



China Synthetic Diamond Industry Report, 2010-2011

April/2011

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2. Status Quo of China Synthetic Diamond Industry

2.3 Application of Synthetic Diamond

2.3.3 Machinery, Mining, Energy

China’s economic growth has entered a mid-stage of transformation, several endogenous forces such as rising labor costs, target market transferred from export to domestic demand, and acceleration of urbanization, coupled with the subjective promotion of policies, China’s equipment manufacturing industry is accelerating the upgrading. According to the downstream demand structures of diamond tools in China, the United States and Japan (the shares of manufacturing industry in the consumption of diamond tools are **%, **% and **% in China, the United States and Japan respectively), diamond products have huge growth potential in China.

Machinery and Automobile: Diamond tools are in the mid-stage of application promotion in the U.S. and European markets, and are in the initial stage of promotion in China. It’s predicted that diamond tools will see the highest sales growth rate in the field of machinery in China, which will remain as high as **% in 2008-2013.

Shares of Global Complex Chip (for PCD/PCBN Cutting Tools) Market



Source: ResearchInChina

Mine and Oil Field: Synthetic diamond tools achieved market penetration over **% in China's oil extraction industry, but most of them are diamond drills imported from foreign countries or made by joint ventures. The stage of import substitution is to come; large-scale promotion hasn't been carried out in the field of coal mining, and the integration of coal mines will promote the application of synthetic diamond tools.

Polycrystalline diamond tools mainly take advantage of the excellent anti-impact strength of diamond with large crystals, so they can be used for cutting. In general, there are three categories of demand: the PDC cutter of oil/gas well drill bit or PDC bit; PDC cutter for mining; and lathe tool / milling cutter (metal processing involves six processes, namely, lathe, milling, planing, grinding, drilling and boring. Polycrystalline diamond can only be used to manufacture tools in simple shapes). PDC cutter of oil/gas well drill bit or PDC bit is the largest application in the U.S. and European markets, and also an application with the biggest challenge to the quality of composite chip. According to the statistics of the total depth of wells dug in the U.S. in 2010, about 65% used diamond drills.

Shares of Global Oil / Gas-use PDC Market



Source: ResearchInChina

Output Value of Chinese Composite Superhard Materials and Market Size of Global Products (Unit: RMB bn)



Source: ResearchInChina

As technology advances, diamond drills can be used in wider geological scope. Although PDC is harder than cemented carbide, it has a problem in the combination of polycrystalline diamond and substrate. In addition, different principles of diamond drill breaking rock lead to drill losses of varying degrees, and diamond drills are in a disadvantageous position in breaking hard rock.

During the development of the Twelfth Five-Year Plan, high-speed rail was recognized as a development priority among the strategic emerging industries during the Twelfth Five-Year Plan period. The localization of high-speed rail parts has entered a pressing stage. As the Ministry of Railways plans to achieve localization over 80% during the Twelfth Five-Year Plan period, and the eight-year cooperation agreement signed by the Ministry of Railways and the world's top three giants in 2003 will expire in 2012, the localization of high-speed rail equipment and parts is imperative. The localization of high-speed rail brake is expected to start around 2012, and the market capacity is expected to reach about RMB** billion in 2015.

Competition in Chinese High-speed Rail Brake Market

Enterprise	Competition
Bosun Tools Co., Ltd.	*****
Hunan Boyun New Materials Co., Ltd.	*****
GHH Friction Materials Ltd.	*****
Beijing Wabtec Huaxia Technology Co., Ltd.	*****
Shandong Gold Phoenix Group	*****

Source: ResearchInChina

3. Enterprises in China Synthetic Diamond Industry

3.3 Zhengzhou Sino Crystal Diamond Co., Ltd. (300064)

3.3.1 Profile

Established in December 2004 with the registered capital of RMB114 million, Zhengzhou Sino Crystal Diamond Co., Ltd. is a national high-tech enterprise highlighting the R&D, production, and sales of synthetic diamond and raw & auxiliary materials as well as the R&D of synthetic diamond synthesizing equipment. It is situated at No.24, Dongqing Street, High & New Tech Industrial Development Zone, Zhengzhou City, Henan Province. Its stock named Sino Crystal Diamond successfully went public in Shenzhen Stock Exchange on March 26, 2010 with the stock code of 300064.

As the pillar of superhard material industry and the key enterprise of national superhard material industrial base in Henan Province, Zhengzhou Sino Crystal Diamond Co., Ltd. has participated in the constitution of various national and industrial standards. Its engineering technology research center boasts abundant reserve researches, and the in-research products cover novel compressor, wire saw, ultra-thin saw blade, crystalline silicon cutting jigsaw, milling tools, CVD diamond thin film, and jewel-grade diamond. The company's sales will obtain the leapfrog development once the research on new products makes breakthroughs. The net profit margin of the company is as high as 30%. The product unit price will be in decline in the future, but it is possible for Zhengzhou Sino Crystal Diamond Co., Ltd. to maintain the present average unit price and profit for a long time by virtue of product grade advancement and the launch of new products.

3.3.2 Operation

Sino Crystal Diamond acquired the revenue of RMB** million throughout 2010, up **% from the prior year, and the net income RMB**million, up 44.84%YoY. Benefiting from the technical and cost edges, the gross margin rested on **%, and the net profit margin **%. The overhead expenses were evidently raised, primarily due to the fact that the issue expenses were included based on the requirements of Ministry of Finance. The main business will be unceasingly bigger and stronger in the future, and the capacity will exceed ** billion carat in 2011.

