



VID

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The Synthetic Diamond Technology

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**■ DIAMOND WHEELS FOR GRINDING
OF CIRCULAR SAW BLADES**





2015

Diamond grinding wheels

Resin bonded synthetic diamond grinding surface

About the synthetic diamond

The synthetic diamond originates through the action of high pressure and temperature on the natural graphite. Through various levels of pressure and temperature different degrees of hardness of the synthetic diamond grain are achieved. The requested grit size is then achieved through crushing, grinding, sifting and rinsing.

Diamond is the hardest known material and in the hardness scale it is assigned number 10. Besides its hardness, this material is also exceptional for its good thermal conductivity and resistance to temperatures up to 700C (1292F) and for its resistance to all kinds of chemical effect at standard temperatures.

Table of grain size of the synthetic diamond powder

| FEPA ISO 6106 | Dimension µm | US Standard ASTM E 11 | ČSN 224015 |
|------------------|-----------------|--------------------------|------------|
| D 151 | 150/125 | 100/120 | 160/125 |
| D 126 | 125/106 | 120/140 | 125/100 |
| D 107 | 106/90 | 140/170 | 100/80 |
| D 91 | 90/75 | 170/200 | |
| D 76 | 75/63 | 200/230 | 80/63 |
| D 64 | 63/53 | 230/270 | 63/50 |
| D 54 | 53/45 | 270/325 | 50/40 |
| D 46 | 45/38 | 325/400 | |

Contact for the receipt of orders

Address: VID GlassPartner s.r.o., U nádraží 1297, 511 01 Turnov, Czech Republic

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Charge-free advisory service

Besides suggesting the proper wheel shape and its specific grinding qualities (free of charge), we offer an advisory service as well as a thorough counseling in areas of individual technologic steps and complex technologies according to the needs and demands of our customers.

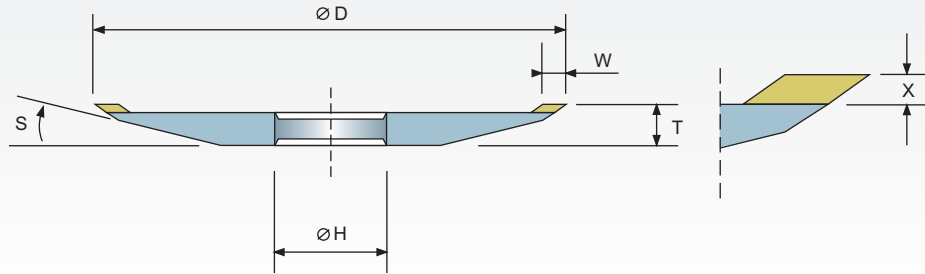
Designing of such technologic steps will be charged after mutual consent and consultation with the sales department.

The charge-free advisory service email account: info@vid-glasspartner.com

1. Diamond wheels for grinding of circular saw blades

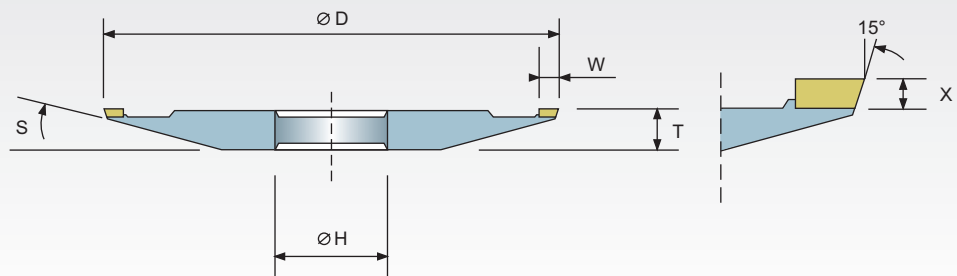


1.1 Diamond wheels for deep grinding of the cutting face of the blades Resin bonded synthetic diamond grinding surface



12V2 (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|------|------|-----|-----------|--------------|---------------|
| | 100 | 4 | 2 | 25 | 10 | 20° | D46 - D64 | DIA600H-W(C) | C125 |
| | 125 | 4 | 2 | 25 | 11 | 20° | | | |
| | 125 | 4 | 2 | 32 | 13 | 20° | | | |
| | 150 | 4 | 2 | 20 | 13 | 20° | | | |
| | 150 | 4 | 2 | 32 | 13 | 20° | | | |



