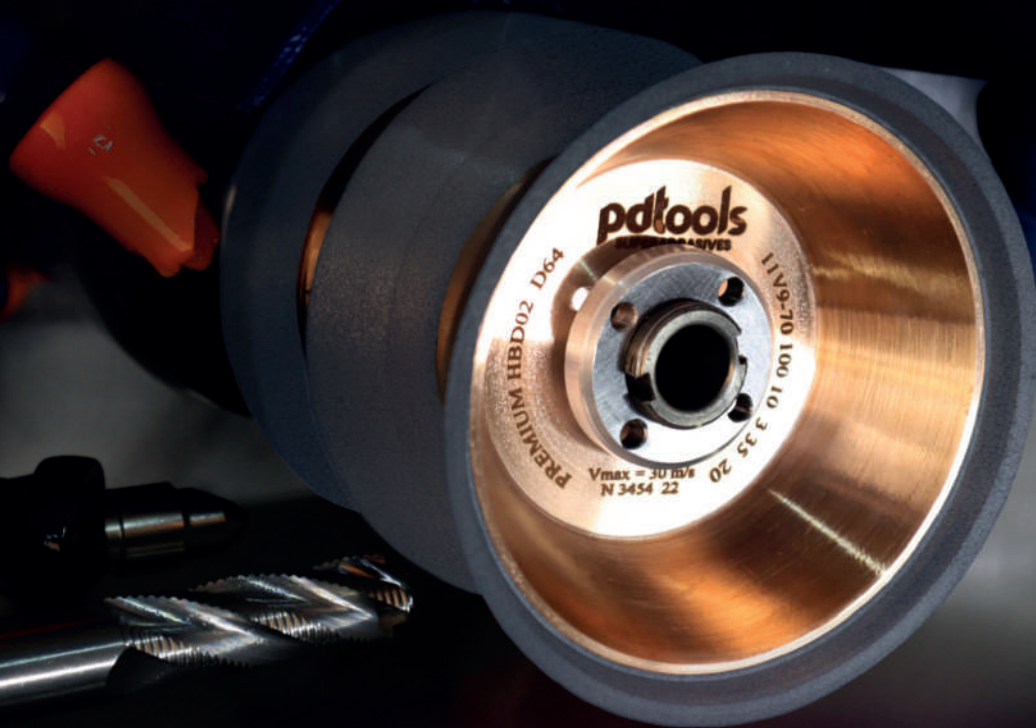


pdtools
SUPERABRASIVES

PREMIUM



HYBRID BONDED WHEELS

**HYBRID BONDED WHEELS
FOR ROTARY TOOLS**

Contents

BOND DESCRIPTION	2
RECOMMENDATIONS FOR APPLICATION	3
1A1, 14A1 WITH FPD01, RPD01, HPD01, LPD01 BONDS	4
RECOMMENDED PARAMETERS FOR 1A1, 14A1 WITH FPD01 BOND	5
RECOMMENDED PARAMETERS FOR 1A1, 14A1 WITH RPD01 BOND	6
RECOMMENDED PARAMETERS FOR 1A1, 14A1 WITH HPD01 BOND	7
RECOMMENDED PARAMETERS FOR 1A1, 14A1 WITH LPD01 BOND	8
1V1 10°; 15°; 20° WITH FPD01, RPD01, HPD01, LPD01 BONDS	10
RECOMMENDED PARAMETERS FOR 1V1 10°; 15°; 20° ANGLE WITH FPD01 BOND	11
RECOMMENDED PARAMETERS FOR 1V1 10°; 15°; 20° ANGLE WITH RPD01 BOND	12
RECOMMENDED PARAMETERS FOR 1V1 10°; 15°; 20° ANGLE WITH HPD01 BOND	13
RECOMMENDED PARAMETERS FOR 1V1 10°; 15°; 20° ANGLE WITH LPD01 BOND	14
1V1, 14V1 30° WITH FPD01, RPD01, HPD01, LPD01 BONDS	16
RECOMMENDED PARAMETERS FOR 1V1, 14V1 30° ANGLE WITH FPD01 BOND	17
RECOMMENDED PARAMETERS FOR 1V1, 14V1 30° ANGLE WITH RPD01 BOND	18
RECOMMENDED PARAMETERS FOR 1V1, 14V1 30° ANGLE WITH HPD01 BOND	19
RECOMMENDED PARAMETERS FOR 1V1, 14V1 30° ANGLE WITH LPD01 BOND	20
1V1, 14V1 45° WITH FPD01, RPD01, HPD01, LPD01 BONDS	22
RECOMMENDED PARAMETERS FOR 1V1, 14V1 45° ANGLE WITH FPD01 BOND	23
RECOMMENDED PARAMETERS FOR 1V1, 14V1 45° ANGLE WITH RPD01 BOND	24
RECOMMENDED PARAMETERS FOR 1V1, 14V1 45° ANGLE WITH HPD01 BOND	25
RECOMMENDED PARAMETERS FOR 1V1, 14V1 45° ANGLE WITH LPD01 BOND	26
11V9-70 WITH VPD02 BOND. RECOMMENDED PARAMETERS	28-29
11V9-70 WITH HPD03 AND HPD04 BONDS. RECOMMENDED PARAMETERS	30-31
12V9-45 WITH HPD03 AND HPD04 BONDS. RECOMMENDED PARAMETERS	32-33
1V1, 14V1 45° WITH HPD04 BOND. RECOMMENDED PARAMETERS	34-35
1A1, 14A1 WITH HPD04/05 BONDS. RECOMMENDED PARAMETERS	36-37
1V1 10°; 15°; 20° WITH HPD04/05 BONDS. RECOMMENDED PARAMETERS	38-39
1V1, 14V1 30° WITH HPD04/05 BONDS. RECOMMENDED PARAMETERS	40-41
1S1 FOR CHIPBREAKER GRINDING	42-43
1A1R WITH B1000 BOND	44
TRUING AND DRESSING OF DIAMOND AND CBN WHEELS	45

FPD01 BOND is designed for power grinding during fluting operations for wheels with 1A1 and 1V1 shapes. It is suitable for workpieces diameters from 4 to 22 mm when cutting flutes on machines with a spindle power of more than 20 kW (high-speed machining).

RPD01 BOND is designed for power grinding during fluting operations for wheels with 1A1 and 1V1 shapes. It is suitable for workpieces diameters from 4 to 22 mm for cutting flutes on machines with a spindle power of 9 kW or more (automated series production).

HPD01 BOND is intended for power grinding during the fluting operation for wheels with 1A1 and 1V1 shapes. It is suitable for workpieces diameters from 4 to 22 mm for cutting flutes on machines with a spindle power of 7 kW or more (small batch production).

LPD01 BOND is designed for power grinding during the fluting operation for wheels with 1A1 and 1V1 shapes. It is suitable for workpieces diameters from 4 to 22 mm while cutting flutes on machines with a spindle power of 7 kW or more (low-speed machining modes).

VPD02 BOND is designed for productive sharpening of cutting tools for 11V9-70 wheel shapes and workpieces diameters from 4 mm. It has increased edge resistance and extended lifetime.

HPD03 BOND is designed for high-quality sharpening of cutting tools for 11V9-70 wheel shapes. It has an increased sharpening finish. It is used for gash operation for wheels with 12V9-45 shapes.
Universal bond for sharpening, gashing and fluting (small batch production).

HPD04 BOND is designed for fluting, gashing and sharpening operations for wheels on 1A1, 1V1, 11V9-70 and 12V9-45 shapes with workpieces diameters up to 4 mm.

HPD05 BOND is designed for the “polishing” operation for wheels with 1A1 and 1V1 shapes.



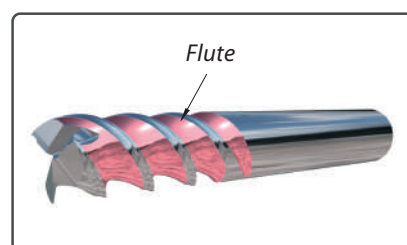
Operation parameters and grit size should be selected based on the catalog's recommendations, following the rule of reducing the feed rate while increasing the depth of cut per pass. Important: If the angle geometry of the 1V1 increases while maintaining the same feed rate, it is necessary to reduce the infeed.

