

LOGAN

SUPERABRASIVES



Advanced Superabrasives,
PDC Cutters & Microwave Sintered
Carbide Products

We specialize in developing new applications for superabrasive and microwave sintered carbide products, and engineering new materials, as well as finished tools that effectively use them.

Products include high-performance polycrystalline diamond compact (PDC) cutters for oilfield drill bits; PDC thrust and microwave sintered carbide (MSC) radial bearings for downhole drilling motors and production pumps; and other superabrasive tools and wear parts for an array of other industries. Our most recent materials developments of MSC and carbide/diamond composites — demonstrate high levels of wear resistance and impact properties not possible with conventionally sintered tungsten carbides.

About Us

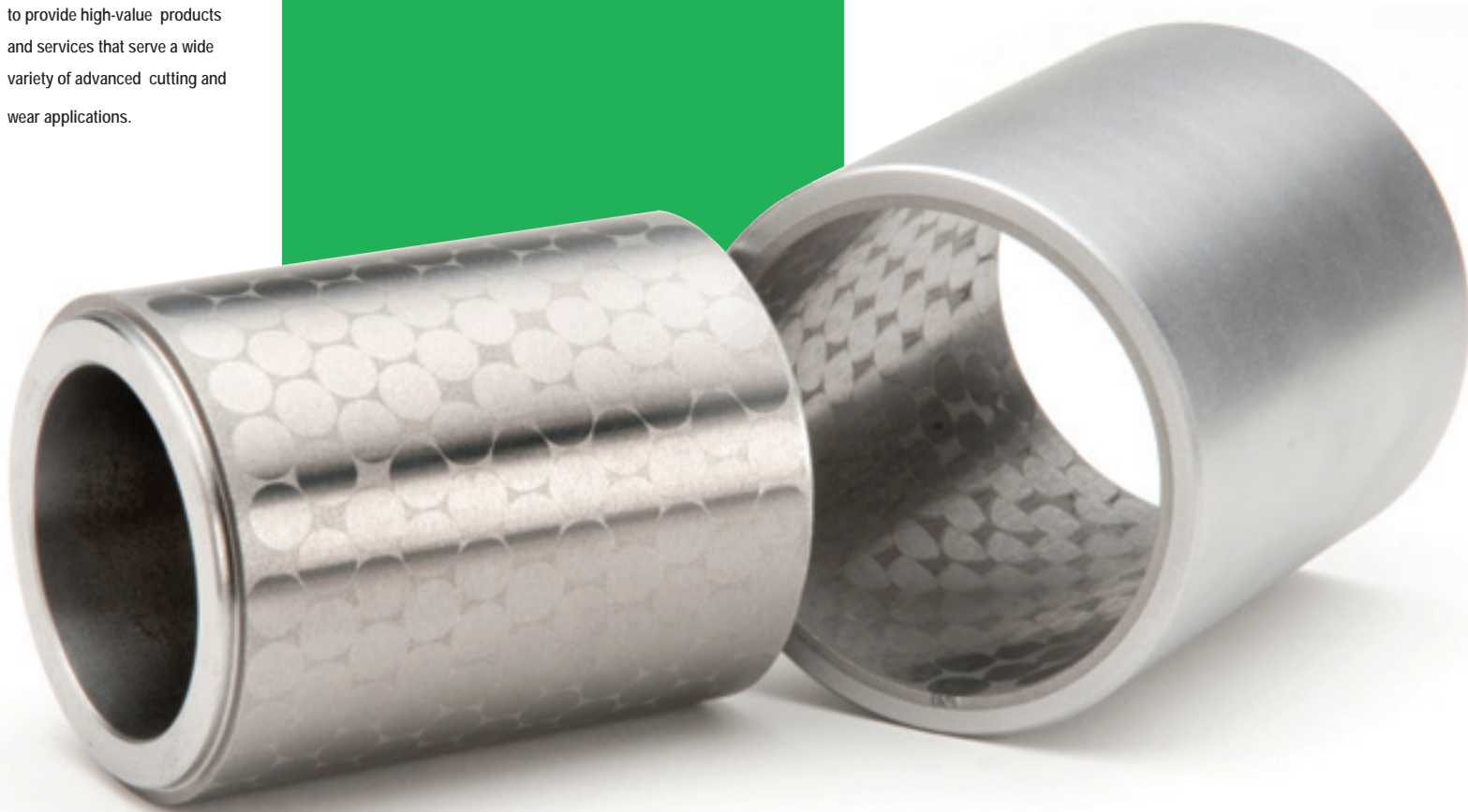
Logan SuperAbrasives draws on more than 150 years of combined experience in the development of high-performance super-abrasives. This broad experience base, coupled with our state-of-the-art design and production capabilities, uniquely enables us to provide high-value products and services that serve a wide variety of advanced cutting and wear applications.



Our Products

High-Performance PDC Cutters for Oilfield Drill Bits

Logan SuperAbrasives develops and manufactures a complete line of high-performance PDC products for fixed cutter drill bits. These products are available in all standard diameters ranging from 8mm to 19mm. The patented, non-planar interface geometries were designed using sophisticated FEA modeling and stress analysis to maximize diamond content while improving the impact strength of the overall cutting structure. Proprietary microwave sintered carbide substrates are utilized to offer carbide substrate grades that are optimized specifically for PDC cutter applications. This has resulted in exceptional downhole performance not possible with conventional carbide materials. In-house manufacturing of the microwave sintered carbide has reduced the development time of new products by several weeks or months. Using advanced engineering and materials technology, Logan SuperAbrasives continues to push the performance limits of PDC cutters used to drill increasingly harder, more abrasive, and interbedded formations.



