

Het Belang Van Limburg

Saturday, January 23, 2021 – Economy

How diamond farmers from India want to conquer the world from Lommel

A diamond factory is running in Lommel. Currently still a small factory, but the first Limburg lab diamonds have already gone abroad to make jewelery with them. In time, Heyaru Engineering from Lommel wants to become an important supplier for high-tech applications of synthetic diamonds. "Instead of a Silicon Valley, we dream of a Diamond Valley here."



To be honest, it still looks a bit shabby, this large, abandoned warehouse of what was a production hall of the Lommel glass producer Ducatt, which was declared bankrupt in 2017. Yet here in this shed, in a corner closed by gates of not much more than 50 m², exciting contemporary industrial history takes place. Still with a product that makes many eyes shine. Diamond, but made in Limburg. And that's not a bad joke. Since last summer, diamonds *grown* in Limburg have already been exported to India to have them cut and to eventually sparkle on all kinds of ravishing body parts. Although it does say on the invoice: *Made in Belgium*. Limburg is not ringing a bell in India yet.

https://www.hbvl.be/cnt/dmf20210122_98234292

Exactly the same

Diamond made? Cultured diamond? Yes. They grow layer by layer in three ovens from Heyaru Engineering, a company with Indian roots. Vikram Shah (45) is the founder of that company. “We produce rough diamonds in these ovens,” he shows. “Diamond is nothing more than carbon compressed at a very high temperature and under high pressure. About two billion years ago, diamonds originated in this way in our earth's layers. However, it takes a lot of effort for people to get that diamond, the hardest material there is, out of our earth. ”

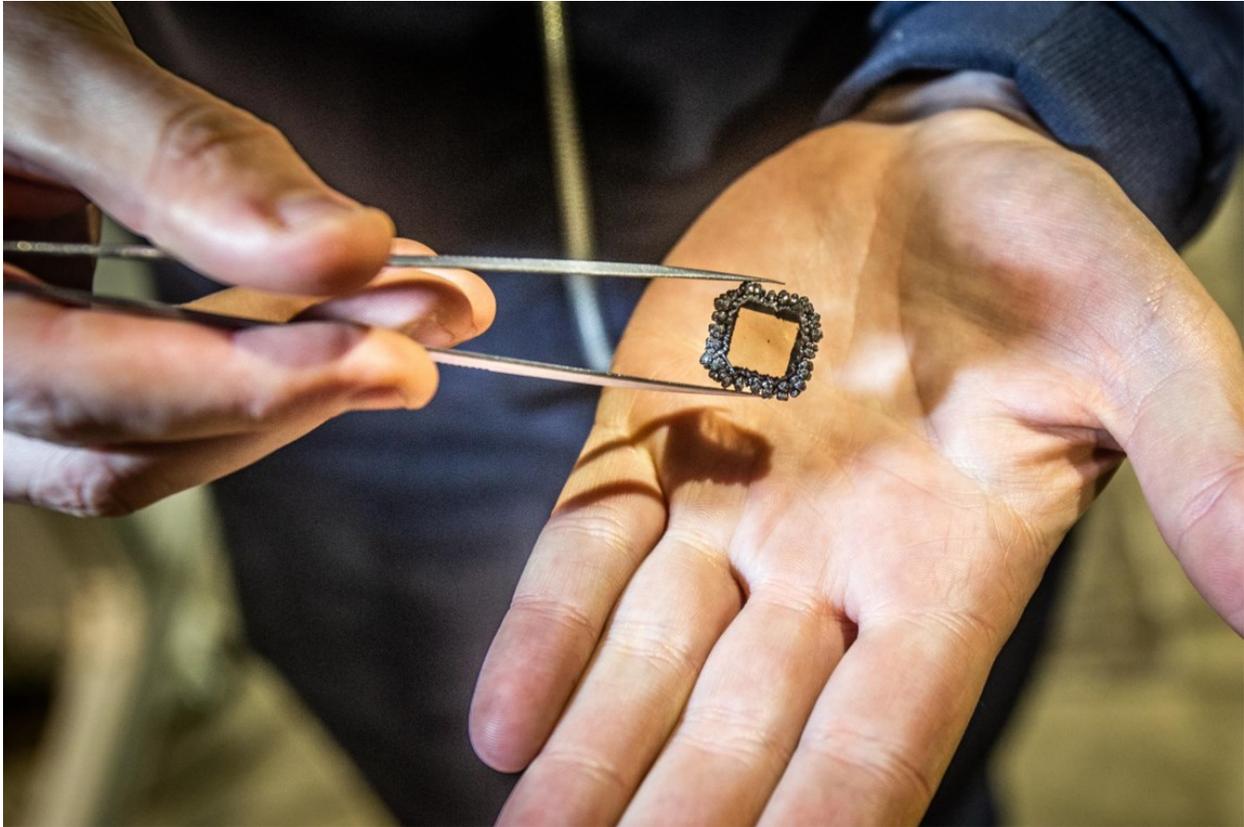
It can also be done differently. Man today can mimic the natural process. “The result is exactly the same as the natural diamond. Chemically, a lab diamond is quite the same as a natural diamond, “says Vikram Shah firmly.

