



HHV WORLD

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Editorial

Advancing Technology with Purpose, Precision, and Partnership

Welcome to **HHV World – February 2026**, a reflection of the sustained innovation, engineering excellence, and collaborative spirit that define the HHV Group.

This edition captures a period of strong technological momentum across vacuum science, thin films, precision optics, and thermal engineering. HHVTT continues to strengthen its leadership in high-temperature and high-vacuum systems, with advanced solutions such as very **high temperature vacuum sintering furnaces** and **diffusion bonding hot presses** supporting demanding applications in ceramics, aerospace, nuclear, and advanced materials processing. These systems underscore HHVTT's decades-long expertise in delivering reliable, safe, and scalable thermal technologies for both R&D and industrial environments.

At HHVAT, innovation remains firmly aligned with real-world impact. From horizontal inline magnetron sputtering systems enabling high-quality chromium coatings for automotive safety components, to the **Decora Series PVD platforms** redefining decorative and functional coatings for high-volume production, HHVAT continues to bridge precision engineering with industrial scalability. Our growing contributions to space and optics—including complex fused silica aspheric components and large-format precision prisms—reflect our ability to meet the most exacting performance requirements in advanced scientific applications.

This issue also highlights significant recognitions and strategic milestones. From **DSIR recognition for in-house R&D**, **process qualification extensions from SAC-ISRO**, and **CII recognition for excellence in Women in STEM**, to strategic investments and partnerships in the space technology ecosystem, these achievements reaffirm HHV's role as a trusted contributor to India's and the world's high-technology landscape.

Equally important is our continued engagement with people and purpose. Industry-academia interactions, global conferences and exhibitions, technical webinars, safety initiatives, and celebrations of culture, quality, and teamwork reflect HHV's belief that technological progress must go hand in hand with learning, inclusion, and well-being.

As we move through 2026, we remain grateful to our employees, customers, collaborators, and partners who make this journey possible. Together, we continue to build technologies that not only push boundaries—but do so with responsibility, resilience, and a shared vision for the future.

CONTENTS



Translating Indian Scientific Heritage into
Global Technological Impact, The HHV Story

4



Very High Temperature Vacuum
Sintering Furnace

8



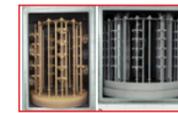
Diffusion Bonding Hot Press

10



Horizontal Inline Magnetron
Sputtering System

12



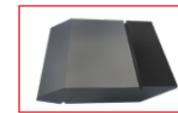
Decora Series PVD Systems

14



Monolithic Aspherics for Space Flight
Applications

16



Singleblock Periscope Prisms

17



Award, Agreements, MOU

18



Events

22



Conferences & Exhibitions

32

Translating Indian Scientific Heritage into Global Technological Impact, The HHV story

Having built a reputation, HHV now looks at new business avenues for growth



Six decades ago, it was rare for an individual embracing communist ideology to become a businessman. There was a fundamental, ideological conflict involved therein. The principles of communism perceived business as symptomatic of capitalism, which operates within a profit-driven system.

But young S.V. Narasaiah, fondly called SVN, bucked the trend. A believer in communist ideology, he still wanted to engage in business, while advocating self-reliant technology and promoting ethical practices for worker protection. These, he felt, were important for the country's economic growth, rather than outright opposition to capitalism. He believed that a majority of his colleagues in the party were not looking at the larger picture of building a sustainable economy. It was a time when India imported almost all scientific instruments. When others saw it as a challenge, he found it an opportunity. With his clear passion and understanding for vacuum technology and optics, he founded Hind High Vacuum Co Pvt Ltd (HHV) in 1965, which began its journey as India's

first home-grown vacuum technology enterprise then onwards. Indeed, a true example of the 'Make in India' movement, long before it became our national slogan!

Vacuum technology involves creating and controlling an environment with pressure significantly lower than normal atmospheric pressure. This necessitates using pumps to remove air and other gases for various processes like insulation, material processing (coating, drying, degassing), particle acceleration and food packaging, by altering chemical reactions, reducing molecular collisions or minimising heat transfer. It ranges from creating partial vacuums to ultra-high vacuums, with applications stretching from everyday vacuum cleaners and thermos flasks to advanced scientific research in space simulation and semiconductor manufacturing.

