

by Glen A. Beres

The scoop on synthetics

Can we ID them? Should we grade them? Do we need them?

Although they have been available for decades, synthetic diamonds – also known as “cultured” and “lab-created” – have become a lightning-rod issue for many in the jewellery industry in recent years. With more and more product coming on the market, and improving technology, the trade has major concerns about how synthetics ultimately will impact the global diamond market.

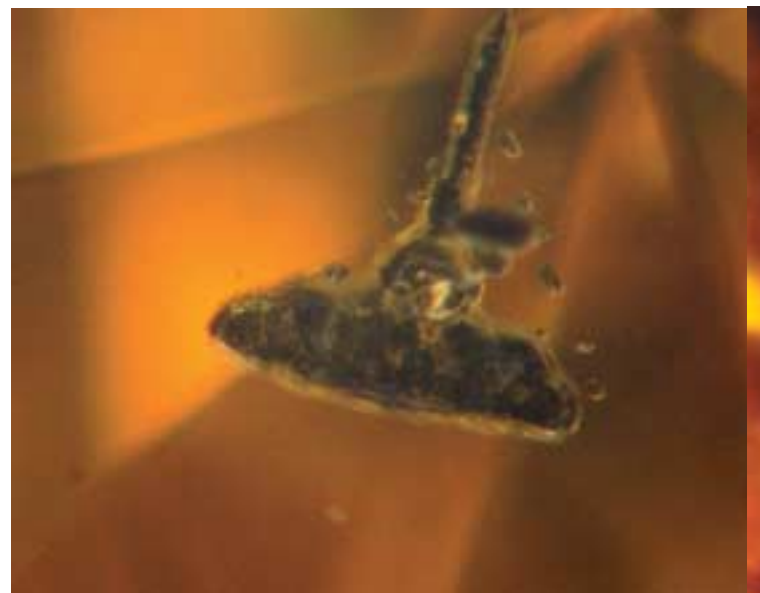


Lab created diamonds by Chatham.

Disclosure and detection top the list as the biggest issues surrounding synthetics. Many worry that synthetics getting mixed into the natural diamond market and sold to unsuspecting consumers could have a severe impact on the industry. Other issues on the minds of industry leaders include ethics, pricing, quality, grading and terminology.

While the playing field for developing synthetic diamonds continues to expand, the four largest players, according to most trade estimates, are Apollo Diamond, Boston, Mass.; Gemesis Corp., Sarasota, Fla. (the distributor in Canada is Michael Drechsler Jewelry, Vancouver); Chatham Created Emeralds, San Francisco, Calif.; and Lucent Diamonds, Lakewood, Colo.

Apollo produces its gem-quality synthetic diamonds using



Metallic inclusion in a synthetic diamond.
Photomicrograph courtesy of EGL Vancouver.

the chemical vapor deposition (CVD) method, where diamond crystal is formed when a plasma cloud of carbon is deposited onto diamond wafers. The wafer seeds grow into diamond mini-bricks, rough diamonds that are then sliced into wafers and cut and polished into finished diamonds.

Gemesis produces its synthetic diamonds through the high pressure/high temperature (HPHT) process, where a small carbon seed is subjected to high temperatures and pressure that cause it to re-form into a rough diamond crystal of unique shape, quality and size. The rough is then removed from its chamber and cut and polished into a diamond. Chatham also develops its synthetic diamonds utilizing the HPHT process. And Lucent develops synthetic diamonds as well as color-enhanced natural diamonds using HPHT.

Currently, the market for synthetic diamonds is overwhelmingly slanted toward colored diamonds. Although many companies, particularly Chatham, have been experimenting to produce a viable, high-quality white synthetic diamond, no one has come up with a way to do it economically on a mass level.

“We don’t even know if the inclusions in synthetics are the same as inclusions in natural diamonds.”



Synthetic diamond jewellery from Gemesis.



Color zoning, right, and clouds, above, in synthetic diamonds. Photomicrograph courtesy of EGL Vancouver.



Synthetic diamonds from Gemesis.

Disclosure and Detection

Undoubtedly, the most important issue concerning synthetics is disclosure and detection. Numerous retailers and diamond manufacturers say they fear that, if the product’s origins are not fully disclosed, it could lead to high-profile negative incidents at the retail counter that could really undermine the credibility of the diamond and jewellery industry in general.

