



Stratapax* Drill Blanks & Geoset Drill Diamond



Stratapax* Titan Cutter

Higher Impact without Sacrificing Abrasion Resistance

Diamond Innovations is focused on continuously providing new cutter options. Advanced engineered polycrystalline cutters are tailored to meet the needs of a diverse and demanding drilling industry. Six Sigma quality in the manufacturing process and sophisticated inspection procedures verify the consistency and uniform structure of each cutter.

Stratapax Titan Cutters are the latest advancement in Diamond Innovations' high-pressure/high-temperature diamond cutter engineering. Diamond Innovations utilizes advanced finite element analysis to reduce residual stress and optimize the performance and life of the drill bit downhole. A series of enhanced, highly effective design features provide you with significant improvements compared to other cutters on today's market.



Enhanced Design Features

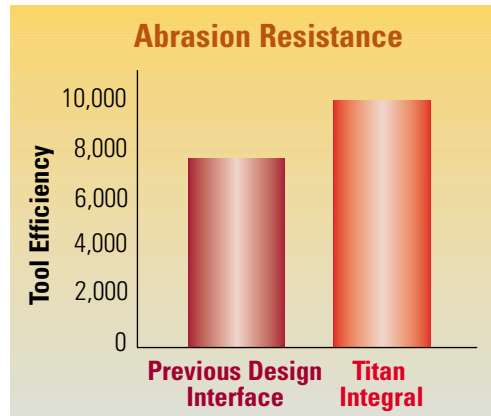
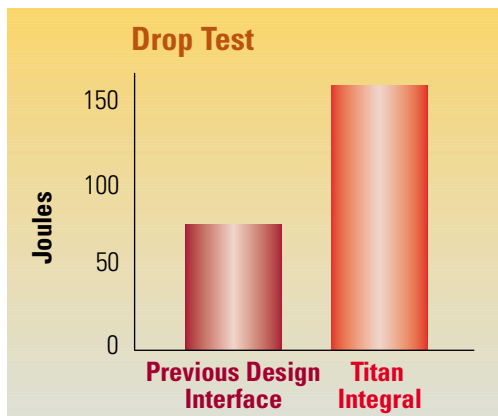
- Diamond Innovations's patented sloping outer rim
- Stress reducing radial rib design
- Optimized diamond microstructure
- Thicker diamond tables

Measurable Improvements

- Higher impact resistance
- Better abrasion performance
- Lower residual stresses



Stratapax Titan Cutters Deliver Impressive Results



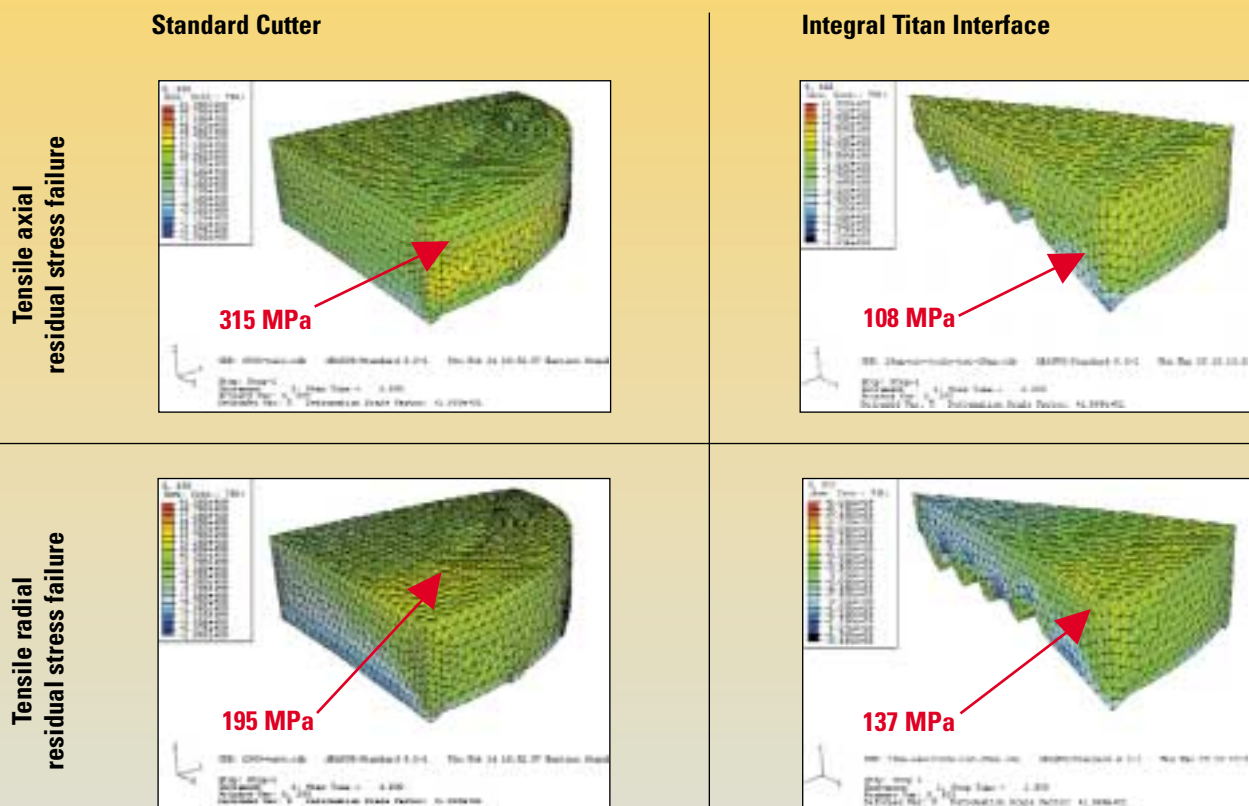
Performance data of Stratapax Titan Cutters show a 2X improved impact resistance without sacrificing abrasion resistance.

