



microdiamant

Micron diamond powder

Product range

Matching diamond type and size with your process requirements ensures first-class results.

Diamond type selection

Polycrystalline diamond is best suited for lapping and polishing of both extremely hard and soft materials. Thanks to its unique characteristics, maximum material removal rates and superior surface quality are achieved. Monocrystalline synthetic diamond is relatively inexpensive to produce and therefore widely used for grinding, lapping and polishing applications. Natural diamond is preferred for the production of electroplated diamond tools. Nanodiamond is a nano-material used in a variety of applications and research projects.

Key properties of diamond types:

Performance Index

The Performance Index is an efficiency indicator. It is defined as the product of material removal rate and surface quality. The highest Performance Index indicates the most efficient achievement of stock removal and surface quality.

Particle strength

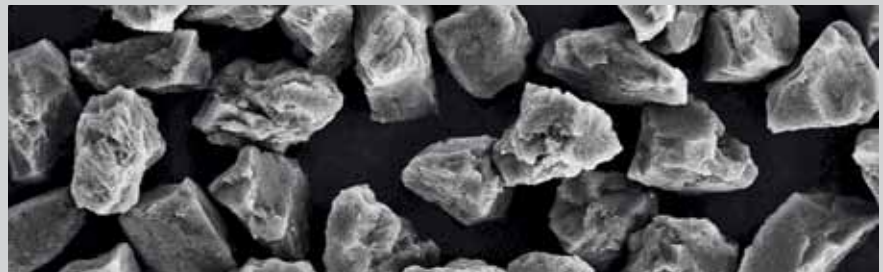
A high particle strength minimizes fraction of the diamond during the process and thus provides higher rates of material removal. The particle strength depends primarily on the structure of the diamond. Thanks to its amorphous structure with no cleavage planes, polycrystalline diamond is most pressure-resistant.

Grading

The particle size distribution has a direct influence on results in surface roughness and quality. Precision grading with narrow particle size distribution ensures a high performance and allows to fine tune the diamond size in order to meet surface roughness specifications.

Detailed information on each diamond type can be found in the corresponding product data sheet.

Diamond type	Polycrystalline synthetic diamond		
	DP Precision size range	FG Standard size range	FGW Wide size range
Synthesis	Detonation Synthesis (DuPont process)		
Particle structure	polycrystalline		
Particle surface	Rough surface with micro cutting edges		
Performance Index	7.3	6.8	6.4
Particle strength	9.0	9.0	9.0
Grading	7.4 Precision size range	6.6 Standard size range	6.1 Wide size range
Purity	>99.5%	>99%	>99%
Applications	Lapping/polishing of precision parts, high level of removal rate and surface quality	High-efficiency lapping, polishing	High-efficiency lapping



SmartMicron diamond

SMU
Precision size range

Modified synthetic diamond

monocrystalline

Micro-structured, rough surface

7.8

5.0

6.6 Standard size range

> 99 %

Brittle surface features allow efficient self-sharpening and scratch-free surfaces

SMP
Standard size range

7.6

7.0

6.6 Standard size range

>99%

Lapping of superhard materials

Monocrystalline synthetic diamond

MSY
Precision size range

High-pressure/high-temperature synthesis

monocrystalline

Blocky particle surface with sharp cutting edges

4.8

5.0

7.4 Precision size range

>99.5%

Lapping/polishing
Grinding/honing tools metal-bond or vitrified, surface coatings, functional surfaces

MONO-ECO
Standard size range

4.4

5.0

6.6 Standard size range

> 99 %

General lapping applications

Natural diamond

NAT
Precision size range

Natural diamond

monocrystalline

Blocky particle shape with sharp cutting edges

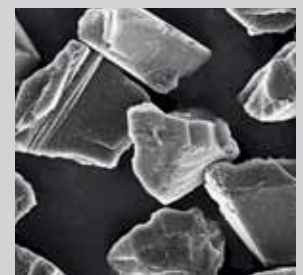
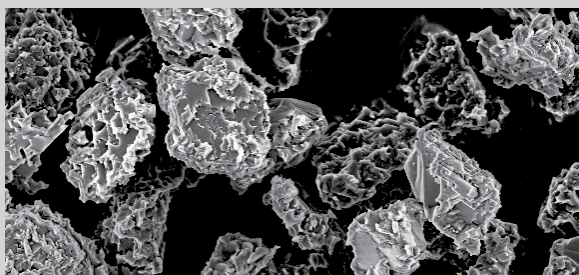
4.9

5.0

7.4 Precision size range

> 98 %

Lapping/polishing
Electroplated grinding/honing tools



Microdiamant has extensive application know-how for the various uses of micron diamond. We will gladly assist you in choosing the ideal product for your needs.

Choosing the right diamond size

The choice of the diamond size is determined by the surface quality requirements, or respectively, by the function of the surface coating. Particles in the precision size range guarantee the highest performance and reproducibility levels and provide an accurate matching of diamond size to the application. The standard or wide size ranges are preferred when cost-effectiveness directly depends on the price of the diamond.

¹ DP diamond is available up to 20 to 30 microns.

² NAT diamond is available from 0 to 0.25 microns.

³ SMU and SMP diamond is available from 2 to 30 microns.

Customer-specific sizes on request.

Orders

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	Precision size range	Standard size range	Standard size range	Wide size range
	DP ¹ , MSY, NAT ²	MONO-ECO	FG, SMU, SMP ³	FGW
	0 – 0.03			
	0 – 0.05			
	0 – 0.1			
	0 – 0.15			
	0 – 0.2			
	0 – 0.25	0 – 0.25		
	0 – 0.35			
	0 – 0.5	0 – 0.5	0.25	0.25
	0.25 – 0.5			
	0.25 – 0.75	0 – 1	0.5	0.5
	0.5 – 1	0.5 – 1		
	0.75 – 1.25			
	1 – 1.5	0 – 2	1	1
	1 – 2			
	1.25 – 2.25	0.5 – 3	1.5	
	1.5 – 2.5	1 – 3		
	1.5 – 3		2	2
	2.25 – 3.5			
	2.5 – 4	2 – 4	3	3
	3 – 5		4	
	4 – 6	3 – 6	5	4.5
	4.5 – 7			
	5.5 – 8	4 – 8	6	6
	6 – 10			
	8 – 12	6 – 12	9	9
	10 – 16	8 – 15	12	12
	10 – 20	10 – 20	15	15
	15 – 25			
	20 – 30	15 – 30		
	20 – 40	20 – 40	30	
	30 – 40			
	35 – 45			
	40 – 60	40 – 60		
	50 – 70			
	60 – 80			

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