“We’re pretty confident with the major producers disclosing their synthetics,” says one large chain retailer. “The big question is whether there are little guys out there doing synthetic diamond melee in China or another foreign market and salting it into natu-

ral parcels. If these synthetics were to get mixed into the natural pipeline, it could be disastrous for the industry.” The retailer, from a national chain, spoke out in a recent industry seminar on the topic, but did not want to be identified in this article.

To address the detection issue, De Beers has developed two state-of-the-art synthetic diamond detection devices and has made them available to the trade. DiamondSure is a rapid screening instrument that identifies natural diamonds and refers all synthetics and simulants for further testing. The HRD (Diamond High Council) has a similar instrument called the D-screen, which quickly refers diamonds that might have been HPHT treated. De Beers’ DiamondView is more sophisticated. It uses a shortwave ultraviolet light imaging system to differentiate the growth structure of diamonds vs. synthetics and simulants.

Both De Beers instruments carry a significant price tag – a big factor for retailers, particularly those that would need to put one in multiple stores. DiamondSure costs in the US\$10,000 to US\$12,000 range, and the HRD’s D-Screen is about US\$4,000, while DiamondView costs in the US\$40,000 to US\$50,000 range, according to trade estimates. Other experts have questioned whether the machines can detect synthetic stones of less than three points. “Pavé fashion pieces lend themselves to those sizes,” says one retailer. “We have sent these kinds of pieces out [to Gemological Institute of America] for testing, and they sent them back as inconclusive.”

James Shigley, director of research for GIA, notes that most synthetics can be identified with a standard gem microscope, and DiamondSure and DiamondView are just backup systems. He also believes the machines can successfully test smaller stones in most instances. “We haven’t really run into a situation where we can’t detect something,” he says. “We are very aggressive in our testing.”

Shigley acknowledges that synthetic salting at the melee level is a real concern for the industry, particularly for synthetics grown in Russia or China by unknown producers.



EGL is currently the only major lab that grades synthetic diamonds.

Most major gem labs will only identify synthetic diamonds, but not grade them. In the May 14, 2004 issue of the *GIA Insider*, GIA president William Boyajian stated the organization's position on grading synthetics. "GIA's policy is, as it always has been, that there is nothing inherently wrong with synthetics, provided they can be identified and are properly disclosed. However, as a matter of policy at this time, we have decided not to issue grading reports on synthetic diamonds. Instead, we offer gemological identification reports, as we do for any polished gem material submitted to our laboratory."

For the International Gemological Institute, the decision to identify but not grade synthetic diamonds is partly an ethical issue and partly a more practical issue. Jerry Ehrenwald, president of IGI, points out that the GIA grading system is based on rarity of natural products, and to grade a man-made product by the same system is ethically wrong.

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"We don't even know if the inclusions in synthetics are the same as inclusions in natural diamonds," he says.

Ehrenwald also worries that consumers may get confused if they see synthetics being given the same grading terminology as natural stones. "The consumer sees a synthetic diamond with a VVS2 grade, but at a much lower price than a comparable natural, and they think they are getting a bargain [on a natural stone]," he said. "They don't understand it's man-made."

Meanwhile, Ehrenwald says he has no objections to a separate grading system being developed for synthetics. But he foresees a time in the near future when synthetic technology will improve to the point where every stone that is grown is flawless – thereby making grading pointless.

The European Gemological Laboratory is the only major gem lab currently grading synthetic diamonds. According to Branko Deljanin, director of EGL's Canadian operations in Vancouver, EGL decided to take the industry lead in grading synthetic diamonds to ensure they are properly disclosed. Deljanin notes that EGL is in no way trying to promote synthetics over naturals, and is just trying to help the industry.

"We think grading synthetic diamonds is the right thing to do to help educate the trade about what is out there," Deljanin says. "If you refuse to disclose them, they can go undercover, and might be sold on the market without certs as naturals." To further help in disclosure and tracking, EGL laser inscribes all of the synthetic diamonds it evaluates.

