

Natural Diamond Industry...

Alive and Well

by
Steve Roffman, Division Mgr.
Lieber & Solow Company
New York, NY

*Diamond . . . beautiful exciting, intriguing . . .
All true, when thinking about those sparkling
polished gemstones in beautifully designed
jewelry. Now, think about industrial diamond,
natural industrial diamond . . . where is the
excitement and the intrigue?*

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By Steve Roffman, Lieber & Solow, Ltd., VP

Today, when we attend Superabrasive symposiums or look at trade journals we are inundated by information concerning polycrystalline diamond, synthetic single crystal diamond and CVD diamond products. These are the products of today's technologies, in fact, during the past 10-15 years, the focus of R&D within the industrial diamond industry has been on synthetic superabrasive products. However, while the spotlight is on these new developments, the fact is that natural diamond is still the best selection for a variety of applications. And that's why behind the scenes, quietly working away, in small shops and in large factories, on simple dressing tasks and on the most critical super finishing requirements, natural industrial diamond tools continue to get the job done.

The natural industrial diamond business is vibrant and important to the manufacturing community. Large and small diamond toolmakers throughout the world design, produce and inventory a broad range of widely used natural diamond tooling. Of course, we are all aware of the many changes that have occurred in our industry. In fact, some areas of natural diamond usage have been displaced by either new manufacturing technologies or by synthetic diamond products. Still, in many areas, natural diamond continues to be the ideal material, maintaining its price to performance advantage, and proving over and over a gain that new technologies are not always the right technologies for every application.

Ten years ago, any career counselor would have collapsed at the thought of making a long term commitment to the natural industrial diamond industry! Well, nature's best is still around and here to stay!

Let us examine a few aspects of this unique business where natural diamond continues to play a vital role and thereby shows perception is not the entire story.

Dressing Tools

Demand for natural dresser material has remained steady. Using natural diamond as a proven resource, toolmakers have engineered this basic product to optimize its value to the end user. The variety of qualities and sizes readily available to the end user has allowed flexibility in manufacturing at price to quality values which cannot be met by other dresser products. Profitability remains intact as productivity is maintained and improved continuously. End users continue to fine tune their requirements, thereby improving their performance/cost ratio. For dressing applications, synthetic diamond simply cannot meet the price to performance ratio obtained with natural diamond tooling. PCD has been tried and shown to be unable

to withstand the workload which natural diamond can easily withstand. Single crystal synthetics are expensive and limited to a very narrow range. Natural diamond holds the line as the superabrasive product for dressing applications.

Shaping Tools

For the full range of shape tools, for trueing, turning, superfinishing and a variety of other important applications, natural diamond remains the desired product. Available in a vast variety of natural shapes, sizes and qualities, natural diamond allows toolmakers to combine their creativity and ingenuity with the selection of the appropriate type of diamond to make tools that best fit the specific needs of the end user. Here, natural diamond finds its place in a market where design flexibility and final finish are of the utmost importance. While PCD's have successfully penetrated segments of the market, they have also sparked an expansion of the overall usage of shape materials. This has been positive for both synthetic and natural diamond tooling. As synthetics effectively fill a wide range of requirements, having pushed deeply into the carbide arena, naturals find their home where finish must be obtained to the final specifications and price must be addressed in order to maintain profitability! Furthermore, toolmakers and end users alike find that certain synthetic products pose a variety of problems both in tool production and in application. Meanwhile, natural diamonds are tried and true. When handled by professionals, from designing and manufacturing tools to using the tool in its end use application, industry consistently finds the value, performance and finish demanded in many of today's tough applications, best satisfied by natural diamond.

Wire Drawing Dies

The general perception seems to be that in the wire drawing die industry, natural diamond has been replaced by PCD and single crystal synthetics. This is just not so!

Both in the U.S.A. and abroad, demand for all sizes of natural diamond die stones continues to be strong. Even in application areas where naturals were supposedly "finished", we find a resurgence of demand. And, demand for natural diamond die stones runs the full spectrum of sizes. Although single crystal synthetics are available, and prices for small sizes are becoming more competitive, the preference for natural diamond remains evident as the market remains strong throughout the world. Where usage went to PCD in sizes of 1/4 carat and up, end users have moved back to natural to resolve manufacturing problems which occur with PCD as well as with synthetic single crystals. Perception proves inaccurate as the market reverts back to basics to resolve certain tough and intractable problems; natural diamond is the key to success in wire manufacturing when synthetics just can't cut it!

Drilling Bits

At one time demand for natural diamond used in drill bits was an extremely active area of the diamond tool industry. Today, much of the tooling is designed using PCD or synthetic grits. While in no way can we compare today's drilling market with the demands prior to 1982, natural diamond continues to play a key role in mining, exploration and construction. In order to obtain optimum results in these applications, toolmakers combine the best of both worlds, using synthetic product where appropriate, yet taking full advantage of the availability of the full range of natural and processed natural diamonds on the market today.

From fine West African materials, to medium range Australian assortments to low

end Congo stones, bit manufacturers find price advantage and product flexibility by combining modern technology with design ingenuity. Therefore, demand for natural and processed diamond drill remains interesting and an important aspect of our industry.

When we consider the spectrum of diamond types being used in industry today, the whole story begins to take on an entirely new dimension. In addition to standard dressing, shaping, wire drawing and drilling, we see that there is demand for a multitude of diamond types to meet the needs of industry.

Macles of window or cushion type, small and large longs, flats and flat longs, crystals for dressers, crystals for dies, sawn materials, are only part of the variety of shapes available for use.., and the list goes on. All are available in various qualities and sizes; all being used today, actively and aggressively. The standards and the specialties of the diamond tool trade are designed and manufactured by the creative minds and talents of those working in the industry today. They are tile people who take a broader view of our industry. They understand the need to meet the new demands of industry in general, and act to develop the technologies which will maximize the benefits of natural diamond.

In order for the natural industrial diamond business to remain vital and to have growth potential, a renewed positive perception of all aspects of this industry is most urgent. A particular aspect which should be addressed is that of supply, in this unique business, diamond is the central theme. Supply must be stable and prices should remain relatively constant. Although rough diamond in general is subject to the ups and downs of the gem market, the industrial portion is handled by specialized diamond suppliers whose focus and commitment is to the long term goal of growth in this most interesting and intriguing field.

The industrial diamond dealers are uniquely positioned to work in the international marketplace to ensure the supply of a complete variety of diamond suitable for industrial applications. This group of professional and knowledgeable dealers makes available a full range of diamond materials, assorted and inventoried for rapid shipping, giving toolmakers and end users a sense of confidence in the supply of this important material. A competitive atmosphere helps maintain stability of pricing, and relatively new large mines ensure the stability of supplies.

A renewed confidence in all areas of the business coupled with newly developed technology, will generate new growth in an old business. A new generation of toolmakers will carry the torch of technical and intuitive knowledge, solving new problems with natural diamond tooling. Certainly we all must address the reality of new technologies. The fact is that synthetic diamond has indeed effectively penetrated many traditional superabrasive markets. At the same time, it has also enhanced and expanded the overall market. As the market continues to grow, we must be innovative in creating new applications and applying natural diamond tools where they excel.

The industrial diamond industry is inherently a changing industry. The positive aspects of new technologies are important, necessary and welcome. However, let us not lose sight of the fact that natural diamond continues to offer industry unique, adaptable, and flexible advantages.

So . . . the beauty, excitement and intrigue of diamond does still exist in our industry. Natural diamond tooling exploits a truly powerful element of nature. Here, we see the beauty of man working with nature to bring to market exciting products with intriguing results. Natural diamond is your natural choice for many applications.