SHAPE	OPERATION	DIAMETER OF THE WORKPIECE, mm					
		to 1 mm	from 1 to 4 mm	from 4 to 12 mm		from 6 to 22 mm	
1A1	Fluting	HPD04 D16	HPD03 D30	FPD01; RPD01 HPD01; LPD01 HPD03	D46	FPD01; RPD01 HPD01; LPD01 HPD03	D64
	Polishing	HPD05 D10	HPD05 D10	HPD05 D10		HPD05 D10	
1V1 10°, 15°, 20°, 30°	Fluting	HPD04 D16	HPD03 D30	FPD01; RPD01 HPD01; LPD01 HPD03	D46	FPD01; RPD01 HPD01; LPD01 HPD03	D64
	Polishing	HPD05 D10	HPD05 D10	HPD05 D10		HPD05 D10	
1V1 45°	Fluting	HPD04 D16	HPD03 D30	FPD01; RPD01 HPD01; LPD01 HPD03	D46	FPD01; RPD01 HPD01; LPD01 HPD03	D64
	Gashing	HPD04 D16	x	FPD01; RPD01 HPD01; LPD01 HPD03	D46	FPD01; RPD01 HPD01; LPD01 HPD03	D64
11V9-70	Sharpening	x	HPD03 D30	VPD02 D46 (productive; better edge)		VPD02 D64 (productive; better edge)	
	Sharpening	x	HPD03 D30	HPD03 D46 (best finish)		HPD03 D64 (best finish)	
12V9-45	Gashing	HPD04 D16	HPD03 D30	HPD03 D46		HPD03 D64	

The manufacturer recommends using the tool in accordance with these guidelines. The customer can use the tool with their own parameters; however, not following the recommendations may lead to excessive wear or even destruction of the tool. During the production of mills with large diameters (more than 12 mm diameter), where the chip flute must be made in a few passes. The depth of each pass and the length of the feed must be selected to ensure that each pass of the wheel is performed with the same productivity. Where productivity is the cross-sectional area of the material, removed by the wheel per pass multiplied by the longitudinal feed rate of the wheel relative to the workpiece.

GRAIN OF DIAMOND AND CBN POWDER ACCORDING TO INTERNATIONAL STANDARDS

Ukrainian Standard DSTU 3292-95	FEPA Diamond / CBN	ANSI B74-16 USA	GRIT	GRIT SIZE CLASS
µm	µm	mesh	GRIT	
160/125	D151/B151	100/120	120	LARGE
80/63	D76/B76	200/230	230	
63/50	D64/B64	230/270	270	FINE
50/40	D46/B46	325/400	400	
40/28	D30/B30	600	600	VERY FINE
14/10	D16/B16	1500	1500	
10/7	D10/B10	2000	1700	MICRON



1A1, 14A1 with FPD01, RPD01, HPD01, LPD01 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH FPD01, RPD01, HPD01, LPD01 BONDS

Code	D, mm	D, inch	T, mm	T, inch	X, mm	X, inch	H, mm	H, inch
FM1-65	60	2 3/8	10	3/8	10	3/8	20	0,787
FM1-51	75	3	10	3/8	5	13/64	20	0,787
FM1-53	75	3	5	13/64	10	3/8	20	0,787
FM1-54	75	3	5	13/64	10	3/8	31,75	1 1/4
FM1-52	80	3 1/7	6	1/4	5	13/64	20	0,787
FM1-02	100	4	10	3/8	10	3/8	20	0,787
FM1-31	100	4	10	3/8	10	3/8	31,75	1 1/4
FM1-04	100	4	12	1/2	10	3/8	20	0,787
FM1-32	100	4	12	1/2	10	3/8	31,75	1 1/4
FM1-06	100	4	15	19/32	10	3/8	20	0,787
FM1-33	100	4	15	19/32	10	3/8	31,75	1 1/4
FM1-08	100	4	20	51/64	10	3/8	20	0,787
FM1-34	100	4	20	51/64	10	3/8	31,75	1 1/4
FM1-63	100	4	6	1/4	10	3/8	20	0,787
FM1-62	100	4	6	1/4	10	3/8	31,75	1 1/4
FM1-00	100	4	8	5/16	10	3/8	20	0,787
FM1-30	100	4	8	5/16	10	3/8	31,75	1 1/4
FM1-12	125	5	10	3/8	10	3/8	20	0,787
FM1-36	125	5	10	3/8	10	3/8	31,75	1 1/4
FM1-14	125	5	12	1/2	10	3/8	20	0,787
FM1-37	125	5	12	1/2	10	3/8	31,75	1 1/4
FM1-16	125	5	15	19/32	10	3/8	20	0,787
FM1-38	125	5	15	19/32	10	3/8	31,75	1 1/4
FM1-59	125	5	16	5/8	15	19/32	20	0,787
FM1-60	125	5	16	5/8	15	19/32	31,75	1 1/4
FM1-18	125	5	20	51/64	10	3/8	20	0,787
FM1-39	125	5	20	51/64	10	3/8	31,75	1 1/4
FM1-48	125	5	6	1/4	10	3/8	20	0,787
FM1-49	125	5	6	1/4	10	3/8	31,75	1 1/4
FM1-10	125	5	8	5/16	10	3/8	20	0,787
FM1-35	125	5	8	5/16	10	3/8	31,75	1 1/4
FM1-22	150	6	10	3/8	10	3/8	20	0,787
FM1-41	150	6	10	3/8	10	3/8	31,75	1 1/4
FM1-24	150	6	12	1/2	10	3/8	20	0,787
FM1-42	150	6	12	1/2	10	3/8	31,75	1 1/4
FM1-26	150	6	15	19/32	10	3/8	20	0,787
FM1-43	150	6	15	19/32	10	3/8	31,75	1 1/4
FM1-44	150	6	16	5/8	10	3/8	20	0,787
FM1-45	150	6	16	5/8	10	3/8	31,75	1 1/4
FM1-28	150	6	20	51/64	10	3/8	20	0,787
FM1-64	150	6	20	51/64	10	3/8	31,75	1 1/4
FM1-20	150	6	8	5/16	10	3/8	20	0,787
FM1-40	150	6	8	5/16	10	3/8	31,75	1 1/4

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR FPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	90	100	110	120	140	160	180	200	220	240	260	280
1,5												
2												
2,5												
3												
3,5												



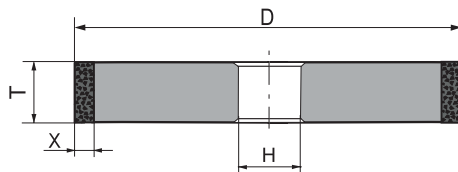
• Dark green color - recommended modes (optimal modes);



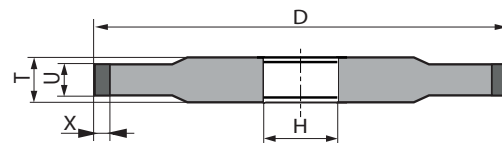
• Light green color - acceptable operating modes;

CASE STUDY FOR FPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1A1 D100 T10 X10 H20 D64 FPD01
Operation	Fluting
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	4
Infeed per pass, mm	2
Feedrate, mm/min	200
Wheel speed, m/s	18
Profiling cycle, pcs.	90



shape 1A1 D×T×X×H



shape 14A1 D×T×U×X×H

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	70	80	90	100	110	120	140	160	180	200	220	240
1,5												
2												
2,5												
3												
3,5												
4												

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	70	80	90	100	110	120	140	160	180	200	220	240
1,5												
2												
2,5												
3												
3,5												
4												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

CASE STUDY FOR RPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1A1 D100 T10 X10 H20 D64 RPD01	1A1 D100 T10 X10 H20 D64 RPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,25	2,25
Feedrate, mm/min	120	140
Wheel speed, m/s	18	18
Profiling cycle, pcs.	150	160

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	50	60	70	80	90	100	110	120	140	160	180	200
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	50	60	70	80	90	100	110	120	140	160	180	200
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR LPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	20	30	40	50	60	70	80	90	100	110	120	140
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												
5,5												

• Dark green color - recommended modes (optimal modes);

• Light green color - acceptable operating modes;

CASE STUDY FOR LPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1A1 D100 T10 X10 H20 D64 LPD01	1A1 D100 T10 X10 H20 D64 LPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,25	2,25
Feedrate, mm/min	40	60
Wheel speed, m/s	18	18
Profiling cycle, pcs.	50	60



D54 RPD01 N 23012624

pdttools

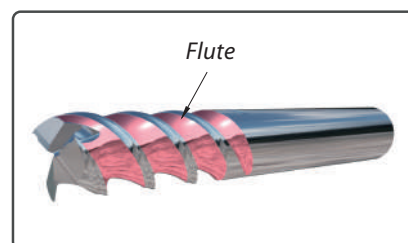
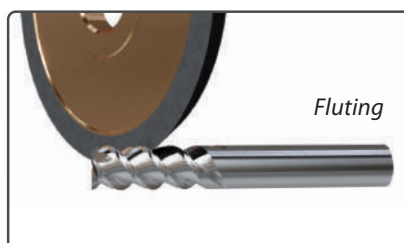
1A1 125 6 10 20 PREMIUM

$V_{max} = 35 \text{ m/s}$
 $\Omega_{max} = 5350 \text{ 1/min}$

EN13236

www.pdt.tools

WITH RPD01 BOND



1V1 10°; 15°; 20° ANGLE with FPD01, RPD01, HPD01, LPD01 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH FPD01, RPD01, HPD01, LPD01 BONDS

