

A large circular inset showing a close-up of a CNC precision grinding process. A metal workpiece is being ground by a grinding wheel. The workpiece has a complex, multi-faceted shape. The grinding wheel is in contact with the workpiece, creating a fine surface finish. The background is blurred, showing other parts of the machine.

# CNC Precision Grinding

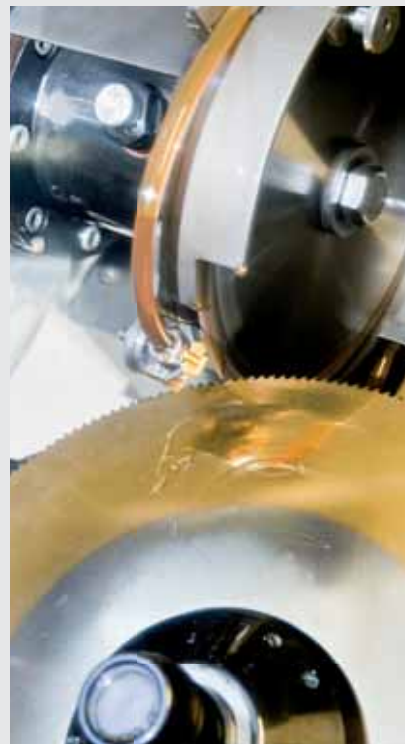
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**molemab**<sup>®</sup>  
we shape your world



Power  
through  
Innovation



Development  
through dialog with the  
customers



Welcome  
to the world of  
precision grinding wheels





## Get in shape with us

We are a competent manufacturer of Diamond and CBN grinding wheels with many years of experience in this area.

Through close cooperation with our customers we help them to gain the competitive edge with increased productivity, technical Know How and high quality products.

A high degree of flexibility along with our ability to adapt to customer requirements and a customer orientated Service differentiates us from many of our competitors.

Your Molemab Team



# Application Technology



We view the problems of our customers as individual challenges to which we dedicate ourselves in our modern grinding centre.

Through customized test programs and technical analysis solutions are identified and defined. Following this, our highly qualified application engineers support customers with the successful implementation.

Inotech Austria  
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we shape your world



# Flute grinding-Quality Metal and Polyimide Diamond Bond



D46-D91 HDC01009
D46-D91 FORTE MD
D46-D91 FORTE LD+C
D46-D91 FORTE LD
D46-D91 FORTE WD
D46-D91 HDC01101



Bonds	Carbide Milling Tool Ø 10 mm		Carbide Milling Tool Ø 16 mm		Carbide Milling Tool Ø 20 mm	
	FORTE	Polyimide	FORTE	Polyimide	FORTE	Polyimide
Tool data	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40
Cutting edge	4	4	4	4	4	4
Cutting edge length	23 mm	23 mm	33 mm	33 mm	39 mm	39 mm
Flute depth	2, 25 mm	2, 25 mm	3,6 mm	3, 6 mm	4,5 mm	4,5 mm
Helix angle	30°	30°	30°	30°	30°	30°
Cutting edge angle	8°	8°	8°	8°	8°	8°
Setting angle	15°	15°	15°	15°	15°	15°
Carbide grade	HB30F	HB30F	HB30F	HB30F	HB30F	HB30F
Machine	Deckel S22	Deckel S22	Deckel S22	Deckel S22	Deckel S22	Deckel S22
Spindle Power	15 kW	15 kW	15 kW	15 kW	15 kW	15 kW
Coolant	Oil	Oil	Oil	Oil	Oil	Oil
<b>Flute</b>	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40	1V1/1A1 D54 FORTE LD	1V1/1A1 D64 AB40
Vf (mm/min)	200	100	120	60	80	40
Vc (M/s)	16 - 18	22	16 - 18	16 - 22	16 - 18	22
Q'w	7,5	3,75	7,2	3,6	6	3



