

# Notes

This stock programme catalogue contains all standard SAINT-GOBAIN Abrasives diamond and CBN grinding wheels for use on CNC tool grinding machines.

The selection of grinding wheels and their application is dependent on application and software of the machine manufacturer.

Some examples of grinding wheel combinations, mounted as spindle sets, are illustrated on page 3.

Indications on application of each shape are given at the foot of the table in the respective section.

SAINT-GOBAIN Abrasives CNC diamond and CBN grinding wheels are suitable both for grinding with oil and emulsion cutting fluids.

SAINT-GOBAIN Abrasives diamond and CBN grinding wheels are available ex stock, i.e. with a short delivery lead time.

In addition to this specific CNC grinding wheel range, SAINT-GOBAIN Abrasives has further catalogues of stock programmes:

- Grinding tool programme for the wood and plastics working industry (wood-working catalogues)
- Superstandard programme for tool making
- ID grinding catalogue.

If you have further questions on our grinding wheel programme, please contact us.

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Q-Flute<sup>2</sup> 8,9

µmicro 10

14F1 11

6V5/12V5 12

12A2 12

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4A2 13

### CBN grinding wheels for HSS tools

11V9 4

12V9 5

1A1 6

1V1 / 14V1 7

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14F1 11

6V5/12V5 12

12A2 12

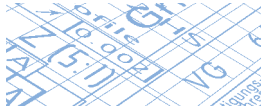
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### Dressing grinding wheel

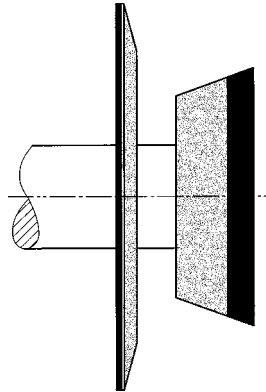
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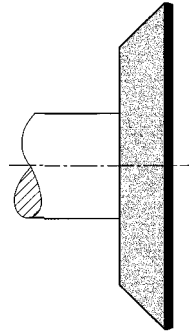




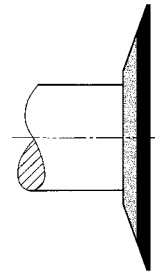
## Examples of possible Grinding Wheel Combinations



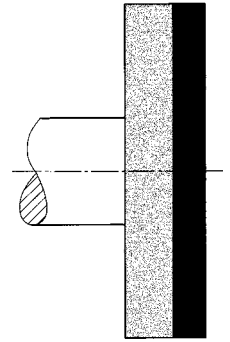
Shape 4A2 11V9



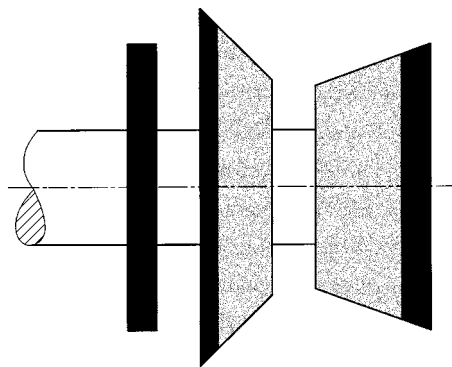
12A2



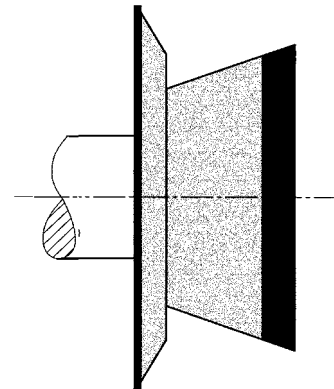
4BT9



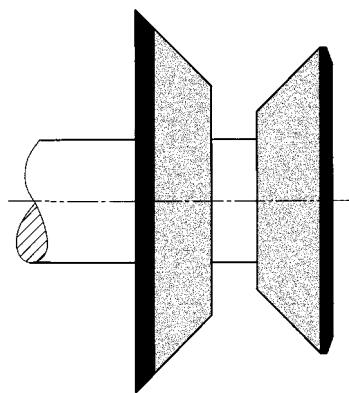
6A9



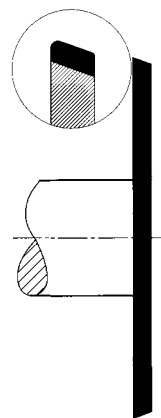
Shape 1A1 12V9 11V9



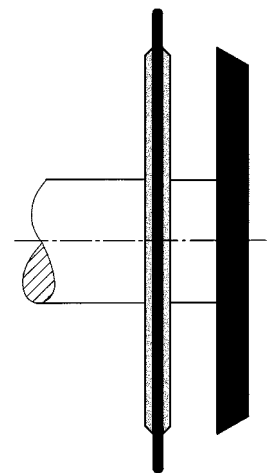
4A9 11V9



Shape 12V9 12V5

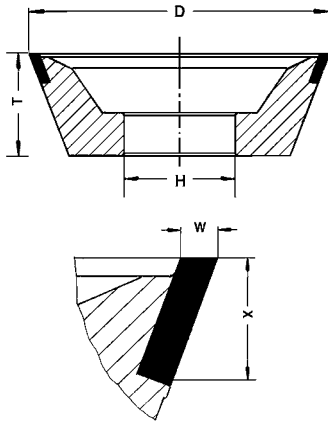


700



14F1 1V1

Grinding wheel  
shape according to  
FEPA **TIV9**



## WINTER

### For carbide tools

| Shape    | - D - W - X - H     | Grit size | Bond          | Concentration | ORDER NO.   | Remarks              |
|----------|---------------------|-----------|---------------|---------------|-------------|----------------------|
| 7K TIV9  | - 75 - 2 - 10 - 20  | D64       | K-plus 1421 R | C100H         | 66260338587 | T = 30               |
|          |                     | D64       | K-plus 1410   | C125H         | 60157685425 | T = 30 <sup>1)</sup> |
| 2K TIV9  | - 75 - 3 - 10 - 20  | D64       | K-plus 1421 R | C100H         | 66260347304 | T = 30               |
| 8K TIV9  | - 100 - 2 - 10 - 20 | D64       | K-plus 1421 R | C100H         | 66260338586 | T = 35               |
|          |                     | D64       | K-plus 1410   | C125H         | 69014163728 | T = 35 <sup>2)</sup> |
|          |                     | D64       | K-plus 980-42 | C125H         | 66260324844 | T = 25               |
|          |                     | D91       | K-plus 921    | C125H         | 66260383968 | T = 35               |
|          |                     | D91       | K-plus 1410   | C125H         | 66260336262 | T = 35 <sup>2)</sup> |
| 10K TIV9 | - 100 - 3 - 10 - 20 | D126      | K-plus 888 R  | C100H         | 66260344473 | T = 35               |
|          |                     | D46       | K-plus 1421 R | C100H         | 66260346530 | T = 35               |
|          |                     | D64       | K-plus 1421 R | C100H         | 66260334264 | T = 35               |
| 11K TIV9 | - 125 - 3 - 10 - 20 | D64       | K-plus 1421 R | C100H         | 66260338584 | T = 40               |

Application depending on software of machine manufacturer:

For grinding 1<sup>st</sup> and 2<sup>nd</sup> relief, periphery, minor cutting edge, full radii and chamfered corners of drills and milling cutters.