Code	D, mm	D, inch	T, mm	T, inch	X, mm	X, inch	α°	H, mm	H, inch
FM2-02	100	4	10	3/8	10	3/8	15	20	0,787
FM2-31	100	4	10	3/8	10	3/8	15	31,75	11/4
FM2-04	100	4	10	3/8	10	3/8	20	20	0,787
FM2-32	100	4	10	3/8	10	3/8	20	31,75	11/4
FM2-60	100	4	12	1/2	10	3/8	10	20	0,787
FM2-61	100	4	12	1/2	10	3/8	10	31,75	11/4
FM2-63	100	4	12	1/2	10	3/8	15	31,75	11/4
FM2-64	100	4	12	1/2	10	3/8	15	31,75	11/4
FM2-66	100	4	12	1/2	10	3/8	20	20	0,787
FM2-67	100	4	12	1/2	10	3/8	20	31,75	11/4
FM2105	100	4	14	9/16	10	3/8	10	20	0,787
FM2106	100	4	14	9/16	10	3/8	10	31,75	11/4
FM2108	100	4	14	9/16	10	3/8	15	20	0,787
FM2109	100	4	14	9/16	10	3/8	15	31,75	11/4
FM2111	100	4	14	9/16	10	3/8	20	20	0,787
FM2112	100	4	14	9/16	10	3/8	20	31,75	11/4
FM2-12	125	5	10	3/8	10	3/8	15	20	0,787
FM2-36	125	5	10	3/8	10	3/8	15	31,75	11/4
FM2-75	125	5	12	1/2	10	3/8	10	20	0,787
FM2-76	125	5	12	1/2	10	3/8	10	31,75	11/4
FM2-78	125	5	12	1/2	10	3/8	15	20	0,787
FM2-79	125	5	12	1/2	10	3/8	15	31,75	11/4
FM2-81	125	5	12	1/2	10	3/8	20	20	0,787
FM2-82	125	5	12	1/2	10	3/8	20	31,75	11/4
FM2120	125	5	14	9/16	10	3/8	10	20	0,787
FM2121	125	5	14	9/16	10	3/8	10	31,75	11/4
FM2123	125	5	14	9/16	10	3/8	15	20	0,787
FM2124	125	5	14	9/16	10	3/8	15	31,75	11/4
FM2126	125	5	14	9/16	10	3/8	20	20	0,787
FM2127	125	5	14	9/16	10	3/8	20	31,75	11/4
FM2180	150	6	16	5/8	10	3/8	10	20	0,787
FM2181	150	6	16	5/8	10	3/8	10	31,75	11/4
FM2183	150	6	16	5/8	10	3/8	15	20	0,787
FM2184	150	6	16	5/8	10	3/8	15	31,75	11/4
FM2186	150	6	16	5/8	10	3/8	20	20	0,787
FM2187	150	6	16	5/8	10	3/8	20	31,75	11/4

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR FPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	80	90	100	110	120	140	160	180	200	220	240	260
1,5												
2												
2,5												
3												
3,5												



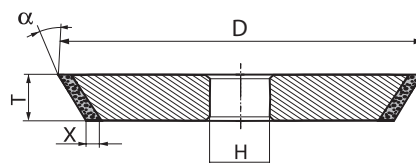
• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY FOR FPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V15 D64 FPD01
Operation	Fluting
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	4
Infeed per pass, mm	2,5
Feedrate, mm/min	160
Wheel speed, m/s	18
Profiling cycle, pcs.	85



shape 1V1 D×T×X×α×H

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	60	70	80	90	100	110	120	140	160	180	200	220
1,5												
2												
2,5												
3												
3,5												
4												

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	60	70	80	90	100	110	120	140	160	180	200	220
1,5												
2												
2,5												
3												
3,5												
4												

• Dark green color - recommended modes (optimal modes);

• Light green color - acceptable operating modes;

CASE STUDY FOR RPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V15 D64 RPD01	1V1 D100 T10 X10 V15 D64 RPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,5	2,5
Feedrate, mm/min	100	110
Wheel speed, m/s	20	18
Profiling cycle, pcs.	100	130

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

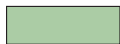
Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	40	50	60	70	80	90	100	110	120	140	160	180
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	40	50	60	70	80	90	100	110	120	140	160	180
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR LPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	10	20	30	40	50	60	70	80	90	100	110	120
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												
5,5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY FOR LPD01 BY CARBIDE END MILL PRODUCTION

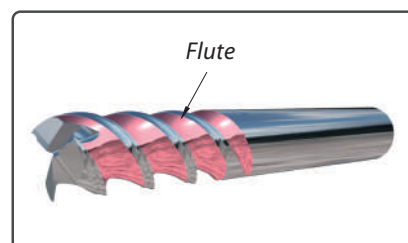
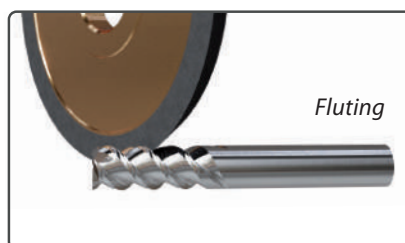
MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V15 D64 LPD01	1V1 D100 T10 X10 V15 D64 LPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,5	2,5
Feedrate, mm/min	40	50
Wheel speed, m/s	20	18
Profiling cycle, pcs.	70	100



TVT



10° 15° 20°



1V1, 14V1 30° with FPD01, RPD01, HPD01, LPD01 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH FPD01, RPD01, HPD01, LPD01 BONDS

Code	D, mm	D, inch	T, mm	T, inch	U, mm	U, inch	X, mm	X, inch	α°	H, mm	H, inch
FM2-54	100	4	10	3/8	5	13/64	10	3/8	30	20	0,787
FM2-55	100	4	10	3/8	5	13/64	10	3/8	30	31,75	1 1/4
FM2-56	100	4	10	3/8	5	13/64	10	3/8	30	32	1,260
FM2-48	75	3	5	13/64	-	-	10	3/8	30	20	0,787
FM2-49	75	3	5	13/64	-	-	10	3/8	30	31,75	1 1/4
FM2-50	75	3	5	13/64	-	-	10	3/8	30	32	1,260
FM2-06	100	4	10	3/8	-	-	10	3/8	30	20	0,787
FM2-33	100	4	10	3/8	-	-	10	3/8	30	31,75	1 1/4
FM2-07	100	4	10	3/8	-	-	10	3/8	30	32	1,260
FM2-69	100	4	12	1/2	-	-	10	3/8	30	20	0,787
FM2-70	100	4	12	1/2	-	-	10	3/8	30	31,75	1 1/4
FM2-71	100	4	12	1/2	-	-	10	3/8	30	32	1,260
FM2114	100	4	14	9/16	-	-	10	3/8	30	20	0,787
FM2115	100	4	14	9/16	-	-	10	3/8	30	31,75	1 1/4
FM2116	100	4	14	9/16	-	-	10	3/8	30	32	1,260
FM2129	125	5	14	9/16	-	-	10	3/8	30	20	0,787
FM2130	125	5	14	9/16	-	-	10	3/8	30	31,75	1 1/4
FM2131	125	5	14	9/16	-	-	10	3/8	30	32	1,260
FM2-84	125	5	12	1/2	-	-	10	3/8	30	20	0,787
FM2-85	125	5	12	1/2	-	-	10	3/8	30	31,75	1 1/4
FM2-86	125	5	12	1/2	-	-	10	3/8	30	32	1,260

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR FPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

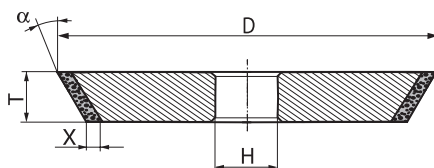
Infeed t, mm	Feedrate S, mm/min											
	80	90	100	110	120	140	160	180	200	220	240	260
1,5												
2												
2,5												
3												
3,5												

Dark green color - recommended modes (optimal modes);

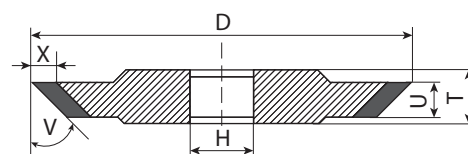
Light green color - acceptable operating modes;

CASE STUDY FOR FPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V30 D64 FPD01
Operation	Fluting
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	4
Infeed per pass, mm	2,5
Feedrate, mm/min	140
Wheel speed, m/s	18
Profiling cycle, pcs.	70



shape 1V1 D×T×X×α×H



shape 14V1 D×T×U×X×α×H

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	60	70	80	90	100	110	120	140	160	180	200	220
1,5												
2												
2,5												
3												
3,5												
4												

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	60	70	80	90	100	110	120	140	160	180	200	220
1,5												
2												
2,5												
3												
3,5												
4												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

