

FLUTE – SPEED®

BOND SYSTEM FOR
PRODUCTIVE CNC
GRINDING OF TOOLS

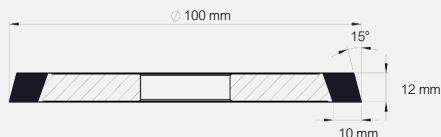
Flute – Speed® bond system offers high performance and excellent quality for a variety of grinding applications, be it for fluting, gashing or clearance angle grinding. Our wheels are an ideal fit for customers, who produce tools from tungsten carbide, or HSS and for whom productivity is the key factor.

Wheels with Flute – Speed® bonds maintain constant geometry and at the same time work at high feed rates & infeeds. Thanks to this trait, customers save time and costs on their grinding tasks. Our wheels are available in all standard dimensions, but alternations are possible upon customer's request (see other side for more information).

CASE STUDY: FLUTING ON AN END MILL

WHEEL:

- Grit D54
- FS-H4



WORKPIECE:

- Ø 20 mm 4-flute End Mill from tungsten carbide (ISO K20-40 with 10% Co)

MACHINE & COOLANT:

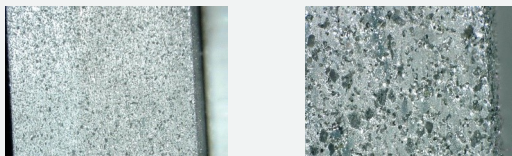
- Reinecker WZS 70, cooled by oil

GRINDING CONDITIONS:

- Cutting Speed: 18 m/s
- Infeed: 4,5 mm
- Feedrate: 80 mm/min

RESULTS:

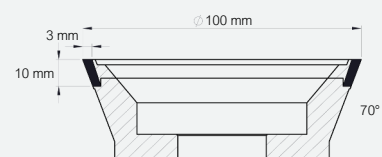
- Re-dressed after 100 pieces
- Porosity still open
- Ready for further grinding



CASE STUDY: FACE GRINDING ON A MILLING CUTTER

WHEEL:

- Grit D54
- FS-H3



WORKPIECE:

- Ø 10 mm, 4-flute End Mill from tungsten carbide (ISO K40UF)

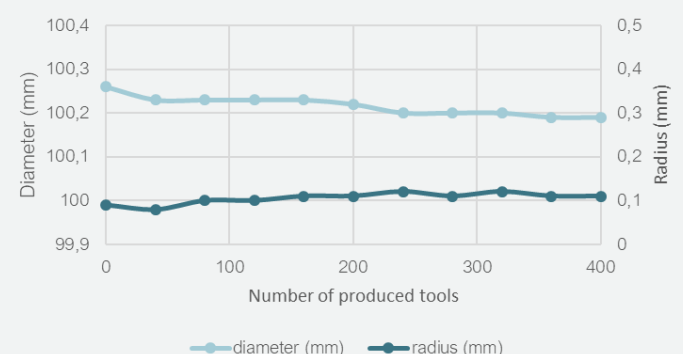
MACHINE & COOLANT:

- Walter Helitronic Mini Power, cooled by oil

GRINDING CONDITIONS:

- Cutting Speed: 22 m/s
- Infeed: 2 mm max.
- Feedrate: 160 mm/min max.

RESULTS:



AVAILABLE SHAPES AND SIZES

Below is a list of available FEPA shapes and dimensions. If you won't find your desired combination, do not worry: tailor-made products are also available. Just reach out to us and we will find the best solution together with you.

WHEEL TYPE	Ø D (mm)	X (mm)*	U (mm)*	V (°)*
1A1	50 / 75 / 100 / 125 / 150 / 175 / 200	6 / 10 / 15 / 20	5 – 20	–
1V1	50 / 55 / 75 / 100 / 125 / 150 / 175** / 200**	6 / 10 / 15	5 – 22	2 – 75
11V9	75 / 100 / 125	3	10	70
12V9	75 / 100 / 125	3	6 / 10	35 / 45

*Not all combinations of wheel's dimensions are available. Send us your requirements and we will come back to you.
**Produced as 1B1

RECOMMENDED GRINDING CONDITIONS

Conditions for flute grinding (only for 1A1 / 1V1 wheels)

Table on the right shows recommended grinding parameters for fluting applications with 1A1 or 1V1 wheels.

Correct setting of your grinding machine depends on the expected *Material Removal Rate* = $Q \cdot w$.

$$Q \cdot w = (a_e \cdot v_t) / 60 \quad [\text{mm}^3 / \text{mm} \cdot \text{s}]$$

Please, take into account that the grinding conditions can be influenced by workpiece's diameter, coolant / lubricant and available machine power.

Feed Rate V_t [mm/min]	Infeed a_e [mm]										
	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	
40	1,3	1,7	2,0	2,3	2,7	3,0	3,3	3,7	4,0	4,3	
50	1,7	2,1	2,5	2,9	3,3	3,8	4,2	4,6	5,0	5,4	
60	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	
70	2,3	2,9	3,5	4,1	4,7	5,3	5,8	6,4	7,0	7,6	
80	2,7	3,3	4,0	4,7	5,3	6,0	6,7	7,3	8,0	8,7	
100	3,3	4,2	5,0	5,8	6,7	7,5	8,3	9,2	10,0	10,8	
120	4,0	5,0	6,0	7,0	8,0	9,0	10,0	11,0	12,0	13,0	
140	4,7	5,8	7,0	8,2	9,3	10,5	11,7	12,8	14,0	15,2	
160	5,3	6,7	8,0	9,3	10,7	12,0	13,3	14,7	16,0	17,3	
180	6,0	7,5	9,0	10,5	12,0	13,5	15,0	16,5	18,0	19,5	
200	6,7	8,3	10,0	11,7	13,3	15,0	16,7	18,3	20,0	21,7	

Initial setup Ideal setup Setup with special solution Not recommended setup

Recommended Cutting Speeds (general)

Table below displays recommended velocities for grinding with *Flute – Speed*® wheels, depending on the wheel's type and type of superabrasive in it.

Wheel Type	Cutting Speed v_c [m/s]	
	Diamond	CBN
1A1	16 - 18*	25 - 30
1V1		
11V9	22 - 25	25 - 30
12V9		

* Using higher speed requires selecting a special bond.

Contact us for more information.



CONTACT US TO GET A QUOTATION

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