4B9 (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|------|------|-----|-----------|--------------|---------------|
| | 125 | 3 | 1,5 | 32 | 12 | 9° | D46 - D76 | DIA650H-W(A) | C125 |
| | 125 | 3 | 2 | 32 | 12 | 9° | | | |
| | 125 | 3 | 3,8 | 32 | 14 | 15° | | | |
| | 200 | 3 | 1,5 | 32 | 15 | 15° | | | |

1. Diamond wheels for grinding of circular saw blades



1.1 Diamond wheels for deep grinding of the cutting face of the blades

Resin bonded synthetic diamond grinding surface

12V2 (FEPA)

4B9 (FEPA)

For deep wet grinding of the cutting face it is recommended to use two types of bonding: DIA650H-W(A) and DIA600H-W(C).

For grinding of the cutting face of the blades with intensive regimes of grinding, it is recommended to use the bond type DIA650H-W(A), for example in case of wet grinding using emulsion as the coolant at manufacture of the blade with the grinding depth of $t=0.15\text{mm}$ or in case of wet re-sharpening of the blade with the grinding depth of $t=0.15\text{mm}$.

In some cases the intensive regimes of grinding are not necessary. In such cases we recommend to use the bond type DIA600H-W(C), for example for wet re-sharpening of the blade with the grinding depth of $t=0.02-0,05\text{ mm}$.

The wheels of the type 4B9 are mostly used for more intensive regimes of grinding (for ex. in production) than the wheels of the type 12V2. These are mostly used for re-sharpening.

| Bond | Coolant |
|--------------|----------|
| DIA650H-W(A) | emulsion |
| DIA600H-W(C) | oil |

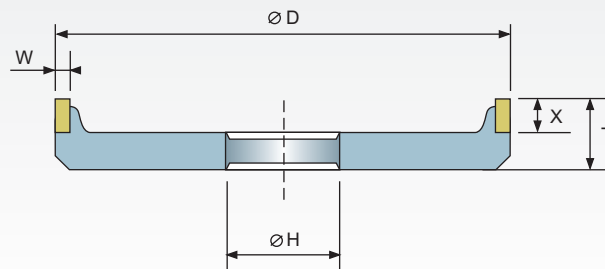


1. Diamond wheels for grinding of circular saw blades



1.2 Diamond wheels for deep grinding of the back side of the blades

Resin bonded synthetic diamond grinding surface



12A9 (FEPA)

Catalogue No.

D
mm

W
mm

X
mm

H
mm

T
mm

S

Grain

Bond

Concentration

125

3

6,5

32

18

-

D54, D64

DIA650H-W

C100

12A9Z (FEPA)

12A9 (FEPA)

For wet grinding of the back side of the blade it is recommended to use the bond type DIA650H-W(A), using emulsion as the coolant.

For deep wet grinding of the ridge of the blade with intensive regimes of grinding, it is recommended to use the bond type DIA650H-W(A), using emulsion as the coolant, for example at production of the blade with the grinding depth of $t=0.4\text{mm}$ and feed speed $s=6\text{mm/s}$ or in case of wet re-sharpening of the blade with the grinding depth of $t=0.2\text{mm}$ and feed speed $s=12\text{mm/s}$.

The use of a finer grain D35 (30-40 μm) instead of the traditionally used D46 on the inner side reduces the roughness of the processed surface by 10-15% while keeping the same lifetime of the wheel.

The use of the wheels with higher concentration C125/C100, which are more expensive but have a longer lifetime, can be in some cases economically more efficient.

The wheels of the type 12A9 with only one size of grain in their diamond layer are recommended for smooth grinding of the back side of the blade (e.g. with the grinding depth of $t=0.01\text{mm}$).

The wheels of the type 12A9Z with two sizes of grain in their diamond layer are, on the contrary, better for use wherever deep grinding is intended.

