

Beyond Brilliance: Uncovering the brilliance of Lab-Grown Diamonds



New Delhi, Delhi Mar 23, 2023 ([Issuewire.com](https://www.issuewire.com)) - SLTL Group is thrilled with the fact that our success has been inscribed in the cover story of one of the prominent Diamond magazines with an exclusive interview about the latest diamond MPCVD machine.

Owing to the futuristic technology we have been felicitated with eminent awards amongst which [Best CVD Machine Manufacturer 2023](#) and Best International Laser Machine Award are the recent addition. Explore the Fascinating History and Science behind the World's Most Coveted Gemstone – Lab Grown or CVD Diamonds.

During its 34-year business journey, the SLTL group has won many awards. The recent two JMAIIE excellence awards for Best International Laser Machine and Best CVD machine manufacturer 2023, further consolidate its global dominance.

The Innovators

SLTL: INNOVATION IS A WAY OF LIFE

SLTL Group (Sahajanand Laser Technology Limited) is at the forefront of cutting-edge technology. It recently won awards for Best CVD machine manufacturer 2023 and Best international laser machine. Dr. Arvind Patel, its visionary founder chairman, and Managing Director has an enviable track record of being the pioneer in Indian LASER technology. It has the distinction of being the first in the world to invent a [Fiber Laser Cutting Machine](#). SLTL group provides a one-stop solution for diamond processing starting from inclusion mapping to planning & marking, laser sawing bruited, 4P, fancy auto processing & polishing. The measurement of the rough diamond is done by an AI-assisted planning process that provides insights regarding the optimal diamond yield to the user. The group's latest award-winning MPCVD reactor has received an overwhelming response from LGD growers in India. It is now geared up to meet the growing demand from the overseas market. Anil Prabhakar travelled to Gandhinagar to meet Dr. Patel and his sons, Maulik and Mayank for this story.

The Early Days: The processing of diamonds was a time-consuming and expensive process. The inclusions present in the diamond could not be identified easily, which led to the supply of poor-quality diamonds.

Cutting and polishing were mostly done manually. It was an inefficient process as it would result in the loss of the broken diamond pieces and potential profits.

The hand-operated emery wheels meant that the workers would process fewer than three pieces of diamonds per day.

The laser (LASER is an acronym for "light amplification by stimulated emission of radiation") machines brought a revolutionary change in the Diamond manufacturing industry. The diamond processing machines perform all the applications starting from Planning to Polishing. Lasers minimized wastage as well as scanned the impurities which boosted the quality of the diamonds.

Ahmedabad-born Dr. Arvind Patel is a first-generation technocrat and a double graduate in Electronics and Biomedical technology. He started the company (SLTL) with his younger brother Dinesh.

India's first diamond sawing machine was developed and launched by SLTL and therefore Dr. Patel is rightfully known as the father of laser technology. Laser technology has wide scope and application across machines. Their father also an electric engineer was working with a textile mill in Ahmedabad. Arvind developed an interest in Laser technology while working with Indian Space Research Organization (ISRO) in the industry sectors. Dr. Patel then identified the business potential and diversified across industry segments.

A family of technocrats: I had a detailed discussion with Dr. Patel's younger son which is outlined below. Mayank Patel is 33 but looks much younger. Maulik his elder brother is 37. Mayank & Maulik are Mechatronic graduates from Ganpat University. Mechatronics is an interdisciplinary branch of engineering that focuses on the integration of mechanical, electrical, and electronic engineering systems, and robotics.

After doing his Mechatronics, he did a crash course in Robotics from Liverpool UK.

Mayank informed me that the world's first 4 P and 7 G machines are SLTL innovations. Before the versatile 4 P machine was launched, four to 6 different machines were required to cut the Table, Crown, Girdle, and Cones. SLTL's 4P can do the job of four machines. While SLTL is a leader in 4P machines, 40 to 50 offshoots floated by the former employees of SLTL have sprung up but are far behind **SLTL Group's Technology**. The cycle from rough to polish used to take 15 to 20 days (depending on the size) and is now compressed to 30 minutes.

Trailblazing products: 7 G machine is the world's first machine for fancy shape cutting. These machines are versatile and are used in mined as well as [lab-grown diamonds](#). After the proliferation of lab-grown manufacturing, the demand for SLTL machines has picked up and SLTL has secured orders from Canada, Russia, Spain, etc. "We have supplied more than 400 machines to China for HPHT and CVD cutting. For mined diamonds we have clients in South Africa, Canada, Botswana, Russia, and Switzerland," says Mayank.

SLTL's MPCVD machines have received an encouraging response since their launch. "We have launched 2.45 GHz 6KW MPCVD in solid state (as against magnetron based).

At the heart of an MPCVD reactor is the microwave generator. It is a sophisticated, mostly electronic, piece of equipment designed to generate and emit microwave energy from electricity. Microwave energy is mainly used to heat products or generate plasma and is very useful for many applications in various sectors. The microwaves are always created by a magnetron or by a solid-state microwave generator.

Advantages of Solid state technology machines: Solid-state microwave power generators (SSPG) are the next revolution in the microwave technology field. Although they are still limited to a few kW in power, they offer many advantages compared to previous magnetron technology, such as delivering a stable microwave signal of 2.45 GHz and offering unbounded electric yield with the high lifespan

Growing diamonds is a lengthy process. The duration of a production batch lasts over 300 to 600 hours. Any interruption during the process would lead to the loss of the entire batch of diamonds.

Another aspect is the stability of the spectrum necessary to produce the purest diamonds possible.

Multiple features, such as an Automatic Restart Function (ARF), and Preventive Alarm Management (PAM, alarms that do not stop the production process) are installed to allow you to go to the end of your production batch, even in the case of micro power-cuts. Though they cost 20% more than MAGNETRON-based machines, they have many advantages over magnetron-based reactors. Even though we can make them both, we try and convince our customers to go for a Solid state as it consumes less power. The life of a magnetron varies between 7000 to 8000 hours (after which it has to be replaced) when compared to a solid state that lasts for 20,000 to 25000 hours. Magnetron manufacturing is an expensive proposition & they cannot be repaired.

In layman's terms, Magnetron can be compared to Halogen lamps and Solid state LEDs: They also manufacture diamond seeds. Scientists from their in-house R & D team, have successfully conducted research on seed making & development. Owing to the successful research, SLTL Group has started growing & commercializing the CVD rough as well.

The way forward: Within a span of 34 years, SLTL has introduced many orbit-shifting gems & jewellery processing machines. These are the machines that have taken the diamond and jewellery

industries as well as SLTL to new heights.

With more than 15000 successful installations and a global footprint in over 40 countries, SLTL Group has come a long way. The team has been felicitated with 31 awards for their unparalleled efforts. And the technocrats have registered 26+ patents for an innovative solution. The first patent was filed in the year 1992 for being the first to introduce the Laser Diamond Sawing system in India, followed by the patent for World's first [high-power Fiber laser cutting system](#) in 2007 and others.

The second-generation siblings, Maulik and Mayank are now fully geared up for leading the group to achieve new milestones. The thriving LGD industry backed by global demand and Indian Government's support offers them an environment to realize and fulfill their ambition.



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