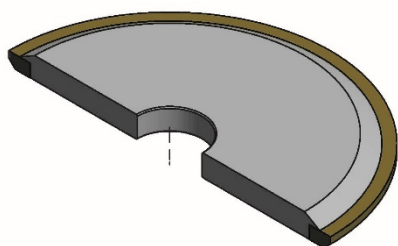
3M9 (shape N°2)

D___-T___-H___-U___-X___-V___-U1___-d___-E___-K___ / N°2
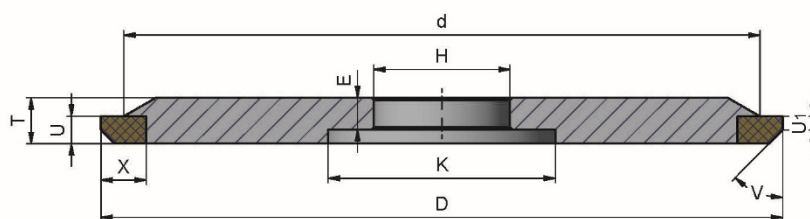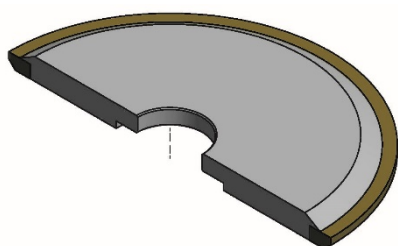
3M9B

D___-T___-H___-U___-X___-V___-U1___-BC___-d___
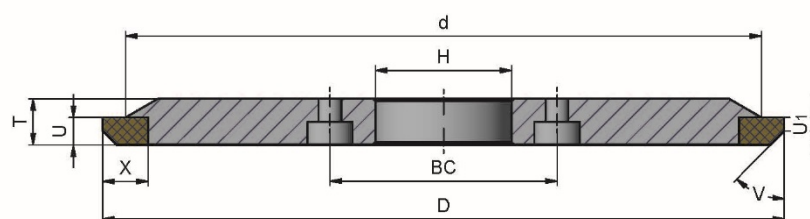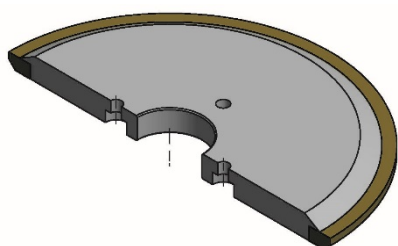
3Q1P (shape N°1)

D___-T___-H___-U___-X___-R___-E___
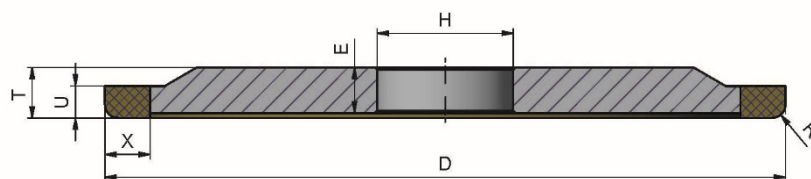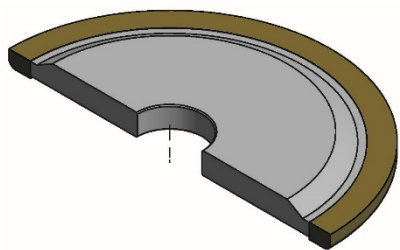
3Q1P (shape N°2)

D___-T___-H___-U___-X___-R___ / N°2
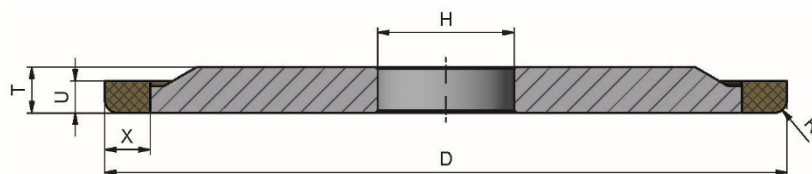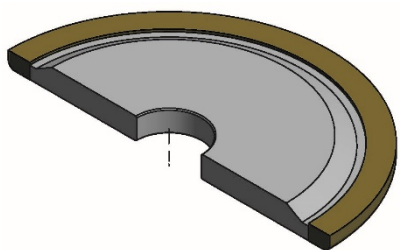
3V1 (shape N°1)

D___-T___-H___-U___-X___-V___
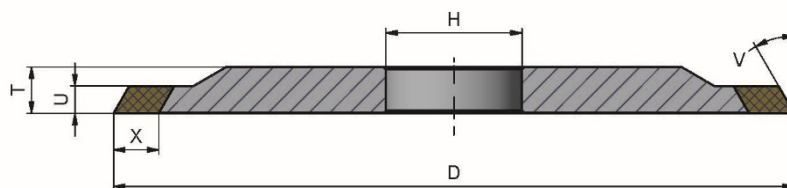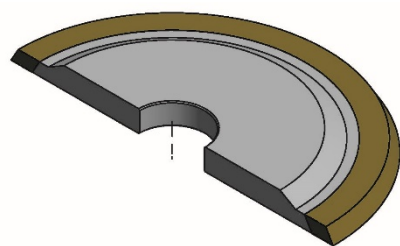
3V1 (shape N°2)

D___-T___-H___-U___-X___-V___-E___-K___ / N°2
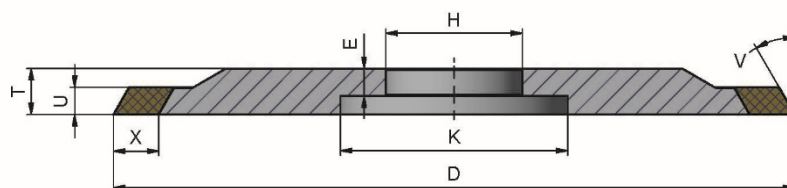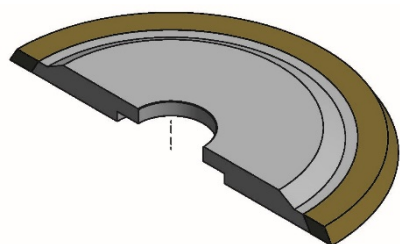
3V9 (shape N°1)

D___-T___-H___-U___-X___-V___
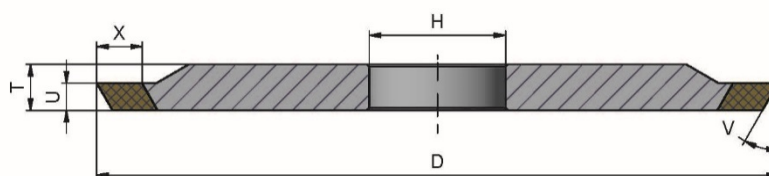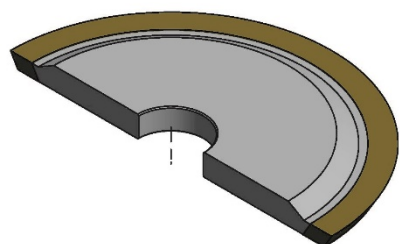
3V9 (shape N°2)

D__-T__-H__-U__-X__-V__-E__-K__ / N°2
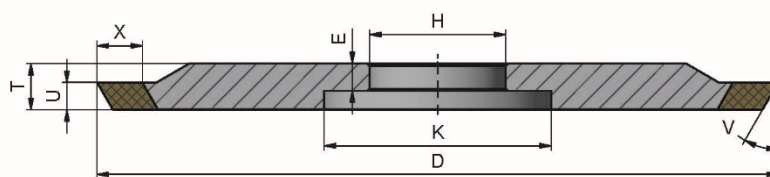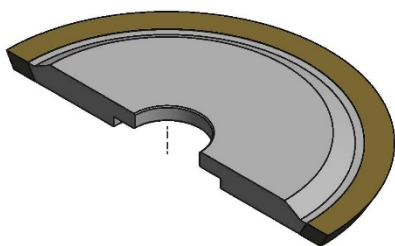
3Y1 (shape N°1)

D__-T__-H__-U__-X__-V__-U1__
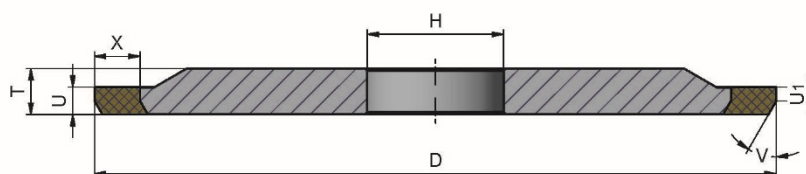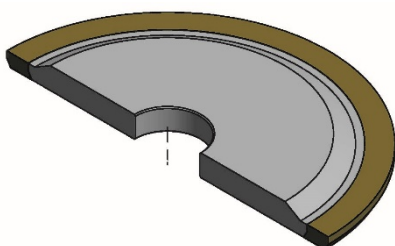
3Y1 (shape N°2)

D__-T__-H__-U__-X__-V__-U1__-E__-K__ / N°2
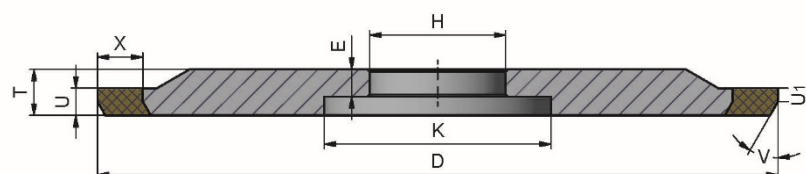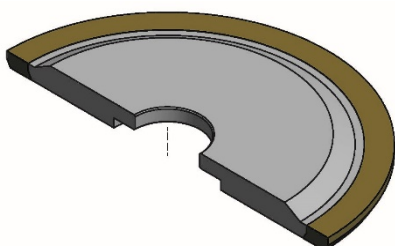
4A2

D__-T__-H__-W__-X__-E__-S__
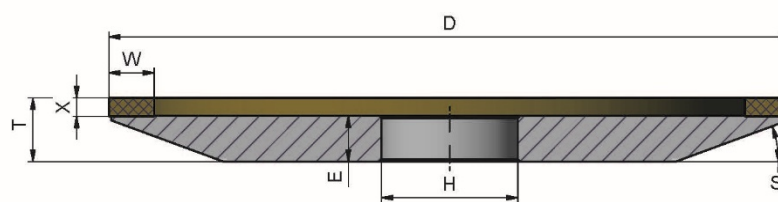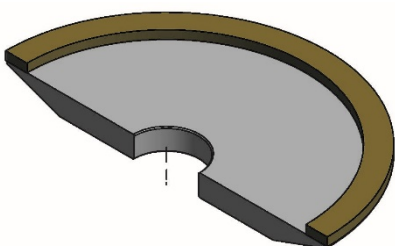
4A9P