New technique

This knowledge is of course not new. From the mid-20th century onwards, the dream of being able to make diamonds yourself was gradually realized with so-called HPHT technology (*High Pressure High Temperature*). “That technology is now outdated,” says Vikram Shah. “A method that imitated nature, but the result of which was ultimately of lower quality. Although those diamonds can be used for drill heads or saw blades. ”

“Who knows, instead of a Silicon Valley, there will ever be a Diamond Valley in Lommel? That is in fact the dream. ”

VIKRAM SHAH
Heyaru Engineering



Here in Lommel, on one of the Kristalpark industrial estates, the three ovens work with the newer CVD technology. What stands for *Chemical Vapor Deposition*. "Think of them as big microwave ovens," explains Vikram patiently. "For which we only need electricity, industrial gases and our diamond seed."

Vikram shows such a seed: a plate 5 millimeters square and barely 0.33 millimeters thick. "The oven heats up to about a thousand degrees. Combined with a vacuum, we inject gases containing carbon. Such as methane or butane. The gas turns into a very hot plasma globe. This creates chemical reactions that eventually cause the carbon to precipitate and attach itself to this image. If we keep this process continuously for 400 to 800 hours, so sometimes longer than a month, you will get diamond cubes of 4 to 8 millimeters thick. The width of the final diamond depends on the seed. The thickness is determined by the time in the oven. "

Fresh harvest

In the office behind the ovens is fresh Limburg diamond harvest. Lars Antonissen, the operations manager here and also the first Heyaru Engineering employee, shows one. Among us, they don't look. Blackened square crusts. Is this diamond? "Just wait until the crust is lasered off and then sharpened," laughs Vikram. "Then you get very good diamonds. Two percent of natural diamonds only achieve the purity of these CVD artificial diamonds. "

"Two percent of natural diamonds only achieve the purity of these artificial diamonds"

VIKRAM SHAH
Heyaru Engineering



"Although not all of our diamonds work. Some may also crack. We can control the circumstances strictly, not all stones react the same. That is still a learning process. In that sense, we *grow* diamonds. Are we diamond farmers. And that is why two of our

current three ovens are running for production and we are experimenting with our third oven, among other things to test industrial applications for the future as well. ”

Belgian diamond knowledge

Why here, why not in India? “In 2012 we started the production of art diamonds in India. These ovens require a lot of energy, you know. Where we have our factory in India, there is a power cut every week. That is bad for diamond production. Here in Lommel, with the Kristalpark solar panel park nearby, the largest in the Benelux, we have a lot of stable energy nearby that is green. Moreover, it is too hot in India. Our reactors must be able to cool down. That cooling cost is much higher in India than here. It may sound strange, but the price for developed industrial land is also less expensive here than in India. By autumn this year, we want to be in our own building. We can use this for the time being thanks to the mediation of LRM. ”