Born in 1924 in Taduvai in the Guntur district, Andhra Pradesh, SVN was a student leader of the Communist Party and a protégé of the popular Communist leader P. Sundarayya. He moved to Chellapalli town for his early education and attended

Guntur AC College. He was actively involved in writing in support of the party and used to edit Praja Shakti, a local newspaper. An avid photographer, Narasaiah also covered the whole of Eastern Europe during its post-war reconstruction activities. He developed a passion for vacuum technology and optics, too, and moved to Bangalore in 1964 to look for avenues to further his passion for vacuum technology, with the help of his mentors, Satish Dhawan and H.N. Nanjundaiah, eminent scientists in the Indian Institute of Science. He started HHV in 1965 as a small-scale industry in Bangalore.

Taking up the challenge

Following India's first nuclear test, the Western nations imposed technology embargoes and cut off the supply of critical high-vacuum and thin-film equipment. HHV became a national resource, taking up the challenge of developing indigenous substitutes for restricted technologies. In 1986, his sons Nagarjun and Prasanth Sakhamuri joined him in the business. Nagarjun, now 68, holds a Bachelor's degree in Mechanical Engineering from Wayne State University in the US, while Prasanth, 62, has a Master's in Business Administration from IRMA, Anand. They learned the nitty-gritties of the business and progressively grew the business. Meanwhile, SVN, the doyen of vacuum technology in India, passed away in 2021, at the age of 97.

The closely held and Bengaluru-based HHV is India's premier thin film and vacuum technology group today, with over 60 years of expertise in designing and manufacturing high-vacuum equipment for research and industrial applications. The foresight and strategy of the founder, who also had enormous experience in engineering, have paid the company rich dividends.

HHV's products are integral to multiple sectors, including aerospace, automotive and defence. As much as 60 per cent of the group's revenue comes from the government. The group faced several ups and downs of the business cycles, but careful implementation of new-edge technology helped the company to stay relevant. Today, it reflects a mindset of being innovative, well supported by investment in research and service. "The driver of our success has been winning the customer's confidence for offering sustainable solutions, efficiency and staying current with technology,"

explains Nagarjun Sakhamuri, MD, HHV.

To sharpen focus and faster growth, HHV was reorganised into two key entities: HHV Thermal Technologies (HHVTT), for vacuum furnaces and specialised process equipment; and HHV Advanced Technologies (HHVAT), for thin-film deposition systems and precision optics. During the last five years, the group has doubled its revenue (Rs195 crore as on 2024-25) and is today employing nearly 750 people. HHVAT constitutes over 55 per cent of the group's revenue. Nagarjun and Prasanth, as MDs of HHVTT and HHVAT, respectively, focus on their respective areas for growth.

HHVTT designs and makes large vacuum furnaces and space simulation chambers, as well as graphitisation and siliconisation furnaces for various carbon composite materials for space, aerospace, astrophysics, defence, as also automotive and metallurgy industries. Its full-fledged design centre, with 3D designing facilities, designs systems with international standards, adhering to NADCAP specifications and certified for CE. The modern manufacturing facility is situated at Peenya Industrial Area in Bengaluru. The company produces all equipment through home-grown technology, which is recognised by the Department of Science & Technology and granted R&D status.

Taking competition head-on

"Sustainability and innovation are more than just buzzwords," contends Nagarjun. "We at HHVTT put more emphasis on continually improving product performance by adopting an innovative design and engineering, with respect to current technological trends for the specific applications. This has helped us to stay abreast with global competition."

Recently, the company designed and made a large-sized vacuum-sintering furnace for St Gobain, India. Now, a similar one is under process for Germany, which is of useable hot zone size of 1.2m x 1.2m x 4.5m, meant for sintering/infiltration of silicon metals into Silicon Carbide jobs at a temperature of 2,000 degree C under vacuum/inert gas atmosphere. Nagarjun claims that HHVTT is the market leader in the field and way ahead in competition.