Another reason why EGL decided to grade synthetic diamonds, Deljanin says, is because there are differences in value between synthetic colored diamonds based on color and the number of inclusions. "EGL Lab has an appraising division that needs to put value, at the client's request, on diamonds based on their quality," he says. "Because their color and clarity are stable, EGL would describe and grade color and clarity like other natural diamonds."

As for the argument that synthetic diamonds should not be graded using the universal GIA diamond grading system, Deljanin acknowledges that the industry as a whole needs to collaborate on creating a separate grading

system for synthetics, and says EGL is working on developing the terminology. But he doesn't see this new grading system being developed anytime soon because it doesn't seem to be "high on the industry's radar right now" – perhaps because synthetics still represent a very small part of the overall diamond business.

While new testing equipment and laser inscribing all help in the disclosure of synthetics and their origins, they obviously are not infallible measures. Some experts point out that laser inscriptions can be polished off by unscrupulous sellers. One synthetic diamond producer, Gemesis, says it deliberately adds nickel to its synthetic diamonds so they will be detectable.

Whether other synthetic producers follow a similar path remains to be seen. At a forum on synthetic diamonds at this year's JCK Las Vegas Show, Bryant Lenares, president of Apollo Diamond, said the company currently does not add components to its synthetics for the purpose of identification because of cost and competitive factors. "We would have to ask ourselves, 'is it financially viable?' and 'are we competing with those who don't?'"

Tom Chatham, president of Chatham Created Emeralds, acknowledged that cost is an important factor in considering whether to add a component to a synthetic diamond to make it easily detectable (Chatham doesn't). However, an even more important issue, he stresses, has to do with the delicate, complicated alchemy involved in producing synthetics and how introducing a foreign compound into the mix could affect the process.

"It took years for us and other companies to solve the problem of growing viable synthetic diamonds," Chatham said. "Adding an outside compound creates a whole new research project with endless permutations and computations. It also adds something unnatural to the diamond, which it can be argued, makes it no longer a diamond."

Chatham also argues that, if anyone should come up with a compound to put into synthetic diamonds to aid detection, it should be De Beers, since they are the world's biggest producer of man-made diamonds for industrial applications.

Even the terminology for synthetic diamonds is at issue. GIA, for instance, notes there is evidence that consumers are confused over the term "cultured diamond," and therefore advocates "synthetic diamond." Other opponents of the term "cultured" believe it should be reserved for organic materials, such as cultured pearls. Some producers, however, believe "synthetic" is too close to "simulant" and is therefore even more confusing to consumers.

At this point, some experts note that prices between synthetics and naturals aren't really far enough apart for synthetics to "really take off" and challenge the



Gemesis produces synthetic diamonds using the HPHT process.



De Beers' DiamondSure.

diamond market. But many in the industry are worried that, when colorless synthetic diamonds do become feasible – and more affordable – on a mass level, this will have a dramatic impact on price and demand for natural diamonds.

"Synthetic diamonds will have a significant place in the market in five to seven years because there aren't enough real diamonds," Apollo's Lenares said in Las Vegas.

"Synthetic diamonds have the potential to destroy the natural diamond market," warns Bill Dodderidge, CEO of Goldenwest Diamond Corp., a Tustin, Calif., chain of 14 stores in major cities across the U.S. The company is also one of the largest direct diamond importers in the U.S. "Few people can really tell the difference between synthetic and natural. If white synthetic diamonds were to become mass produced, they would take sales away from natural diamonds. And if they aren't disclosed properly, they could really undermine the confidence in natural diamonds."

Not everyone believes synthetics will significantly harm the natural diamond market, however. McEwen from Gemesis, in fact, believes the prospect of a mass white synthetic diamond market could present a huge opportunity to the diamond industry in general by filling the demand gap as natural diamonds become more scarce.

But GIA's Shigley doesn't see production of white synthetic on a mass scale happening any time in the near future. "There's really no way to predict impact, but in our opinion, treated colored natural diamonds present a much more real challenge to the trade because they are easier to produce in mass quantity." ♦

Glen A. Beres is a veteran industry writer who has held senior editorial positions with *JCK*, *National Jeweler*, *High-Volume Jeweler* and *New York Diamonds* magazines. He is the owner of GAB Communications, a jewellery communications/marketing firm.