





Resin-Bond Series

True Resin-Bond Diamond

LANDS Superabrasives supplies a carefully engineered line of resin-bond synthetic diamond, having various degrees of G-Ratio's. The product line is designed to be self-sharpening during the life of the tool. These properties allow the user to obtain extended tool life while maintaining cost effectiveness.

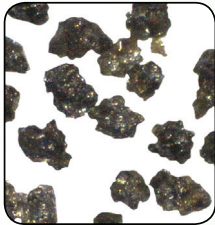
LS070



The most friable diamond in the resin-bond series; this crystal fractures quickly and is ideal in low force grinding applications where fast removal rate is key. An irregular shape characterizes this diamond crystal.

Available Sizes: 80/100-400/500

LS100



The staple product in the resin-bond series. Its high friability ensures controlled breakdown of the crystals. Strong bond retention results from its irregular shape and rough surface area.

Available Sizes: 60/80-400/500

LS120



A blocky crystal, offering a more consistent crystal shape than the LS100. This crystal is recommended in more demanding applications where a tougher crystal is required, especially in processing material containing more than 20-30% steel.

Available Sizes: 60/80-400/500



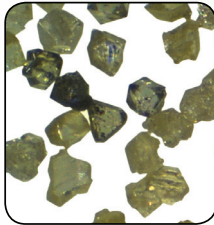


Resin-Bond Series

Metal-Bond Diamond used in Resin-Bond Applications

LANDS Superabrasives supplies a carefully engineered line of “metal-bond” synthetic diamond, specifically for resin-bond applications. The product-line features sharp crystals, ideal of extended tool-life.

LSMB0



Friable Metal Bond Crystal

One of the strongest crystals in the resin-bond series; with the right-hardened resin-bond it is an extremely competitive product. The LSMB0 is identified as the ‘all-purpose’ crystal since it remains sharp while retaining its shape in almost all resin-bond grinding.

Available Sizes: 30/40-400/500

LS-30W

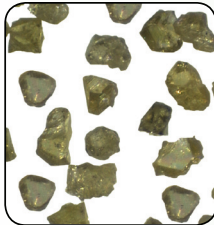


Standard Metal Bond Crystal

Although a crystal used primarily in metal-bond, this crystal has proven to be the crystal of choice in resin-bond wheels for steel-carbide grinding. The LS-30W features a true mono-crystalline crystal type with a blocky crystal shape.

Available Sizes: 30/40-400/500

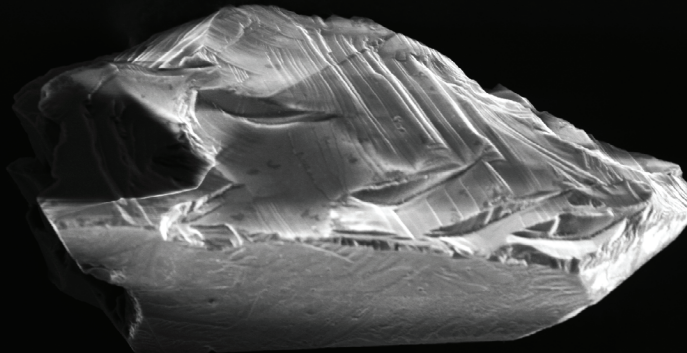
LS2280



LS2280 -developed as an alternative to natural diamond it has found its way into the traditional resin-bond series. When a harder bond requires a harder crystal than the regular LS100-series or LSMB0 series, the LS2280 can be utilized. This product is also being promoted as an economical, price controlled alternative to natural diamond grit.

Available Sizes: 30/40-400/500

LSMB0 80/100 SEM





COATINGS

Metal Coatings by Electrolysis and Electro-less coating help to improve the life of our Diamond (and CBN crystals). LANDS offers a full array of metal coatings. The coatings offer improved bond retention, aid in thermal conductivity, and protection within the bond against thermal degradation. The nickel cladding also assists in heat dissipation protecting the base so it can withstand the highest RPM speeds, grinding forces, and temperatures.

Standard Nickel (30-56-60%): Ideal for high force grinding.

Dual Layer Ti/Ni (60%): Better heat dissipation between CBN crystal, Ni layer, and bond.

Spiky Nickel (30-56-60%): Enhanced bond retention/heat dissipation ideal for tungsten carbide grinding applications.

Nodular Nickel (60%): Tough Ni coating; better retention in polyimide resin-bonds.

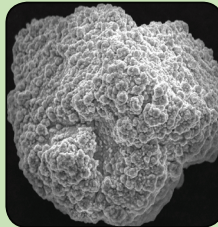
Standard Silver (50%): Dry grinding applications, low-pressure.

Standard Copper (50%): Dry grinding applications.

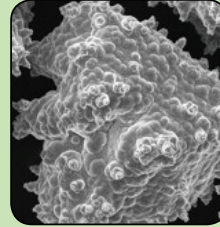
SILVER



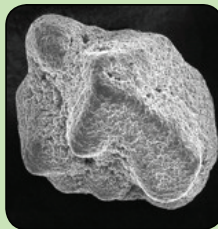
COPPER



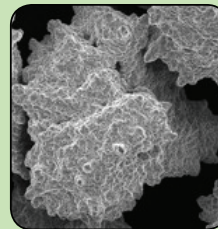
NODULAR Ni



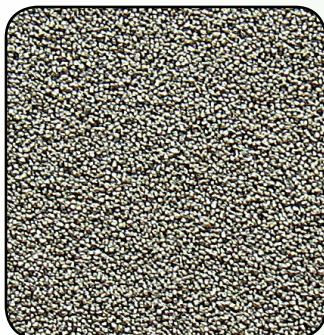
STANDARD Ni



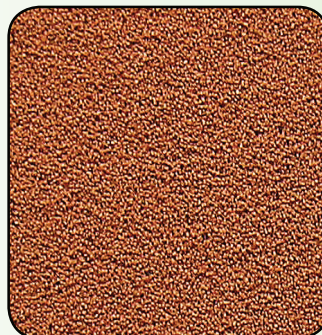
SPIKY Ni



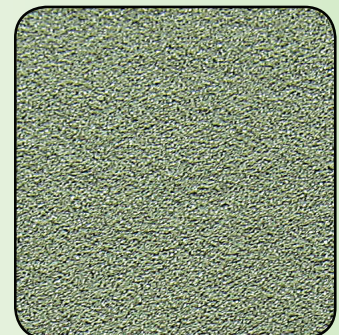
LS105Ag



LS105C



LS105N





RESIN-BOND *Series*



COATINGS

MOST FRIABLE		>>>>>	>>>>>	MOST TOUGH	
DIAMOND CHOICES FOR RESIN-BOND GRINDING	LS070	LS100	LS120	LSMBO	LS30W
BASE CRYSTAL	Ultra friable, irregular resin-bond diamond	True resin-bond diamond	Blocky true resin-bond diamond	Friable metal-bond diamond	True metal-bond diamond
SIZES AVAILABLE	80/100 - 400/500	60/80 - 400/500		30/40 - 400/500	
COATINGS	Unclad 30%, 56%, 60% Nickel (Ni), Spiky Ni, Nodular Ni Coating				
		50% Copper (Cu), 50% Silver (Ag), Ag/Cu combo			
CHARACTERISTICS	Very friable and aggressive	Friable and aggressive “standard resin-bonds”	Tough yet aggressive	Sharp and tough	True metal-bond, mono-crystalline, blocky and tough
STANDARD APPLICATION	Specialized grinding benefiting from a free cutting crystal	Wet and dry carbide grinding	Strenuous carbide grinding, ceramic grinding	“All-purpose” grinding, higher temperature applications	Carbide-Steel