<sup>1)</sup> Delivery within four weeks.

<sup>2)</sup> W = 0.8 mm by after-work possibly.

## WINTER

### For carbide tools

| Shape     | - D - W - X - H     | Grit size | Bond        | Concentration | ORDER NO.   | Remarks |
|-----------|---------------------|-----------|-------------|---------------|-------------|---------|
| 2 SP TIV9 | - 75 - 2 - 10 - 20  | D46       | W-plus 3060 | C125H         | 66260118286 | T = 30  |
| 2 SP TIV9 | - 100 - 2 - 10 - 20 | D46       | W-plus 3060 | C125H         | 66260346785 | T = 35  |

Application depending on software of machine manufacturer:

For flute grinding, periphery grinding, relief grinding, radius sharpening.

## WINTER

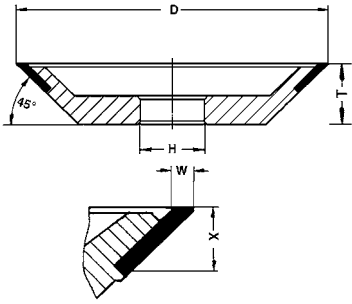
### For HSS tools

| Shape    | - D - W - X - H     | Grit size | Bond       | Concentration | ORDER NO.   | Remarks |
|----------|---------------------|-----------|------------|---------------|-------------|---------|
| 7K TIV9  | - 75 - 2 - 10 - 20  | B107      | KSS 12 N   | V240H         | 66260352681 | T = 30  |
|          |                     | B107      | KSS 980-60 | V240H         | 60157685182 | T = 30  |
| 2K TIV9  | - 75 - 3 - 10 - 20  | B107      | KSS 12 N   | V240H         | 66260352679 | T = 30  |
| 8K TIV9  | - 100 - 2 - 10 - 20 | B107      | KSS 12 N   | V240H         | 66260352678 | T = 35  |
|          |                     | B107      | KSS 980-60 | V240H         | 69014163185 | T = 35  |
|          |                     | B151      | KSS JY-63  | V240H         | 66260128341 | T = 35  |
| 10K TIV9 | - 100 - 3 - 10 - 20 | B107      | KSS 12 N   | V240H         | 66260352675 | T = 30  |
| 11K TIV9 | - 125 - 3 - 10 - 20 | B107      | KSS 12 N   | V240H         | 66260352674 | T = 40  |

Application depending on software of machine manufacturer:

For grinding 1<sup>st</sup> and 2<sup>nd</sup> relief, periphery, minor cutting edge, full radii and chamfered corners of drills and milling cutters.

Grinding wheel  
shape according to  
FEPA **12V9**



## WINTER

### For carbide tools

| Shape   | D   | W | X  | H  | Grit size | Bond          | Concentration | ORDER NO.   | Remarks              |
|---------|-----|---|----|----|-----------|---------------|---------------|-------------|----------------------|
| 2K 12V9 | 50  | 2 | 6  | 20 | D64       | K-plus 1421 R | C100A         | 66260128817 | T = 19               |
| 3K 12V9 | 75  | 2 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260338583 | T = 20               |
| 2K 12V9 | 75  | 3 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260352673 | T = 20               |
| 6K 12V9 | 100 | 2 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260344811 | T = 20               |
|         |     |   |    |    | D64       | K-plus 1410   | C125H         | 69014163229 | T = 20               |
| 3K 12V9 | 100 | 3 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260339437 | T = 20               |
|         |     |   |    |    | D126      | K-plus 888 R  | C100H         | 66260128545 | T = 20               |
| 9K 12V9 | 125 | 2 | 10 | 20 | D64       | K-plus 1410   | C125H         | 69014182731 | T = 25               |
|         |     |   |    |    | D91       | K-plus 921    | C125H         | 66260383462 | T = 25               |
|         |     |   |    |    | D64       | K-plus 980-42 | C125H         | 60157672850 | T = 25               |
|         |     |   |    |    | D91       | K-plus 1410   | C125H         | 66260340845 | T = 20               |
| 5K 12V9 | 125 | 3 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260334260 | T = 25 <sup>1)</sup> |
| 5K 12V9 | 150 | 3 | 10 | 20 | D64       | K-plus 1421 R | C100H         | 66260117874 | T = 25               |

<sup>2)</sup> W = 0.8 mm by after-work possibly.

### For carbide tools

| Shape     | D   | W | X | H  | Grit size | Bond        | Concentration | ORDER NO.   | Remarks |
|-----------|-----|---|---|----|-----------|-------------|---------------|-------------|---------|
| SP 12V9   | 100 | 2 | 6 | 20 | D46       | W-plus 3060 | C125H         | 66260348949 | T = 20  |
| 2 SP 12V9 | 125 | 2 | 6 | 20 | D46       | W-plus 3060 | C125H         | 66260350500 | T = 20  |

Application depending on software of machine manufacturer:  
For flute grinding, periphery grinding, relief grinding, radius sharpening.

## WINTER

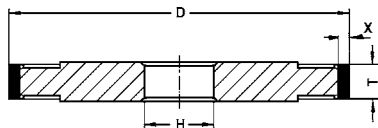
### For HSS tools

| Shape   | D   | W | X  | H  | Grit size | Bond       | Concentration | ORDER NO.   | Remarks              |
|---------|-----|---|----|----|-----------|------------|---------------|-------------|----------------------|
| 3K 12V9 | 75  | 2 | 10 | 20 | B107      | KSS 12 N   | V240H         | 66260352670 | T = 20               |
| 6K 12V9 | 100 | 2 | 10 | 20 | B107      | KSS 12 N   | V240H         | 66260352669 | T = 20               |
|         |     |   |    |    | B107      | KSS 980-60 | V240H         | 60157685426 | T = 20               |
| 9K 12V9 | 125 | 2 | 10 | 20 | B107      | KSS 980-60 | V240H         | 60157685183 | T = 25               |
| 1K 12V9 | 100 | 3 | 15 | 20 | B107      | KSS 12 N   | V240H         | 66260352668 | T = 20               |
|         |     |   |    |    | B151      | KSS JY-77  | V240H         | 60157642984 | T = 20               |
| 6K 12V9 | 125 | 3 | 15 | 20 | B107      | KSS 12 N   | V240H         | 66260352667 | T = 25               |
|         |     |   |    |    | B151      | KSS JY-77  | V240H         | 66260128064 | T = 25               |
| 5K 12V9 | 125 | 3 | 10 | 20 | B107      | KSS 12 N   | V240H         | 66260354629 | T = 25               |
| 5K 12V9 | 150 | 3 | 10 | 20 | B107      | KSS 12 N   | V240H         | 66260128353 | T = 25 <sup>1)</sup> |

Application depending on software of machine manufacturer:  
For grinding relief, ball shapes of end mills, relief grinding of minor cutting edge, grinding 1<sup>st</sup> and 2<sup>nd</sup> relief.