CASE STUDY FOR RPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V30 D64 RPD01	1V1 D100 T10 X10 V30 D64 RPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,5	2,5
Feedrate, mm/min	100	110
Wheel speed, m/s	20	18
Profiling cycle, pcs.	70	90

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

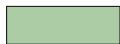
Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	40	50	60	70	80	90	100	110	120	140	160	180
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	40	50	60	70	80	90	100	110	120	140	160	180
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR LPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	10	20	30	40	50	60	70	80	90	100	110	120
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												
5,5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY FOR LPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V30 D64 LPD01	1V1 D100 T10 X10 V30 D64 LPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	2,5	2,5
Feedrate, mm/min	40	50
Wheel speed, m/s	18	18
Profiling cycle, pcs.	50	70



30°

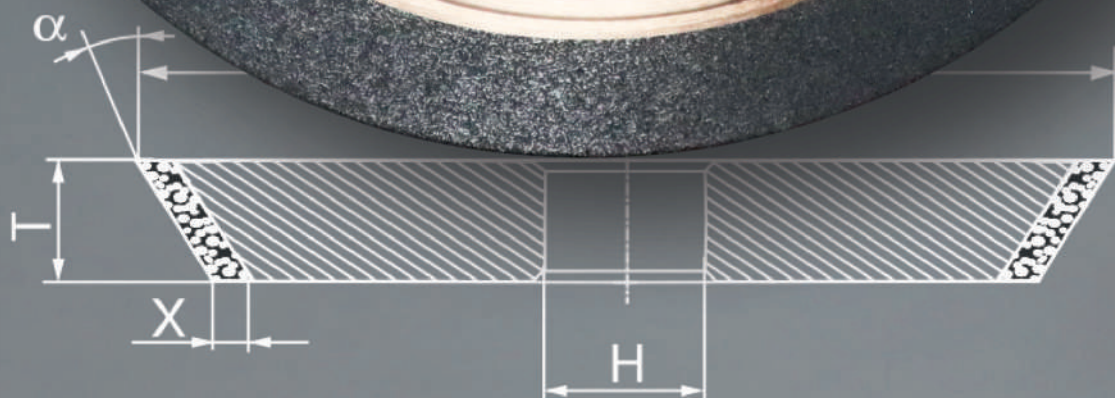


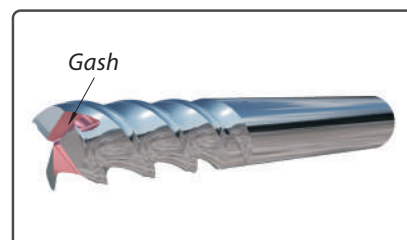
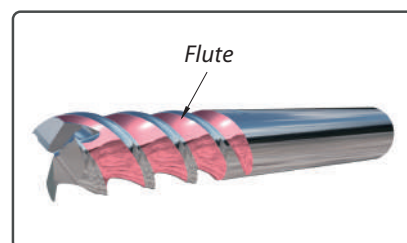
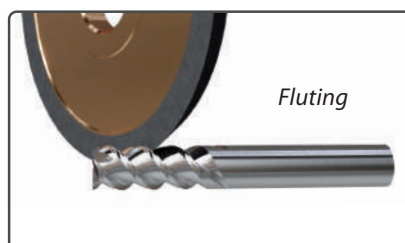
D64 RPD01 N 23089375

Paloos

$V_{max} = 35 \text{ m/s}$
 $n_{max} = 6688 \text{ 1/min}$
EN 13296

1 V 1 100 10 10 30 20 PREMIUM





1V1, 14V1 45° with FPD01, RPD01, HPD01, LPD01 bonds are designated for power grinding in the fluting and gashing operations during the manufacture of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH FPD01, RPD01, HPD01, LPD01 BONDS

Code	D, mm	D, inch	T, mm	T, inch	U, mm	U, inch	X, mm	X, inch	α°	H, mm	H, inch
FM2-57	100	4	10	3/8	5	13/64	10	3/8	45	20	0,787
FM2-58	100	4	10	3/8	5	13/64	10	3/8	45	31,75	1 1/4
FM2-59	100	4	10	3/8	5	13/64	10	3/8	45	32	1,260
FM2-51	75	3	5	13/64	-	-	10	3/8	45	20	0,787
FM2-52	75	3	5	13/64	-	-	10	3/8	45	31,75	1 1/4
FM2-53	75	3	5	13/64	-	-	10	3/8	45	32	1,260
FM2-72	100	4	12	3/8	-	-	10	3/8	45	20	0,787
FM2-73	100	4	12	3/8	-	-	10	3/8	45	31,75	1 1/4
FM2-74	100	4	12	3/8	-	-	10	3/8	45	32	1,260
FM2117	100	4	14	1/2	-	-	10	3/8	45	20	0,787
FM2118	100	4	14	1/2	-	-	10	3/8	45	31,75	1 1/4
FM2119	100	4	14	1/2	-	-	10	3/8	45	32	1,260
FM2-18	125	5	10	9/16	-	-	10	3/8	45	20	0,787
FM2-39	125	5	10	9/16	-	-	10	3/8	45	31,75	1 1/4
FM2-19	125	5	10	9/16	-	-	10	3/8	45	32	1,260
FM2-87	125	5	12	9/16	-	-	10	3/8	45	20	0,787
FM2-88	125	5	12	9/16	-	-	10	3/8	45	31,75	1 1/4
FM2-89	125	5	12	9/16	-	-	10	3/8	45	32	1,260
FM2132	125	5	14	1/2	-	-	10	3/8	45	20	0,787
FM2133	125	5	14	1/2	-	-	10	3/8	45	31,75	1 1/4
FM2134	125	5	14	1/2	-	-	10	3/8	45	32	1,260

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR FPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10-20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	70	80	90	100	110	120	140	160	180	200	220	240
1,5												
2												
2,5												
3												
3,5												



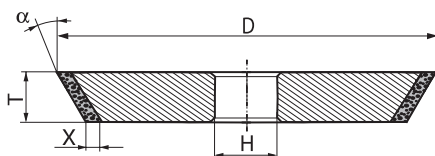
• Dark green color - recommended modes (optimal modes);



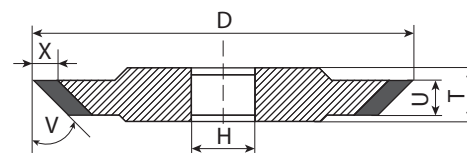
• Light green color - acceptable operating modes;

CASE STUDY FOR FPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V45 D64 FPD01
Operation	Fluting
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	8
Infeed per pass, mm	2
Feedrate, mm/min	140
Wheel speed, m/s	18
Profiling cycle, pcs.	28



shape 1V1 $D \times T \times X \times \alpha \times H$



shape 14V1 $D \times T \times U \times X \times \alpha \times H$

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	50	60	70	80	90	100	110	120	140	160	180	200
1,5												
2												
2,5												
3												
3,5												
4												

RECOMMENDED PARAMETERS FOR RPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	50	60	70	80	90	100	110	120	140	160	180	200
1,5												
2												
2,5												
3												
3,5												
4												

• Dark green color - recommended modes (optimal modes);

• Light green color - acceptable operating modes;

CASE STUDY FOR RPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V45 D64 RPD01	1V1 D100 T10 X10 V45 D64 RPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	8	8
Infeed per pass, mm	2	2
Feedrate, mm/min	80	100
Wheel speed, m/s	20	18
Profiling cycle, pcs.	50	60

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

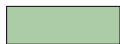
Spindle power 9-15 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	30	40	50	60	70	80	90	100	110	120	140	160
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD01 BOND DURING ONE-PASS CUTTING

Spindle power 20-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	30	40	50	60	70	80	90	100	110	120	140	160
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR LPD01 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	10	20	30	40	50	60	70	80	90	100	110	120
1,5												
2												
2,5												
3												
3,5												
4												
4,5												
5												
5,5												

• Dark green color - recommended modes (optimal modes);

• Light green color - acceptable operating modes;

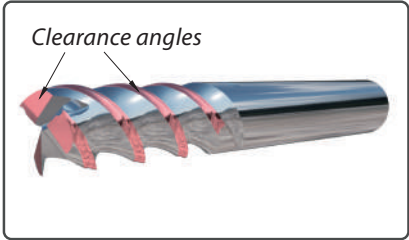
CASE STUDY FOR LPD01 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	1V1 D100 T10 X10 V45 D64 LPD01	1V1 D100 T10 X10 V45 D64 LPD01
Operation	Fluting	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	8	8
Infeed per pass, mm	2	2
Feedrate, mm/min	30	40
Wheel speed, m/s	20	18
Profiling cycle, pcs.	30	40



45°





11V9-70 with VPD02 bond are designated for production and clearance angles grinding of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH VPD02 BOND