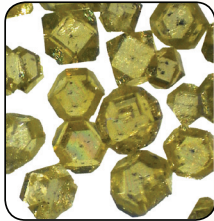


Carbon+

Sawing & Grinding

LANDS Superabrasives supplies a carefully engineered synthetic diamond grit for sawing and grinding applications. The carbon+ series is manufactured under a new revolutionary engineering process developed by LANDS Superabrasives. The Carbon+ crystals reach the highest level of product quality and consistency.

LOW

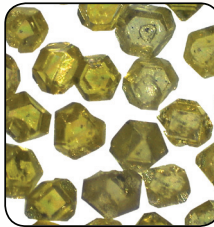


LS4750+ | LS4760+

This grade is ideal for light applications and medium strength impacts. The distribution of the diamond shape is wider than LS4770+ and LS4780+ respectively. This diamond type is ideal for low impact strength diamond ideal for moderate stone applications. Sintering temperatures up to 850°C.

Available Sizes: 25-400; other sizes upon request

MEDIUM

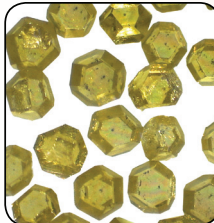


LS4770+ | LS4780+ | LS4790+

The diamonds have a uniform shape and strength with a low inclusion level. Ideal in general purpose applications. The diamonds are mainly cubo-octahedral in shape with a high impact toughness. Ideal in hard granite and concrete applications. Sintering temperature up to 950°C. The diamonds have a very low level of inclusions, wider variety of shape ideal for multipurpose applications.

Available Sizes: 25-400; other sizes upon request

HIGH



LS4810+ | LS4820+

This is the highest performing grit in the carbon+ range. This diamond is specially engineered to have the most optimized shape and inclusion level. The diamond can be sintered at temperatures in excess of 1000°C. Recommended in reinforced concrete, asphalt as well as core drilling. The diamonds are cubo-octahedral with minimal inclusions and high thermal strength. Ideal in high impact/power machines.

Available Sizes: 25-400; other sizes upon request



COATINGS / TREATMENTS

*Treatment for Electroplating
Titanium, TiNi Coating*

All products in Metal-Bond Series can be treated for use in electroplating. These treated products are designated with the suffix "E", for example LS4820+E.

LANDS Superabrasives promotes the use of titanium coated diamond crystals for the manufacturing of stone processing tools. Multiple benefits will come both to the tool manufacturer and to the end-user who is processing the stone.

Key Benefits

- » Prevention of early pull-out.
- » Increased tool life resulting in a lower cutting cost per square meter.
- » Less power consumption for the end-user, since a better free cutting action is obtained.
- » Better bond retention, since the crystal sticks to the matrix and gets completely embedded.
- » Better heat dissipation (thermal conductivity) improving the grit strength and decreasing the crystal tensions.
- » Diamond surface protection against aggressive metals and gasses from the matrix during the sintering process.

TITANIUM COATING



Titanium coated diamond crystals can be used in any regular and classic bond matrix.

LANDS Superabrasives offers also a dual Ti/Ni coating, maximizing bond-retention and heat dissipation.

For GRINDING Applications

LS4810+ LS4820+	LS4790+	LS4780+	LS4770+	LS4760+	LS4750+
High toughness High stock removal	High toughness	Medium toughness Long contact area	Low toughness	Electrodeposition	Low toughness
GLASS					
-chamfering car glass -grooving car glass -grooving (slotting) crystal ware	-chamfering car glass -grooving car glass -engraving crystal ware -profiling of crystalware with 22% Pb	-chamfering -finish of glass and mirrors -making of 3 dimensional profiles	-profiling mirrors -polishing chamfers	-profiling mirrors -polishing chamfers	
GRANITE					
-smoothing & chamfering -minor cutting -grinding	-calibrating	-minor cutting -calibrating	-polishing -honing	-polishing	
MARBLE/LIMESTONE			MARBLE		
-minor cutting		-minor cutting -honing	-polishing		
FERRITE		TUNGSTEN CARBIDE	CERAMICS		
-grinding		-sharpening & cutting edges	-dental drills		
CERAMIC TILES		CAST IRON			
-minor cutting -calibrating		-honing of cylinder heads			

Traditional

Grinding

LANDS Superabrasives supplies a series of carefully engineered metal-bond synthetic diamonds. Each type has individual characteristics that provide a wide range of possible applications for the tool makers.

LOW

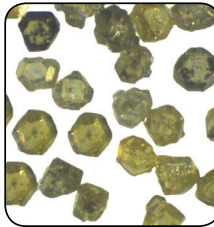


LS200 | LS230

Very friable metal-bond diamond powder with irregular shaped crystals. It features an excellent price/quality ratio for some specific non-demanding metal-bond applications.

Available Sizes: Mesh 30-500

MEDIUM

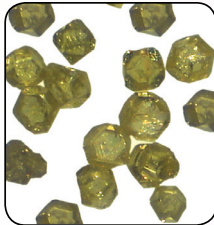


LS240 | LS250 | LS260

A regular-shaped, medium-tough diamond. This semi-blocky crystal with angular shapes is considered the standard product for the widest variety of metal bond and electroplating applications.

Available Sizes: Mesh 80-500

HIGH



LS270 | LS290

Premium strong and blocky crystals that will hold up under severe working conditions featuring a very low rate of fracture during the grinding process. The LS290 features the toughest crystal in the series. Its shape is (cubo)octahedral with virtually no inclusions. The LS290 is the preferred product in the most demanding applications, highest sintering temperatures and grinding pressure.

Available Sizes: Mesh 80-500

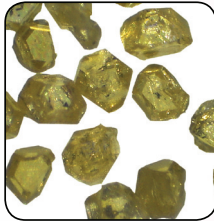


Traditional

Sawing

LANDS Superabrasives supplies a series of carefully engineered metal-bond synthetic diamonds. Each type has individual characteristics that provide a wide range of possible applications for the tool makers.

LOW

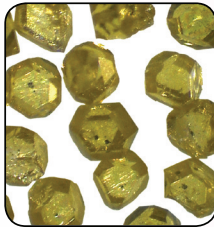


LS400 | LS430

These qualities feature blocky and mostly regular shape crystals of medium toughness, recommended for use in low to medium temperature metal-bond systems. Rougher surface of crystals results in superior bond retention in both sintered and electroplating applications.