<sup>1)</sup> Delivery within four weeks.

Grinding wheel  
shape according to  
FEPA **1A1**



## WINTER

### For carbide tools

| Shape | - D - T - X - H      | Grit size | Bond          | Concentration | ORDER NO.   | Remarks |
|-------|----------------------|-----------|---------------|---------------|-------------|---------|
| K 1A1 | - 75 - 3 - 5 - 20    | D46       | K-plus 920    | C100A         | 60157643388 |         |
| K 1A1 | - 75 - 10 - 5 - 20   | D64       | K-plus 1421 R | C100H         | 66260339426 |         |
| K 1A1 | - 100 - 10 - 5 - 20  | D64       | K-plus 1421 R | C100H         | 66260339422 |         |
| K 1A1 | - 100 - 10 - 5 - 20  | D91       | K-plus 1421 J | C75A          | 66260356902 |         |
| K 1A1 | - 100 - 12 - 5 - 20  | D64       | K-plus 1421 R | C100H         | 66260347629 |         |
| K 1A1 | - 100 - 15 - 5 - 20  | D64       | K-plus 1421 R | C100H         | 66260339419 |         |
| K 1A1 | - 100 - 15 - 5 - 20  | D91       | K-plus 1421 J | C75A          | 66260355621 |         |
| K14A1 | - 125 - 5 - 5 - 20   | D54       | K-plus 4821   | C100A         | 60157643037 |         |
| K 1A1 | - 125 - 5 - 10 - 20  | D64       | K-plus 1421 R | C100A         | 66260350079 |         |
| K 1A1 | - 125 - 5 - 15 - 20  | D126      | K-plus 921    | C100A         | 66260131770 |         |
| K 1A1 | - 125 - 6 - 15 - 20  | D64       | K-plus 921    | C100A         | 66260132044 |         |
| K 1A1 | - 125 - 8 - 15 - 20  | D64       | K-plus 921    | C100A         | 66260131843 |         |
| K 1A1 | - 125 - 8 - 15 - 20  | D126      | K-plus 921    | C125A         | 66260130889 |         |
| K 1A1 | - 125 - 10 - 10 - 20 | D64       | K-plus 1421 R | C100A         | 66260341750 |         |
| K 1A1 | - 125 - 10 - 15 - 20 | D64       | K-plus 921    | C100A         | 66260374178 |         |
| K 1A1 | - 125 - 12 - 10 - 20 | D64       | K-plus 1421 R | C100A         | 66260352659 |         |
| K 1A1 | - 125 - 16 - 10 - 20 | D64       | K-plus 1421 J | C100A         | 66260351497 |         |
| K 1A1 | - 150 - 12 - 10 - 20 | D64       | K-plus 1421 R | C100A         | 66260352657 |         |

Application depending on software of machine manufacturer:  
For flute grinding, periphery grinding, relief grinding, radius sharpening.

## WINTER

### For carbide tools

| Shape    | - D - T - X - H      | Grit size | Bond        | Concentration | ORDER NO.   | Remarks |
|----------|----------------------|-----------|-------------|---------------|-------------|---------|
| 1 SP 1A1 | - 100 - 6 - 5 - 20   | D46       | W-plus 3060 | C125A         | 66260134471 |         |
| 1 SP 1A1 | - 100 - 8 - 10 - 20  | D46       | W-plus 3060 | C125A         | 66260134472 |         |
| 1 SP 1A1 | - 100 - 10 - 15 - 20 | D46       | W-plus 3060 | C125A         | 60157643656 |         |
| 1 SP 1A1 | - 125 - 10 - 10 - 20 | D46       | W-plus 3060 | C125A         | 66260112833 |         |

Application depending on software of machine manufacturer:  
For flute grinding, periphery grinding, relief grinding, radius sharpening.

## WINTER

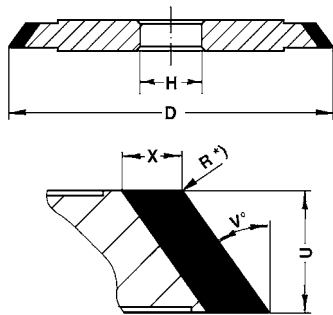
### For HSS tools

| Shape | - D - T - X - H     | Grit size | Bond     | Concentration | ORDER NO.   | Remarks |
|-------|---------------------|-----------|----------|---------------|-------------|---------|
| K 1A1 | - 75 - 10 - 5 - 20  | B107      | KSS 12 N | V240H         | 66260352656 | )       |
| K 1A1 | - 100 - 10 - 5 - 20 | B107      | KSS 12 N | V240H         | 66260352654 |         |
| K 1A1 | - 100 - 15 - 5 - 20 | B107      | KSS 12 N | V240H         | 66260347909 |         |
| K 1A1 | - 125 - 6 - 5 - 20  | B107      | KSS 12 N | V240A         | 66260118167 | )       |
| K 1A1 | - 125 - 10 - 5 - 20 | B107      | KSS 12 N | V240A         | 66260352653 |         |
| K 1A1 | - 150 - 12 - 5 - 20 | B107      | KSS 12 N | V240A         | 66260352652 |         |

Application depending on software of machine manufacturer:  
For flute grinding, periphery grinding, relief grinding, radius sharpening.

) Delivery within four weeks.