D__-T__-H__-U__-X__-E__-S__-d__
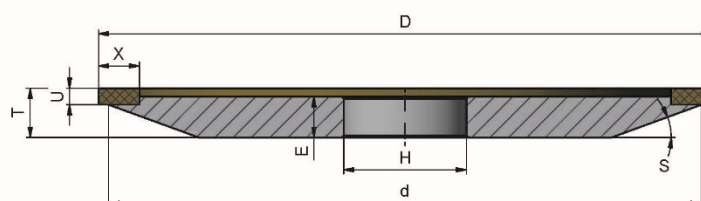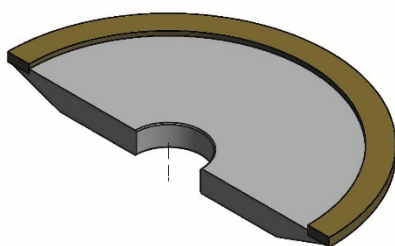
4AA2

D___-T___-H___-W___/__-X___-E___-S___

4BT9

D___-T___-H___-W___-X___-J___

5.00°

20.00°
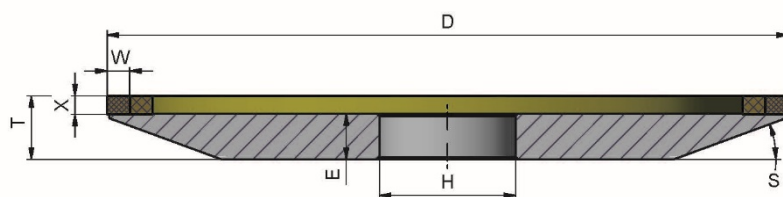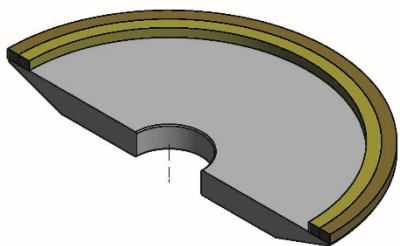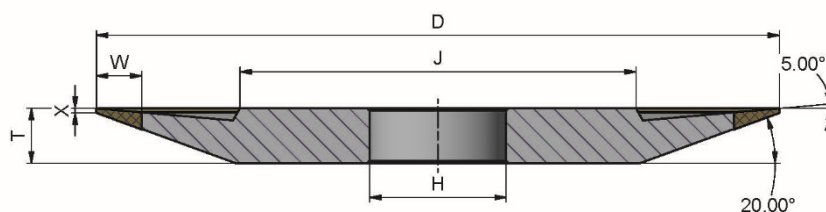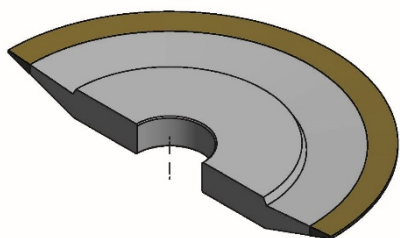
6A2 (shape N°1)

D___-T___-H___-W___-X___-E___-K___
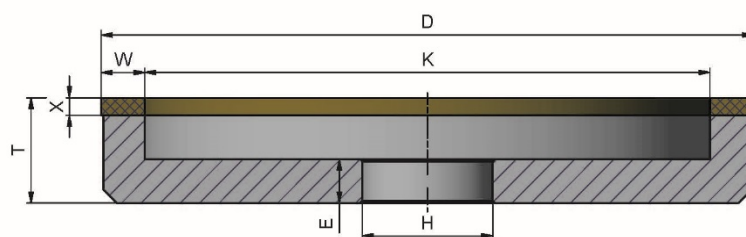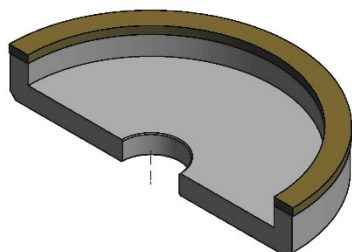
6A2 (shape N°2)

D___-T___-H___-W___-X___-E___-K___ / N°2
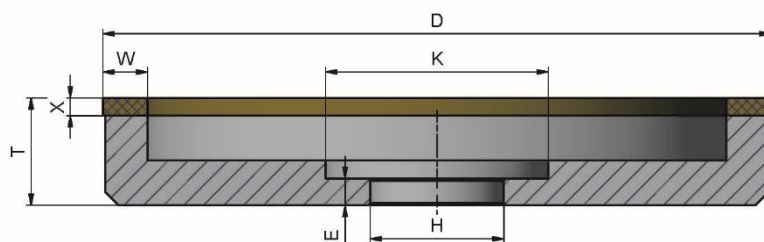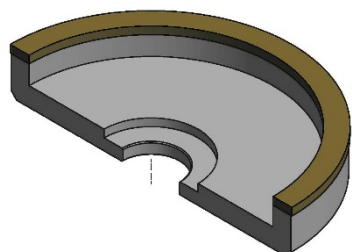
6A2 (shape N°3)

D___-T___-H___-W___-X___-E___-K___ / N°3
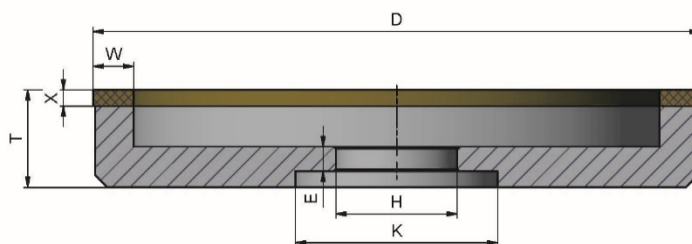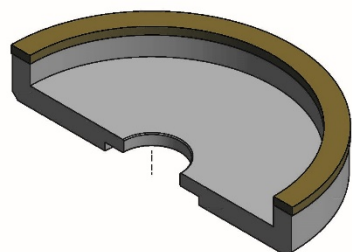
6A2K

D___-T___-H___-W___-X___-E___-K___
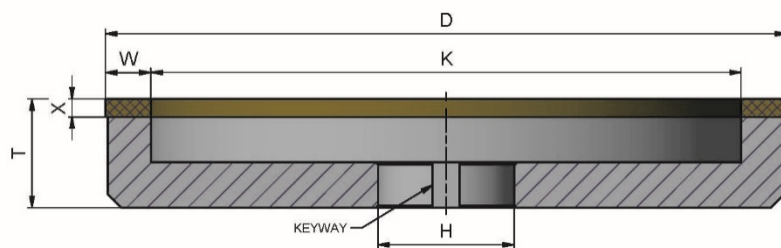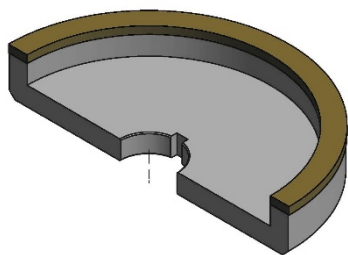
6A9

D___-T___-H___-U___-X___-E___-K___
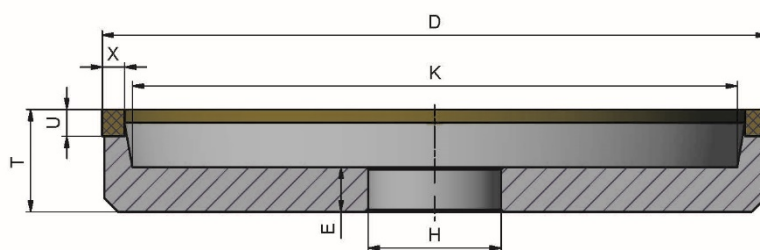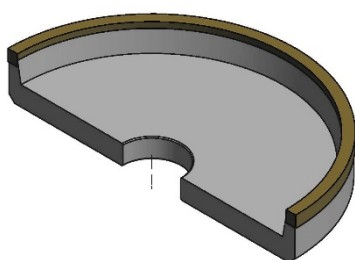
6A9H

D___-T___-H___-U___-X___-E___-K___-BC___
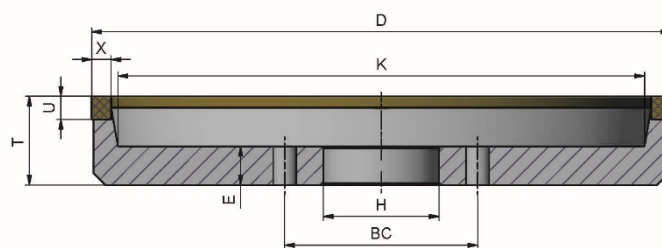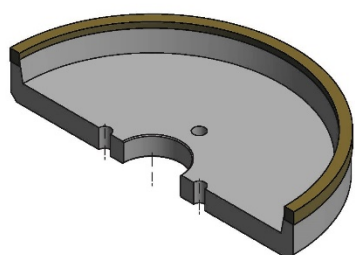
6A9T

D___-T___-H___-U___-X___-E___-K___-BC___
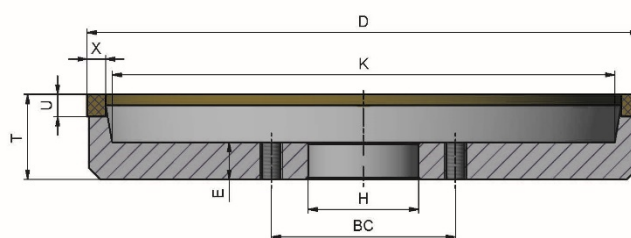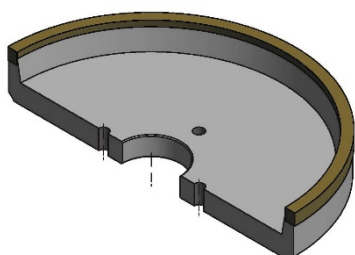
6AA2 (shape N°1)

D___-T___-H___-W__/__-X___-E___-K___
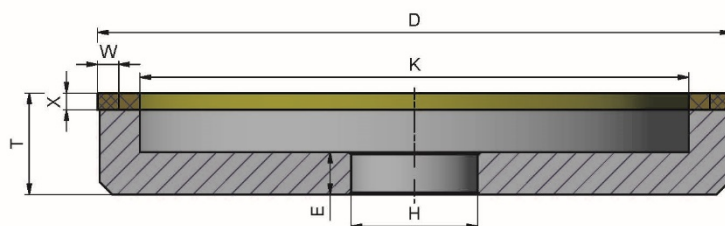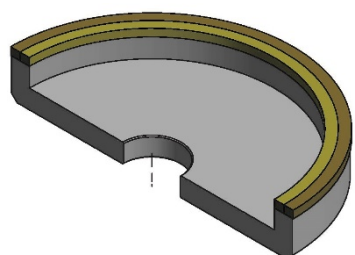
6AA2 (shape N°2)

D__-T__-H__-W__/__-X__-E__-K__ / N°2
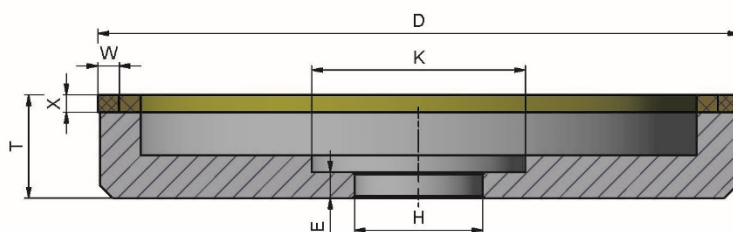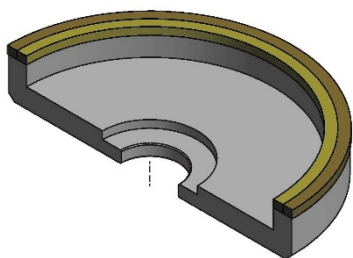
6AA2 (shape N°3)