Available Sizes: Mesh 30-80; other sizes upon request

MEDIUM



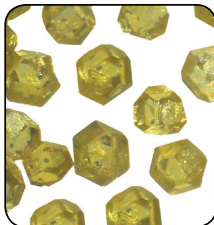
LS450 | LS460 | LS470

This saw blade range features a majority of cubo-octahedral crystals with well developed, smooth faces. The very high relative toughness of these crystals makes it ideal for extremely hard working conditions in medium and high temperature bonds.

Recommended for use in most sawing, drilling and finishing applications.

Available Sizes: Mesh 30-80; other sizes upon request

HIGH



LS480 | LS490

These grits consist of an almost entirely cubo-octahedral shaped crystals. This crystal is designed to perform in the most demanding applications without compromising removal rate or its strength integrity. This quality consists of specially selected, tough crystals, used for grinding of more wear resistant materials and is recommended where increased power is used and continuous cutting is required to avoid diamond glazing.

Available Sizes: Mesh 30-80; other sizes upon request



LSA Series

For applications where price-performance is most critical

LANDS Superabrasives supplies a carefully engineered metal-bond synthetic diamond mostly used in low-impact applications. The LSA series is used primarily in metal-bonds, brazed applications as well as electroplating for a wide variety of high end as well as a number of DIY applications.

LOW



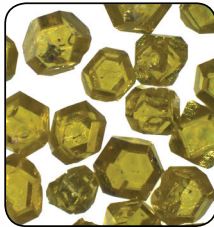
LSA04 | LSA08 | LSA12

The economy grade developed especially for low-impact metal-bond wheels as well as an excellent crystal within both electroplating applications. This line performs best in lower temperature applications as well as under lower sintering temperatures. Mostly cubic shaped crystals with sparse inclusions results in a more friable yet aggressive crystal.

Applications include: Plated and bonded tile-blades, cutting blades, certain brazed product, applications which traditionally use natural diamond.

Available Sizes: Mesh 30-500

MEDIUM



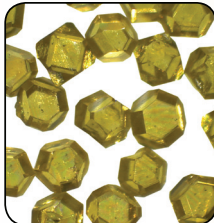
LSA16 | LSA20 | LSA24

The medium grades within the LSA series developed specifically for general purposed applications especially in medium power and impact applications. This line is defined by its mostly cubic shape with small levels of inclusions.

Applications include: Non-reinforced concrete granite slabs, sintered temperatures in a range for 900-950°C, processing of natural stone and applications benefitting most from medium-grinding forces.

Available Sizes: Mesh 30-500

HIGH



LSA28 | LSA32 | LSA36

The premium grades in the LSA series developed specifically for improved wear performance in high-power and high-impact applications. This line is defined by its cubic shape with very small levels of inclusions and is recommended when the toughest crystal is needed.

Applications include: high temperature metal-bonds and brazed products used for the processing of reinforced concrete, granite and wire sawing.

Available Sizes: Mesh 30-500

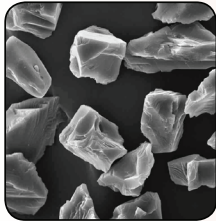




Micron

LANDS Superabrasives supplies a full range of virgin synthetic micronized diamond powders. This material is graded to severe standards, ensuring a narrow size distribution and no oversize particles.

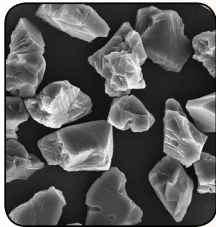
LS600F



LS600F is a uniform, blocky, friable resin-bond micron powder without slivers and irregular shapes. This material will perform to the high standards required in industry today. Excellent results in grinding, lapping, polishing of cemented carbides, special steels, glass, natural stone, hard metal dies, plastics and hard materials.

Available Sizes: 0-1/4 to 54-80; other sizes upon request

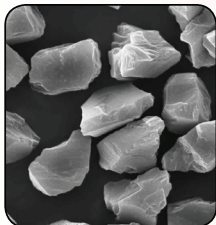
LS6BXF



LS6BXF has specifications that cover a wider range for a more aggressive crystal on the same workpiece as the LS600F. This resin-bond diamond uses a similar feedstock material as the LS600F while incorporating variations on the milling and crushing steps resulting in a distinct different product when it comes to grinding, lapping and polishing.

Available Sizes: 0-1/4 to 54-80; other sizes upon request

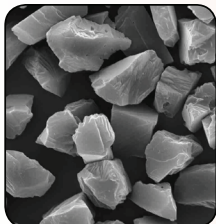
LS600T



LS600T is precision graded and features a blocky, tough, metal-bond crystal. This product was originally developed for metal-bond applications but today is used for the polishing, lapping and grinding of ultra hard materials. This micron product is used in processing diamond and PCD dies and tools, ceramics, hard alloys, precious and semi-precious stones.

Available Sizes: 0-1/4 to 54-80; other sizes upon request

LS6BXT



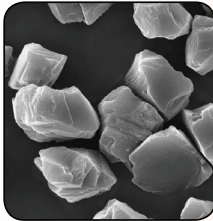
In applications that require wider specifications in size ranges, shape and crystal structure, the LS6BXT is the product of choice. Although the source base material is similar to that of the LS600T, variations in the milling/crushing steps of the micronizing process results in a distinctly different product when it comes to grinding, lapping and polishing.

Available Sizes: 0-1/4 to 54-80; other sizes upon request

Micron

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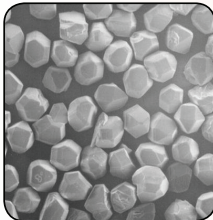
LS700T



LS700T Optical Micron is a metal-bond diamond. A superior aspect-ratio guarantees a blocky, regular shaped material that can be micronized to the narrowest size distribution and the elimination of oversized particles. It is the ultimate product for precision lapping and grinding for optical materials, glass, memory-chips, and silicon wafers.

Available Sizes: 0-1/4 to 20-40

LS800T



LS800T is a synthesized crystal (opposed to the milled crystals of the LS600 and LS700 series). This is a true crystallized powder for use in ultra precision grinding and lapping of electronics parts.

Available Sizes: 400/500, 500/600, 600/800 Mesh

LS600X

LS600X is a micron powder created by explosion-method instead of produced through milling and crushing. This product is well graded and the preferred choice for extreme applications. The LS600X reduces roughness to a nanometer/angstrom scale. Applications: Silicon, Gallium Arsenide, Sapphire, Ruby NaCl, KBr.

Available Sizes: 0-1/4 to 20-40





COATINGS / TREATMENTS

Any of the poreducts in the Micron Series can be *treated for use in electroplating*. These treated products are designated with the suffix "E", for example LS800T-E.

Metal Coatings by Electrolysis and Electro-less coating help to improve the life of our CBN and Diamond crystals. LANDS offers a full array of metal coatings. The coatings offer improved bond retention, aid in thermal conductivity, and give protection within the bond against thermal degradation. The nickel cladding also helps in heat dissipation protecting the base so it can withstand the highest RPM speeds, grinding forces, and temperatures.