The company takes pride in its role as a leading specialist in plant engineering. The after-sales services are meticulously designed to ensure

uninterrupted performance of the furnace, eliminating unexpected downtime and disruptions.

“HHV has been associated with us for almost three decades, supplying us with our requirements,” says Srinivas Reddy, MD, MTAR Technologies. “Excellent products are now being made in India by them, which saves us extra-cost; they offer good service support too and ensure that all our lines are operational.” The Bengaluru-based MTAR makes components and equipment for clean energy sectors, defence and aerospace. Vacuum furnaces and vacuum ovens form a part of the process tools for vacuum brazing.

HHVAT, the other business entity, provides thin film solutions, which include chemical vapour deposition (CVD) and physical vapour deposition (PVD) coating machines, coating as a service and high-precision optics. It is India’s premier thin film and vacuum technology maker for optical, decorative, functional coatings and astronomical telescope mirrors and special-purpose vacuum equipment, produced in its state-of-the-art facility at Devaspeth, Bengaluru, equipped with ISO 7, ISO 8 clean rooms.

The company produces over 100,000 optical components every year for domestic and international markets. With sales offices in the UK and global distributor presence, HHVAT exports to about 75 countries, including the US, the UK, Germany, Italy, Turkey, Switzerland, Singapore and China. HHV acquired the thin film business of Edwards, a leading vacuum company in the UK, in 2014 and established HHV Limited in the UK to handle international marketing, service and support, gaining global recognition. Currently, HHVAT exports 38 per cent of its products.

Rise of the third generation

Smriti Sakhamuri (Prasanth’s daughter) is a member of the third generation, who joined the group seven years ago to support the business. She holds a Bachelor’s degree in Mathematics from the University of Warwick and a Master’s in Applied Economics from the University of Michigan. She spearheads the HHVAT as executive director. “I’ve realised that our brand is incredibly strong, but we’re not leveraging it. So, my focus is to have a real presence in the market, and I have been aggressively pushing us in the export market. The

effort has yielded positive results, with our exports increasing by 10-15 per cent,” says Smriti.

The company was also awarded certification of qualification by the Indian Space Application Centre, ISRO, for its thin-film metalised substrates. The seeker heads for all the Nag and Helena missiles, hybrid micro-circuit for Chandrayaan, and periscope prisms consist of ITO-coated heater plates that are laminated through an autoclave process for sealing and encapsulation used for submarines and battle tanks for defence. These are some of the high-level precision coatings done in the HHVAT plant.

“We have an order book of Rs140 crore carried forward in advanced technologies,” says Prasanth. “Our roadmap includes expansion of the optics campus, deeper international collaborations and greater participation in aerospace, semiconductor and photonics supply chains.

HHV has contributed to India’s space programme by supplying hybrid micro-circuits and lenses used on the moon, developed coating machines for large telescopes like those in Kavalur, Hanle, and successfully installed a 3.7-metre telescopic mirror coater at Mount Abu. The creation of indigenous space simulation chambers capable of high vacuum and temperature cycling to replicate deep space conditions, and supplied optical components for defence periscopes and drones.

It was reported that a reputed mobile phone manufacturing company approached HHV for the coating technology for the handset. The trial run is on, but the company is tight-lipped about the development.

HHV has been closely working with Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), a top national multi-disciplinary research institute, under the Department of Science & Technology. “HHV do not shy away from collaborating with academic practitioners,” says G.U. Kulkarni of JNCASR. “Whether it is buying ready or custom-made products, R&D related or even translating basic research ideas into knowledge-based products, I found HHV to be a good partner to work with.”

The company focuses on organic growth, developing indigenous technologies rather than

relying on imports, and is expanding into new markets such as the solar and semiconductor industries as part of its plans. The company set up a 50:50 joint venture with engineering specialist ASM Technology for making tools and sub-systems for the solar and semiconductor sectors. It is yet to start. “We have set up this company in advance to gather technology know-how to build the expertise, because today there is no direct demand in the country,” explains Dinesh Kamath, CFO, HHVAT.