D__-T__-H__-W__/__-X__-E__-K__ / N°3
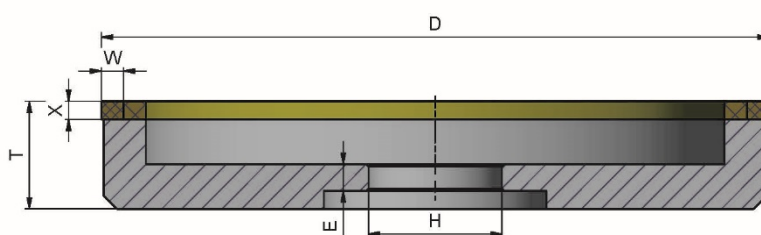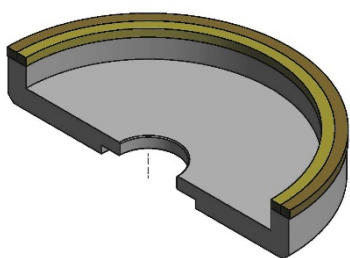
6AA7

D__/__-T__-H__-W__/__-X__-E__-K__
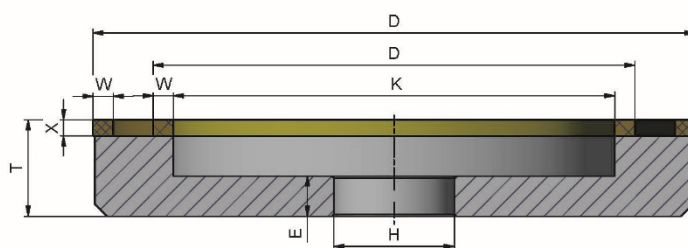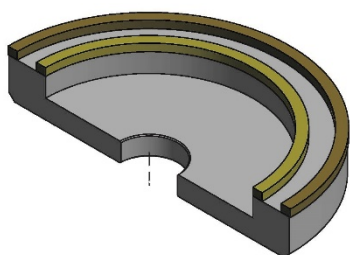
6AAA2 (shape N°1)

D__-T__-H__-W__/__/__-X__-E__-K__
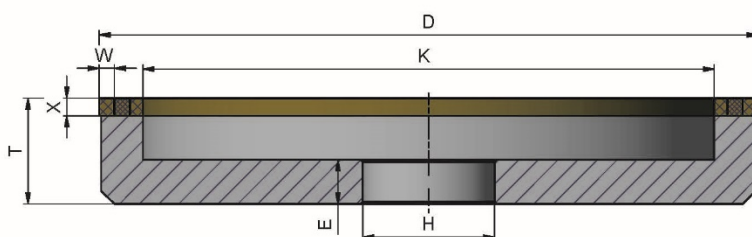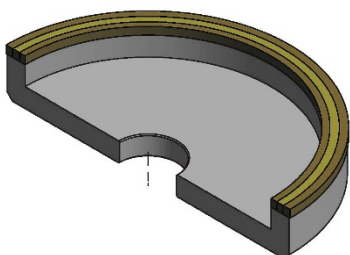
6AAA2 (shape N°2)

D__-T__-H__-W__/__/__-X__-E__-K__ / N°2
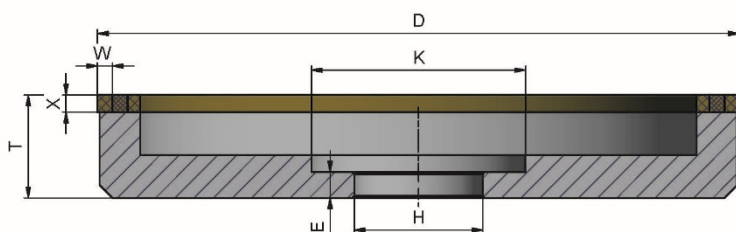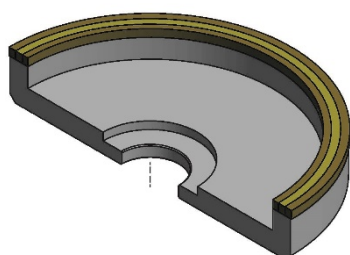
6AAA2 (shape N°3)

D___-T___-H___-W__/__/__-X___-E___-K___ / N°3
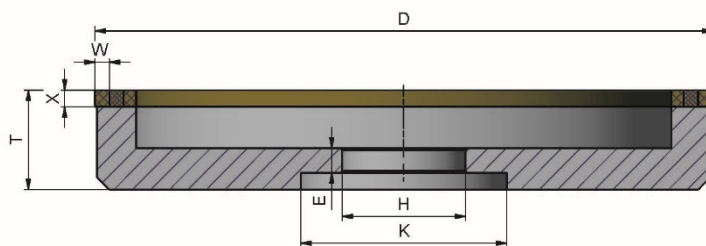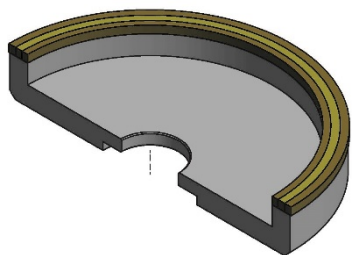
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D__/__-T___-H___-W__/__/__-X___-E___-K___
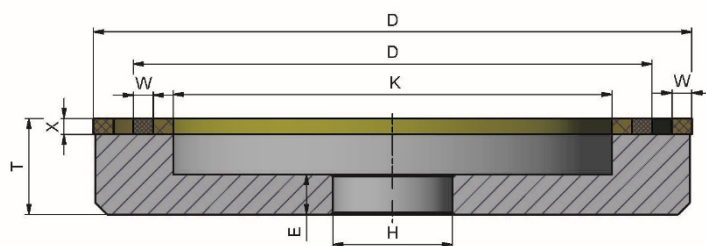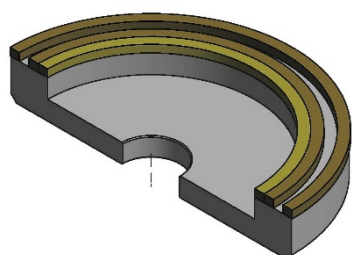
6B2 (shape N°1)

D___-T__-H__-W__-X__-V__-E___-K__
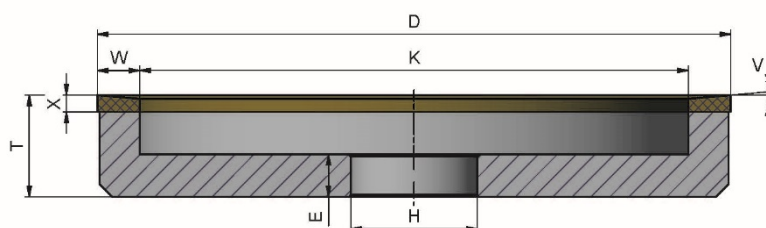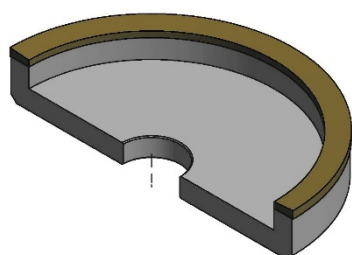
6B2 (shape N°2)

D___-T__-H__-W__-X__-V__-E___-K__ / N°2
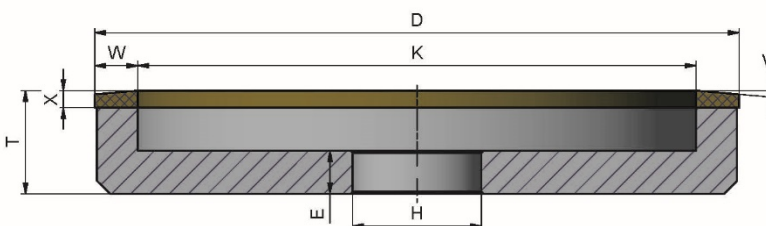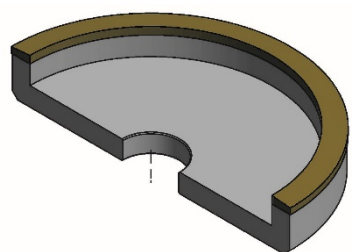
6B9 (shape N°1)

D__-T__-H__-U__-X__-V__-E___-K__
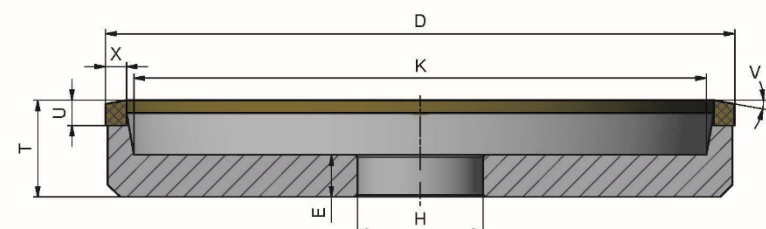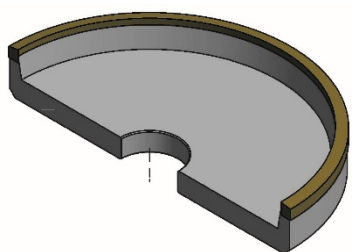
6B9 (shape N°2)

D___-T___-H___-U___-X___-V___-E___-K___ / N°2
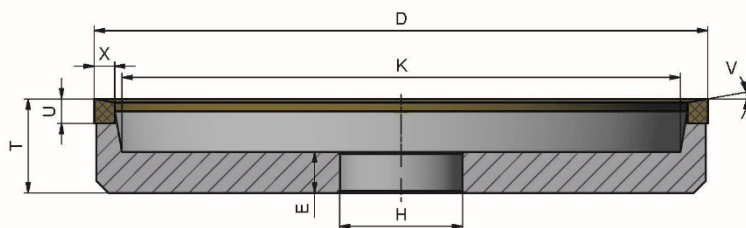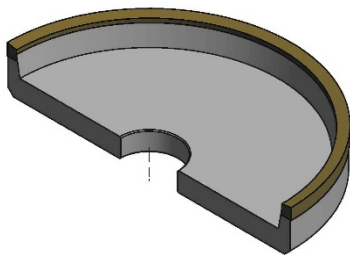
6M9

D___-T___-H___-U___-X___-E___-K___-V___-U1___
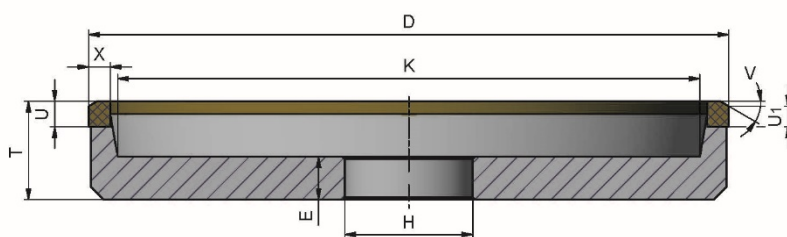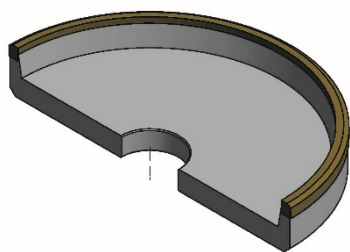
6V5