Code	D, mm	D, inch	U, mm	U, inch	X, mm	X, inch	T, mm	T, inch	H, mm	H, inch
FR1-03	100	4	10	3/8	3	1/8	35	1 3/8	20	0,787
FR1-04	100	4	10	3/8	3	1/8	35	1 3/8	31,75	1 1/4
FR1-05	100	4	10	3/8	3	1/8	35	1 3/8	32	1,260

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR VPD02 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

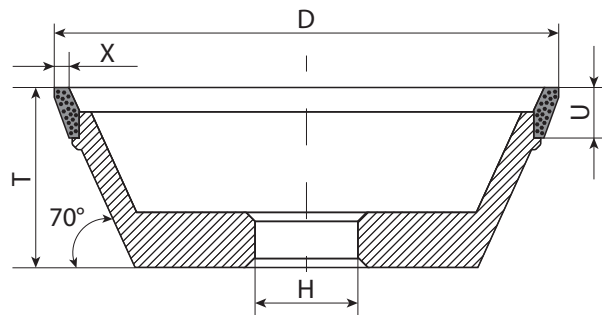
Infeed t, mm	Feedrate S, mm/min													
	30	40	50	60	70	80	90	100	110	120	140	160	180	200
0,2														
0,3														
0,5														
1														

• Dark green color - recommended modes (optimal modes);

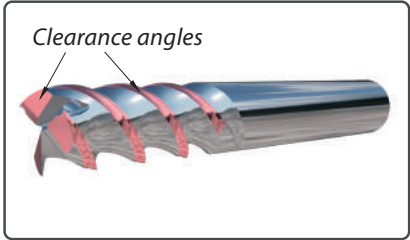
• Light green color - acceptable operating modes;

CASE STUDY FOR VPD02 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	WALTER HELITRONIC POWER 5-AXES CNC, SPINDLE POWER 25 KW
Grinding wheel	11V9-70 D100 U10 X3 T35 H20 D64 VPD02	
Operation	Clearance angles	
Coolant	Pure oil with superfiltration and chiller	
Workpiece D×L/L flute, mm	12×100/50	12×100/50
Flute q-ty, pcs.	4	4
Infeed per pass, mm	0,3	0,4
Feedrate, mm/min	90	100
Wheel speed, m/s	25	25
Profiling cycle, pcs.	140	140



shape 11V9-70 D×U×X×T×H



11V9-70 with HPD03 bond are designated for production and clearance angles grinding of cutting tools:

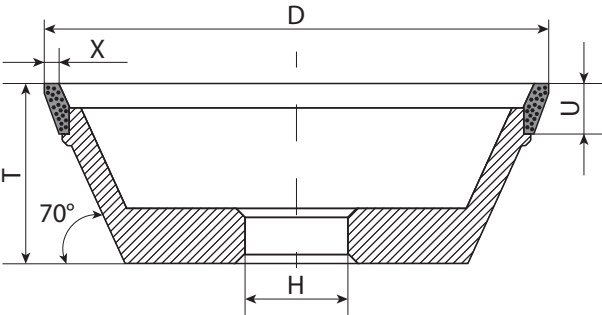
- *workpieces over 6 mm with using D64 grit size;*
- *workpieces from 4 to 12 mm with using D46 grit size.*

11V9-70 with HPD04 bond are designated for production and clearance angles grinding of cutting tools with diameter of workpiece up to 6 mm diameter with using M30 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD03 AND HPD04 BONDS

Code	D, mm	D, inch	U, mm	U, inch	X, mm	X, inch	T, mm	T, inch	H, mm	H, inch
FR1-00	75	3	10	3/8	3	1/8	30	13/64	20	0,787
FR1-01	75	3	10	3/8	3	1/8	30	13/64	31,75	1 1/4
FR1-03	100	4	10	3/8	3	1/8	35	1 3/8	20	0,787
FR1-04	100	4	10	3/8	3	1/8	35	1 3/8	31,75	1 1/4
FR1-05	100	4	10	3/8	3	1/8	35	1 3/8	32	1,260
FR1-06	100	4	10	3/8	3	1/8	40	1 4/7	20	0,787
FR1-07	100	4	10	3/8	3	1/8	40	1 4/7	31,75	1 1/4
FR1-08	100	4	10	3/8	3	1/8	40	1 4/7	32	1,260

Customer-specific and other grinding tools can be produced on request.



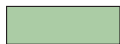
shape 11V9-70 D×U×X×T×H

RECOMMENDED PARAMETERS FOR HPD03 BOND D46-D64 GRIT SIZE DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

Infeed t, mm	Feedrate S, mm/min													
	30	40	50	60	70	80	90	100	110	120	140	160	180	200
0,2														
0,3														
0,5														

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD04 BOND M30 GRIT SIZE DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

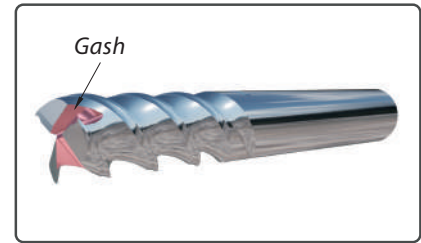
Infeed t, mm	Feedrate S, mm/min													
	20	30	40	50	60	70	80	90	100	110	120	140	160	180
0,2														
0,3														

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

CASE STUDY FOR HPD04 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW
Grinding wheel	11V9-70 D75 U10 X3 T30 H20 M30 HPD04
Operation	Clearance angles
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	2
Infeed per pass, mm	0,05 outer diameter, 0,3 end surface
Feedrate, mm/min	75
Wheel speed, m/s	18-20
Profiling cycle, pcs.	60



12V9-45 with HPD03 bond are designated for gashing and reshaping operations of cutting tools:

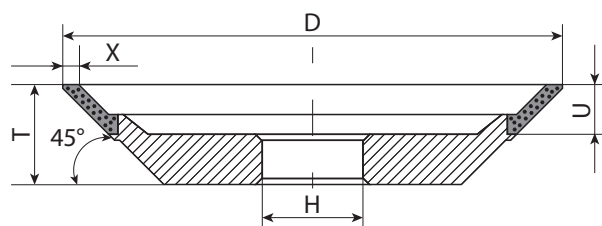
- workpieces over 6 mm with using D64 grit size;
- workpieces from 4 to 12 mm with using D46 grit size.

12V9-45 with HPD04 bond are designated for gashing and reshaping operations of cutting tools with diameter of workpiece up to 6 mm diameter with using M30 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD03 AND HPD04 BONDS

Code	D, mm	D, inch	U, mm	U, inch	X, mm	X, inch	T, mm	T, inch	H, mm	H, inch
FR2-00	75	3	6	1/4	2	5/64	16	21/32	20	0,787
FR2-01	75	3	6	1/4	2	5/64	16	21/32	31,75	1 1/4
FR2-02	75	3	6	1/4	2	5/64	16	21/32	32	1,260
FR2-03	100	4	10	3/8	3	1/8	20	51/64	20	0,787
FR2-04	100	4	10	3/8	3	1/8	20	51/64	31,75	1 1/4
FR2-05	100	4	10	3/8	3	1/8	20	51/64	32	1,260
FR2-06	125	5	10	3/8	3	1/8	25	1	20	0,787
FR2-07	125	5	10	3/8	3	1/8	25	1	31,75	1 1/4
FR2-08	125	5	10	3/8	3	1/8	25	1	32	1,260

Customer-specific and other grinding tools can be produced on request.



shape 12V9-45 $D \times U \times X \times T \times H$

RECOMMENDED PARAMETERS FOR HPD03 BOND D46-D64 GRIT SIZE DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 20-26 m/s.

Infeed t, mm	Feedrate S, mm/min													
	20	30	40	50	60	70	80	90	100	110	120	130	140	160
0,5														
1														
2														
3														



• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

RECOMMENDED PARAMETERS FOR HPD04 BOND M30 GRIT SIZE DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 20-26 m/s.