Bond

DIA650H-W(A)

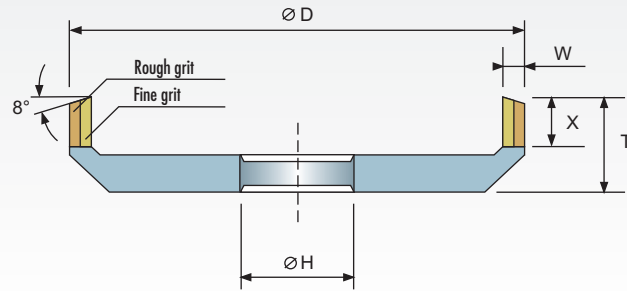
Coolant

emulsion

1. Diamond wheels for grinding of circular saw blades

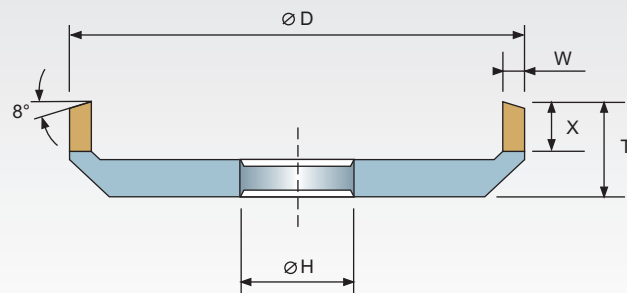


1.2 Diamond wheels for deep grinding of the back side of the blades Resin bonded synthetic diamond grinding surface



12A9Z (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|---------|------|------|------|---|-----------|-----------|---------------|
| | 100 | 2,5-2,5 | 6 | 25 | 20 | - | D126, D46 | DIA650H-W | C100, C75 |
| | | | | | | | D126, D35 | | C100, C75 |
| | | | | | | | D126, D46 | | C125, C100 |
| | 100 | 2,5-2,5 | 10 | 25 | 24 | - | D126, D46 | | C100, C75 |
| | | | | | | | D126, D35 | | C100, C75 |
| | | | | | | | D126, D46 | | C125, C100 |
| | 125 | 2,5-2,5 | 6 | 32 | 18 | - | D126, D46 | DIA650H-W | C100, C75 |
| | | | | | | | D126, D35 | | C100, C75 |
| | | | | | | | D126, D46 | | C125, C100 |
| | 125 | 2,5-2,5 | 10 | 32 | 22 | - | D126, D46 | | C100, C75 |
| | | | | | | | D126, D35 | | C100, C75 |
| | | | | | | | D126, D46 | | C125, C100 |



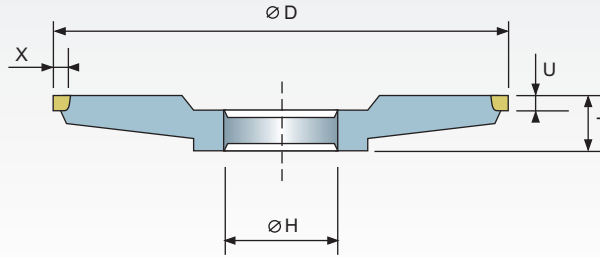
12A9Z (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|------|------|---|-------|-----------|---------------|
| | 125 | 5 | 10 | 32 | 22 | - | D54 | DIA650H-W | C100 |

1. Diamond wheels for grinding of circular saw blades



1.3 Diamond wheels for grinding of the sides of the blades Resin bonded synthetic diamond grinding surface



12B9 (FEPA)

| Catalogue No. | D mm | X mm | U mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|-------|------|---|-------|-----------|---------------|
| | 100 | 4,5 | 2,5 | 20/32 | 14 | - | D64 | DIA610H-W | C75 |
| | | | | | | | D107 | | C60 |
| | | | | | | | D107 | | C75 |
| | | | | | | | D126 | | C75 |
| | 100 | 4,5 | 4 | 20/32 | 14 | - | D64 | DIA610H-W | C75 |
| | | | | | | | D107 | | C60 |
| | | | | | | | D107 | | C75 |

For deep wet grinding of the ridge of the blade it is recommended to use the bond type **DIA610H-W(A/A)** using emulsion as the coolant or bond type **DIA608H-W(A/C)** using oil as the coolant.

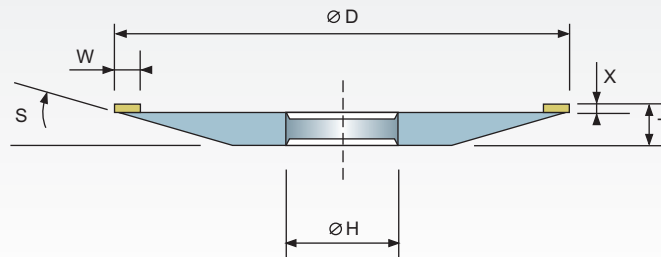
| Bond | Coolant |
|----------------|----------|
| DIA610H-W(A/A) | emulsion |
| DIA608H-W(A/C) | oil |