India’s vacuum technology and thin film coating market is experiencing robust growth, driven by escalating demand from consumer electronics, automotive, aerospace and renewable energy sectors, with opportunities in advanced processes like ALD and PVD for high-performance coatings. However, challenges exist in high costs, supply chain and competition. The market leverages fundamental vacuum principles for oxidation prevention and quality, seeing investment in both equipment and services, positioning India for significant future expansion in this high-tech domain. HHV invests about 7-8 per cent of its revenue in R&D, and focuses on continuous innovation to meet new customer demands and maintain technological leadership.

The group plans to go public in the next five years, when it achieves a turnover target of Rs1,300-1,400 crore and both its business verticals become healthy with 50 per cent of the revenue from exports. “It is good to go public. The company will get a huge facelift and enhance the trust factor. Going public comes with a certain commitment to good governance,” says Kamath. “However, as of now, our focus is only on optics coating. But we have to venture into other areas of coating like metal coatings, which need to create capacity for large volumes and that will generate interest in the company in the market.” Within the group, it’s HHVAT that is considered the suitable entity for an IPO.

“The HHV story is about vision across generations, translating Indian scientific heritage into global technological impact,” Smriti affirms. The group has demonstrated its ability to move with the times. With immense brand value and established markets, the company will continue to retain its leadership position.

Article Courtesy: <https://businessindia.co/magazine/corporate-report/translating-indian-scientific-heritage-into-global-technological-impact-the-hhv-story>



Very High Temperature Vacuum Sintering Furnace

Vacuum sintering is an effective method for obtaining dense sintered metals and ceramics. Simply put, sintering is to turn a powdered material into a dense item.

Sintering processes have been widely used in many industries such as steel, metallurgy and ceramics, etc.

As new materials are developed and put into production for hard metal applications, vacuum sintering furnaces find increasing use in preference to atmosphere furnaces because of their ability to provide consistent process environments, extremely close temperature uniformity, various atmospheres, precise heating ramps and auto cycles, repeatability, and economy in operation.

HHV Thermal Technologies (HHVTT) has been designing and manufacturing a range of vacuum sintering furnaces for R&D and for industrial applications.

With more than 6 decades of experience in production and processing of vacuum sintering furnaces, heat treatment furnaces, high temperature furnaces, and silicon carbide sintering furnaces, HHVTT is good at handling high temperature materials.

In the heat treatment application, the powder, powder compact or other forms of materials are heated to a certain sintering temperature, which are kept for a certain period of time and then cooled, so that the materials undergo a series of physical and chemical changes, gradually densifying from looseness to a certain geometric shape that is solid and the mechanical strength is greatly improved, so as to obtain material with the required performance. This process is called sintering heat treatment process.

HHVTT has designed and manufactured a large size vacuum sintering furnace of usable hot zone size of 1.2 mtrs x 1.2 mtrs x 4.5mtrs deep. It is for Sintering/Infiltration of silicon into Silicon Carbide jobs at a temperature of 2000 deg C under vacuum/inert gas conditions. The organic binders which are released from the job during sintering process are thermally treated in a Thermal Oxidiser using advanced safety mechanism that comply with local environmental regulations. This furnace is horizontally mounted front-loading type, double

walled with water cooling, design as per ASME pressure vessel code section VIII, Division-I. The size of the chamber is 2800 mm diameter x 5000 mm cylindrical length. The chamber is fabricated following ASME code section IX and the chamber is constructed with stainless steel SS 304 L material.

The entire system is enabled with safety instrumentations and automated with PLC and SCADA control systems. It consists of furnace chamber, hot zone, vacuum pumping system, partial pressure inert gas system, control & instrumentation, safety devices and interlocks.

Front door to allow complete access to the hot zone with necessary automatic locking arrangement using pneumatic clamps and appropriate sealing to achieve leak tightness and vacuum levels. A hinge

supported dished end front door to be opened manually. A high-temperature resistant Viton O-ring is provided to ensure complete sealing

HHVTT vacuum sintering furnace can be used for sintering and heat treatment of Silicon carbide to improve material properties. The ceramic products industry catering to architectural ceramics, sanitary ceramics, and fire-resistant ceramics uses continuous sintering furnaces or intermittent sintering furnaces for sintering. The sintering furnace can be used for drill sintering, alumina sintering, zirconia ceramic sintering, diamond saw blade sintering and so on.