## Grinding wheel shape according to FEPA **1V1 / 14V1**



\*) Radius nur bei extra gekennzeichneten Ausführungen, siehe Bemerkung

## WINTER

### For carbide tools

| Shape   | - D   | - U  | - X | - V° | - H  | Grit size | Bond         | Concentration | ORDER NO.   | Remarks                    |
|---------|-------|------|-----|------|------|-----------|--------------|---------------|-------------|----------------------------|
| 1K 1V1  | - 75  | - 10 | - 5 | - 10 | - 20 | D64       | K-plus1421 R | C100H         | 66260339433 |                            |
| 1K 1V1  | - 100 | - 10 | - 5 | - 10 | - 20 | D64       | K-plus1421 R | C100H         | 66260339432 |                            |
| 1K 1V1  | - 100 | - 15 | - 5 | - 10 | - 20 | D64       | K-plus1421 R | C100H         | 66260339431 | 1)                         |
| K 1V1   | - 100 | - 15 | - 5 | - 20 | - 20 | D64       | K-plus1421 R | C100H         | 66260347907 |                            |
| K 1V1   | - 100 | - 15 | - 5 | - 30 | - 20 | D64       | K-plus1421 R | C100H         | 66260342813 |                            |
| K 1V1   | - 100 | - 15 | - 5 | - 45 | - 20 | D64       | K-plus1421 R | C100H         | 66260352665 |                            |
| 1K 14V1 | - 125 | - 4  | - 6 | - 45 | - 20 | D64       | K-plus921    | C100A         | 66260352637 |                            |
| 1K 1V1  | - 125 | - 6  | - 5 | - 20 | - 20 | D64       | K-plus1421 R | C100A         | 66260117593 | Hertel SE-Drill R = 0,2 1) |
| 1K 1V1  | - 125 | - 10 | - 5 | - 10 | - 20 | D64       | K-plus1421 R | C100A         | 66260352633 |                            |
| 3K 1V1  | - 125 | - 10 | - 5 | - 20 | - 20 | D64       | K-plus1421 R | C100A         | 66260346267 | Hertel SE-Drill R = 0,5    |
| 1K 1V1  | - 125 | - 10 | - 5 | - 30 | - 20 | D64       | K-plus1421 R | C100A         | 66260115545 |                            |
| 1K 1V1  | - 125 | - 10 | - 5 | - 45 | - 20 | D64       | K-plus1421 R | C100A         | 66260352664 |                            |
| 1K 1V1  | - 125 | - 15 | - 5 | - 10 | - 20 | D64       | K-plus1421 R | C100A         | 66260352641 |                            |
| 1K 1V1  | - 125 | - 15 | - 5 | - 20 | - 20 | D64       | K-plus1421 R | C100A         | 66260345983 | Hertel SE-Drill R = 0,9    |
| K 1V1   | - 125 | - 15 | - 5 | - 30 | - 20 | D64       | K-plus1421 R | C100A         | 66260352640 | 1)                         |
| K 1V1   | - 125 | - 15 | - 5 | - 45 | - 20 | D64       | K-plus1421 R | C100A         | 66260352639 |                            |
| 1K 14V1 | - 150 | - 4  | - 5 | - 45 | - 20 | D91       | K-plus921    | C100A         | 66260131709 | 1)                         |
| K 1V1   | - 150 | - 12 | - 5 | - 15 | - 20 | D64       | K-plus1421 R | C100A         | 66260119886 | 1)                         |

Application depending on software of machine manufacturer: For flute grinding, end and end relief thinning, drill sharpening (in some cases Hertel SE drill).

1) Delivery within four weeks.

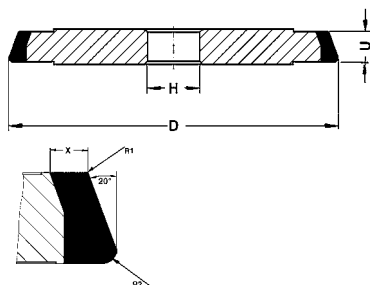
### For HSS tools

| Shape   | - D   | - U  | - X | - V° | - H  | Grit size | Bond     | Concentration | ORDER NO.   | Remarks |
|---------|-------|------|-----|------|------|-----------|----------|---------------|-------------|---------|
| 1K 1V1  | - 100 | - 10 | - 5 | - 10 | - 20 | B107      | KSS 12 N | V240H         | 66260127891 | 1)      |
| 1K 1V1  | - 100 | - 15 | - 5 | - 10 | - 20 | B107      | KSS 12 N | V240H         | 66260116353 |         |
| K 1V1   | - 100 | - 15 | - 5 | - 20 | - 20 | B107      | KSS 12 N | V240H         | 66260115554 | 1)      |
| K 1V1   | - 100 | - 15 | - 5 | - 30 | - 20 | B107      | KSS 12 N | V240H         | 66260115756 |         |
| K 1V1   | - 100 | - 15 | - 5 | - 45 | - 20 | B107      | KSS 12 N | V240H         | 66260352663 |         |
| 1K 1V1  | - 125 | - 12 | - 5 | - 10 | - 20 | B107      | KSS 12 N | V240A         | 66260119462 | 1)      |
| 1K 1V1  | - 125 | - 12 | - 5 | - 45 | - 20 | B107      | KSS 12 N | V240A         | 66260352661 |         |
| 1K 14V1 | - 150 | - 4  | - 5 | - 45 | - 20 | B107      | KSS 12 N | V240A         | 66260131441 | 1)      |
| K 1V1   | - 150 | - 12 | - 5 | - 15 | - 20 | B107      | KSS 12 N | V240A         | 66260127964 | 1)      |

Application depending on software of machine manufacturer: For flute grinding, end and end relief thinning, drill sharpening.

1) Delivery within four weeks.

## Grinding wheel shape **700** (not FEPA Standard)



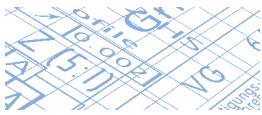
## WINTER

### For carbide tools

| Shape  | - D   | - U  | - X | - H  | Grit size | Bond          | Concentration | ORDER NO.   | Remarks               |
|--------|-------|------|-----|------|-----------|---------------|---------------|-------------|-----------------------|
| 2K 700 | - 125 | - 6  | - 3 | - 20 | D46       | K-plus 1421 R | C100H         | 66260119545 | Drill Ø 3...6 mm 1)   |
| 2K 700 | - 125 | - 10 | - 5 | - 20 | D46       | K-plus 1421 R | C100A         | 66260384095 | Drill Ø 6...8 mm 1)   |
| 1K 700 | - 125 | - 12 | - 5 | - 20 | D46       | K-plus 1421 R | C100A         | 66260352647 | Drill Ø 8...11 mm 1)  |
| 1K 700 | - 125 | - 16 | - 5 | - 20 | D46       | K-plus 1421 R | C100H         | 66260384094 | Drill Ø 11...15 mm 1) |
| 1K 700 | - 125 | - 22 | - 5 | - 20 | D46       | K-plus 1421 R | C100A         | 66260127878 | Drill Ø 15...20mm 1)  |

Application depending on software of machine manufacturer: Preferably Hertel SE drill

1) Delivery within four weeks.