LANDS offers the following coatings for micron powder products, in sizes of 10 micron and up.

Other sizes available upon request.

Standard Nickel (30-56-60%): Ideal for high force grinding.

Spiky Nickel (30-56-60%): Enhanced bond retention/heat dissipation ideal for tungsten carbide grinding applications.

Nodular Nickel (60%): Tough Ni coating; better retention in polyimide resin-bonds.

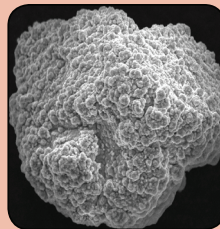
Standard Silver (50%): Dry grinding applications, low-pressure.

Standard Copper (50%): Dry grinding applications.

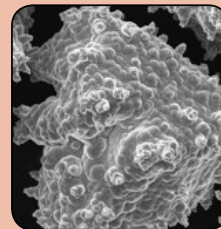
SILVER



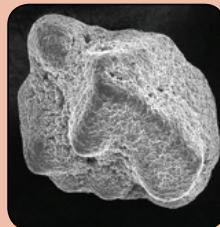
COPPER



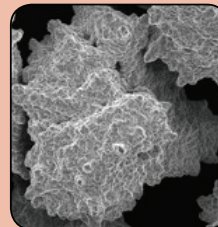
NODULAR Ni



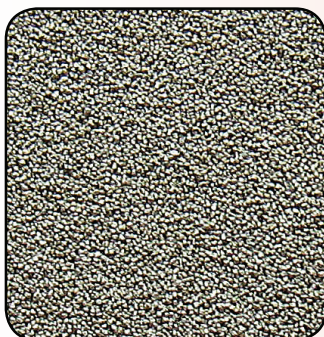
STANDARD Ni



SPIKY Ni



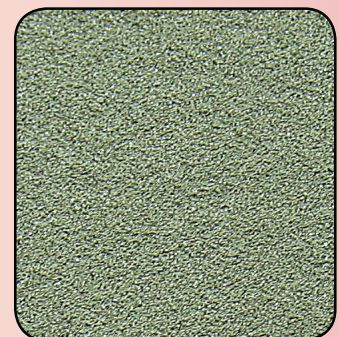
LS605F-Ag



LS605FC



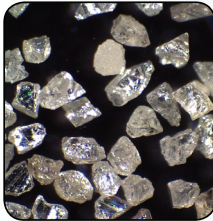
LS605FN



LSNP Series

LANDS Superabrasives supplies a natural virgin diamond powder which is engineered for metal-bond applications as well as for electroplated products.

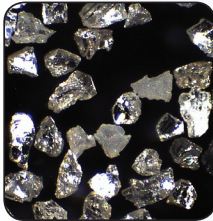
LSNPG



LSNPG consists of very blocky, well shaped natural diamond particles, with irregular surfaces for strong bond retention. The strong edges of this selected product guarantee optimal cutting action of the tool. LANDS takes pride in supplying a consistent quality material. This product is also available in processed versions: lightly processed (-lp), processed (-p), and fully processed (-fp)

Available Sizes: Mesh 12-80

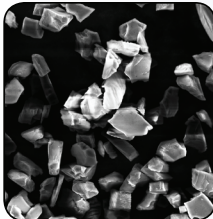
LSNPW



LSNPW is a virgin material that features characteristics similar to LSNPG, but marketed in sizes smaller than 80 mesh. This superior material consists of strong particles having compact shape and sharp edges. Having excellent bond retention, LSNPW is known to the tool maker as a true multi-purpose performing natural diamond powder.

Available Sizes: Mesh 80-500

LSNPM



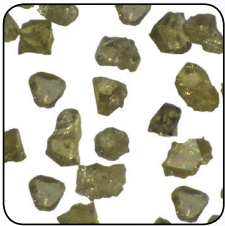
LSNPM is a natural diamond micron powder manufactured to high standard with regard to both shape and size distribution. Our quality control guarantees a product that has superior wear characteristics when compared to conventional abrasives. This micron powder is produced to the same strict tolerances as LANDS synthetic diamond micron powders.

Available Sizes: 0-1/4 to 54-80

The high level of thermal stability makes the powders ideally suited for tools requiring high temperature metal-bond systems. When properly heated and under perfect conditions to max 1100°C, diamond will not break down in the manufacturing process.

The natural mesh and micron powders of LANDS Superabrasives are carefully produced to yield a consistent high quality product. Particle shape and size distribution are carefully monitored.

TI Comparison of LSNP Series vs LS2280

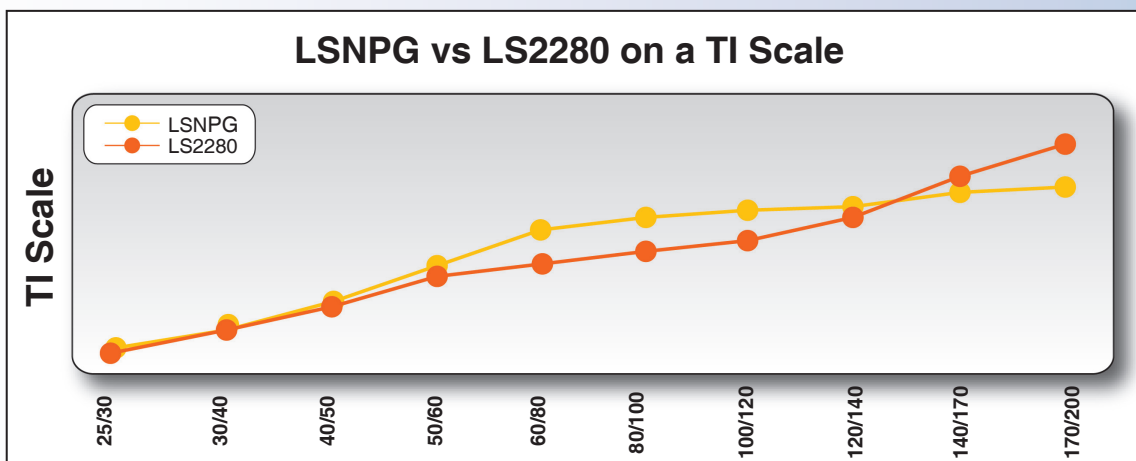
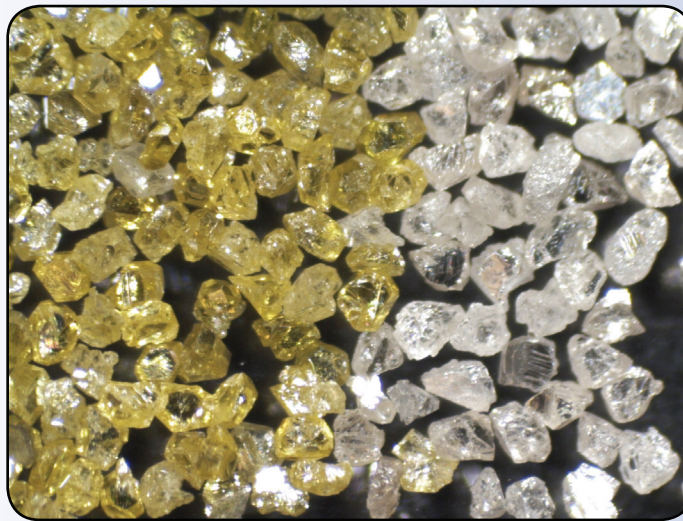


Similarities between natural (LSNP series) and LS2280

Crystal Structure- Like natural diamond the LS2280 is a milled product which gives both products an almost identical crystal structure.

