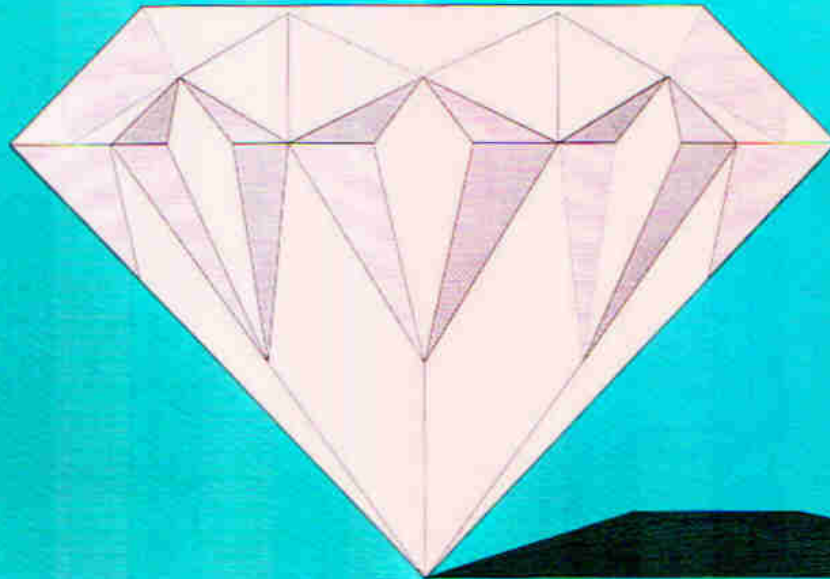


Evolution of the Natural Diamond Industry



over the Past 50 Years

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1946 World War II was over and America was rebounding, regrouping and finding itself feeling strong and focused. Industry was the driving force of the economy. During the war, in order to satisfy the need for improved productivity and tighter machining tolerances, diamond was used more and more extensively in manufacturing processes. Diamond "boart" became the desired abrasive for grinding a variety of materials.

After the war, engineers started designing more tools using diamonds as the working material for such applications as dressing and truing of conventional abrasives, hard rock drilling, wire drawing and a variety of other standard and specialized applications. America, as well as the rest of the world's manufacturing community was only beginning to tap the usefulness of diamond, soon to be known as the premier superabrasive material.

In 1946 the entire world production of mined natural diamond was about 5,300,000 carats. It was not long until world economies were starting to demand more diamond than was then available. Prior to W.W.II, production of industrial diamond had been far greater than usage, and the price of industrial diamond collapsed. Boart had dropped to \$0.50 per carat from earlier prices of \$3.00 - \$4.00 per carat. By 1950, although world production had increased to approximately 12,600,000 carats, natural sources were unable to adequately fill all demands. Then, as now, mining of diamonds was primarily to satisfy the demand for gemstones; but the by-product of the world's most desired gemstones, industrial grade diamond, was fast becoming the world's most desired and essential abrasive and tooling raw material. It is interesting to note that, although only 15% by weight of mined diamonds is of gem quality, this represents approximately 85% of the value of all diamonds mined. The balance of the carats mined, 85%, are crushed, treated or sorted into the multitudes of types of diamonds industry requires.

Throughout the decade of the 1950's, two important factors emerged out of the need for more industrial diamonds. First, better mining techniques were developed and new mines were continuously opening. That expanded volume entering the market gave users confidence there would be a plentiful supply of mined diamonds. Second, synthetic diamond became available on a large scale. At the same time, the technology for producing and using synthetic diamond improved rapidly to the point where products became commercial viable.

As the world entered the early to mid 1960's, mined diamond production grew dramatically. In 1966, 38,000,000 carats of diamond were mined in the world. And concurrently, the development of synthetic diamond kept pace, so that it remained a competitive material. This helped expand the markets and uses of all types of industrial diamonds. Although faced with this new

competition, natural diamond continued to evolve as a great, available and flexible resource. The uses of diamonds now encompassed abrasives, tooling for manufacturing, drilling, construction, wire production, as well as a variety of emerging technologies. Diamond tool manufacturers were becoming more and more prominent. Throughout the world, specialized tool makers designed products using natural and/or synthetic diamonds to meet growing demands of industry.

During the middle to late 1970's, the market for natural industrial diamonds was at its peak. Worldwide, the demands were difficult to meet. Diamond for construction and exploration was being used in vast quantities. All qualities of diamonds were in demand, not only by American tool makers, but by the other manufacturing centers of the world. From Japan and the Asian Rim to Western Europe, as well as Eastern Europe, demand for natural diamond and its products continued to grow.

By the early 1980's, many new factors began to affect the supply and demand of natural diamond. Diamond was now being mined at record levels. New mines in Australia and Russia, as well as increased production from Africa and South America, brought to market an increasing flow of rough diamonds. Competition for many of the traditional industrial materials emerged as India more and more became the center for polishing small and inexpensive diamonds. Previously, the polishing of industrial grade diamonds into gemstones was not commercially worthwhile, as labor costs were too high to justify cutting these materials. The Indian cutting centers were able to process vast quantities of inexpensive rough diamonds at reasonable cost to supply the jewelry market's emerging demand for lower and mid-priced diamond jewelry. While this was good for the diamond industry in general, it limited supplies for some industrial applications and pushed the price of some materials to levels which caused diamond tool makers to explore alternatives to natural diamonds. Some of these alternative materials were already being produced by manufacturers of synthetic diamonds.

An opening therefore emerged, which permitted these companies to create a variety of products which were capable of competing with many of the natural diamond products then available. The impact of synthetic in the traditional diamond markets kept growing. In the abrasives field, from micron powders to grinding materials to saw products, synthetic diamonds had become a competitively priced, reliable product. Within the construction and exploration bit market, bits impregnated with synthetic grits began to replace the traditional surface set bits. In the mid to late 1980's, polycrystalline products began to push into large oil bit products, as well as many of the shape tool and wire die products.

The face of the natural diamond business was therefore changing. During that period, many diamond tool makers, as well as dealers, (and, of course, the producers of synthetics) began to predict the demise of the natural diamond business. Nothing could be further from the truth! Without doubt, radical changes in demand occurred, and dealers of natural diamonds suffered the consequences of sudden and dramatic changes in the use and value of various materials.

Still, throughout the 1980's, natural diamond demand continued. And, in certain markets which were using primarily synthetics, end users and toolmakers rediscovered the advantages of naturals. Slowly, natural diamonds are recovering some ground, either in conjunction with synthetics, or exclusively as the best materials for the specific job.

As we entered the 1990's, production of natural diamond reached record levels. U.S. Bureau of Mines reported 107 million carats produced in 1992, of which 55 million carats were considered industrial grade. This would suggest that the requirement for natural diamond seems to go unabated. Even as new synthetic materials emerge, including synthetic monocrystals and

cvd products, natural diamond demand continues to be strong. However, demand changes faster today than ever, requiring suppliers, as well as tool makers, to become more sophisticated in their abilities to handle materials.

This is a challenge which is clearly understood by most people involved in the natural diamond industry. It is also the challenge that keeps suppliers sharp and prepared for more changes that are sure to come as we move on to the next century and to the next **50** years of our ever changing business.