D___-T___-H___-W___-X___-V___-E___-K___
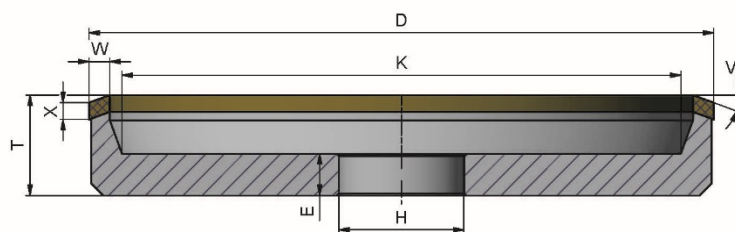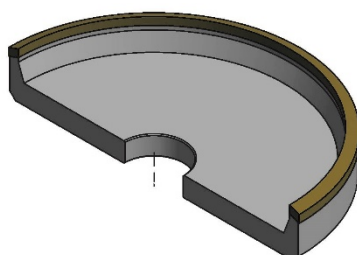
6Y9

D___-T___-H___-U___-X___-E___-K___-V___-U1___
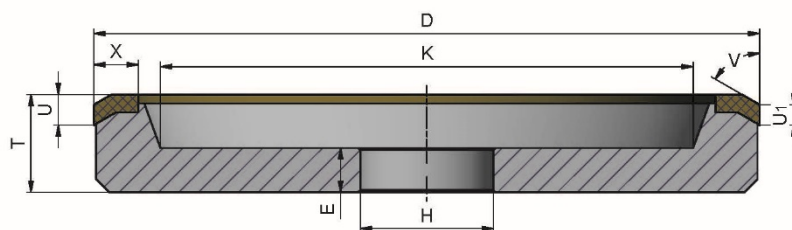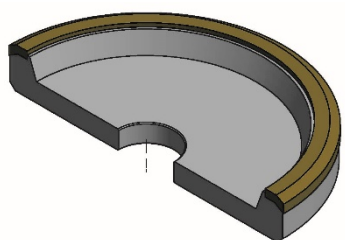
9A3 (shape N°1)

D___-T___-H___-W___-X___-E___
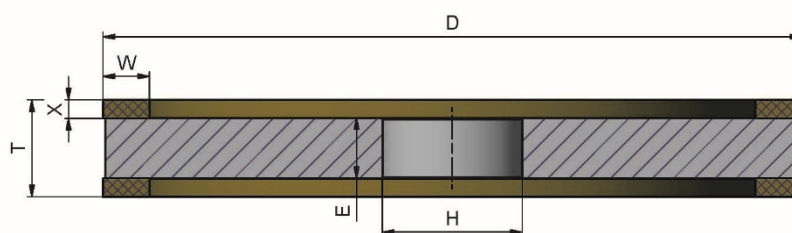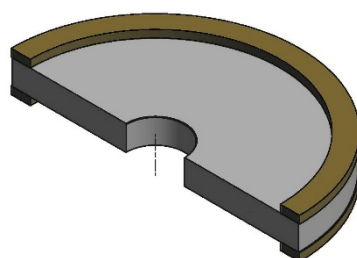
9A3 (shape N°2)

D___-T___-H___-W___-X___-E___-K___ / N°2
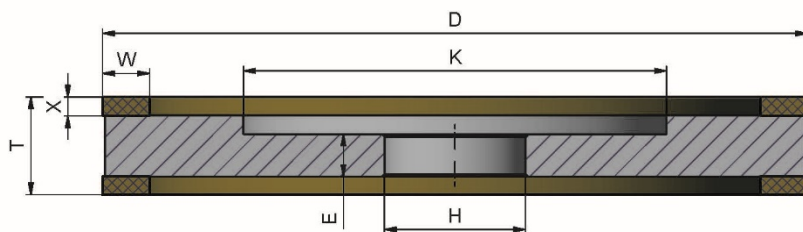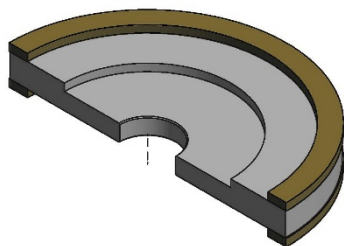
9A3 (shape N°3)

D___-T___-H___-W___-X___-E___-K___ / N°3
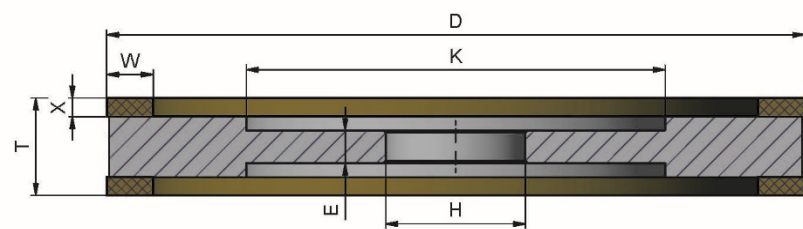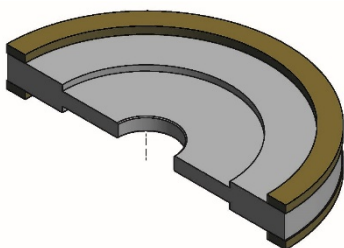
9AA3

D___-T___-H___-W___/___-X___-E___-K___
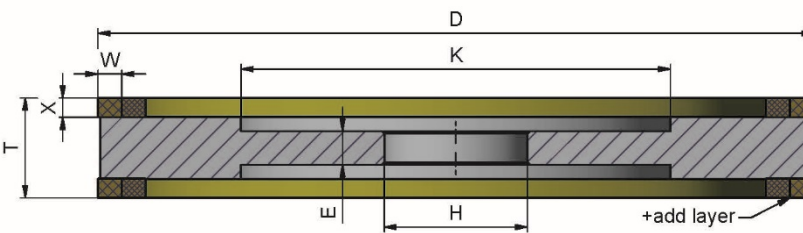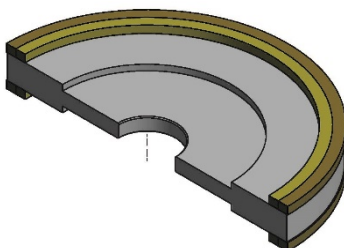
9AAA1

D___-T___-H___-U___-X___-E___-K___
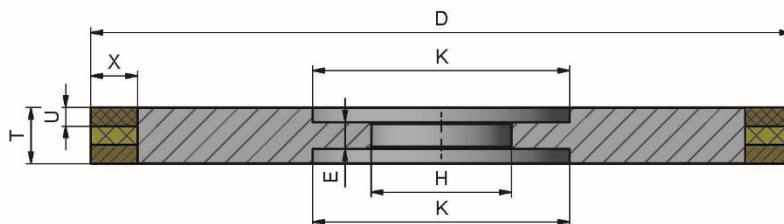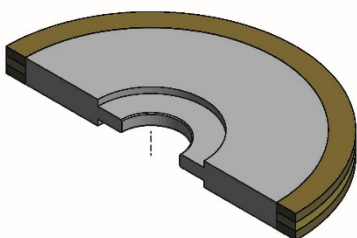
10A2

D___-T___-H___-W___-X___-E___-K___-J___-S___
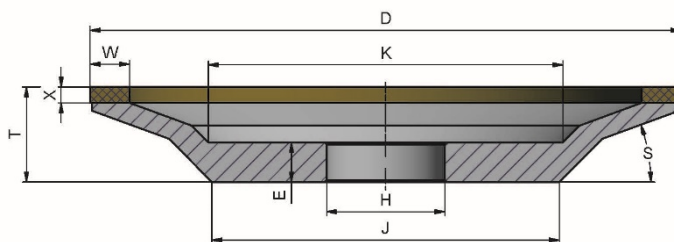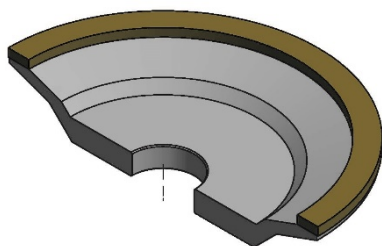
11A1

D___-T___-H___-U___-X___-E___-K___-S___
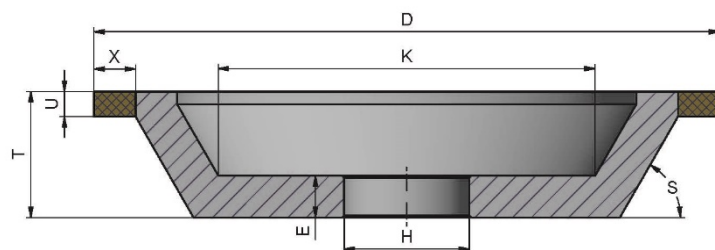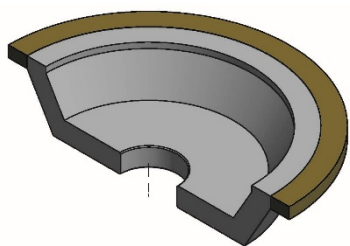
11A2

D___-T___-H___-W___-X___-E___-K___-S___
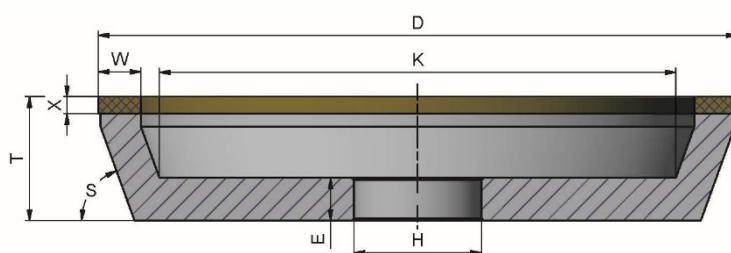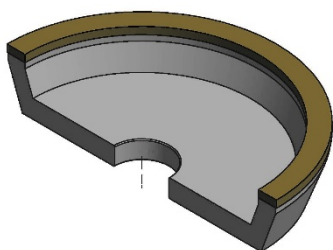
11A2B

D___-T___-H___-W___-X___-E___-K___-S___-BC___
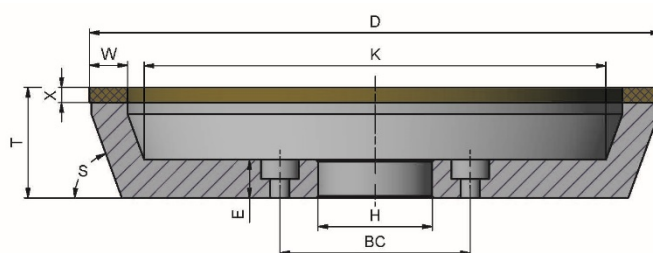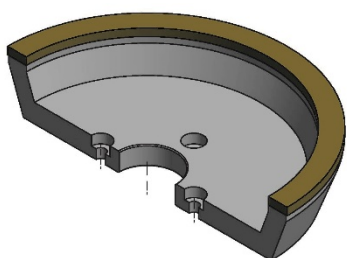
11A2H