# Application Table - Flute grinding

max. Profile depth $a_t$ [mm]	Infeed rate $v_t$ [mm/min]																
	30	40	50	60	70	80	100	120	140	160	180	200	220	240	260	280	300
2,6	1,3	1,7	2,2	2,6	3,0	3,5	4,3	5,2	6,1	6,9	7,8	8,7	9,5	10,4	11,3	12,1	13,0
2,8	1,4	1,9	2,3	2,8	3,3	3,7	4,7	5,6	6,5	7,5	8,4	9,3	10,3	11,2	12,1	13,1	14,0
3,0	1,5	2,0	2,5	3,0	3,5	4,0	5,0	6,0	7,0	8,0	9,0	10,0	11,0	12,0	13,0	14,0	15,0
3,2	1,6	2,1	2,7	3,2	3,7	4,3	5,3	6,4	7,5	8,5	9,6	10,7	11,7	12,8	13,9	14,9	16,0
3,4	1,7	2,3	2,8	3,4	4,0	4,5	5,7	6,8	7,9	9,1	10,2	11,3	12,5	13,6	14,7	15,9	17,0
3,6	1,8	2,4	3,0	3,6	4,2	4,8	6,0	7,2	8,4	9,6	10,8	12,0	13,2	14,4	15,6	16,8	18,0
3,8	1,9	2,5	3,1	3,8	4,4	5,1	6,3	7,6	8,9	10,1	11,4	12,7	13,9	15,2	16,5	17,7	19,0
4,0	2,0	2,7	3,3	4,0	4,7	5,3	6,7	8,0	9,3	10,7	12,0	13,3	14,7	16,0	17,3	18,7	20,0
4,2	2,1	2,8	3,5	4,2	4,9	5,6	7,0	8,4	9,8	11,2	12,6	14,0	15,4	16,8	18,2	19,6	21,0
4,4	2,2	2,9	3,7	4,4	5,1	5,9	7,3	8,8	10,3	11,7	13,2	14,7	16,1	17,6	19,1	20,5	22,0
4,6	2,3	3,1	3,8	4,6	5,4	6,1	7,7	9,2	10,7	12,3	13,8	15,3	16,9	18,4	19,9	21,5	23,0
4,8	2,4	3,2	4,0	4,8	5,6	6,4	8,0	9,6	11,2	12,8	14,4	16,0	17,6	19,2	20,8	22,4	24,0
5,0	2,5	3,3	4,2	5,0	5,8	6,7	8,3	10,0	11,7	13,3	15,0	16,7	18,3	20,0	21,7	23,3	25,0
5,5	2,8	3,7	4,6	5,5	6,4	7,3	9,2	11,0	12,8	14,7	16,5	18,3	20,2	22,0	23,8	25,7	27,5
6,0	3,0	4,0	5,0	6,0	7,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	22,0	24,0	26,0	28,0	30,0
6,5	3,3	4,3	5,4	6,5	7,6	8,7	10,8	13,0	15,2	17,3	19,5	21,7	23,8	26,0	28,2	30,3	32,5
7,0	3,5	4,7	5,8	7,0	8,2	9,3	11,7	14,0	16,3	18,7	21,0	23,3	25,7	28,0	30,3	32,7	35,0