Crystal Surface- A surface treatment gives the faces of the diamond a rough 'crater-like' surface which like natural diamond helps it grip into an electroplating bond and hold throughout the use of the tool or wheel.

Toughness Index- The LS2280 has a TI (toughness index) almost identical to the TI of natural diamond, as shown on the chart below:



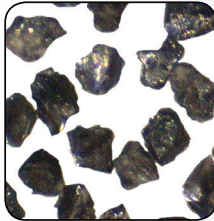


CBN Series

Black CBN for Resin-Bond and Metal-Bond Applications

LANDS Superabrasives supplies a carefully engineered CBN line offering the optimal product for resin-bond, metal-bond, vitrified bonds, and electroplated products.

BN2000



The most friable CBN crystal in the series, although relatively blocky—this product offers the highest friability in the CBN line. The BN2000 is an easily fracturing product used most often in resin-bonds where the wheel maker is looking for a combination of quick removal rate and the most economical crystal.

Available Sizes: 40/50 & 50/60, 60/80-400/500

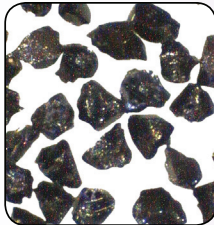
BN2500



The staple product in the CBN series, this crystal combines high friability and sharp edge ideal for most resin-bond applications. Its high friability ensures controlled breakdown of the crystals. Strong bond retention results from its irregular shape and rough surface area.

Available Sizes: 40/50 & 50/60, 60/80-400/500

BN200V



Featuring a regular shaped but still sharp crystal which is used in both resin-bond and vitrified applications, this black crystal is recommended in more demanding applications where a tough crystal is required, especially in processing work-pieces with high steel alloys.

Available Sizes: 40/50 & 50/60, 60/80-400/500

BN3000



The toughest and most blocky crystal in the pure black CBN line although it can be used in resin-bonds—it would require a hardened resin-bond in order to get optimal tool life out of the crystal. Used primarily in vitrified and electroplating applications, it offers an extremely competitive product because of its ability to withstand the highest force.

Available Sizes: 60/80-400/500

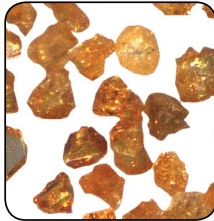


CBN Series

Amber CBN for Resin-Bond and Metal-Bond Applications

LANDS Superabrasives supplies a carefully engineered CBN line offering the optimal product for resin-bond, metal-bond, vitrified bonds, and electroplated products.

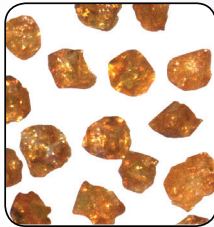
AN2000



The more friable CBN crystal in the amber series, this product features a semi-sharp product ideal for resin-bond applications. The AN2000 is most often used in resin-bonds where the wheel maker is looking for quick removal rate of softer weaker steel alloys.

Available Sizes: 40/50 & 50/60, 60/80-400/500

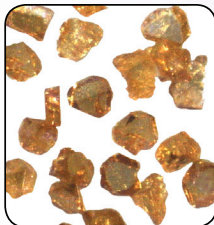
AN4000



A fully crystallized amber-red product featuring a blocky almost rounded crystal offering a higher TI level than the AN2000 product and used primarily in electroplating and metal-bond applications.

Available Sizes: 40/50 & 50/60, 60/80-400/500

AN5000



The most blocky and toughest crystal available. This crystal shines in the most vigorous applications that demand the highest grinding speeds, stock removal and impact with a toughness index 50% higher than standard CBN products. It is the ultimate choice when tool life is required.

Available Sizes: 30/40, 40/50, 50/60, 60/80-400/500





CBN Series

CBN for Metal-Bond and Vitrified Applications

LANDS Superabrasives supplies a carefully engineered CBN line offering the optimal product for resin-bond, metal-bond, vitrified bonds, and electroplated products.

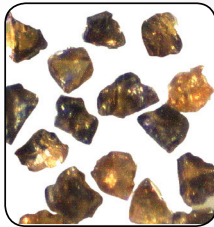
BN5000



This brown product features a sharp angular crystal shape and tends to fracture under load-pressure giving it free cutting characteristics under lower grinding power. The angular shape offers sharp edges suitable for applications demanding low pressure removal rate.

Available Sizes: 40/50 & 50/60, 60/80-400/500

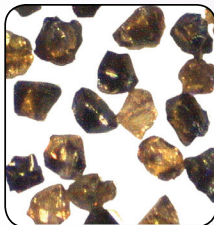
AN3000



The dark amber fully crystallized CBN is irregular in shape but offers excellent crystal strength and is a preferred product in high temperature applications both in resin-bonds and vitrified applications.

Available Sizes: 40/50 & 50/60, 60/80-400/500

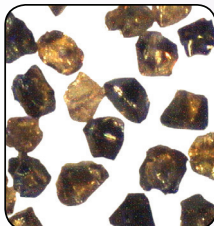
AN300V



This dark amber fully crystallized CBN is more regular in shape, providing maximum crystal strength in its kind. This product is specifically sorted and tabled for use in high demanding vitrified bond applications.

Available Sizes: 40/50 & 50/60, 60/80-400/500

GN5000



This brownish gold highly crystallized material is blocky in shape and the ideal product to consider in high pressure and high temperature applications and offers benefits including high crystal strength and ability to withstand the highest temperatures and grinding power.

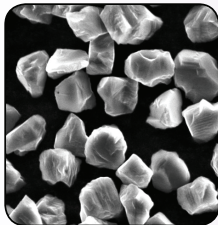
Available Sizes: 40/50 & 50/60, 60/80-400/500



CBN Series

Micronized CBN

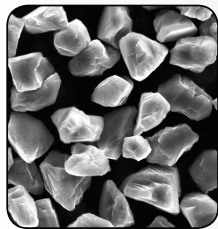
LANDS Superabrasives supplies a carefully engineered CBN line offering the optimal product for resin-bond, metal-bond, vitrified bonds, and electroplated products.



BN2600 | AN2600

This CBN product (Black | Amber) features a sharp angular crystal shape and tends to marco-fracture under load-pressure giving it free cutting characteristics under lower grinding power. The angular shape offers sharp edges suitable for applications demanding low pressure removal rate.