# Flute grinding perfection - Solutions for each geometry

## Q-Flute<sup>2</sup>



This specification is the newest flute grinding development from WINTER. With Q-Flute<sup>2</sup>, clearly increased Material Removal Rates (MRR) are possible whilst at the same time maintaining edge stability. Therefore, Q-Flute<sup>2</sup> delivers the optimum combination of lifetime and free grinding behaviour.

In many cases dramatically increased feed rates with simultaneously longer dressing intervals have been achieved. The wheel wear per part is reduced accordingly.

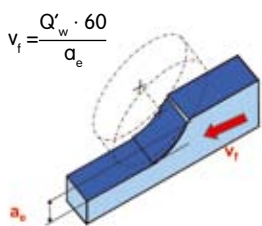
### Fields of application:

The new Q-Flute<sup>2</sup> is the solution for all flute grinding applications in the diameter range  $\varnothing \geq 3$  mm. This bond system is applicable not only under oil but also under water and emulsion. It provides outstanding results for tungsten carbide tools as well as for HSS tools.

| Specification              | Application                           |
|----------------------------|---------------------------------------|
| D54 Q-Flute <sup>2</sup>   | Tungsten carbide, oil                 |
| B64 Q-Flute <sup>2</sup>   | High speed steel, oil                 |
| D54 Q-Flute <sup>2</sup> W | Tungsten carbide, water based coolant |

## Application guide

### High Performance Grinding Wheels for Flute-Grinding.



$$v_f = \frac{Q'_w \cdot 60}{a_e}$$

Example: Q-Flute<sup>2</sup>  
( $Q'_w = 6 \text{ mm}^3 / \text{mm} \cdot \text{s}$ ),  $a_e = 4 \text{ mm}$   
 $v_f = \frac{6 \cdot 60}{4} = 90 \text{ mm/min}$

Test **start** with following parameter:

Q-Flute<sup>2</sup> Dress < D46  $Q'_w = 4 \text{ mm}^3/\text{mm} \cdot \text{s}$

Q-Flute<sup>2</sup> Dress  $\geq$  D46  $Q'_w = 5 \text{ mm}^3/\text{mm} \cdot \text{s}$

Q-Flute<sup>2</sup>  $Q'_w = 6 \text{ mm}^3/\text{mm} \cdot \text{s}$

(If Infeed  $< a_e = 3 \text{ mm}$ ,  
Start with approx.  
 $v_f = 80 \text{ mm/min}$   
 $v_c 15...18 \text{ m/s}$

Important:  
Condition before first grinding.

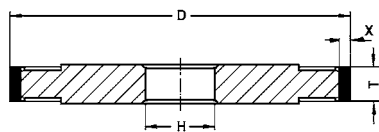
| Infeed $a_e$ [mm] | Feed rate $v_f$ [mm/min] |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                   | 30                       | 40  | 50  | 60  | 70  | 80  | 90  | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 |
| 3                 | 1,5                      | 2   | 2,5 | 3   | 3,5 | 4   | 4,5 | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  |
| 3,2               | 1,6                      | 2,1 | 2,7 | 3,2 | 3,7 | 4,3 | 4,8 | 5,3 | 6,4 | 7,5 | 8,5 | 9,6 | 11  | 12  | 13  | 14  | 15  | 16  |
| 3,4               | 1,7                      | 2,3 | 2,8 | 3,4 | 4   | 4,5 | 5,1 | 5,7 | 6,8 | 7,9 | 9,1 | 10  | 11  | 12  | 14  | 15  | 16  | 17  |
| 3,6               | 1,8                      | 2,4 | 3   | 3,6 | 4,2 | 4,8 | 5,4 | 6   | 7,2 | 8,4 | 9,6 | 11  | 12  | 13  | 14  | 16  | 17  | 18  |
| 3,8               | 1,9                      | 2,5 | 3,2 | 3,8 | 4,4 | 5,1 | 5,7 | 6,3 | 7,6 | 8,9 | 10  | 11  | 13  | 14  | 15  | 16  | 18  | 19  |
| 4                 | 2                        | 2,7 | 3,3 | 4   | 4,7 | 5,3 | 6   | 6,7 | 8   | 9,3 | 11  | 12  | 13  | 15  | 16  | 17  | 19  | 20  |
| 4,2               | 2,1                      | 2,8 | 3,5 | 4,2 | 4,9 | 5,6 | 6,3 | 7   | 8,4 | 9,8 | 11  | 13  | 14  | 15  | 17  | 18  | 20  | 21  |
| 4,4               | 2,2                      | 2,9 | 3,7 | 4,4 | 5,1 | 5,9 | 6,6 | 7,3 | 8,8 | 10  | 12  | 13  | 15  | 16  | 18  | 19  | 21  | 22  |
| 4,6               | 2,3                      | 3,1 | 3,8 | 4,6 | 5,4 | 6,1 | 6,9 | 7,7 | 9,2 | 11  | 12  | 14  | 15  | 17  | 18  | 20  | 21  | 23  |
| 4,8               | 2,4                      | 3,2 | 4   | 4,8 | 5,6 | 6,4 | 7,2 | 8   | 9,6 | 11  | 13  | 14  | 16  | 18  | 19  | 21  | 22  | 24  |
| 5                 | 2,5                      | 3,3 | 4,2 | 5   | 5,8 | 6,7 | 7,5 | 8,3 | 10  | 12  | 13  | 15  | 17  | 18  | 20  | 22  | 23  | 25  |
| 5,2               | 2,6                      | 3,5 | 4,3 | 5,2 | 6,1 | 6,9 | 7,8 | 8,7 | 10  | 12  | 14  | 16  | 17  | 19  | 21  | 23  | 24  | 26  |
| 5,4               | 2,7                      | 3,6 | 4,5 | 5,4 | 6,3 | 7,2 | 8,1 | 9   | 11  | 13  | 14  | 16  | 18  | 20  | 22  | 23  | 25  | 27  |
| 5,6               | 2,8                      | 3,7 | 4,7 | 5,6 | 6,5 | 7,5 | 8,4 | 9,3 | 11  | 13  | 15  | 17  | 19  | 21  | 22  | 24  | 26  | 28  |
| 5,8               | 2,9                      | 3,9 | 4,8 | 5,8 | 6,8 | 7,7 | 8,7 | 9,7 | 12  | 14  | 15  | 17  | 19  | 21  | 23  | 25  | 27  | 29  |
| 6                 | 3                        | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 12  | 14  | 16  | 18  | 20  | 22  | 24  | 26  | 28  | 30  |

Increase potential →

|   |   |
|---|---|
| For $a_e < 3 \text{ mm}$ : Start with ca. $v_f = 80 \text{ mm/min}$ | Starting parameters for Q-Flute <sup>2</sup> DRESS $\geq$ D46 |
| Starting parameters for Q-Flute <sup>2</sup> DRESS < D46            | Starting parameters for Q-Flute <sup>2</sup>                  |