D___-T___-H___-W___-X___-E___-K___-S___-BC___
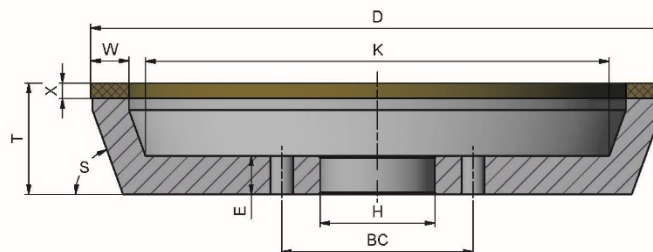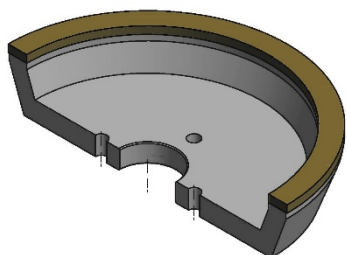
11A9

D___-T___-H___-U___-X___-E___-K___-S___
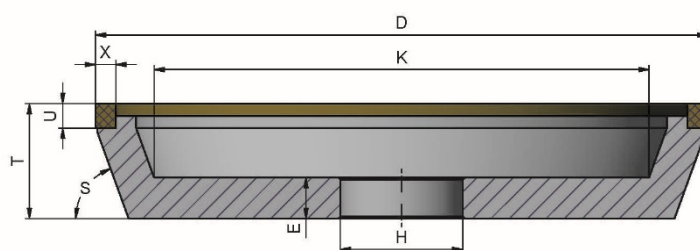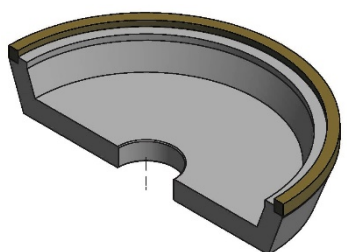
11AA2

D___-T___-H___-W___/___-X___-E___-K___-S___
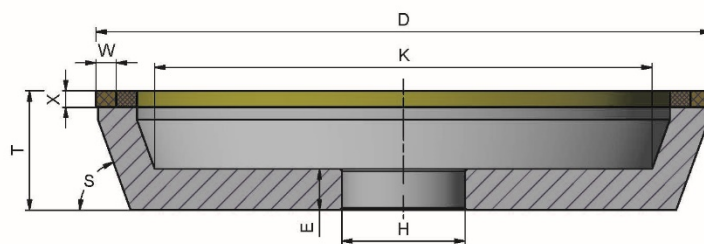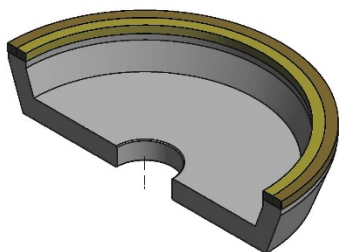
11AA2B

D___-T___-H___-W___/___-X___-E___-K___-S___-BC
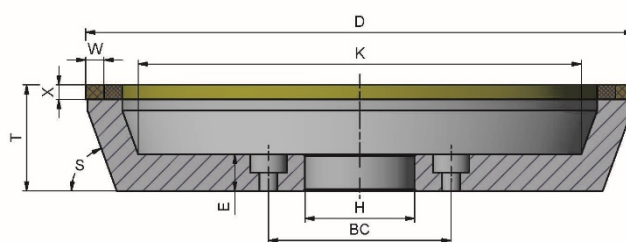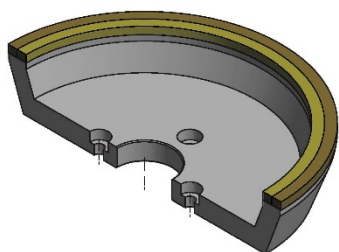
11B2

D___-T___-H___-W___-X___-V___-E___-K___-S___
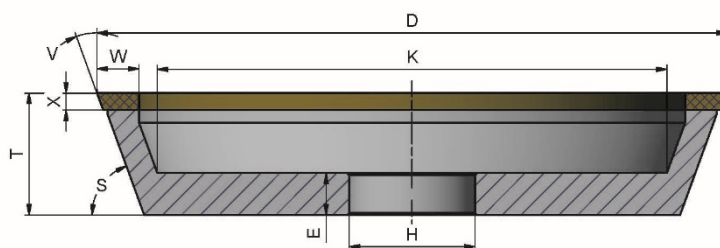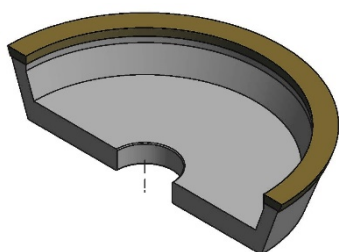
11B2R

D___-T___-H___-W___-X___-V___-E___-K___-S___
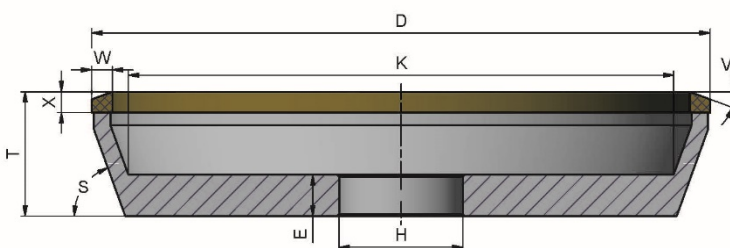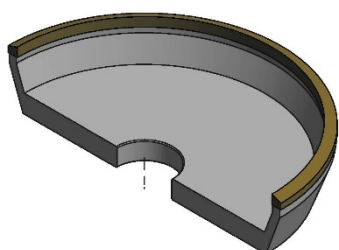
11B9

D___-T___-H___-U___-X___-V___-E___-K___-S___
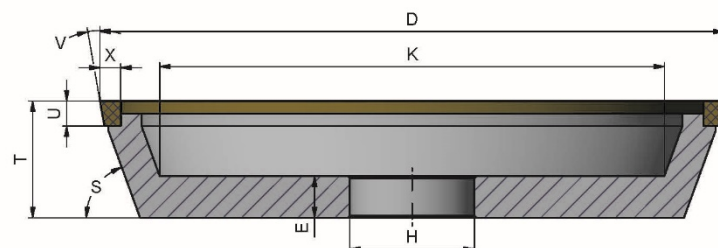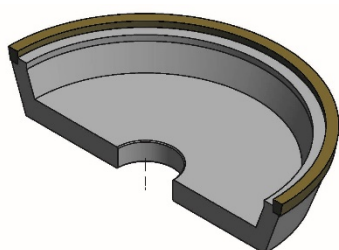
11BT1T

D___-T___-H___-U___-X___-E___-K___-A___-B___-S___-BC___-d___
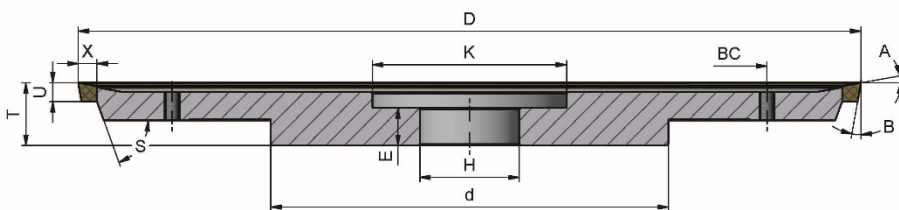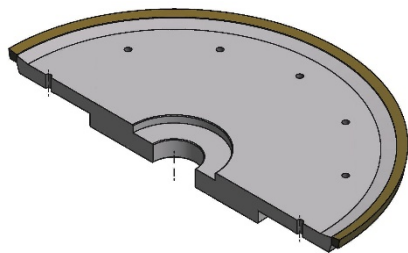
11BT9

D___-T___-H___-U___-X___-E___-K___-A___-B___-S___
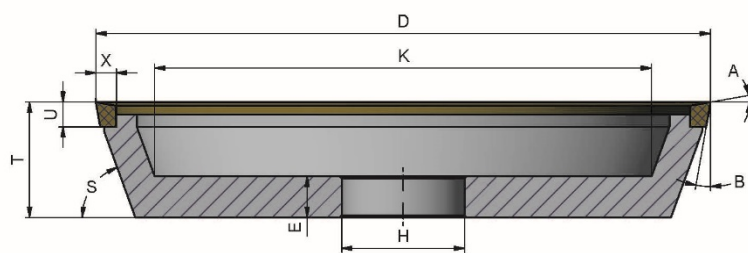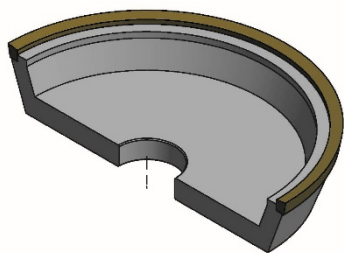
11C9

D___-T___-H___-U___-W___-X___-E___-K___-S___
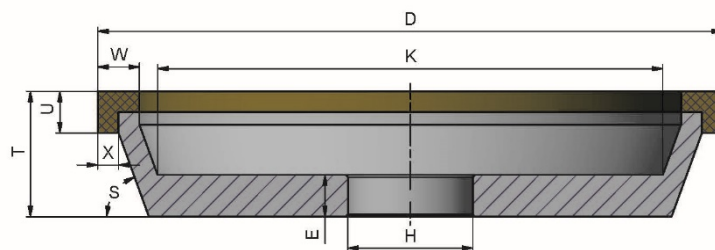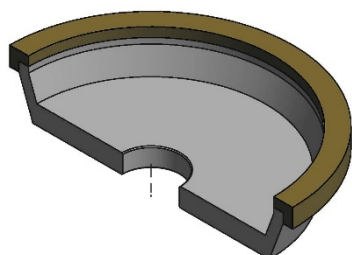
11V5

D___-T___-H___-W___-X___-V___-E___-K___-S___
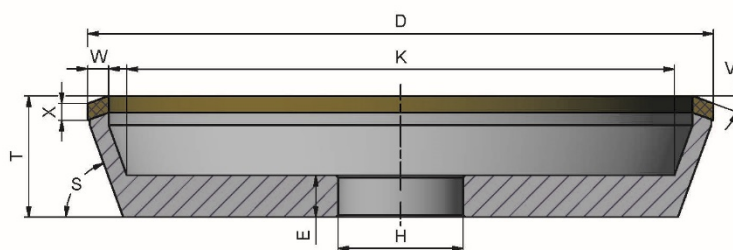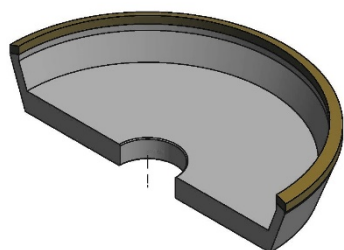
11V5R