Fig 1. Horizontal Vacuum Sintering Furnace

Diffusion Bonding Hot Press

HHVTT design and develop a range of vacuum technology based customized autoclave systems from a lab scale to a large industrial horizontal type of autoclave systems as per ASME pressure vessel codes safety standards for a variety of applications.

In recent years, diffusion bonding, which enables precision bonding, direct bonding, and dissimilar material bonding has been attracting attention. It integrates the base material to be joined and is positioned as a type of solid phase joining.

When two parts are held in close contact and heated in a clean vacuum environment, diffusion bonding occurs. Solid state diffusion of atoms across the interface produces a 100% metallurgical bond.

This process is superior to conventional brazing because no lower melting catalyst is introduced. It is superior to welding processes because no localized high stress is produced and distortion is eliminated. Major industries including aerospace frame and engine manufacturers, electronics and nuclear parts producers rely on this process.



Fig 1. 30 Ton Diffusion Bonding Vacuum Hot Press

HHVTT specializes in high vacuum and high temperature diffusion bonding hot presses with power-regulated resistance heating or induction heating. HHVTT's expertise is in designing and developing vacuum diffusion bonding hot presses tailored to customer specifications, wherein the chamber size, tonnage of the press, pressure and temperature are specifically suited to the requirements of the customer. HHVTT hot presses provide high consistency and low contamination for pressing, sintering and compacting.

The HHVTT Diffusion Bonding Hot Press is a packaged system able to press up to 200 tons (or more) force at temperatures up to 2500°C in high vacuum or controlled atmosphere.

This diffusion bonding press has a vertically mounted double walled water cooled 'D' shaped chamber having dimensions of 800 mm diameter x 800 mm height with a split construction.

The heating chamber consists of heaters and heat insulators inside a vacuum vessel made of Stainless Steel, and a vacuum pump used to create vacuum inside a vacuum furnace vessel to raise the temperature to over 2400°C in vacuum with a temperature uniformity of $\pm 50^\circ\text{C}$ within the working volume.

A 30 Ton capacity (in picture) rectangular open pillar type hydraulic press with a hydraulic power pack and electrical control panel is used. The Top (active) and bottom ram (stationary) ram has a solid heat-treated, ground, stainless steel and water-cooled shaft, passing through a silicon oil lubricated sliding bulk seal made of high strength stainless steel for transferring of the force from hydraulic cylinder piston rod to the compacting device in the hot zone.

HHVTT diffusion bonding vacuum hot press instrumentation includes a programmable controller with PLC for process control and SCADA system for complete automation.

Horizontal Inline Magnetron Sputtering System

HHV Advanced Technology (HHVAT) has long been a trusted name in high-quality thin-film deposition systems for both research and production applications. Our mission is to empower users by providing advanced, customizable equipment that meets evolving technological demands.

A recent highlight from HHVAT is a horizontal inline magnetron sputtering system designed for the deposition of chromium coatings on ABS pad rings, which are critical components in safety airbag modules. These pad rings serve as the structural support that ensures the airbag cover opens in a controlled manner during deployment.

The chromium sputter coating primarily serves decorative and protective purposes, providing a premium chrome finish, enhancing scratch and UV resistance, and ensuring long-term aesthetics without compromising the safe tear performance of the airbag cover.

Key System Features:

- **Inline Magnetron Sputtering Design:** Optimized for maximum throughput, exceptional film quality, and operational flexibility, all at the industry's lowest cost of ownership.
- **Dual-Isolation and dual load lock chambers:** Minimizes contamination and increases efficiency.
- **Horizontal Pallet Transport:** Pad rings are mounted on pallets (eight pad rings per pallet) and transferred in a convoy through the transport subsystem. Pallets and cathodes are aligned horizontally, with substrates facing upward and cathodes are facing down (Sputter down configuration)