## Grinding wheel shape according to FEPA 1A1



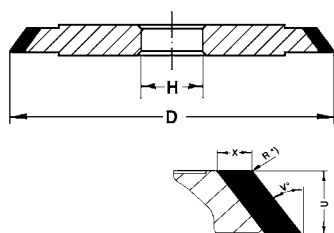
### For carbide tools, oil coolant

| Shape  | - D   | - T  | - X  | - H  | Grit size | Bond                 | Concentration | ORDER NO.   | Remarks |
|--------|-------|------|------|------|-----------|----------------------|---------------|-------------|---------|
| SP 1A1 | - 100 | - 8  | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157687140 |         |
| SP 1A1 | - 100 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157680365 |         |
| SP 1A1 | - 100 | - 12 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157697235 |         |
| SP 1A1 | - 100 | - 15 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157680730 |         |
| SP 1A1 | - 125 | - 8  | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260113945 |         |
| SP 1A1 | - 125 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157688224 |         |
| SP 1A1 | - 125 | - 12 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157687848 |         |
| SP 1A1 | - 125 | - 15 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260117916 |         |

More specifications: D54 Q-Flute<sup>2</sup> W for carbide tools, coolant on water base  
B64 Q-Flute<sup>2</sup> for HSS, Oil coolant

NORTON dressing wheels see page 14

## Grinding wheel shape according to FEPA 1V1



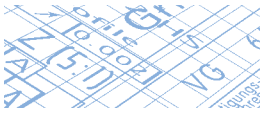
### For carbide tools, oil coolant

| Shape  | - D   | - U  | - X  | - V° | - H  | Grit size | Bond                 | Concentration | ORDER NO.   | Remarks       |
|--------|-------|------|------|------|------|-----------|----------------------|---------------|-------------|---------------|
| SP 1V1 | - 100 | - 10 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260137553 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 10 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260117361 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 10 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260129994 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 10 | - 10 | - 45 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260129991 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 12 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260113283 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 12 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260113288 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 12 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260134586 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 15 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157680737 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 15 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260115978 | <sup>1)</sup> |
| SP 1V1 | - 100 | - 15 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157697875 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 10 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260129330 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 10 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260117631 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 10 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260320401 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 10 | - 10 | - 45 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260115514 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 12 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260113290 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 12 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260113296 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 12 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260391300 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 15 | - 10 | - 10 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260128867 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 15 | - 10 | - 15 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 60157690276 | <sup>1)</sup> |
| SP 1V1 | - 125 | - 15 | - 10 | - 20 | - 20 | D54       | Q-Flute <sup>2</sup> | -             | 66260324379 | <sup>1)</sup> |

More specifications: D54 Q-Flute<sup>2</sup> W for carbide tools, coolant on water base  
B64 Q-Flute<sup>2</sup> for HSS, Oil coolant

<sup>1)</sup> Delivery within one week.

NORTON dressing wheels see page 14



# Flute grinding perfection - Solutions for each geometry

micro+



**Grinding wheels  
for Mini-, Micro- and Nano tools**

As well as innovation in new materials and tool designs, the recent trend to miniturisation has become more important.

From Mini- and micro- down to nano-tools, today's tools with diameters under 0.1mm are becoming commonplace. The production of these tools demands special grinding wheels with very small and sturdy edge radii.

The tools of the WINTER micro+ series are specifically developed for these requirements characterised by their edge stability.

## Fields of application

Classic areas of application for WINTER micro+ products are mini and micro drills and end mills for electronics and medical technology. In addition, WINTER micro+ grinding wheels can be used for more traditional processes e.g. the production of burrs.

| Work piece   | Work piece material     | Machine  | Grinding wheel  |                  | Coolant         |
|--|-------------------------|--|---|------------------|-----------------|
|  |                         |  | Shape   | Bond             |                 |
| Mini end mills<br>Micro drills<br>Burrs<br>Routers<br>etc. | Tungsten carbide<br>HSS | ANCA<br>Kirner<br>Rollomatic<br>Schuette<br>etc. | 3A1, 4A9, 14V1<br>Ø 50...200<br>X 3...10<br>H (machine dependent) | WINTER<br>micro+ | Oil<br>Emulsion |

### Specification

|             |             |      |
|-------------|-------------|------|
| D15A...D15C | micro+ 2013 | C150 |
| D20A...D25  | micro+ 2012 | C150 |
| D46...D64   | micro+ 2062 | C135 |

### Application

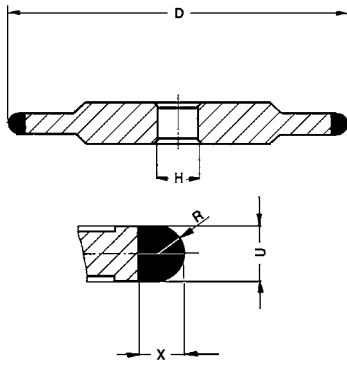
|                        |
|------------------------|
| 0,05 mm – 0,75 mm      |
| 0,75 mm – 2 mm         |
| Rotary tools up to ½ " |

### Ordering Example:

SP4A9 - 100 - 1,2 - 6 20\*D15C micro+2013 C150A



Grinding wheel  
shape according to  
FEPA **14F1**



## WINTER

### For carbide tools

| Shape    | - D   | - U   | - X | - R   | - H  | Grit size | Bond          | Concentration | ORDER NO.   | Remarks                       |
|----------|-------|-------|-----|-------|------|-----------|---------------|---------------|-------------|-------------------------------|
| 1K 14F1  | - 100 | - 4   | - 6 | - 2   | - 20 | D64       | K-plus 1421 R | C100H         | 66260339416 |                               |
| K 14F1   | - 125 | - 3   | - 5 | - 1,5 | - 20 | D64       | K-plus 1421 R | C100H         | 66260114821 |                               |
| K 14F1   | - 150 | - 1,2 | - 5 | - 0,6 | - 20 | D46       | K-plus 888 R  | C100A         | 66260351382 | Hertel SE-Drill               |
| K 14F1   | - 150 | - 2   | - 5 | - 1   | - 20 | D64       | K-plus 888 R  | C100A         | 66260348744 | Hertel SE-Drill               |
| 1K 14F1  | - 150 | - 3   | - 7 | - 1,5 | - 20 | D126      | K-plus 920    | C100A         | 66260133404 |                               |
| K 14F1   | - 150 | - 4   | - 5 | - 2   | - 20 | D64       | K-plus 1421 R | C100A         | 66260351943 | Hertel SE-Drill <sup>1)</sup> |
| K 14F1   | - 150 | - 5   | - 7 | - 2,5 | - 20 | D64       | K-plus 1421 R | C100A         | 66260129473 | )                             |
| 17K 14F1 | - 200 | - 2   | - 7 | - 1   | - 20 | D64       | K-plus 920    | C100E         | 60157695294 |                               |
| 4K 14F1  | - 200 | - 3   | - 7 | - 1,5 | - 20 | D126      | K-plus 920    | C100E         | 66260381129 |                               |
| 2K 14F1  | - 200 | - 5   | - 7 | - 2,5 | - 20 | D126      | K-plus 920    | C100A         | 66260136115 |                               |
| 2K 14F1  | - 200 | - 5   | - 7 | - 2,5 | - 20 | D252      | K-plus 920    | C100A         | 66260132184 |                               |

<sup>1)</sup> Delivery within four weeks.