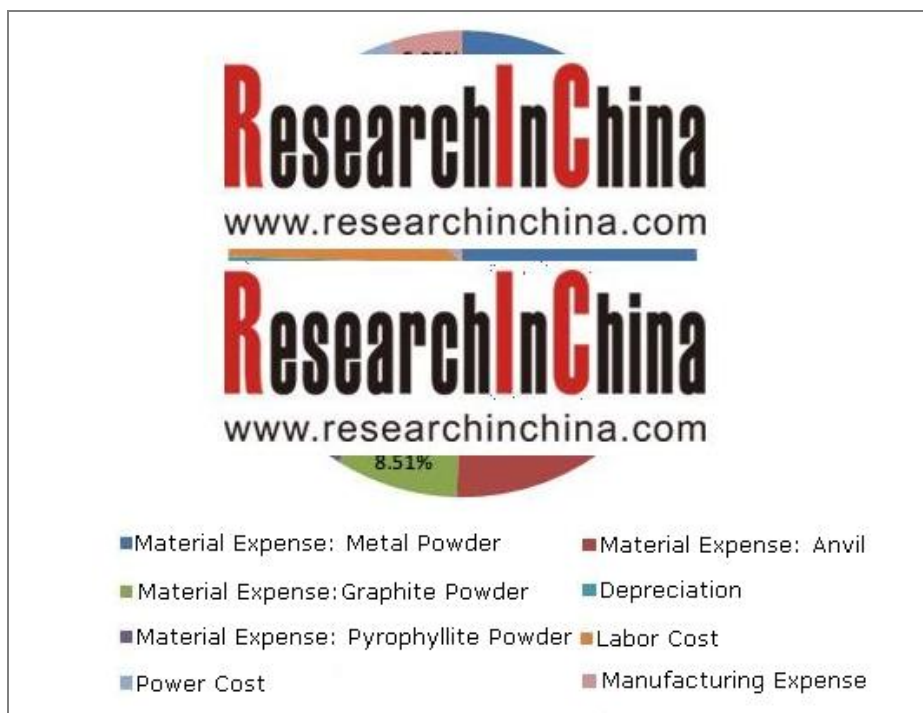
Key Financial Data of Zhengzhou Sino Crystal Diamond, 2009-2012 (Unit: RMB mln)

	2009	2010E	2011E	2012E
Operating Income	***	***	***	***
YoY Growth (%)	***	***	***	***
Net Income Attributed to the Parent Company	***	***	***	***
YoY Growth (%)	***	***	***	***
Gross Margin (%)	***	***	***	***

Source: Sino Crystal Diamond; ResearchInChina

In 2010, the revenue from diamond of Sino Crystal Diamond climbed **%, primarily due to the rising sales volume. Promisingly, the diamond will remain the highly progressed demand and the steadily recovered price. The gross margin rose 0.51% against the same period of the previous year, mainly profiting from the improvement of technology formula and the slightly decreased cost. The sales proportion of the Top 5 clients of Sino Crystal Diamond shrank 9 percentage points to 28%, and the client concentration ratio further declined with the absence of the sales proportion of the single client surpassing 30%.

Cost Structure of Zhengzhou Sino Crystal Diamond, 2009



Source: Sino Crystal Diamond; ResearchInChina

Sales Volume and Income of Monocrystalline Synthesis Project of Zhengzhou Sino Crystal

Diamond, 2009-2012

	2009	2010	2011E	2012E
Sales Volume (mln carat)	***	***	***	***
Unit Price (RMB/ carat)	***	***	***	***
Revenue (RMB mln)	***	***	***	***
Revenue Growth Rate	***	***	***	***
Gross Margin	***	***	***	***

Source: Sino Crystal Diamond; ResearchInChina

Sino Crystal Diamond always takes the lead in raw material proportioning and equipment. Its conversion rate and conversion quality of diamond synthesis are obviously higher than that of other rivals. Sino Crystal Diamond has experimented the cutting of crystalline silicon wafer via diamond steel wire cutting line.

Product Grade of Zhengzhou Sino Crystal Diamond, 2007-2010

Item	2010	2009	2008	2007
Output Proportion of High-grade	***	***	***	***
Sales Proportion of High-grade	***	***	***	***
Output Proportion of Medium-grade	***	***	***	***
Sales Proportion of Medium-grade	***	***	***	***
Output Proportion of Low-grade	***	***	***	***
Sales Proportion of Low-grade	***	***	***	***

Source: Sino Crystal Diamond; ResearchInChina

3.3.3 Development Strategy

As the new entrant in the industry, the monocrystalline silicon capacity of Sino Crystal Diamond is far from that of Huanghe Whirlwind. Sino Crystal Diamond plans to give play to equipment advantage in monocrystalline synthesis, adopt its independently developed HJ-650 reinforced diamond synthesis compressor, and newly construct the project with the annual capacity of 640 million carat high-grade diamond. Sino Crystal Diamond also intends to set up the HJ-1000 larger volume compressor which is currently amid pilot production so as to enhance its equipment edge.

Furthermore, Sino Crystal Diamond has expanded the downstream product market. Large groups of products have accomplished the early stage R&D, the sector of diamond line for polycrystal silicon cutting in the PV industry has fulfilled the trial production of samples, and is anticipated to acquire the mass production in 2013 so as to meet the highly increased demand for diamond tools.

Sino Crystal Diamond plans to invest RMB** million in the project of "PV Dedicated Micron Diamond Line" with the main body of Zhengzhou Sino-Crystal Diamond Joint-stock Co., Ltd, its subsidiary, and the construction scale of 0.33mm 14400km/a and 0.12mm 132000km/a. After the completion and production of the project, the annual revenue can hit RMB** million, the gross margin over 50%, and the net profit margin around 34.8%. As a substitute for the traditional cutting mode of steel wire+ cutting material +cutting fluid, the diamond line cutting mainly needs to solve the problems of breakage rate and wafer surface smoothness. The substitute space will be huge if the technical breakthrough can be made.

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