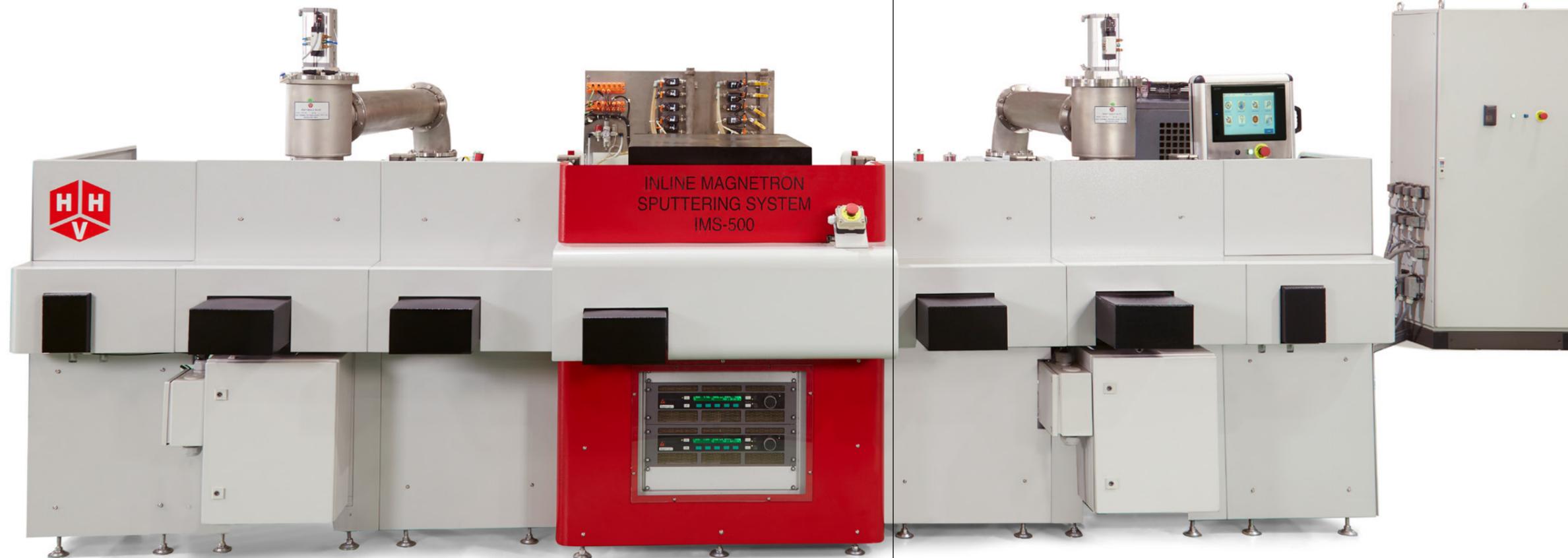


Fig.1. Horizontal Inline Magnetron Sputtering System

- **Slit Valve Isolation & Sectional Processing:** Enables different process sections to operate simultaneously under distinct environments (e.g., sputtering in one chamber while degassing in another).
- **Rotatable Cylindrical Magnetrons:** Two DC-powered rotatable magnetrons run simultaneously to deposit high-quality pure chromium coatings.
- **Cycle Time & Productivity:** Typical cycle time is less than 60 minutes per pallet, ensuring consistent throughput.

Benefits for Users

- Greater process stability and reproducibility
- Enhanced automation and reliability
- High uptime and return on investment (ROI)
- Consistent run-to-run performance

This inline system from HHVAT represents a robust and scalable solution for manufacturers seeking both decorative quality and functional performance in automotive interior safety components.

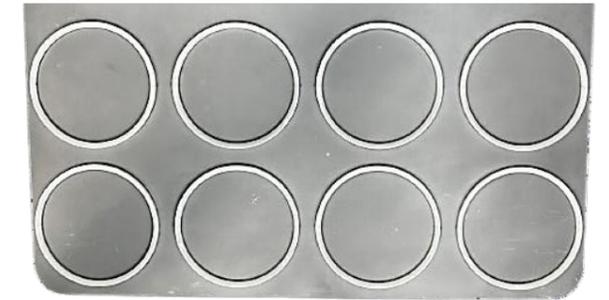


Fig.2. Uncoated samples



Fig.3. Coated samples

Decora Series PVD Systems

Redefining Decorative and Functional Coatings for High-Volume Production



Fig.1. Wall-mounted decorative coating technologies: Cathodic Arc Evaporation System.