Available Sizes: 0-1/4 to 54-80

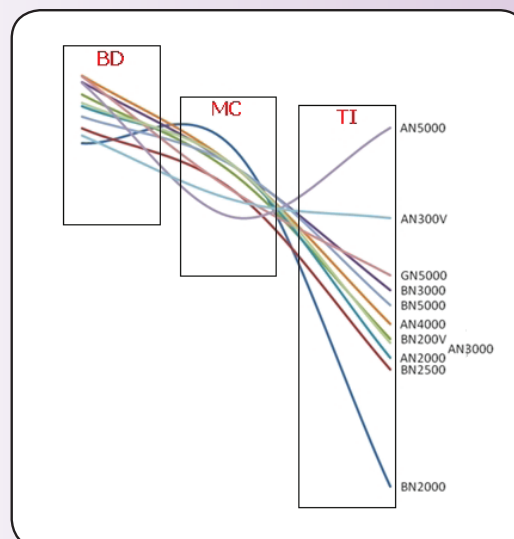


BN3600 | AN3600

This fully crystallized CBN product (Black | Amber) is irregular in shape but offers excellent crystal strength and is a preferred product in high temperature applications both in resin-bonds and Vitrified applications.

Available Sizes: 0-1/4 to 54-80







CBN Series

LANDS Superabrasives supplies a carefully engineered CBN line offering the optimal product for resin-bond, metal-bond, vitrified bonds, and electroplated products.

PRODUCT	COLOR	CHARACTERISTICS	SHAPE	SIZES
BN2000	Black	Low TI	Irregular	40/50 - 400/500
BN2500	Black	Highly Fracturable	Irregular	40/50 - 400/500
BN200V	Black	Tough, Sharp	Blocky	40/50 - 400/500
BN3000	Black	Extremely Tough	Ultra Blocky	60/80 - 400/500
BN5000	Brown	Macro-fracturing	Sharp	40/50 - 400/500
AN2000	Amber	Semi-tough	Irregular	40/50 - 400/500
AN3000	Dark Amber	Tough	Irregular/Crystallized	40/50 - 400/500
AN300V	Amber	Tough	Crystallized	40/50 - 400/500
AN4000	Amber	High TI	Crystallized	40/50 - 400/500
AN5000	Amber	Extremely Tough	Regular & Blocky	40/50 - 400/500
GN5000	Dark Amber	Thermally Stable	Highly Crystallized	40/50 - 400/500
BN2600	Black	Stock-removal	Blocky/friable	0-1/4 to 54-80
AN2600	Amber	Stock-removal	Blocky/friable	0-1/4 to 54-80
BN3600	Black	Polishing	Blocky/pure	0-1/4 to 54-80
AN3600	Black	Polishing	Blocky/pure	0-1/4 to 54-80

Compounds

LANDS Superabrasives supplies a high quality smooth, safe and high performance diamond compound known as "LSDIAC".

LSDIAC compound is the ideal compound for grinding, lapping and polishing various materials from cemented carbides to precious stones. LANDS Superabrasives compounds are manufactured with specially formulated vehicles for all the needs of the polishing and finishing industries.

In LSDIAC compounds our LANDS Superabrasives micron powders will cut, polish and finish continuously. The diamond particles will roll around between tool and work-piece. All sides and every edge of the diamond will be used, since the diamond is suspended in the carrier. This will provide both a high quality surface finishing and an economical processing time as well.

DIAMOND TYPE

Two different types of diamond are available in LSDIAC paste, depending upon application:

LS600F: used for processing cemented carbide, steel and other metals (metallographic analysis).

LS600T: used for processing glass, crystal, PCD blanks, precious and semi-precious stones.

AVAILABLE SIZES

Our synthetic diamond micron powders, LS600F and LS600T, are micronized and graded according to both National and International Standards (ANSI B74-20, FEPA 1977, U.S. Bureau of Standards).

LSDIAC is available in a wide range of sizes. All compounds are color coded for easy identification.

Size	Color Code
¼	white
½	white
1	ivory
3	yellow
6	orange
9	green
15	blue
30	red
45	brown
70	purple
95	gray
135	black

Size	Color Code
¼	white
½	white
1	ivory
3	yellow
6	orange
9	green
15	blue
30	red
45	brown
70	purple
95	gray
135	black

**Other sizes are available upon request*



Compounds

PACKAGING

LSDIAC is supplied in sealed plastic jars or syringes allowing a better and more precise dosing.

Availability is as follows:

Syringes or jars :2 5 10 15 18 20 and 25 gram/unit

Jars only :10 25 50 100 250 and 500 gram/unit

CONCENTRATION

LSDIAC is available in three concentrations: light, medium and heavy.

CARRIERS

The diamond powders are mixed in a variety of carriers in order to obtain a homogeneous, soft and well performing paste or compound. LSDIAC is available in an oil soluble, a water soluble and a both water and oil soluble carrier.

EXAMPLE FOR ORDERING LSDIAC

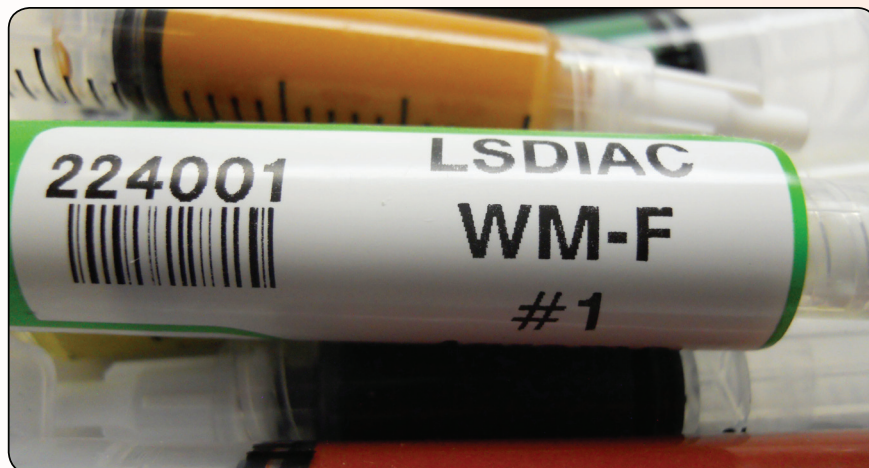
LSDIAC-AM-F6, 5 gr. syringe

A = oil/water soluble carrier

M = medium diamond concentration

F = LS600F diamond for metal processing

6 = 6 micron size (4-8 micron)





PDC for Drilling - Polycrystalline Diamond Compact

LANDS Superabrasives supplies a wide range of PDC cutters for oil, gas, geological and coal mine industries. Our PDC cutters are specially developed for high impact strength and low abrasion wear. LANDS high quality PDC cutters work under the toughest conditions, high speeds, in the hardest and most unpredictable formations.



OPQ Series

LANDS OPQ PDC cutters are the most advanced cutters for Oil drilling. These cutters offer the highest wear resistance of the diamond layer and an unsurpassed impact resistance of the tungsten carbide mountings. These cutters offer significant gains in worldwide oil and gas production.