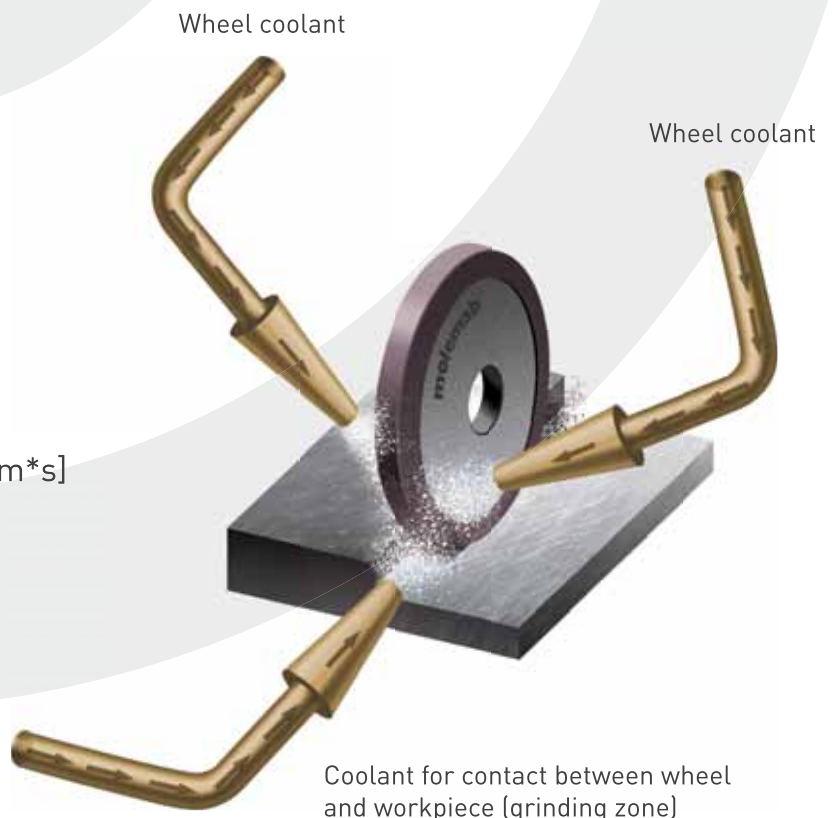
 Polyimide bond

 FORTE - Bond  
min. max.

## Calculation Formula

$$Q'_w = \frac{a_t * v_t}{60}$$

Cutting Speed  $v_c = 15-18$  m/s  
Material Removal Rate  $Q'_w$  [mm<sup>3</sup>/mm\*s]  
Profile depth  $a_t$  [mm]  
Infeed rate  $v_t$  [mm/min]



# Tungsten carbide milling cutter

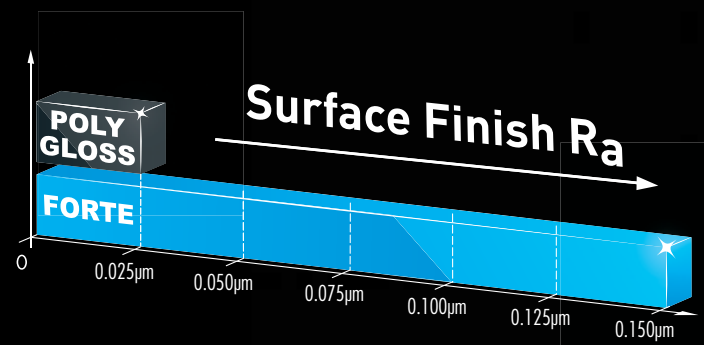
## Face grinding and relief

Bonds	Carbide Milling Tool Ø 10 mm		Carbide Milling Tool Ø 16 mm		Carbide Milling Tool Ø 20 mm	
	FORTE	Polyimide	FORTE	Polyimide	FORTE	Polyimide
Tool data	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99
Cutting edge	4	4	4	4	4	4
Cutting edge length	23 mm	23 mm	33 mm	33 mm	39 mm	39 mm
Flute depth	2, 25 mm	2, 25 mm	3,6 mm	3, 6 mm	4,5 mm	4,5 mm
Helix angle	30°	30°	30°	30°	30°	30°
Cutting edge angle	8°	8°	8°	8°	8°	8°
Setting angle	15°	15°	15°	15°	15°	15°
Carbide grade	HB30F	HB30F	HB30F	HB30F	HB30F	HB30F
Machine	Deckel S22	Deckel S22	Deckel S22	Deckel S22	Deckel S22	Deckel S22
Spindle Power	15 kW	15 kW	15 kW	15 kW	15 kW	15 kW
Coolant	Oil	Oil	Oil	Oil	Oil	Oil
<b>Relief 1</b>	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99
Vf (mm/min)	200	200	175	175	150	150
Vc (m/s)	30	30	30	30	30	30
<b>Relief 2</b>	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99
Vf (mm/min)	150	150	125	125	80	80
Vc (m/s)	30	30	30	30	30	30
<b>Tip relief 1</b>	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99
Vf (mm/min)	200	200	175	175	120	120
Vc (m/s)	30	30	30	30	30	30
<b>Tip relief 2</b>	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99	11V9 100-20-3-20 D64 HDC	11V9 100-10-3-20 D64AB99
Vf (mm/min)	100	100	80	80	60	60
Vc (m/s)	30	30	30	30	30	30
<b>Tip gash out</b>	12V9 100-20-3-20 D64 HDC	12V9 100-10-3-20 D64AB99	12V9 100-20-3-20 D64 HDC	12V9 100-10-3-20 D64AB99	12V9 100-20-3-20 D64 HDC	12V9 100-10-3-20 D64AB99
<b>Gash out</b>						
Vf (mm/min)	80	80	50	50	40	40
Vc (m/s)	22	22	22	22	22	22
<b>End gash</b>						
Vf (mm/min)	20	20	30	30	20	20
Vc (m/s)	22	22	22	22	22	22