Infeed t, mm	Feedrate S, mm/min													
	20	30	40	50	60	70	80	90	100	110	120	130	140	160
0,2														
0,3														
0,5														
0,7														



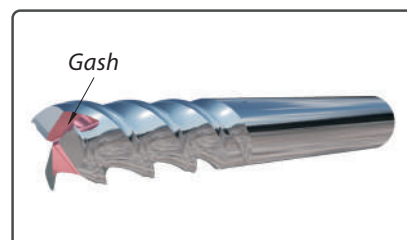
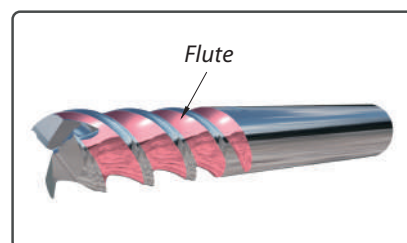
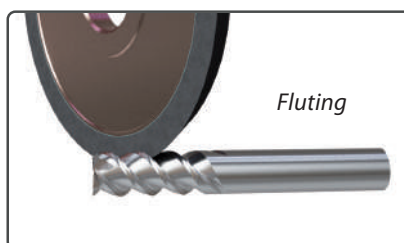
• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY FOR HPD04 BY CARBIDE END MILL PRODUCTION

MACHINE	VOLLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW
Grinding wheel	12V9-45 D75 U6 X2 T16 H20 M30 HPD04
Operation	Gashing
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	12×100/50
Flute q-ty, pcs.	3
Infeed per pass, mm	0,9
Feedrate, mm/min	20
Wheel speed, m/s	22
Profiling cycle, pcs.	40



1V1, 14V1 45° with HPD04 bonds are designated for power grinding in the fluting and gashing operations during the manufacture of cutting tools with a diameter of workpieces from 4 to 12 mm with using D46 grit size and over 6 mm with using D64 grit size.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD04 BOND

Code	D, mm	D, inch	T, mm	T, inch	U, mm	U, inch	X, mm	X, inch	α°	H, mm	H, inch
9-9009	100	4	10	3/8	5	13/64	10	3/8	45	20	0,787
9-9010	100	4	10	3/8	5	13/64	10	3/8	45	31,75	1 1/4
9-9011	100	4	10	3/8	5	13/64	10	3/8	45	32	1,260
9-9003	75	3	5	13/64	-	-	10	3/8	45	20	0,787
9-9004	75	3	5	13/64	-	-	10	3/8	45	31,75	1 1/4
9-9005	75	3	5	13/64	-	-	10	3/8	45	32	1,260
9S3249	100	4	6	1/4	-	-	5	13/64	45	20	0,787
9F3208	100	4	10	3/8	-	-	6	1/4	45	32	1,260
9-9998	100	4	10	3/8	-	-	10	3/8	45	20	0,787
9B3208	100	4	12	1/2	-	-	6	1/4	45	20	0,787
9K3241	125	5	8	5/16	-	-	6	1/4	45	31,75	1 1/4
9-3241	125	5	10	3/8	-	-	6	1/4	45	31,75	1 1/4

Customer-specific and other grinding tools can be produced on request.

RECOMMENDED PARAMETERS FOR HPD04 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min													
	50	60	70	80	90	100	110	120	130	140	160	180	200	220
0,2														
0,3														
0,4														
0,5														
0,8														



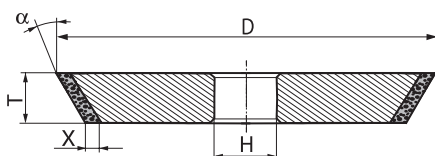
• Dark green color - recommended modes (optimal modes);



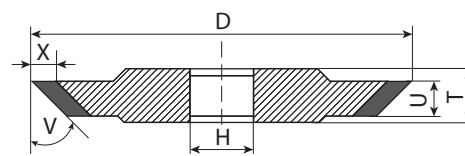
• Light green color - acceptable operating modes;

CASE STUDY FOR HPD04 BY CARBIDE END MILL PRODUCTION

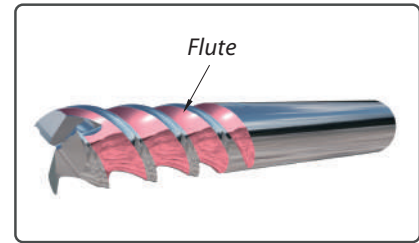
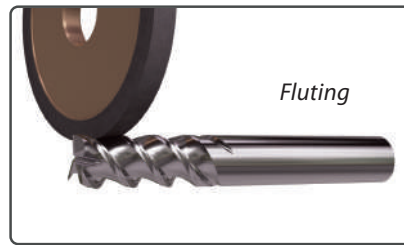
MACHINE	VOLLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW
Grinding wheel	1V1 D75 T5 X10 V45 H20 M30 HPD04
Operation	Fluting
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	4×60/16
Flute q-ty, pcs.	4
Infeed per pass, mm	0,4
Feedrate, mm/min	100
Wheel speed, m/s	22
Profiling cycle, pcs.	30



shape 1V1 $D \times T \times X \times \alpha \times H$



shape 14V1 $D \times T \times U \times X \times \alpha \times H$



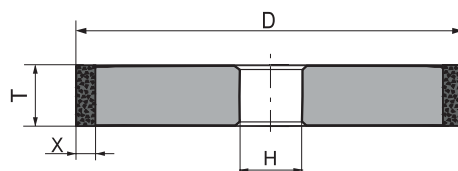
1A1, 14A1 with HPD04 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces over 6 mm with using M30 grit size.

1A1, 14A1 with the HPD05 bond is designed for the operation "polishing" to provide a high quality surface roughness during the manufacture of cutting tools with using M10.

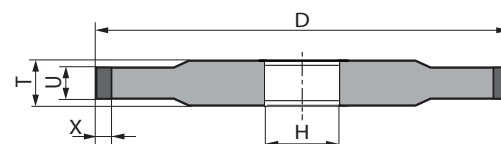
THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD04 BOND

Code	D, mm	D, inch	T, mm	T, inch	U, mm	U, inch	X, mm	X, inch	H, mm	H, inch
9-9015	100	4	10	3/8	5	13/64	10	3/8	20	0,787
9-9016	100	4	10	3/8	5	13/64	10	3/8	31,75	1 1/4
9-9017	100	4	10	3/8	5	13/64	10	3/8	32	1,260
9-9012	75	3	5	13/64	-	-	10	3/8	20	0,787
9-9013	75	3	5	13/64	-	-	10	3/8	31,75	1 1/4
9-9014	75	3	5	13/64	-	-	10	3/8	32	1,260
9-6941	75	3	6	1/4	-	-	5	13/64	10	0,394
9K6941	75	3	6	1/4	-	-	5	13/64	20	0,787
0-0048	80	3	6	1/4	-	-	3	1/8	20	0,787
0-0054	80	3	6	1/4	-	-	5	13/64	20	0,787
0-0050	80	3	10	3/8	-	-	3	1/8	20	0,787
0-0056	80	3	10	3/8	-	-	5	13/64	20	0,787
0-0253	80	3	10	3/8	-	-	10	3/8	20	0,787
0-0063	100	4	6	1/4	-	-	3	1/8	20	0,787
0-0069	100	4	6	1/4	-	-	5	13/64	20	0,787
0-0064	100	4	8	5/16	-	-	3	1/8	20	0,787
0-0065	100	4	10	3/8	-	-	3	1/8	20	0,787
0-0071	100	4	10	3/8	-	-	5	13/64	20	0,787
3-2919	100	4	10	3/8	-	-	7	9/32	20	0,787
0-1004	100	4	10	3/8	-	-	10	3/8	20	0,787
0-0072	100	4	12	1/2	-	-	5	13/64	20	0,787
0M0079	125	5	6	1/4	-	-	3	1/8	20	0,787
0-0079	125	5	6	1/4	-	-	3	1/8	32	1,260
0-0080	125	5	10	3/8	-	-	3	1/8	32	1,260

Customer-specific and other grinding tools can be produced on request.



shape 1A1 $D \times T \times X \times H$



shape 14A1 $D \times T \times U \times X \times H$

RECOMMENDED PARAMETERS FOR HPD04 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	80	90	100	130	140	160	170	190	200	220	240	250
0,2												
0,5												
0,8												
1												
1,5												

RECOMMENDED PARAMETERS FOR HPD05 BOND DURING ONE-PASS POLISHING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	20	30	40	50	60	70	80	90	100	110	120	140
0,02												
0,03												
0,05												



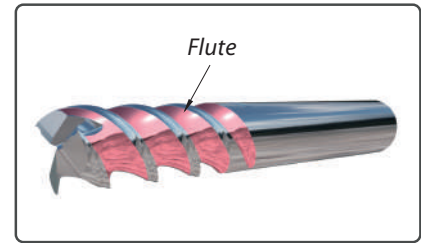
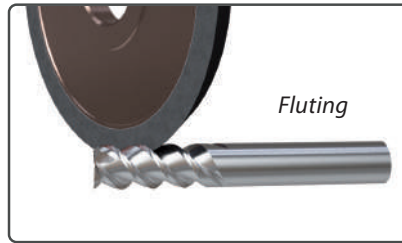
• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY FOR HPD04/05 BY CARBIDE END MILL PRODUCTION

MACHINE		VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	
Grinding wheel	1A1 D75 T5 X10 H20 M30 HPD04	1A1 D100 T12 X5 H20 M10 HPD05	
Operation	Fluting	Polishing	
Coolant	Pure oil with superfiltration and chiller		
Workpiece D×L/L flute, mm	4×60/16	4×60/16	
Flute q-ty, pcs.	3	3	
Infeed per pass, mm	0,25	0,05	
Feedrate, mm/min	140	80	
Wheel speed, m/s	16	20	
Profiling cycle, pcs.	75	50	



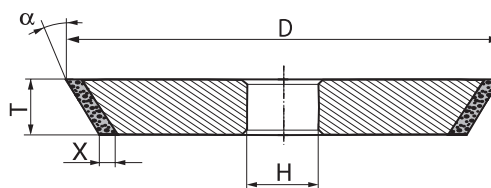
1V1 with HPD04 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces over 6 mm with using M30 grit size.