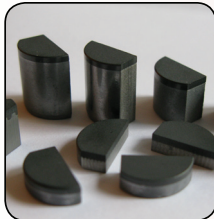
For size availability and chamfer details please refer to our specification sheet



PQ Series

LANDS PQ PDC cutters are economical cutters destined for the oil and gas exploration market where price and performance is a key element. The PQ series is an ideal solution for most standard oil and gas drilling applications.

For size availability and chamfer details please refer to our specification sheet



GEO Series

LANDS GEO cutters are produced specifically for the most common geological and exploration drilling. As not all formations are the same, these cutters can be customized to deliver a customer specified abrasion resistance.

For size availability and chamfer details please refer to our specification sheet



CM Series

LANDS CM series is a special cutter developed for the coal mining industry. It offers an extremely competitive edge in product performance and price ratio.

For size availability and chamfer details please refer to our specification sheet



PCD Polycrystalline Diamond and TSP Thermally Stable Polycrystalline

LANDS Superabrasives supplies a wide range of PCD cutters for the Stone industry, TSP cutters for oil, gas industries and TSP PCD for the gem industry. All cutters are specially developed with high impact strength and low abrasion wear in mind.



PCD for Stone Industry

These cutters are specifically developed and manufactured for the stone industry in chain saws to cut marble and granite in quarries.

For size availability and chamfer details please refer to our specification sheet



TSP PCD for Oil and Gas

LANDS Thermally Stable Polycrystalline cutters have unique self sharpening characteristics used mainly in the surface of the drill bits. LANDS TSP's are also available in Ni-clad coatings for superior bond retention.

Standard products include cubes, triangles and cylinders. Other customer specified dimensions are available.

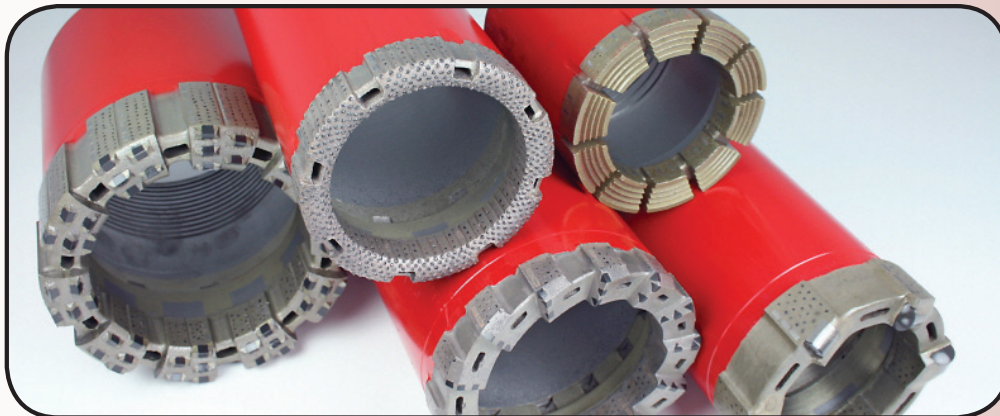
For size availability and chamfer details please refer to our specification sheet



TSP PCD for Gem industry

LANDS Thermally Stable Polycrystalline PCD is specifically manufactured for the Gem industry. They are the first choice for bruining and polishing of gem quality natural diamonds

For size availability and chamfer details please refer to our specification sheet





PDC for Drilling - Polycrystalline Diamond Compact

LANDS Superabrasives supplies a wide range of PDC cutters for oil, gas, geological and coal mine industries. Our PDC cutters are specially developed for high impact strength and low abrasion wear. LANDS high quality PDC cutters work under the toughest conditions, in the hardest and most unpredictable formations with high speeds.

	LANDS Specification	Diameter	Total Height	Diamond Layer Thickness	Chamfer Diamond Layer	Chamfer Tungsten Carbide
OPQ	LS-0808/OPQ/D2	8.00	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1008/OPQ/D2	10.00	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1308/OPQ/D2	13.44	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1313/OPQ/D2	13.44	13.20	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1613/OPQ/D2	16.00	13.20	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1908/OPQ/D2	19.05	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1913/OPQ/D2	19.05	13.20	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
PQ	LS-0803/PQ/D2	8.00	3.53	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-0808/PQ/D2	8.00	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1008/PQ/D2	10.00	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1108/PQ/D2	11.00	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1303/PQ/D2	13.30	3.53	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1308/PQ/D2	13.44	8.10	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1313/PQ/D2	13.44	13.20	2.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
GEO	LS-0803/GEO/D1	8.00	3.53	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-0808/GEO/D1	8.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1008/GEO/D1	10.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1108/GEO/D1	11.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1303/GEO/D1	13.30	3.53	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1308/GEO/D1	13.44	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1313/GEO/D1	13.44	13.20	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
CM	LS-0803/CM/D1	8.00	3.53	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-0808/CM/D1	8.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1008/CM/D1	10.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1108/CM/D1	11.00	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1303/CM/D1	13.30	3.53	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°
	LS-1308/CM/D1	13.44	8.10	1.00 +/- 0.30	0.20 +/- 0.08 x 45°	0.50 +/- 0.08 x 45°

Customer specified dimensions, thicknesses and chamfers upon request.



TSP - Thermally Stable Polycrystalline Diamond

LANDS Superabrasives supplies a wide range of TSP cutters for oil, gas industries (drilling bits and bit reamers) and TSP's for the exclusive use in the Gem industry.
All cutters are specially developed with high impact strength and low abrasion wear in mind.

Cubes	LANDS TYPE	SIZE (mm)
	LS – C10	1.0 x 1.0 x 1.0
	LS – C15	1.5 x 1.5 x 1.5
	LS – C20	2.0 x 2.0 x 2.0
	LS – C25	2.5 x 2.5 x 2.5
	LS – C30	3.0 x 3.0 x 3.0
	LS – C40	4.0 x 4.0 x 4.0
	LS – C50	5.0 x 5.0 x 5.0
	LS – C80	8.0 x 8.0 x 8.0
Triangles	LANDS TYPE	SIZE (mm) a x L x H
	LS – T4027/060	060° x (4.0 x 2.7)
	LS – T4030/060	060° x (4.0 x 3.0)
	LS – T4227/060	060° x (4.2 x 2.7)
	LS – T4230/060	060° x (4.2 x 3.0)
	LS – T4242/060	060° x (4.2 x 4.2)
	LS – T6035/060	060° x (6.0 x 3.5)
	LS – T6042/060	060° x (6.0 x 4.2)
	LS – T6243/060	060° x (6.2 x 4.3)
	<i>Other angles available (35°, 45°, 80°, 90°)</i>	
Cylinders	LANDS TYPE	SIZE (mm) ø x H x a
	LS – CY35/180°	3.0 x 5.0 x 180°
	LS – CY55/180°	5.0 x 5.0 x 180°
	LS – CY88/180°	8.0 x 8.0 x 180°
	<i>Other angles available (45°, 60°, 85°, 90°, 120°)</i>	
Bruiting	LANDS TYPE	SIZE (mm) ø x H
	LS – GEM0818B	1.8 x 0.8
	LS – GEM3060C	3.0 x 6.0
	LS – GEM4060C	4.0 x 6.0
	<i>Cylinders with 90° dome available. Other types available on request.</i>	



Customer specified dimensions, thicknesses and chamfers upon request.