# Polishing of carbide tools

POLY Gloss HD	
<b>Grinding wheel 1A1 and 1V1</b>	
Max. cutting depth	0,15 mm
Cutting speed	27 m/s
Feed rate	50-100 mm/min
<b>Grinding wheel 11V9</b>	
Max. cutting depth	0,1 mm
Cutting speed	27-30 m/s
Feed rate	50-100 mm/min
<b>Grinding wheel 12V9</b>	
Max. cutting depth	0,1 mm
Cutting speed	27-30 m/s
Feed rate	20-60 mm/min





# POLY GLOSS HD

MOLEMAB's new grinding wheel generation for flute- and cutting edge polishing. The application of these grinding wheels permits the flute and cutting edge processing of solid carbide cutting tools. Matt-finished for META Gloss and high-gloss finished for POLY Gloss.

**Using solid carbide cutting tools with polished cutting edges offers considerable advantages particularly with regard to the processing of:**

- Aluminium, copper and brass
- Titanium
- Wood
- Plastics
- Laminated materials
- Tools for hard machining

**Solid carbide cutting tools with polished cutting edges guarantee:**

- Optimized cutting edge geometry with no chunking
- Better chip removal
- Longer service life
- Reduced temperature development
- Optimized surface quality
- Reduced power consumption of the machine tool

**In order to ensure the success of the polishing wheels you have to comply with the following requirements:**

- The grinding wheel must be balanced (if possible fixed on the flange) before usage
- The grinding wheel must be dressed in the grinding machine
- The grinding machine and the spindle bearing must be in good order and condition

Only, if all these conditions are met the successful application of the abrasive wheel can be guaranteed.

**Not polished**



**Polished with  
POLY GLOSS**



# Certificates



## Calculation table from rpm to wheel speed

### Diamond: 15 to 35 m/s

Wheel Ø	10 m/s	15 m/s	20 m/s	25 m/s	30 m/s	35 m/s	40 m/s	45 m/s	50 m/s	60 m/s	70 m/s
5	38200										
10	19100	28600	38200								
15	12700	19100	25500	31800	38200						
20	9500	14300	19100	23900	28600	33500	38200				
25	7600	11500	15300	19100	22900	26800	30500	34400	38200		
30	6400	9550	12700	15900	19100	22300	25500	28650	31800	38200	44600
40	4800	7200	9500	11950	14300	16700	19100	21500	23900	28600	33500
50	3800	5700	7600	9550	11500	13400	15300	17200	.	22900	26750
75	2500	3800	5100	6400	7600	8900	10200	11450	12700	15300	17800
100	1900	2900	3800	4800	5700	6700	7650	8600	9550	11500	13400
125	1500	2300	3050	3800	4600	5350	6100	6900	7650	9200	10700
150	1300	1900	2550	3200	3800	4450	5100	5700	6400	7600	8900
175	1100	1650	2200	2700	3200	3800	4350	4900	5450	6550	7650
200	950	1400	1900	2400	2900	3350	3800	4300	4800	5700	6700

# We shape the World.

Our wheels are successfully used worldwide in the following branches.



## Industrial branches

Aviation Industry  
Aerospace Industry  
Automotive Industry  
Rail Industry  
Engine Industry  
Shipbuilding Industry

Metalworking and  
Processing Industry  
Machine Building Industry

Mining Industry  
Oil Industry

Paper Industry  
Healthcare Industry







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