3-D Residual Stress Modeling – Reliable Reduction of Tensile Residual Stress for New Cutter Technology

Finite Element Analysis (FEA) is used to model the three dimensional residual stress state in Stratapax cutters. Using FEA, Diamond Innovations is able to create a numerical matrix solution, which maps physical properties, such as stress and strain of the

material, at various locations within the cutter. The stress and strain can then be optimized using specific design features built into the cutter. The use of integrated design and FEA has allowed us to develop new cutter technologies with improved performance.

Integral technology reduces the tensile residual stress by 30% in thick diamond table cutters.



For detailed product description please refer to our availability chart on page 6



Premium Stratapax Drill Blanks at Work

Diamond Innovations Premium Stratapax Drill Blanks feature a non-planar diamond/carbide interface, designed to minimize internal stress, improve spalling and chipping resistance, and provide maximum downhole cutting performance. The combination of unique interface geometry and diamond properties results in increased ROP, longer bit life, and reduced WOB in highly demanding drilling applications.



Structured diamond/ carbide interface

Diamond layer integrally bonded to carbide substrate

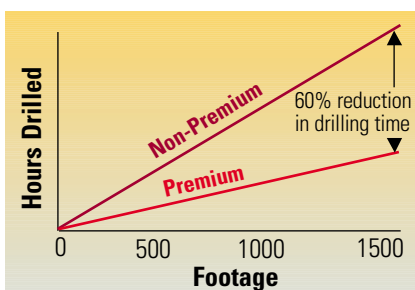
65% Reduction in Drilling Time in the North Sea

Drill Bit Data

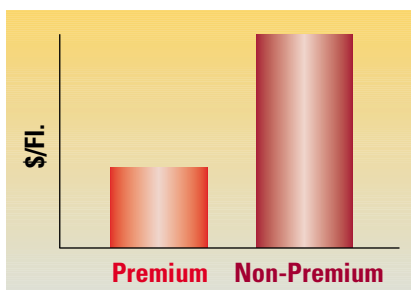
Location	North Sea
Lithology	Limestone/Chalk
Starting Depth	12,000 feet
Bit	12 ^{1/4} inch, 13 mm cutters
Mud Type	Oil based

Bits containing Premium 13 mm Stratapax Drill Blank Cutters drilled more footage in less than half the time, at 40% of the total cost, compared to bits with non-premium cutters. Drilling was completed in a hard and dense section of limestone/chalk in the North Sea, with a single 12^{1/4} inch diameter polycrystalline diamond (PCD) bit. With the high rig rates of North Sea drilling the results of using Diamond Innovations Premium Cutters showed a cost saving of over \$ 300,000.

Drilling cost Comparison



Drilling time was reduced by 60%, yielding a saving of \$ 300,000.

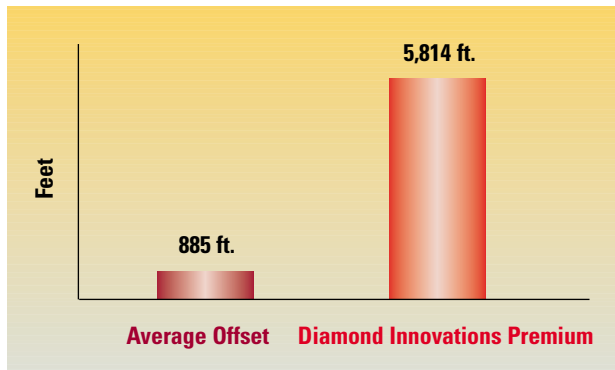


Bit with Diamond Innovations Premium Cutters reduced cost/foot by 64%.

