PURECON

Highlights

- High lot-to-lot consistency thanks to precision grading and tight tolerances
- High reproducibility in the application
- Graduated micro-grain sizes allow precise adjustment to your specification

Nanocluster diamond, sub-micron size range

Microdiamant XP

XP nanodiamond is also referred to as nanocluster diamond. This diamond is formed by a detonation of carbon-containing explosives within a detonation chamber. Diamond crystallites of approximately 4 – 8 nanometers form clusters with an aggregate size up to one micrometer. The high surface area and the micro rough particle surface makes XP nanodiamond particularly suitable for surface coatings and for super fine polishing applications.

Surface area
Depending on particle size, the surface area of bulk XP diamond powder is 200 – 300 m^2/cm^3.

Particle strength
Due to the limited bonding force between the crystallites, the intrinsic strength of XP nanodiamond is inferior to other diamond types. When exposed to high mechanical stress such as ultrasonic treatment, the clusters may break apart.

Precision size range
For polishing purposes, narrowly graded XP nano sizes are available as agglomerate-free Liquid Diamond. For surface coatings, lower-cost diamond powder featuring wider particle size distributions is preferred.

Narrow tolerance
The narrow tolerances in particle size distribution guarantee consistent lot-to-lot performance and reproducible results in the application.

Application recommendations
XP nanodiamond powders are used for functional diamond surface coatings, for example wear-resistant, low friction surfaces. XP nanodiamond is also used to polishing glass and aluminum substrates for hard disks. XP nanodiamond allows for a surface roughness of less than 1 Angstrom (0.1 nm).

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Particle toughness

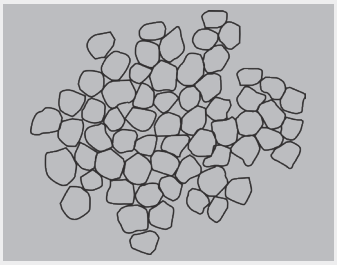
2.0

0 10

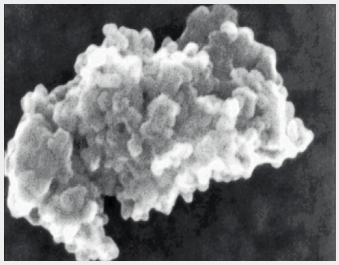
Purity, min.

95 %

0 100



Particle structure of nanocluster diamond



Nanocluster diamond grit

Pureon offers a wide range of customized solutions. Get in touch with us.

Order information

Order code ..... XP 0.018 GAF micron

Packing ..... Liquid Diamond in bottles of 1 kg and 2.5 kg, container 10 kg. Powder in units of 100, 1'000, 5'000 and 2'5000 carats.

Units ..... Carat [ct], 1 ct = 0.2 grams
Micrometer [µm, Micron]
1 micrometer = 0.001 millimeter

Application instructions

– Ultrasonic treatment may cause the XP diamond clusters to break apart, which may ultimately change the product characteristics
– XP Liquid Diamond is a diamond concentrate and must be diluted with deionized water
– Stirring will prevent the diamond from settling
– XP Liquid Diamond should never be allowed to dry
– Doing so will cause the formation of diamond agglomerates

Characteristics

Properties	XP Liquid Diamond	Microdiamant XP
Color	liquid, gray / black	powder grey / black
Density [g/cm³]	1.00 – 1.02	3.1
pH value	4 – 7 non buffered	-
Diamond crystallite size [nm]	< 10	< 10
Diamond spec. surface [m²/cm³]	200 – 300	200 – 300
Diamond purity [%]	> 95	> 95

XP Liquid Diamond

Diamond powder (agglomerate free) dispersed in DI-water

Size[1] [µm]	Median (D50) [nm]	Upper Limit (D99) [nm]	Concentrate [2] [ct/kg]	Concentrate [3] [%] wt
XP 0.018 GAF	30	55	25	0.5
XP 0.03 GAF	38	70	25	0.5
XP 0.05 GAF	50	120	50	1.0
XP 0.10 GAF	100	260	50	1.0
XP 0.15 GAF	300	700	50	1.0

Microdiamant XP

Size[1] [µm]	Median (D50) [nm]	Upper Limit (D99) [nm]
XP 0.25-1	500	1'300
XP 1-3	700	2'900

[1] Particle size refers to the size of the cluster; other sizes available on request

[2] Diamond concentration, in carat per 1 kg Liquid Diamond total weight

[3] Diamond concentration, in % weight based on Liquid Diamond total weight

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