D___-T___-H___-W___-X___-V___-E___-K___-S___

11V9

D___-T___-H___-U___-X___-V___-E___-K___

70.00°
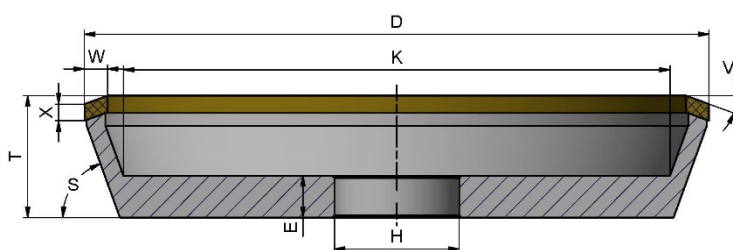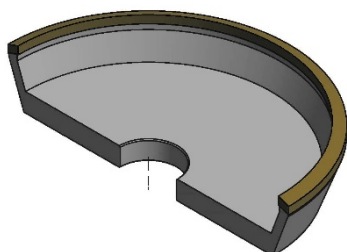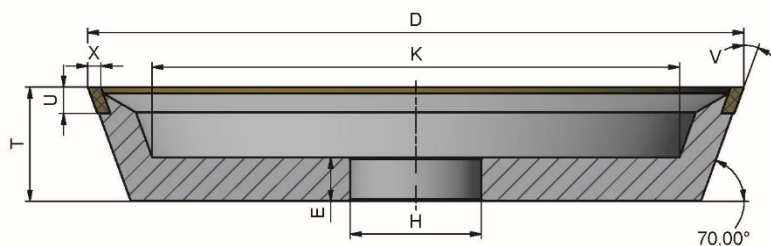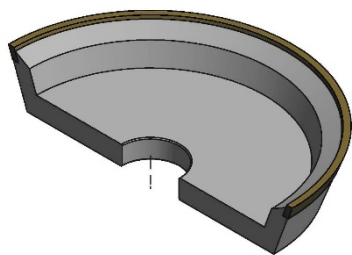
12A1
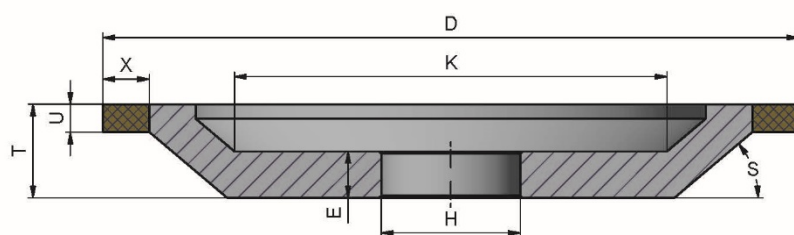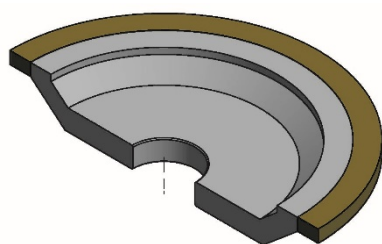
D___-T___-H___-U___-X___-E___-K___-S___

12A2

D___-T___-H___-W___-X___-E___-K___-S___
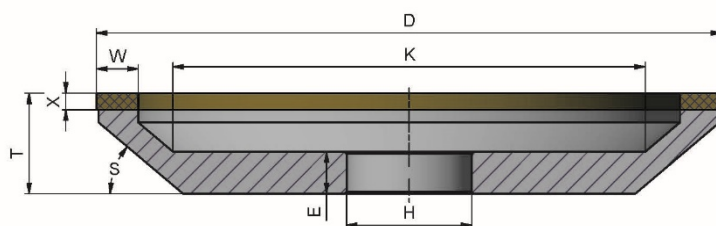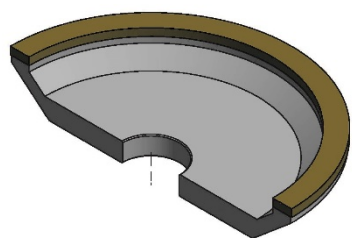
12A9 (shape N°1)

D___-T___-H___-U___-X___-E___-K___-S___
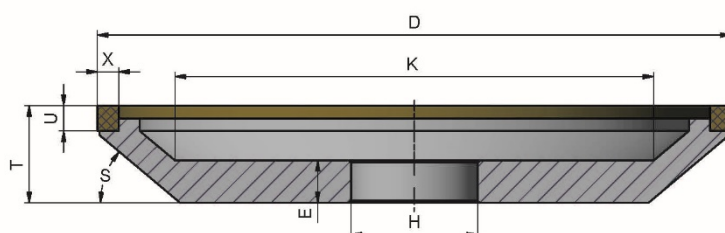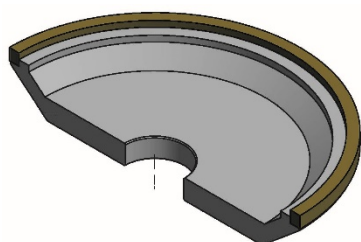
12A9 (shape N°2)

D___-T___-H___-U___-X___-E___-K___-S___ / N°2
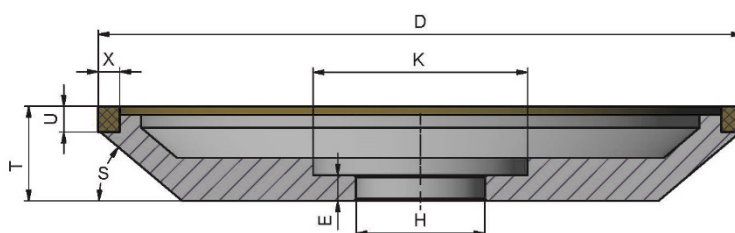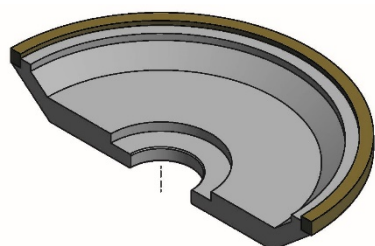
12AA2

D___-T___-H___-W__/___-X___-E___-K___-S__
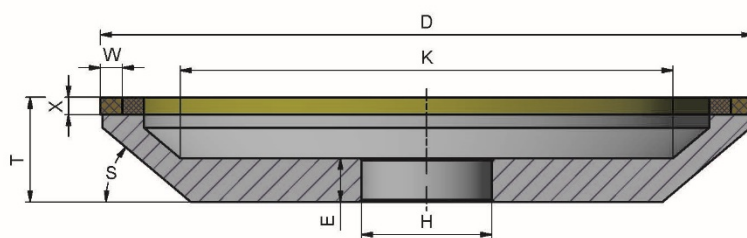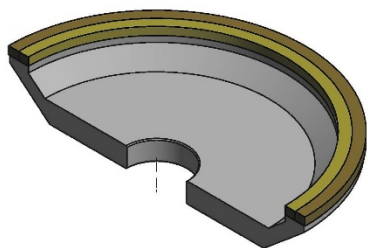
12AA2H

D___-T___-H___-W__/___-X___-E__-K___-S__-BC
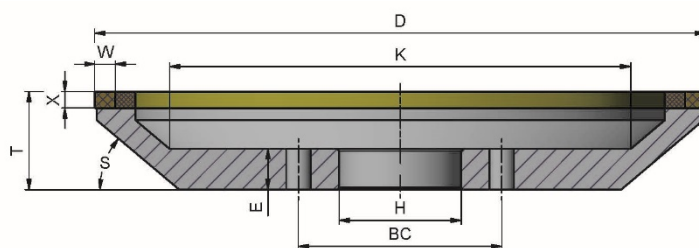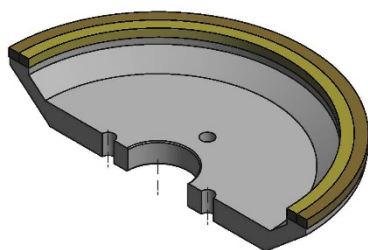
12AA9 (shape N°1)

D___-T___-H___-U__/___-X___-E__-K__-S__
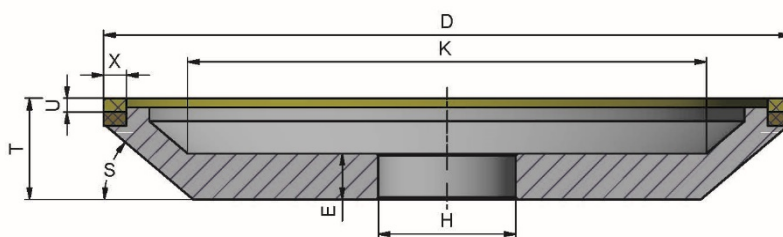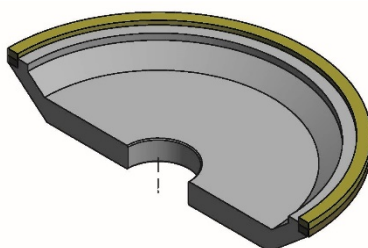
12AA9 (shape N°2)

D___-T__-H___-U__/___-X___-E__-K__-S__ / N°2
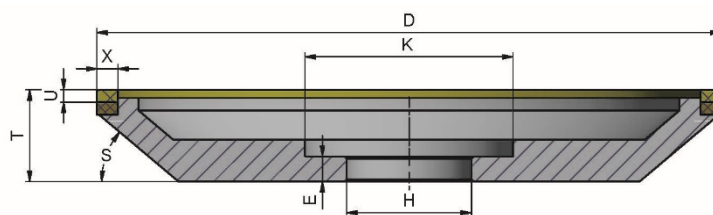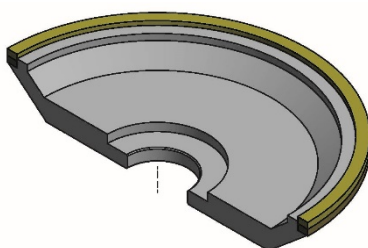
12AAA7H

D__/__-T___-H__-W__/__/___-X__-E__-K__-S__-BC
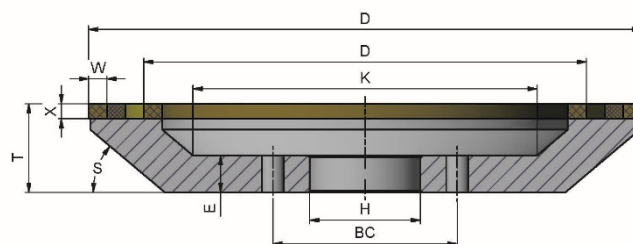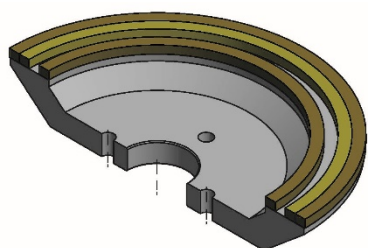
12B1

D__-T__-H__-U__-X__-V__-E__-K__-S__
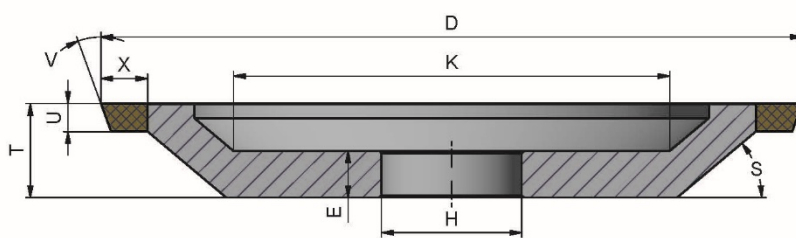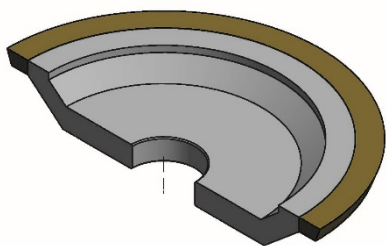
12B2