Stratapax Drill Blank Premium Cutters averaged more than twice the rate of penetration (ROP). The cost per foot was reduced by more than \$ 200.

Record Set in Louisiana Entire Wilcox Formation Drilled

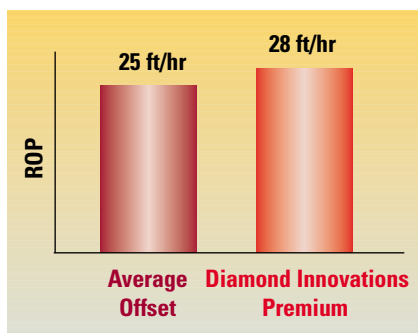
A 12¹/₄ inch polycrystalline diamond bit, containing Stratapax Premium 13 mm drill blanks, drilled 6,5 times further than the average offset footage in the Wilcox formation, and most of the Midway shale before being pulled.



Total footage: 6,5 X greater than average offset

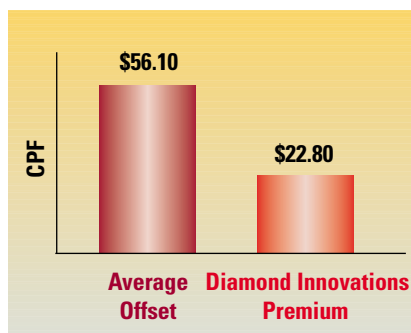


Penetration Rates Increased by 12%



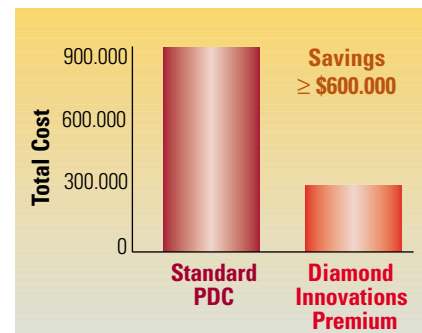
Stratapax Drill Blanks Premium Cutters were also able to increase the ROP by 12% over the average application. The Premium Cutters dull graded with less spalling and chipping of the diamond table.

60% Cost per Foot Reduced



Increases in ROP and total footage resulted in a cost per foot reduction of 60% compared to the offset data.

Total Cost Reduced by More Than 65%



A cost saving was also obtained by eliminating expensive trip time to change bits, which resulted in an additional saving of \$ 600,000.

	Drill Cost \$	Trip Cost \$	Total Cost \$
Standard PCD	600,000	300,000	900,000
Stratapax Drill Blanks	250,000	50,000	300,000
Total Savings: \$ 600,000			

Titan Stratapax Availability

Overall Thickness	Diameter		Tolerance
	13 mm	19 mm	
8 mm	1308 Standard	1908 Made to order	8.1 +/- 0.1 mm 0.52 inch
13 mm	1313 Standard	1913 Standard	13.2 +/- 0.1 mm 0.52 inch
16 mm	1316 Standard	1916 Standard	16.0 +/- 0.1 mm 0.63 inch

Order Example: 1308 Titan

Diameter Tolerances

13.44 +/- 0.03 mm
0.53 inch

19.05 +/- 0.03 mm
0.75 inch

For other sizes and dimensions please contact your Diamond Innovations sales representative.