1. Diamond wheels for grinding of circular saw blades



1.4 Diamond wheels for linear reciprocating motion grinding of the cutting face and of the back side of the blades Resin bonded synthetic diamond grinding surface



4A2 (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|------|------|-----|------------|--|---------------|
| | 125 | 4 | 2 | 20 | 9 | 15° | D46 - D126 | DIA600H-D DIA504M-D DIA650H-W DIA504H-W | C75 |
| | 125 | 4 | 3 | 20 | 10 | 15° | | | |
| | 125 | 4 | 4 | 20 | 11 | 15° | | | |
| | 125 | 5 | 2 | 20 | 9 | 15° | | | |
| | 125 | 5 | 3 | 20 | 10 | 15° | | | |
| | 125 | 5 | 4 | 20 | 11 | 15° | | | |
| | 150 | 4 | 2 | 20 | 11 | 15° | | | |
| | 150 | 4 | 3 | 20 | 12 | 15° | | | |
| | 150 | 4 | 4 | 20 | 13 | 15° | | | |
| | 150 | 5 | 2 | 20 | 11 | 15° | | | |
| | 150 | 5 | 3 | 20 | 12 | 15° | | | |
| | 150 | 5 | 4 | 20 | 13 | 15° | | | |
| | 200 | 4 | 1,5 | 20 | 15 | 15° | | | |
| | 200 | 4 | 3 | 20 | 15 | 15° | | | |

For wet grinding of the sides of the blade, the bond type **DIA610H-W(A)** using emulsion as coolant or the bond type **DIA610H-W(B)** using oil as the coolant is recommended, for example at production of the blades with the grinding depth of $t=0.15\text{mm}$ for each side.

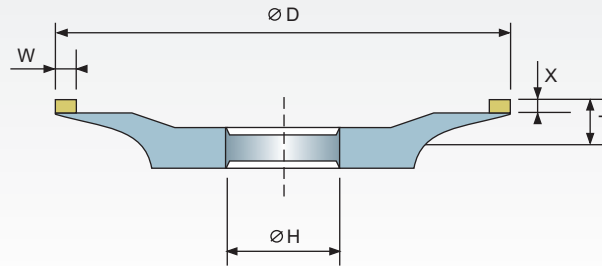
The use of diamond powder with finer grain reduces the roughness of the processed surface, however, it also shortens the lifetime of the wheel.

| Bond | Coolant |
|--------------|----------|
| DIA610H-W(A) | emulsion |
| DIA610H-W(B) | oil |

1. Diamond wheels for grinding of circular saw blades



1.4 Diamond wheels for linear reciprocating motion grinding of the cutting face and of the back side of the blades Resin bonded synthetic diamond grinding surface



13A2 (FEPA)

| Catalogue No. | D mm | W mm | X mm | H mm | T mm | S | Grain | Bond | Concentration |
|---------------|------|------|------|------|------|---|------------|--|---------------|
| | 125 | 5 | 2 | 20 | 23 | - | D46 - D126 | DIA600H-D DIA504M-D DIA650H-W DIA504H-W | C75 |
| | 125 | 5 | 4 | 20 | 23 | - | | | |
| | 150 | 5 | 2 | 20 | 23 | - | | | |
| | 150 | 5 | 4 | 20 | 23 | - | | | |

For the direct two-way motion grinding of the cutting face of the blade and the ridge of the blade on universal lathes, a narrow width of grinding is characteristic. This allows for enhancing of the grinding regimes (e.g. grinding depth = t), as opposed to grinding of the cutting face of the cutter (see 2.1.). For the given operation the following types of bond are recommended: **DIA600H-D(B)** and **DIA504M-D(B)** for dry grinding, and **DIA600H-W(A)** and **DIA504H-W(A)** for wet grinding using emulsion as the coolant.

For dry grinding we recommend the bond type **DIA600H-D(B)** for grinding of narrow surfaces (e.g. b=4mm) and the bond type **DIA504M-D(B)** for grinding of larger surfaces (e.g. b=8mm).

For wet grinding using emulsion as the coolant with more intensive regimes (e.g. for deep grinding) we recommend the bond type **DIA600H-W(A)**, while **DIA504H-W(A)** should be used with less intensive regimes.

| Bond | Coolant |
|---------------------|----------|
| DIA600H-D(B) | x |
| DIA504M-D(B) | x |
| DIA600H-W(A) | emulsion |
| DIA504H-W(A) | emulsion |