PCD Cutters - Polycrystalline Diamond

LANDS Superabrasives supplies a wide range of PCD cutters for the Drilling Industry. All of these cutters are developed and produced with high impact strength and low abrasion wear in mind to confront any type of stone that needs to be processed.

PCD Cutters	LANDS TYPE	SIZE (mm) \varnothing x H
	LS – 0403	4.00 x 3.10
	LS – 0408	4.00 x 8.10
	LS – 0503	5.00 x 8.10
	LS – 0603	6.00 x 3.20
	LS – 0803	8.00 x 3.53
	LS – 0808	8.00 x 8.10
	LS – 1103	11.00 x 3.53
	LS – 1108	11.00 x 8.10
	LS – 1303	13.30 x 3.53
	LS – 1308	13.44 x 8.10
	LS – 1309	13.30 x 9.00
	LS – 1313	13.44 x 13.20
	LS – 1608	16.05 x 8.10
	LS – 1613	16.05 x 13.20
	LS – 1616	16.05 x 16.00
	LS – 1905	19.05 x 5.00
	LS – 1908	19.05 x 8.10
	LS – 1913	19.05 x 13.20
	LS – 1916	19.05 x 16.00
	LS – 2505	25.00 x 5.50



Customer specified dimensions, thicknesses and chamfers upon request.



QC Procedures

Quality Control and Testing Procedures

LANDS Superabrasives performs various standard tests in order to assure and maintain a consistent standard in its product line. In order to guarantee optimum Quality Control in producing consistent materials throughout the line, LANDS Superabrasives has developed a standard testing procedure that involves continuous monitoring of the vital variables. This testing procedure is one of the cornerstones of our Quality Control Program.

In the following paragraphs LANDS Superabrasives presents some of the standard tests used in the Quality Control Maintenance of the product line.

Description of Tests and Testing Procedures

Friability Test. Toughness Index:

Test Objective: The main purpose of this test is to determine the relative strength of the diamond particles. The core of this test is to determine the particle size after the material is subjected to controlled crushing.

Test Procedure: First the diamond is sieved and measured. The sample is then subjected to controlled crushing in a mill using hardened steel balls. The vibration, movement and amplitude of this process is fully controlled. After a defined time period, the diamond is collected and measured again. There is a direct correlation between the spread in residue sizes after crushing and crystal strength. In general, the coarser and larger the residue, the stronger the original crystal; the finer and smaller the residue, the weaker the original crystal

Result: A Toughness Index is generated by using a formula which relates the various factors of time, crushing procedure and final particle size.

Friability Test after Thermal Impact. Thermal Toughness Index:

Test Objective: To determine the thermal stability of diamond products.

Test Procedure: This test is the same as described above, however the diamond is first heated to 1125°C. in a controlled non-oxygen atmosphere.

Heating may cause the crystal to break up or to damage the surface, edges and the faces. Strong crystals will yield lower percentages of fine sizes while weaker crystals yield relatively higher percentages of fine sizes.

Result: A Thermal Toughness Index is generated by using a formula which relates the various factors of time, crushing procedures and final particle size. The higher the value of the TTI, the stronger the crystal.

Bulk Density:

Test Objective: To determine the density of the material

Test Procedure: The bulk density is determined by the weighing the amount of material required to fill a predetermined volume. (Similar to 1 kg of water fills exactly 1 Liter.)

Result: Bulk density provides a relationship between the average shape, smoothness of the crystals and specific weights.



QC Procedures

Size Analysis. Sieving Index:

Test Objective: To determine the size of diamond particles.

Test Procedure: All Mesh powders are sieved according to the latest ASTM / FEPA standard sieving procedures using electro-formed sieves (ANSI B74.16, FEPA and ISO 6106)

Both “Mesh” and “Micron” sizes are obtained by applying consistent and stringent procedures to sieving and sieving techniques.

Result: Consistently graded products, with uniform distribution.

Color Index:

Test Objective: To determine the color of diamond particles to insure color consistency of diamond specimens.

Test Procedure: a light diffractometer determines the exact color of all diamond specimen.

Result: By setting color range standards, LANDS guarantees color consistency for each and every product. If the specimens are not within the range of tolerances, batches are rejected.

Morphological Spread:

Test Objective: To determine the shape of diamond crystals.

Test Procedure: Diamond crystals are put on vibrating tables, which result in the separation of the material into various batches of crystals having similar shape. Each shape is assigned a relative index value that indicates the overall particle shape of the sample.

Result: A range of classes of products, wherein each class of crystals are graded so that a uniform and consistent product is guaranteed.

Visual Aspects:

Test Objective: To determine various visual appearances.

Test Procedure: The diamond is checked under a stereo microscope with different illuminations (light intensities). Shape, structure, color and degree of inclusions are examined.

LANDS issues histograms upon request, showing the distribution of particles in the powders, measuring median and Cumulative Distributions. In addition to the above tests, LANDS Superabrasives administers a variety of other proprietary tests on the aspects of diamond properties such as Impact Resistance, Fatigue Resistance and Crystal purity.

Production Flow

Quality Control - Production Process

- * Incoming source material is logged in per batch/unit from origin, and provided with traceable and unique lot-number.
- * Depending on the ultimate purpose and destination of the diamond, lots are directed through the various channels of the operation; each lot can be definitively marked and followed through the complete operation.
- * Various methods and technologies are used to sieve, separate, sort, table and (for certain applications) milled, rolled, and crushed depending on which grade of LANDS Superabrasives products is required.
- * The various LANDS Superabrasives Product types may be further treated, and/or coated with nickel, copper or other coatings depending on the ultimate requirement of the users.
- * Micron powder production line: various methods and technologies are used to obtain rigidly size-controlled microns. Source material is treated according to above steps and procedures. Appropriate techniques for cleaning and chemical treatment are used to obtain standard material ready for further processing. LANDS Superabrasives uses different micronizing technologies from sedimentation to centrifuge-technology amongst others. Strict procedures are followed to avoid contamination of the microns in any step of the process. After the micronizing and drying processes are completed, the appropriate post micronizing-treatment, such as treatment for use in electroplating, coating with Ni. etc., are applied.
- * Various techniques are used to check diamond particle size. Laser diffraction, Electrical Sensing Zone, and Image Analysis are examples of some additional tests.
- * Methods and technologies include sieving procedures using electroformed sieves according to ANSI B74.16, FEPA and ISO 6106. Bulk-density standards are according to ANSI B74.4-77. Magnetic contents of particles determined by magnetic analyzer. ANSI B74.19. Micron Size Std. IDA, FEPA 1997 and ANSI B74.20 are applied to determine compliance in grading of microns.





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consistent quality

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