D__-T__-H__-W__-X__-V__-E__-K__-S__
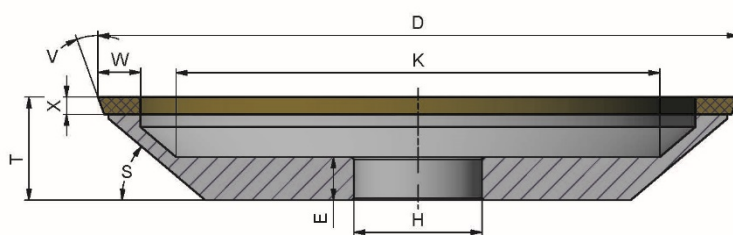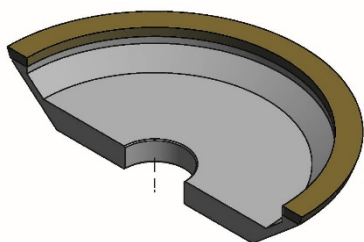
12B9

D__-T__-H__-U__-X__-V__-E__-K__-S__
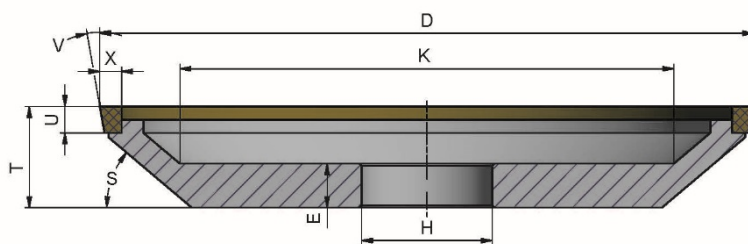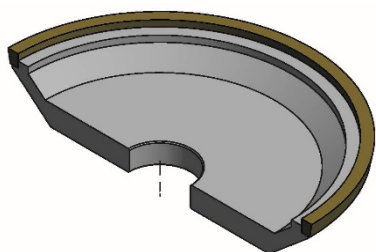
12BT1 (shape N°1)

D__-T__-H__-U__-X__-A__-B__-E__-K__-S__
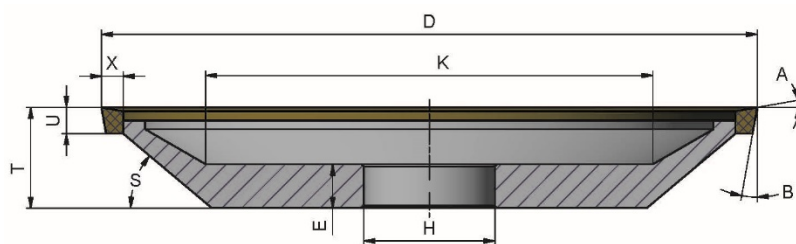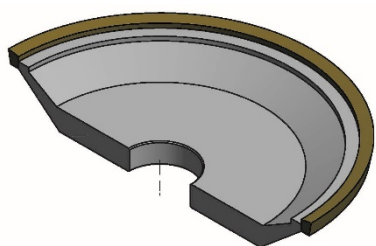
12BT1 (shape N°2)

D__-T__-H__-U__-X__-A__-B__-E__-K__-S__/ N°2
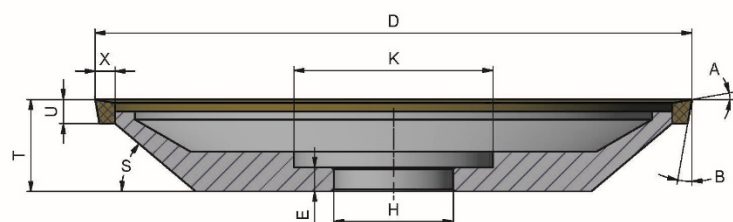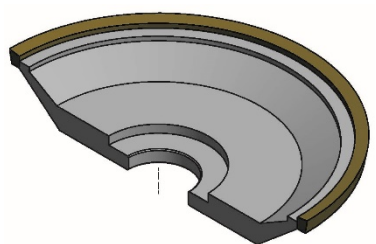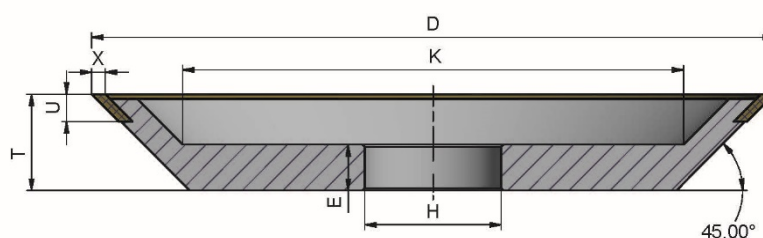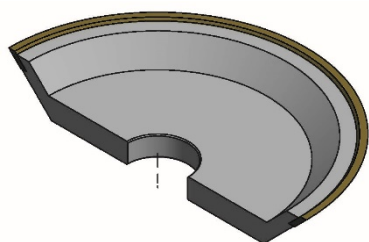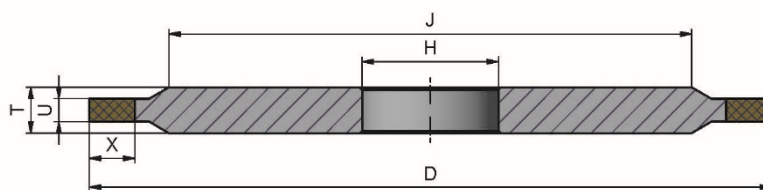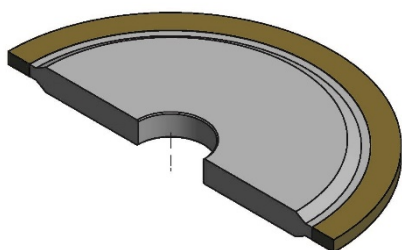
12BT9 (shape N°1)

D___-T___-H___-U___-X___-A___-B___-E___-K___-S___
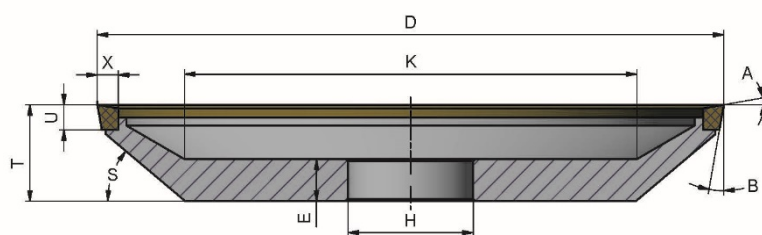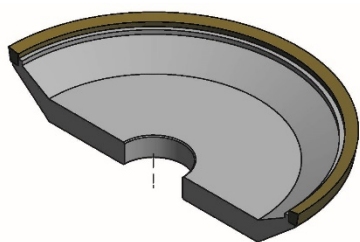
12BT9 (shape N°2)

D___-T___-H___-U___-X___-A___-B___-E___-K___-S___ / N°2
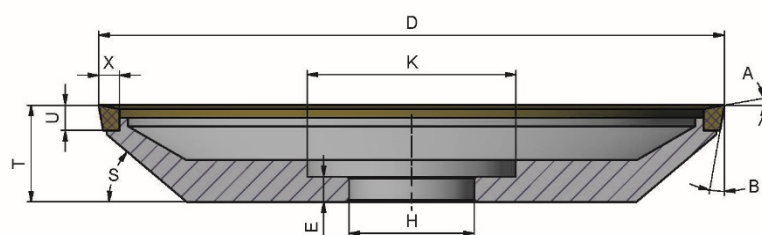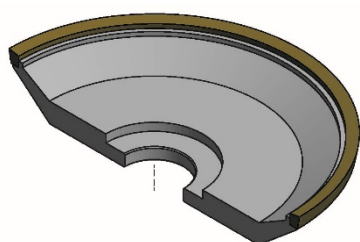
12C9

D___-T___-H___-U___-W___-X___-E___-K___-S___
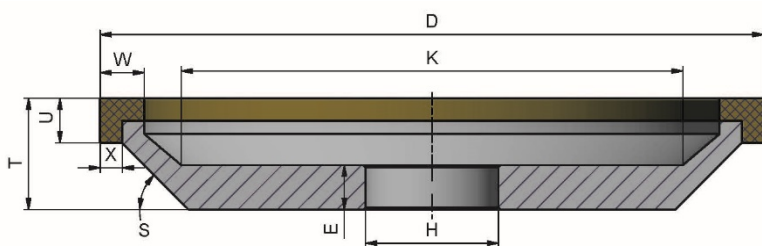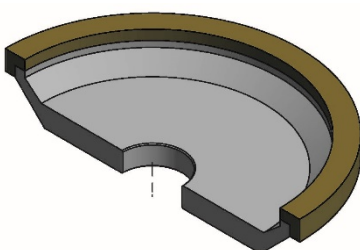
12D9

D___-T___-H___-U___-X___-A___-B___-U1___-E___-K___-S___
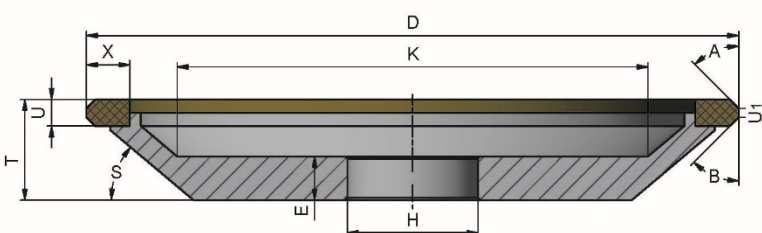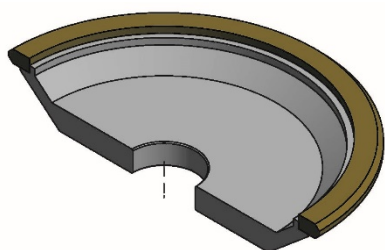
12M9

D___-T___-H___-U___-X___-V___-U1___-E___-K___-S___
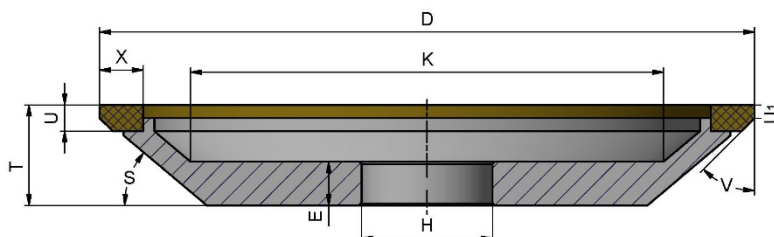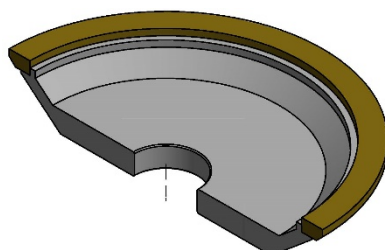
12V5