1V1 with the HPD05 bond is designed for the operation “polishing” to provide a high quality surface roughness during the manufacture of cutting tools with using M10.

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD04 AND HPD05 BONDS

Code	D, mm	D, inch	T, mm	T, inch	X, mm	X, inch	α°	H, mm	H, inch
OL7350	74	3	8	5/16	6	1/4	15	20	0,787
O-7350	75	3	8	5/16	7	9/32	20	20	0,787
O-7352	100	4	6	1/4	7	9/32	20	20	0,787
3R2919	100	4	10	3/8	7	9/32	20	31,75	1 1/4
9C9991	100	4	10	3/8	10	3/8	20	20	0,787
9D9991	100	4	10	3/8	10	3/8	20	32	1,260
9D3206	100	4	12	1/2	6	1/4	15	20	0,787
9Y3206	100	4	12	1/2	6	1/4	20	20	0,787
9S3209	125	5	12	1/2	6	1/4	15	20	0,787
9S3211	125	5	12	1/2	6	1/4	20	20	0,787

Customer-specific and other grinding tools can be produced on request.



shape 1V1 $D \times T \times X \times \alpha \times H$

RECOMMENDED PARAMETERS FOR HPD04 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min											
	80	90	100	110	130	140	160	170	180	200	220	230
0,2												
0,5												
0,8												
1												
1,5												

RECOMMENDED PARAMETERS FOR HPD05 BOND DURING ONE-PASS POLISHING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

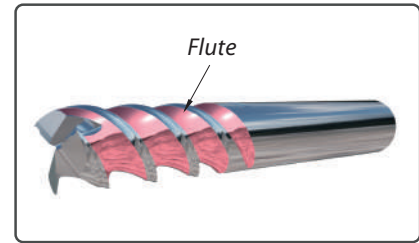
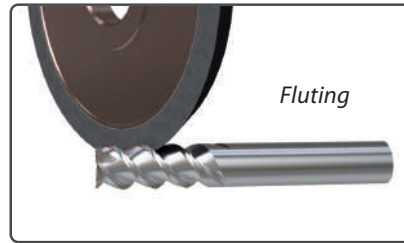
Infeed t, mm	Feedrate S, mm/min											
	20	30	40	50	60	70	80	90	100	110	120	140
0,02												
0,03												
0,05												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

CASE STUDY FOR HPD04/05 BY CARBIDE END MILL PRODUCTION

MACHINE		VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW	
Grinding wheel	1V1 D75 T8 X7 V20 H20 M30 HPD04	1V1 D100 T12 X6 V15 H20 M10 HPD05	
Operation	Fluting	Polishing	
Coolant	Pure oil with superfiltration and chiller		
Workpiece D×L/L flute, mm	4×60/16	4×60/16	
Flute q-ty, pcs.	3	3	
Infeed per pass, mm	0,38	0,05	
Feedrate, mm/min	140	80	
Wheel speed, m/s	18	20	
Profiling cycle, pcs.	75	50	



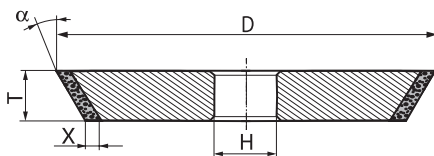
1V1, 14V1 30° with HPD04 bonds are designated for power grinding in the fluting operation during the manufacture of cutting tools with a diameter of workpieces over 6 mm with using M30 grit size.

1V1, 14V1 30° with the HPD05 bond is designed for the operation "polishing" to provide a high quality surface roughness during the manufacture of cutting tools with using M10.

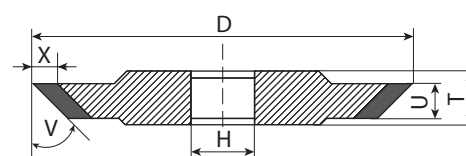
THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH HPD04 AND HPD05 BONDS

Code	D, mm	D, inch	T, mm	T, inch	U, mm	U, inch	X, mm	X, inch	α°	H, mm	H, inch
9-9006	100	4	10	3/8	5	13/64	10	3/8	30	20	0,787
9-9007	100	4	10	3/8	5	13/64	10	3/8	30	31,75	1 1/4
9-9008	100	4	10	3/8	5	13/64	10	3/8	30	32	1,260
9-9000	75	3	5	13/64	-	-	10	3/8	30	20	0,787
9-9001	75	3	5	13/64	-	-	10	3/8	30	31,75	1 1/4
9-9002	75	3	5	13/64	-	-	10	3/8	30	32	1,260
0-7346	75	3	8	5/16	-	-	5	13/64	30	20	0,787
3F2919	100	4	10	3/8	-	-	7	9/32	30	20	0,787
9D3207	100	4	12	1/2	-	-	6	1/4	30	20	0,787
9S3213	125	5	12	1/2	-	-	6	1/4	30	20	0,787

Customer-specific and other grinding tools can be produced on request.



shape 1V1 $D \times T \times X \times \alpha \times H$



shape 14V1 $D \times T \times U \times X \times \alpha \times H$

RECOMMENDED PARAMETERS FOR HPD04 BOND DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

Infeed t, mm	Feedrate S, mm/min													
	50	60	70	80	90	100	110	130	140	150	160	170	180	200
0,2														
0,3														
0,5														
0,8														
1														

RECOMMENDED PARAMETERS FOR HPD05 BOND DURING ONE-PASS POLISHING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

For wheels Ø 100 mm, use standard feed. Increase by 10–20 mm/min for Ø 125 and Ø 150 mm wheels.

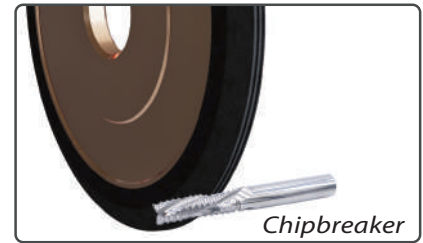
Infeed t, mm	Feedrate S, mm/min											
	20	30	40	50	60	70	80	90	100	110	120	140
0,02												
0,03												
0,05												

 • Dark green color - recommended modes (optimal modes);

 • Light green color - acceptable operating modes;

CASE STUDY FOR HPD04/05 BY CARBIDE END MILL PRODUCTION

MACHINE			VOLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW			
Grinding wheel	1V1 D75 T5 X10 V30 H20 M30 HPD04			1V1 D100 T12 X6 V30 H20 M10 HPD05		
Operation	Fluting			Polishing		
Coolant	Pure oil with superfiltration and chiller					
Workpiece D×L/L flute, mm	4×60/16			4×60/16		
Flute q-ty, pcs.	3			3		
Infeed per pass, mm	0,2			0,05		
Feedrate, mm/min	140			90		
Wheel speed, m/s	20			20		
Profiling cycle, pcs.	60			30		

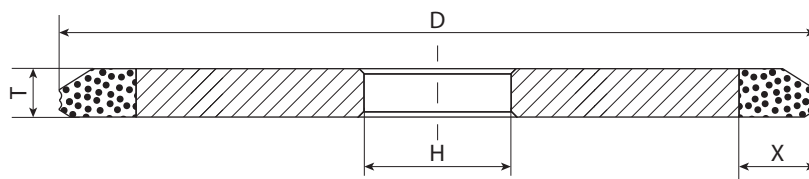


The 1S1 wheel is designed specifically for chip breaker production.