## WINTER

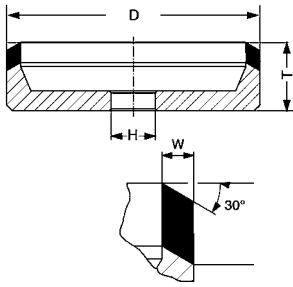
### For HSS tools

| Shape   | - D   | - U | - X | - R   | - H  | Grit size | Bond     | Concentration | ORDER NO.   | Remarks |
|---------|-------|-----|-----|-------|------|-----------|----------|---------------|-------------|---------|
| K 14F1  | - 100 | - 3 | - 5 | - 1,5 | - 20 | B107      | KSS 12 N | V240A         | 66260340210 |         |
| K 14F1  | - 100 | - 4 | - 5 | - 2   | - 20 | B107      | KSS 12 N | V240A         | 66260116260 |         |
| 3K 14F1 | - 125 | - 4 | - 5 | - 2   | - 20 | B107      | KSS 12 N | V240A         | 66260352649 |         |
| K 14F1  | - 150 | - 4 | - 5 | - 2   | - 20 | B107      | KSS 12 N | V240A         | 66260352648 |         |

Application depending on software of machine manufacturer:

For point thinning of major cutting edges, for grinding end cutting edges and corner radii, Hertel SE drill, profile grinding.

Grinding wheel  
shape according to  
FEPA **6V5**



**WINTER**

**For carbide tools**

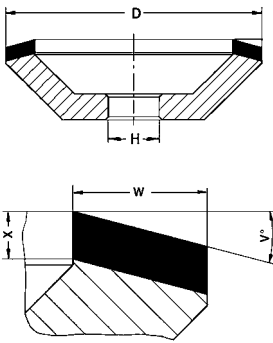
| Shape  | - D - W - X - V° - H       | Grit size | Bond          | Concentration | ORDER NO.   | Remarks |
|--------|----------------------------|-----------|---------------|---------------|-------------|---------|
| 1K 6V5 | - 100 - 4,5 - 10 - 30 - 20 | D64       | K-plus 1421 R | C100H         | 66260370517 | T = 34  |

**For HSS tools**

| Shape  | - D - W - X - V° - H       | Grit size | Bond    | Concentration | ORDER NO.   | Remarks |
|--------|----------------------------|-----------|---------|---------------|-------------|---------|
| 1K 6V5 | - 100 - 4,5 - 10 - 30 - 20 | B107      | KSS12 N | V240H         | 66260370513 | T = 34  |

Application depending on software of machine manufacturer:  
For grinding end mills with corner radius.

Grinding wheel  
shape according to  
FEPA **12V5**



**WINTER**

**For carbide tools**

| Shape  | - D - W - X - V° - H     | Grit size | Bond          | Concentration | ORDER NO.   | Remarks |
|--------|--------------------------|-----------|---------------|---------------|-------------|---------|
| K 12V5 | - 100 - 10 - 5 - 20 - 20 | D46       | K-plus 1421 R | C100H         | 66260352645 | T = 28  |

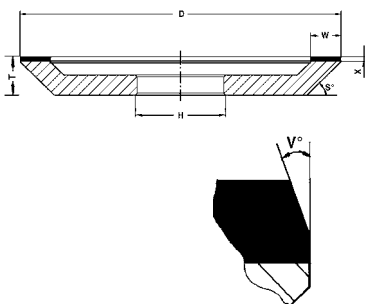
Anwendung je nach Software des Maschinenherstellers:  
Zum Anschleifen von radialem Hinterschliff, Umfang, Schleifen 1. Freiwinkel und Radius.

**For HSS tools**

| Shape  | - D - W - X - V° - H     | Grit size | Bond     | Concentration | ORDER NO.   | Remarks |
|--------|--------------------------|-----------|----------|---------------|-------------|---------|
| K 12V5 | - 100 - 10 - 5 - 20 - 20 | B91       | KSS 12 N | V240H         | 66260127380 | T = 28  |

Application depending on software of machine manufacturer:  
For grinding radial relief, periphery, 1<sup>st</sup> relief and radius.

Grinding wheel  
shape according to  
FEPA **12A2**



**WINTER**

**For carbide tools**

| Form    | - D - W - X - S° - H     | Körnungsgröße | Bindung       | Konzentration | BESTELL-NUMMER | Bemerkung   |
|---------|--------------------------|---------------|---------------|---------------|----------------|-------------|
| 2K 12A2 | - 125 - 15 - 3 - 45 - 20 | D46           | K-plus 1421 R | C100H         | 66260352597    | V=20°, T=26 |

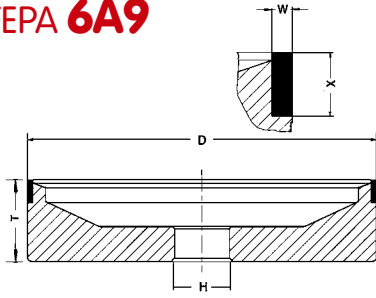
**For HSS tools**

| Form    | - D - W - X - S° - H     | Körnungsgröße | Bindung   | Konzentration | BESTELL-NUMMER | Bemerkung   |
|---------|--------------------------|---------------|-----------|---------------|----------------|-------------|
| 2K 12A2 | - 125 - 15 - 3 - 45 - 20 | B91           | KSS JY-63 | V240H         | 66260352594    | V=20°, T=26 |
|         |                          | B91           | KSS 12 N  | V240H         | 66260352593    | V=20°, T=26 |

Application depending on software of machine manufacturer:  
For grinding drills (e.g. Hertel SE drill), cone envelope grinding, major cutting edge sharpening.