Diamond table thickness

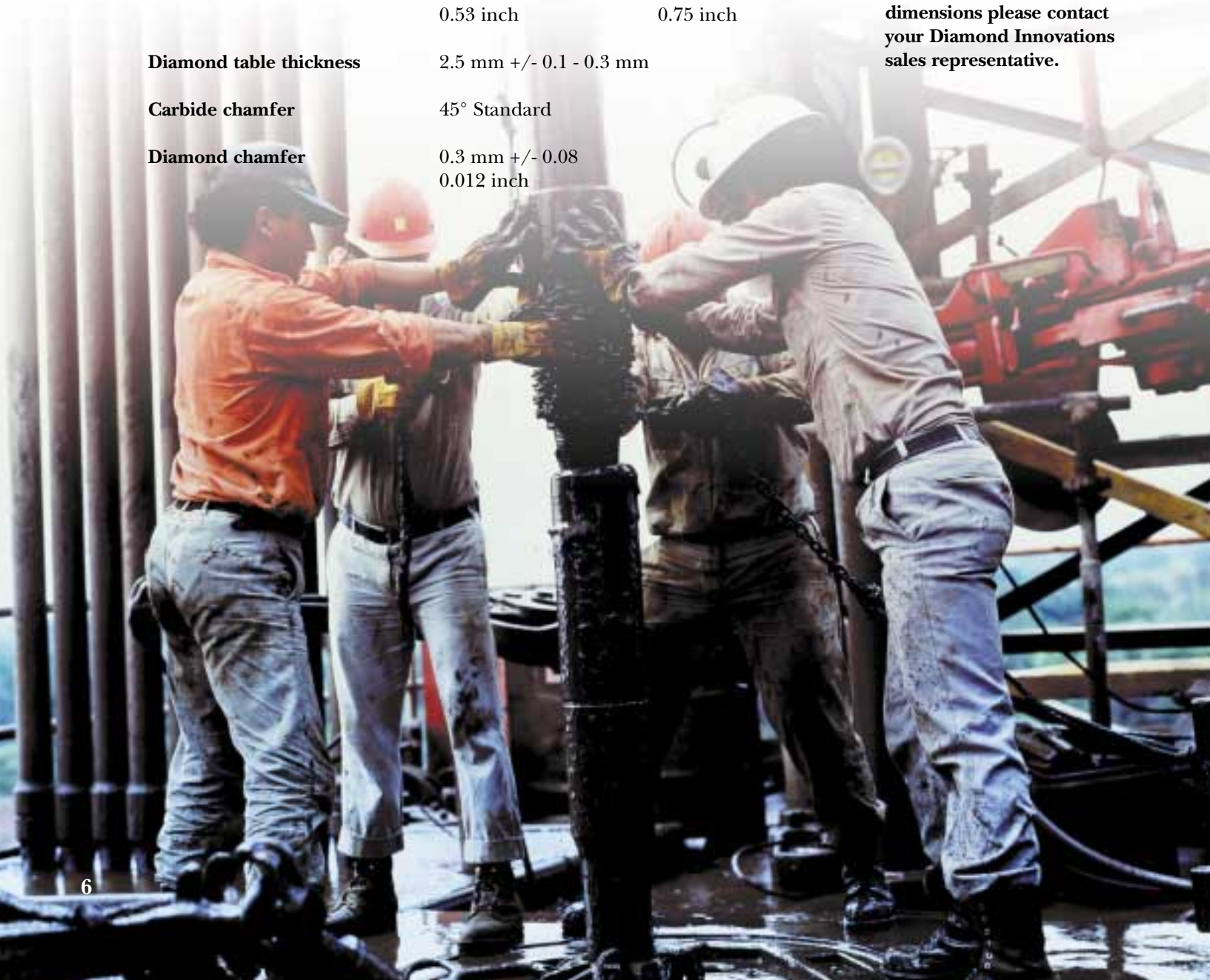
2.5 mm +/- 0.1 - 0.3 mm

Carbide chamfer

45° Standard

Diamond chamfer

0.3 mm +/- 0.08
0.012 inch



Geoset* Drill Diamond

Geoset drill diamond is a tough, self-sharpening, thermally stable product that can be surface set into the face of drill bits. Geoset provides increased performance over mined diamond and tungsten carbide products in a number of applications. Their unique polycrystalline structure, formed through a high pressure-high temperature process, delivers higher crystal to crystal bonding strength for uniform hardness and wear resistance. This micro-structure presents no weak cleavage planes, which eliminates the problem of massive crystal fracturing during drilling.

Thermal stability up to 1200°C in non-oxidizing environments allows Geoset drill diamond to be successfully used in the fabrication of high temperature metal bond systems. These wear resistant metal-matrix bits are used in some of the hardest rock formations for extended life and higher productivity.



Courtesy of Hughes Christensen

Diamond Innovations Advanced Coating Technology – Available on Ni-Coated Geoset Drill Diamonds

Geoset drill diamonds are also available with an advanced Ni-based coating. Diamond Innovations continues to be recognized as the premier coating

expert for industrial diamond products. Coatings protect the diamond crystal from aggressive bonding metals, such as iron, steels, chromium and tungsten. Ni-coated Geoset drill diamonds show unmatched retention in the bond matrix. Pull-outs are effectively reduced, therefore a maximum utilization of every drill diamond can be achieved.

Geoset Thermally Stable Drill Diamond Availability

Product Shape	Product Number	Approx. Carat Weight ¹ per piece	Nominal Dimensions (mm)			
			k°	L	D	T
	2102	0.3	60	2.7	-	4.0
	2102-C*	0.5	60	2.7	-	4.0
	2103	0.9	60	4.3	-	6.2
	2103-C*	0.13	60	4.3	-	6.2
	2161	0.03	360	3.5	1.1	-
	2161-C*	0.07	360	3.5	1.1	-

* Denotes nickel coating

¹ Weight includes coating where applicable

For other sizes and shapes please contact your local Diamond Innovations sales representative.

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