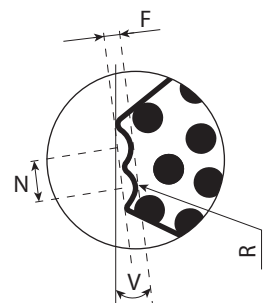
THE MOST FREQUENTLY USED WHEEL DIMENSIONS

Code	D, mm	D, inch	T, mm	T, inch	X, mm	X, inch	V, mm	V, inch	R, mm	R, inch	F, mm	F, inch	N, mm	N, inch	H, mm	H, inch
1-1234	100	4	6	1/4	10	3/8	9	23/64	0,25	0,009	0,4	0,015	0,8	0,031	20	0,787
1-1237	100	4	6	1/4	10	3/8	9	23/64	0,25	0,009	0,4	0,015	0,8	0,031	31,75	1 1/4
1-1238	100	4	6	1/4	10	3/8	9	23/64	0,25	0,009	0,4	0,015	0,8	0,031	32	1,260
1-1235	100	4	6	1/4	10	3/8	9	23/64	0,3	0,011	0,45	0,017	1,0	0,039	32	1,260
1-1239	100	4	6	1/4	10	3/8	9	23/64	0,3	0,011	0,45	0,017	1	0,039	31,75	1 1/4
1-1240	100	4	6	1/4	10	3/8	9	23/64	0,3	0,011	0,45	0,017	1	0,039	32	1,260
1-1236	100	4	6	1/4	10	3/8	9	23/64	0,5	0,019	0,7	0,027	1,5	0,059	20	0,787
1-1241	100	4	6	1/4	10	3/8	9	23/64	0,5	0,019	0,7	0,027	1,5	0,059	31,75	1 1/4
1-1242	100	4	6	1/4	10	3/8	9	23/64	0,5	0,019	0,7	0,027	1,5	0,059	32	1,260

Customer-specific and other grinding tools can be produced on request.



shape 1S1 D×T×X×V×R×F×N×H



RECOMMENDED PARAMETERS DURING ONE-PASS CUTTING

Spindle power 9-30 kW. Coolant - oil. The wheel speed is 16-22 m/s.

Infeed t, mm	Feedrate S, mm/min													
	50	60	70	80	90	100	110	120	130	140	150	160	180	200
0,2														
0,4														
0,6														



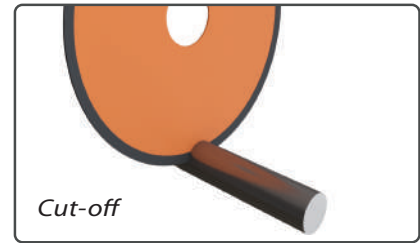
• Dark green color - recommended modes (optimal modes);



• Light green color - acceptable operating modes;

CASE STUDY BY CARBIDE END MILL PRODUCTION

MACHINE	VOLLMER V-GRIND 260 5-AXES CNC, SPINDLE POWER 11 KW
Grinding wheel	1S1 D100 T6 X5 V9 R0.3 F0.45 N1 H20 D64
Operation	Knurled profile grinding
Coolant	Pure oil with superfiltration and chiller
Workpiece D×L/L flute, mm	8×80/30
Flute q-ty, pcs.	3 (94 cuts/mill)
Infeed per pass, mm	0,38
Feedrate, mm/min	100
Wheel speed, m/s	20
Profiling cycle, pcs.	300



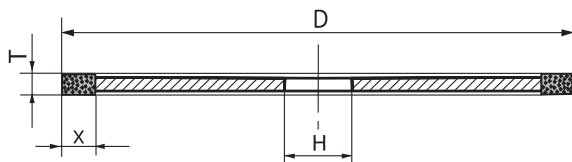
The 1A1R in the B1000 is designed for cutting workpieces during the manufacture of cutting tools.

RECOMMENDED OPERATING CONDITIONS

Coolant - oil/emulsion. The speed of the wheel is 18-26 m/s.

The feed rate depends on the diameter of the workpiece to be cut, but not more than 25 mm/min.

The recommended grit size is D151.



shape 1A1R D×T×X×H

THE MOST FREQUENTLY USED WHEEL DIMENSIONS WITH B1000 BOND

Code	D, mm	D, inch	T, mm	T, inch	X, mm	X, inch	H, mm	H, inch
6M0206	150	6	1,2	1/21	5	13/64	20	0,787
6K0206	150	6	1,2	1/21	5	13/64	31,75	1 1/4
6-0206	150	6	1,2	1/21	5	13/64	32	1,260
6Y0234	200	8	1,2	1/21	5	13/64	20	0,787
6F0234	200	8	1,2	1/21	5	13/64	31,75	1 1/4
6E 0234	200	8	1,2	1/21	5	13/64	32	1,260
6D4002	200	8	1,2	1/21	10	3/8	20	0,787
6F4002	200	8	1,2	1/21	10	3/8	31,75	1 1/4
6E4002	200	8	1,2	1/21	10	3/8	32	1,260
6J0234	200	8	1,5	1/17	5	13/64	20	0,787
6M0234	200	8	1,5	1/17	5	13/64	31,75	1 1/4
6-0234	200	8	1,5	1/17	5	13/64	32	1,260
6K0234	200	8	1,8	1/14	5	13/64	32	1,260

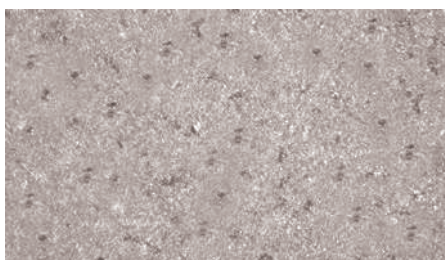
Customer-specific and other grinding tools can be produced on request.

RECOMMENDATIONS FOR THE USE, TRUING AND DRESSING OF DIAMOND AND CBN WHEELS

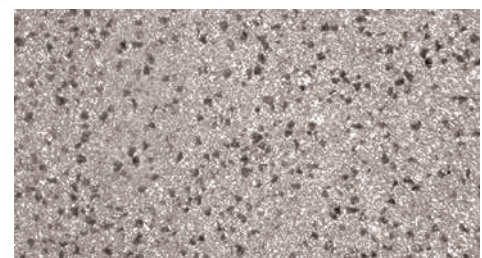
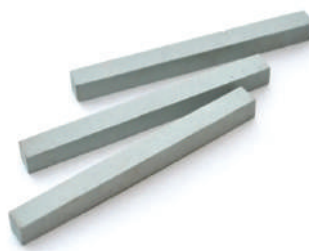
Dressing (cleaning) of diamond and CBN grinding wheels is performed to remove sludge from the working layer and restore grinding ability. The cleaning process should be carried out with aluminium oxide (AlO) stones.

Classically, the stone should be 1 or 2 sizes coarser than a diamond or CBN grinding wheel.

The finer the grit on a CBN or diamond wheel is, the softer the stone should be.



Before dressing



After dressing

You can order by PDTools Superabrasives aluminium oxide dressing stones 25A F220 CM1 for your needs.

When using diamond grinding wheels, the following instructions should be observed:

- grinding wheels are to be mounted on holders or angles and should not be removed until normal usage has occurred;
- the tools are to be mounted securely on the machine spindle in accordance with the technical specifications of the equipment used for diamond tool machining;
- the cleaning of resin bonded diamond wheels is to be performed with a pumice stone, of metal bonded wheels with a green silicon carbide bar made with grit sizes 1 or 2 sizes larger than that of the diamond wheel.

Dressing (truing) of the diamond layer is necessary to restore its shape, eliminate defects from its working surface, and to restore the required profile. As a rule, this is performed without coolant. The most productive way of dressing a diamond layer is to grind it with abrasive wheels. The dressing is performed by wheels of white alumina and green silicon carbide with vitrified bonds with grit sizes 1 or 2 sizes larger than those of the diamond wheels.

Wheels with a hardness of CM1-M1 for dressing the tool is based on the rule:

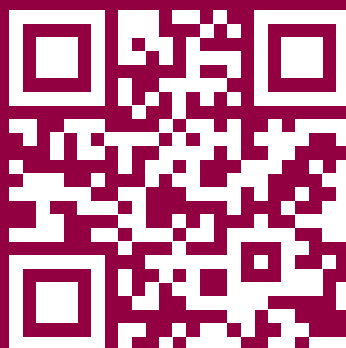
The smaller the gritsize of the superabrasive material, the softer the dressing tool must be.

CONDITIONS OF DIAMOND LAYER DRESSING

Diamond grinding wheel position	Dressing conditions			
	Peripheral speed, m/s		Line feed, m/min	Cross feed, mm/double stroke
	Conventional wheel	Diamond/CBN wheel		
Diamond wheel mounted on holders or angles or spindle of a sharpening or CNC machine.	25 – 35	2 – 5	1,0 – 2,0	0,02 – 0,04

PARAMETERS OF VITRIFIED BONDED CONVENTIONAL WHEELS FOR DRESSING OF SUPERABRASIVE LAYERS

Diamond layer parameters		Dressing wheels parameters		
Bond type	Diamond/CBN grade	Abrasive type	Abrasive grade	Hardness
HPD03, HPD04, HPD05	D151/B151 - D126/B126	Aluminum oxide 22A, 23A, 15A, 16A	20; 16; 12	M-L
	D107/B107 - D76/B76		12; 10; 8	L-K
	D64/B64 - D46/B46		8; 6; 4	K-J
	D40/B40 - D16/B16		D40; D28	J
FPD01, RPD01, HPD01, LPD01, VPD02	D251/B251 - D181/B181	Silicon carbide 62C, 63C, 64C	40; 32	O-N
	D151/B151 - D126/B126		25; 20	N-M
	D107/B107 - D76/B76		16; 12	M-L
	D64/B64 and less		10; 8; 6	L-K



WWW.PDT.TOOLS