Grinding wheel  
shape according to  
FEPA **6A9**



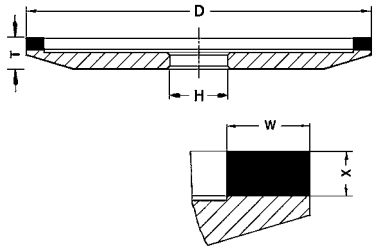
**WINTER**

**For carbide tools**

| Shape         | - D - W - X - H     | Grit size   | Bond                 | Concentration | ORDER NO.          | Remarks |
|---------------|---------------------|-------------|----------------------|---------------|--------------------|---------|
| <b>TK 6A9</b> | - 100 - 3 - 10 - 20 | <b>D64</b>  | <b>K-plus 1421 R</b> | <b>C100H</b>  | <b>66260339412</b> | T=30    |
| <b>IK 6A9</b> | - 125 - 3 - 10 - 20 | <b>D126</b> | <b>K-plus 920</b>    | <b>C100A</b>  | <b>60157643461</b> | T=30    |

Application depending on software of machine manufacturer:  
For grinding 1<sup>st</sup> and 2<sup>nd</sup> relief, periphery, minor cutting edge, full radii corner chamfers of drills and milling cutters.

Grinding wheel  
shape according to  
FEPA **4A2**



**WINTER**

**For carbide tools**

| Shape        | - D - W - X - H    | Grit size  | Bond                 | Concentration | ORDER NO.          | Remarks            |
|--------------|--------------------|------------|----------------------|---------------|--------------------|--------------------|
| <b>K 4A2</b> | - 150 - 4 - 3 - 20 | <b>D64</b> | <b>K-plus 1421 R</b> | <b>C100A</b>  | <b>66260346957</b> | T=12 <sup>1)</sup> |

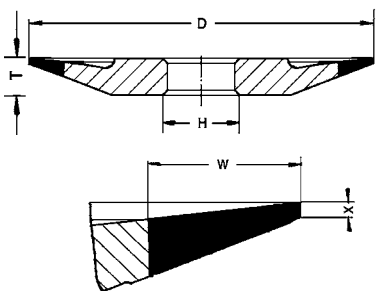
<sup>1)</sup> Lieferzeit innerhalb vier Wochen.

**For HSS tools**

| Shape        | - D - W - X - H    | Grit size  | Bond            | Concentration | ORDER NO.          | Remarks |
|--------------|--------------------|------------|-----------------|---------------|--------------------|---------|
| <b>K 4A2</b> | - 150 - 4 - 3 - 20 | <b>B91</b> | <b>KSS 12 N</b> | <b>V240A</b>  | <b>66260127081</b> | T=12    |

Application depending on software of machine manufacturer:  
For relief grinding on woodworking cutters.

Grinding wheel  
shape according to  
FEPA **4BT9**



**WINTER**

**For HSS tools**

| Shape         | - D - W - X - H     | Grit size   | Bond            | Concentration | ORDER NO.          | Remarks |
|---------------|---------------------|-------------|-----------------|---------------|--------------------|---------|
| <b>K 4BT9</b> | - 100 - 10 - 1 - 20 | <b>B126</b> | <b>KSS 12 N</b> | <b>V180A</b>  | <b>66260132772</b> | T=10    |

Application depending on software of machine manufacturer:  
For point thinning of drills and milling cutters, relief grinding.

## WINTER cleaning and sharpening stones

### WINTER-Stone No. 1AW (100x20x20)

Cleaning for fine grit, < D46, K-plus bonds.

Order No. 66260395639

### WINTER-Stone No. 2 (100x24x13)

Universal sharpening stone.

Order No. 66260195816

### WINTER-Stone No. 5 (100x50x25)

Comments: see WINTER Stone No. 2

Order No. 66260389054

## flexovit cleaning and sharpening stones

### Stone WA 150 GV (25x25x150)

Cleaning and sharpening of vitrified and resin bond grinding wheels > D64

Order No. 69936621643

### Stone WA 220 GV (25x25x150)

Cleaning and sharpening of vitrified and resin bond grinding wheels

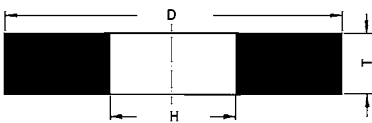
Order No. 69014165446

### Stone WA 320 GV (25x25x150)

Cleaning and sharpening of vitrified and resin bond grinding wheels < D46

Order No. 69936651380

## Grinding wheel 1 (following DIN 69100)



**NORTON**

### Dressing grinding wheels

| Shape | - D - T - X     | Abrasive compound | Grit /Hardness / Bond | Bond | ORDER NO.   | Remarks       |
|-------|-----------------|-------------------|-----------------------|------|-------------|---------------|
| 1     | - 250 - 10 - 51 | 31C               | 120 JOT 8             | V500 | 66243571002 | for Geiger    |
| 1     | - 200 - 10 - 32 | 31C               | 120 JOT 8             | V500 | 69210444752 | for Cleveland |

Application depending on software of machine manufacturer:  
Dressing grinding wheels for QFlute+ and all others CNC grinding wheels.

## For your enquiries please contact:

# WINTER

SAINT-GOBAIN Diamantwerkzeuge GmbH & Co. KG  
Schützenwall 13-17, D-22844 Norderstedt  
P.O.Box 2049, D-22841 Norderstedt  
Tel.: +49 40 5258-0  
Fax: +49 40 5258-215  
[www.winter-superabrasives.com](http://www.winter-superabrasives.com)  
[resin@saint-gobain.com](mailto:resin@saint-gobain.com)

# NORTON

SAINT-GOBAIN Abrasives GmbH  
Dr.-Georg-Schäfer-Str. 1, D-97447 Gerolzhofen  
P.O.Box 1140, D-97441 Gerolzhofen  
Tel.: +49 9382 602-0  
Fax: +49 9382 602-186  
[www.norton-schleifmittel.de](http://www.norton-schleifmittel.de)  
[InfoAWS@saint-gobain.com](mailto:InfoAWS@saint-gobain.com)

Notes



**SAINT-GOBAIN**  
**Diamantwerkzeuge**  
**GmbH & Co. KG**  
Schützenwall 13-17  
D-22844 Norderstedt  
P.O.Box 2049  
D-22841 Norderstedt  
Tel.: +49 40 5258-0  
Fax: +49 40 5258-215  
[www.winter-superabrasives.com](http://www.winter-superabrasives.com)  
[Resin@saint-gobain.com](mailto:Resin@saint-gobain.com)

**SAINT-GOBAIN**  
**Abrasives GmbH**  
Dr.-Georg-Schäfer-Str. 1  
D-97447 Gerolzhofen  
P.O.Box 1140,  
D-97441 Gerolzhofen  
Tel.: +49 9382 602-0  
Fax: +49 9382 602-186  
[www.norton-schleifmittel.de](http://www.norton-schleifmittel.de)  
[InfoAWS@Saint-Gobain.com](mailto:InfoAWS@Saint-Gobain.com)