D___-T___-H___-W___-X___-V___-E___-K___-S___
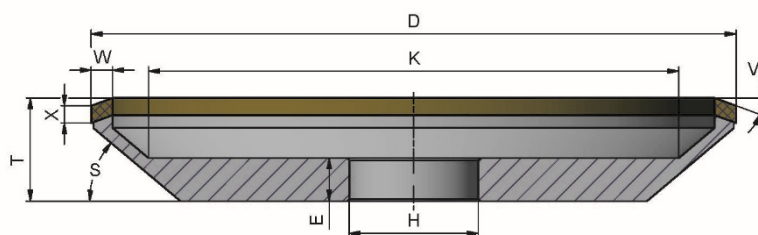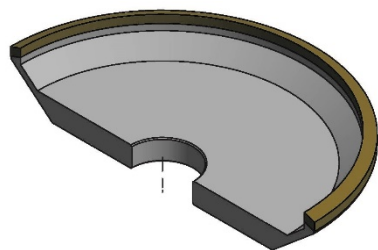
12V9

D___-T___-H___-U___-X___-E___-K___

13V9

D___-T___-H___-U___-X___-V___-E___-K___-J___
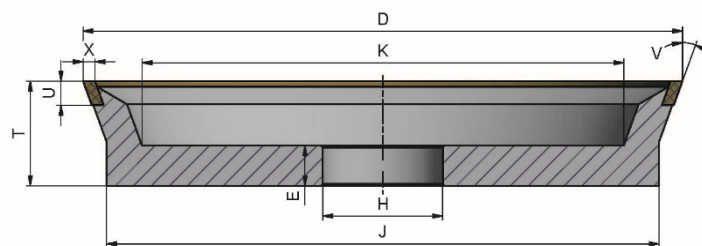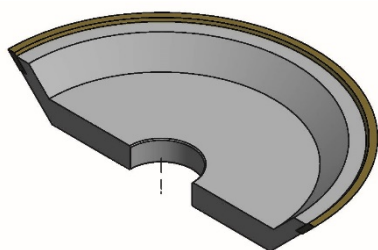
14A1

D___-T___-H___-U___-X___-J___

14A1B

D___-T___-H___-U___-X___-J___-BC___
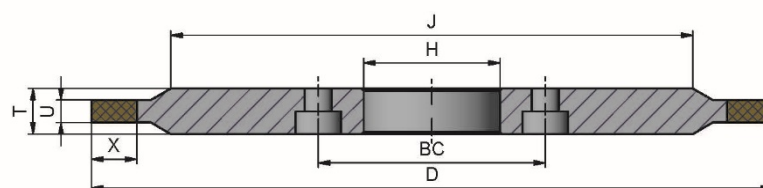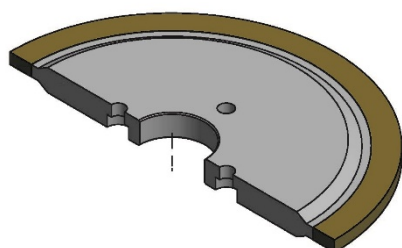
14A1CC

D___-T___-H___-U___-X___-J___-BC___
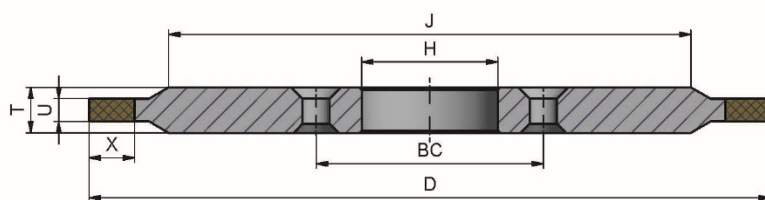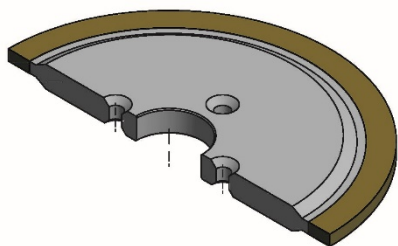
14A1R

D___-T___-H___-U___-X___-J___
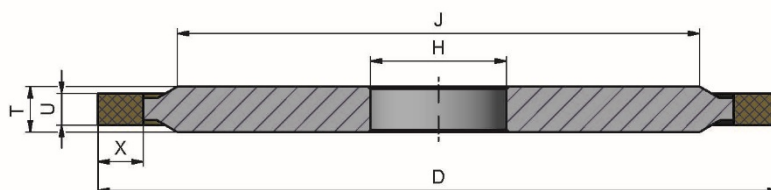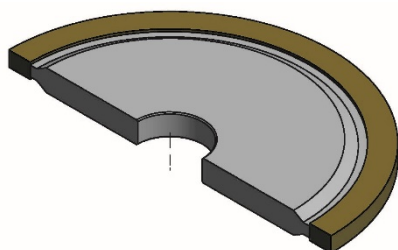
14D1

D___-T___-H___-U___-X___-V___-U1___-J___
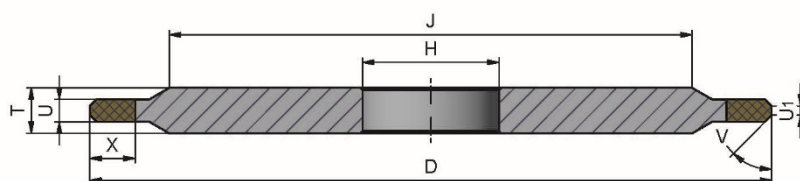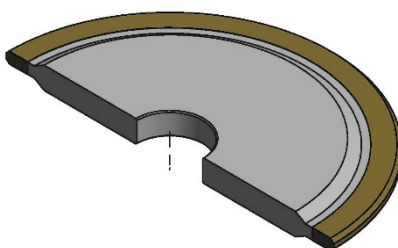
14D1B

D___-T___-H___-U___-X___-V___-U1___-J___-BC___
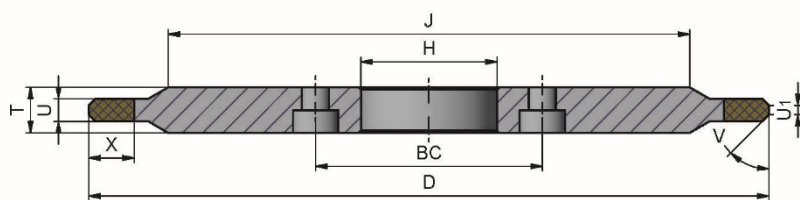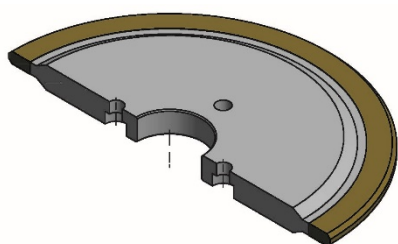
14E1

D___-T___-H___-U___-X___-V___-J___
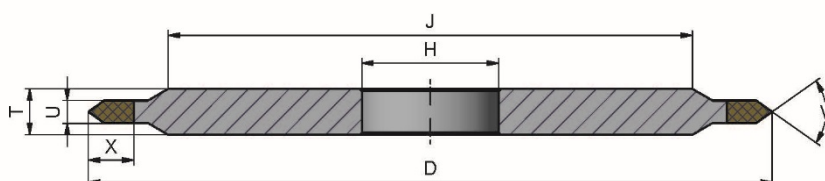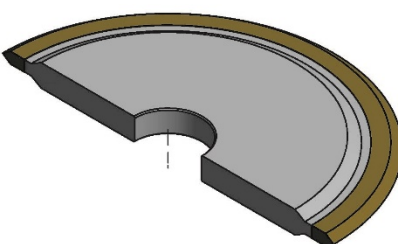
14EF1

D___-T___-H___-U___-X___-V___-R___-J___
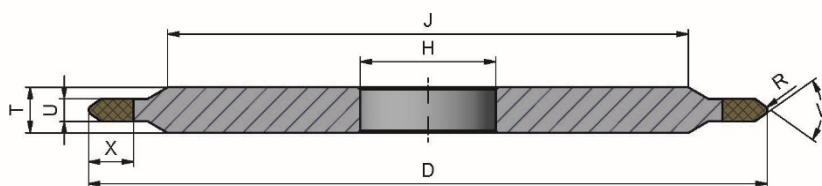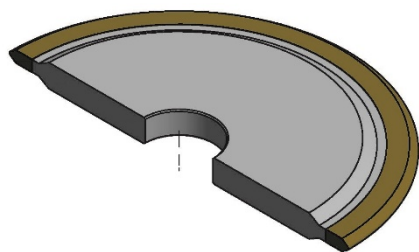
14EF1B

D___-T___-H___-U___-X___-V___-R___-J___-BC___
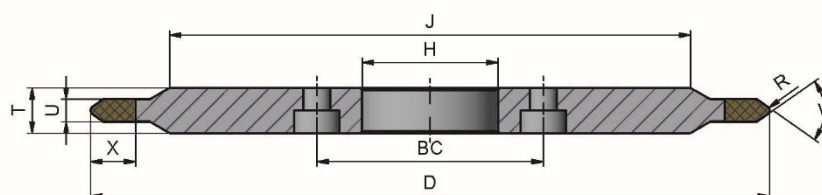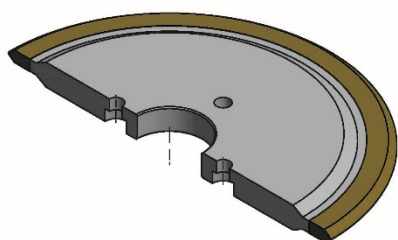
14EF1H

D___-T___-H___-U___-X___-V___-R___-J___-BC___
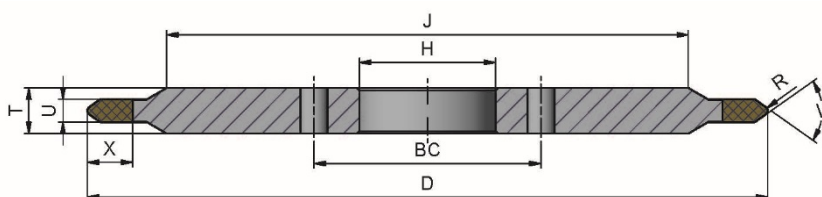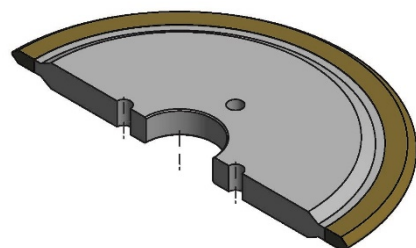
STICK

ARTICLE		A x B x C
A11260	ASA-N°1 → Grite size 46 to 301	13x24x100mm
A11261	ASA-N°2 → Grite size 1 to 40	13x24x100mm
A12848	ASA-N°3 → Grite size 46 to 301	25.4x25.4x152.4mm
A13045	ASA-N°5 → Grite size 1 to 40	25.4x25.4x152.4mm