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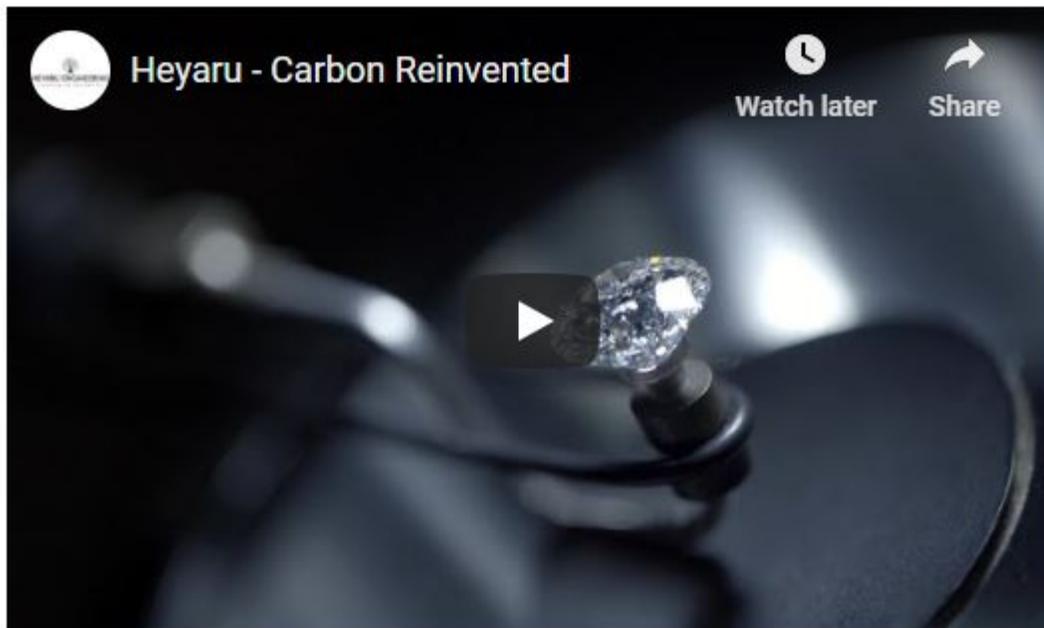
And then of course there is the diamond know-how here in Belgium, Antwerp at the forefront. “But it is not only Antwerp, there is also a lot of scientific knowledge, for example at the UHasselt, to enable other applications of artificial diamonds through scientific research. That is the real future, the real goal. In the first five years, we will focus on the jewelery market for the first proceeds, but within 5 to 10 years we want to evolve towards high-tech industrial applications for our diamonds.

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High technology

Industrial applications of artificial diamond are indeed very promising. Diamant has the potential to switch electricity from power lines to home voltages. Now it works on silicon. “But diamond can also become the raw material for the battery of the future. For example, people are already thinking of storing nuclear waste in diamond, which can then serve as a battery. Batteries that then have a lifespan of ten thousand years and no longer need to be recharged, ”says Vikram.



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It sounds futuristic. But also for the much faster computers of the future, which will run on quantum technology, art diamonds will again be important. “Diamonds are the material of the future,” Vikram Shah is sure. “It is by far the best conductor. For scientists, diamonds are the best toy to experiment with now. ”

“Silicone, the material that is now in all sensors and made from plastic, was the raw material from 40-50 years ago. In the long run, artificial diamond is a much better alternative to those silicones. It

conducts much better, can withstand heat better and is stronger. Who knows, instead of a *Silicon Valley*, *there will ever be a Diamond Valley* in Lommel? That is in fact our dream. ”

Although a number of these promising applications will still require years of additional research, in 2018 the EU decided to invest 1 billion euros in, for example, quantum technology and sensors. That is why Flanders is also supporting the initial investment of 26 million euros by Heyaru Engineering with 2 million euros. In a first phase, 12 to 15 employees will start working here. But over the next 5 to 10 years, the company wants to invest 262 million euros in production capacity and thus in additional diamond furnaces. With work for 120 to 150 people.

Anchoring

“Now we have three reactors there, but the goal is to have 300 here that should be able to run on their own for six months. With that capacity we want to produce 200,000 kilograms of artificial diamond per year. In other words, 1 million carats per year. That would allow us to capture 5 to 7 percent of the global laboratory grown diamond market. Aside from corona, artificial diamond is booming at a growth rate of 30 to 40 percent per year. In the natural diamond the annual growth is only 2 percent. ”

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Heyaru is already working with the Lommel-based SME Jansen Electro Techniek to partly build, automate and perfect these ovens itself in order to gradually increase capacity. He will help develop the software for the new ovens. “It is a dialogue”, confirms manager Jan Jansen (31). “With very small changes sometimes you can strongly influence the result. The fact that we are close by plays to our mutual advantage. It is not far to drop by, try it out and make adjustments. This is also a future for us. ”