PDC and MSC Inserts

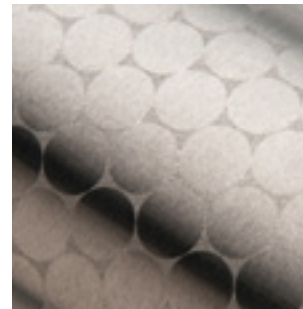
Logan SuperAbrasives developed the raw material specifications and processing parameters for special carbide grades of PDC substrates and roller cone drilling bit inserts. These specialty products are primarily used for gauge protection and in cutting structures for bits designed to handle formations ranging from soft to hard, to highly abrasive. Durable microwave sintered carbide inserts dramatically improve the impact strength, abrasion resistance, and erosion resistance of bits and extend the life of the cutting structure. The higher strength:wear ratio allows for more aggressive loading which leads to higher penetration rates.

Thrust and Radial Bearings for Downhole Tools

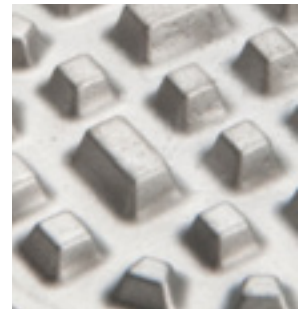
Logan SuperAbrasives makes specialty bearing products used in applications such as oilfield drilling tools. In many oilfield applications, PDC thrust bearings directly replace roller or ball bearings. Use of PDC thrust bearings results in lower reactive torque than roller or ball bearings, which reduces power loss in the tools. PDC bearings are able to carry much higher loads and can operate in harsh downhole environments without protection. Because PDC bearings can operate in mud, air, or air mist environments without seals, they can be used in high temperature applications up to 1600°F. Typical life improvement of PDC thrust bearings versus standard roller or ball bearings is usually 10 to 20 times or longer. Radial bearings utilizing MSC inserts have demonstrated up to 10 times life improvement over conventional carbide bearings.



Thrust bearings



Radial bearings



*PDC substrate interface
(non-planar)*

Our Services

EDM Capabilities

Our modern, on-site Electrical Discharge Machining (EDM) facility provides PDC and polycrystalline cubic boron nitride (PCBN) machined to customer specifications. A complete CAD/CAM capability assures speed and accuracy of special orders. Our engineers are available to assist with application and tooling design, as well as prototype development. Drawing on many years of experience in oilfield drilling applications, our engineers can also assist customers in improving the performance of their products.

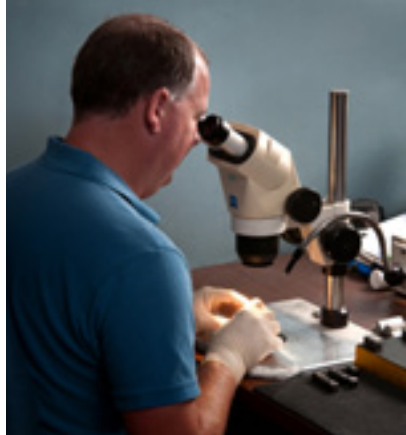
In addition to standard cylindrical geometries, Logan SuperAbrasives specializes in the manufacture of special geometries of parts that may be proprietary to our customers. We can supply standard segments or semi-finished inserts or PDC or PCBN with custom EDM cuts. All of our high-performance PDC or PCBN tool blanks can be custom cut to your specifications.

Prototype Manufacturing

Logan SuperAbrasives specializes in developing new applications for super-abrasive and microwave sintered carbide products — engineering new materials as well as finished tools that effectively use them. In many cases, prototype tools are entirely designed and built at our facility for evaluation purposes. Specialized assembly techniques are often required, and Logan SuperAbrasives has the in-house capability to produce a wide variety of tool types. Once feasibility is established, the manufacturing technology may be transferred to the customer, or production may remain at our production facility on a contract basis.

Our Products

- High-Performance PDC Cutters for Oilfield Drill Bits
- PDC and Microwave Sintered Carbide (MSC) Inserts
- Thrust and Radial Bearings for Downhole Tools
- Microwave Sintered Carbide (MSC) Wear Parts



Quality Control

Every Logan SuperAbrasives product must pass a rigorous series of quality control procedures that evaluate not only overall dimensional specifications, but also grain structure, surface condition, and internal structural integrity. Skilled technicians use an advanced ultrasonic C-scan procedure to look deep into the structure of PDC materials to ensure that each part is free of internal defects and that the integrity of the interface between the superabrasive layer and the carbide substrate is optimal. PDC products are also subjected to ultraviolet dye penetrant examination, microscopic visual examination, and dimensional inspection using PDC-tipped micrometers and other specialized measuring techniques. Brazed products are inspected using ultrasonic inspection techniques to detect possible internal flaws. Numerous in-process inspections, utilization of computerized process controls, and modern inspection equipment ensure that every product we manufacture complies with specifications. Because our products consistently conform to specifications, our products are self-certified at most of our customers' facilities — eliminating the need for re-inspection prior to use.

Logan SuperAbrasives is committed to delivering consistently high-quality PDC products at competitive prices, and devotes an extraordinary level of research and engineering to product development and advanced manufacturing technologies to stay at the forefront of superabrasive material development.

LOGAN

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Customer Satisfaction

Logan SuperAbrasives is committed to total customer satisfaction. We achieve that goal by delivering the highest value in superabrasive materials and related services to our valued customers in a timely manner. Our total quality program involves a comprehensive manufacturing and customer service plan that encompasses every aspect of our operation, from raw material inspection and certification, and product design, to order entry, scheduling, production, and shipping. Our success is measured by the repeat business of satisfied customers.