A New Standard in Decorative and Functional Coating Production

In today's competitive consumer and industrial markets, surface performance is no longer an afterthought—it is a defining factor. From the deep metallic shine of luxury automotive interior trims to the wear resistance of premium faucet finishes and the brilliance of fashion accessories, manufacturers face increasing pressure to deliver coatings that combine exceptional aesthetics with superior durability.

As industries shift away from traditional electroplating toward cleaner, more sustainable, and versatile alternatives, Physical Vapor Deposition (PVD) technologies have emerged as a transformative solution. Within this landscape, the Decora Series PVD System stands out as a next-generation platform engineered for high-volume, reliable production of decorative and functional coatings, offering flexibility, repeatability, and coating excellence.

Designed for Consistency and Scale

The Decora Series is purpose-built for demanding production environments requiring both high coating quality and dependable throughput. Engineered for continuous industrial operation, it ensures consistent film performance across decorative and protective applications.

Its modular design philosophy allows configuration with Cathodic Arc Evaporation, Reactive

Magnetron Sputtering, or Hybrid Arc + Sputtering combinations. This flexibility enables manufacturers to tailor coating technology precisely to their product segment, whether targeting cost-effective decorative finishes or premium, high-uniformity coatings.

The system is available in three proven chamber sizes: Decora 1215, 1515, and 1915. The first two digits indicate chamber diameters of 1200 mm, 1500 mm, and 1900 mm, while the last two digits represent a chamber height of 1500 mm. These standardized platforms provide scalable production capability while allowing customization of chamber layouts, target configurations, process enhancements, and automation solutions.

Advanced Coating Technologies

Cathodic arc evaporation remains widely adopted for decorative applications, offering high deposition rates, strong adhesion, excellent coating density, and cost-effective operation. It is particularly suitable for titanium-based metallic finishes in entry-level and mid-range markets.

Reactive magnetron sputtering enables superior thickness control, excellent uniformity across complex geometries, smoother surface finishes, and high-end interference color coatings. For premium products requiring flawless appearance and refined optical effects, sputtering represents the gold standard.



Fig.2. Wall-mounted decorative coating technologies: Reactive Magnetron Sputtering System.

By integrating arc and sputtering technologies within a hybrid platform, manufacturers can produce hard protective base coatings with decorative top layers, multi-layer systems for enhanced wear resistance, low-friction coatings, and premium decorative finishes with functional durability.

supported sectors. Supported by turnkey delivery and process expertise, the Decora Series establishes a new benchmark in decorative and functional coating production—delivering surfaces engineered to last.

Products:

Expanding Applications and Sustainable Production

Vacuum coating technologies are rapidly replacing electroplating due to broader material compatibility, the ability to coat complex shapes, cleaner manufacturing pathways, enhanced durability, and stable decorative color performance. PVD coatings deliver highly reflective metallic finishes in a wide spectrum of colors with exceptional reproducibility.

Applications span automotive, home and sanitary, consumer and luxury goods, and medical and



Fig.3. Colour Coating developed using Magnetron sputtering and cathodic arc evaporation system

Monolithic Aspherics for Space Flight Applications

Our entry into space optics fabrication was defined by the successful development of a fused silica-based monolithic aspheric component for a space flight application.

The program represented a significant technical milestone for the organisation, demanding precision across optical fabrication, advanced coating implementation, and mechanical integration under stringent space qualification standards.

From the outset, it was clear that this would not be a conventional optical manufacturing effort. Unlike spherical optics, aspheric surfaces require strict control of surface form accuracy, as even minor deviations from the intended profile can directly affect system-level optical performance. Maintaining the designed aspheric contour across the full aperture required disciplined process control and continuous metrology validation throughout fabrication.

The selection of fused silica was driven by its exceptional thermal stability, low coefficient of thermal expansion, and compatibility with the demanding environmental conditions of space. However, while ideally suited for space applications, fused silica presents its own manufacturing challenges. Its hardness and susceptibility to subsurface damage necessitate carefully controlled grinding and polishing cycles to preserve material integrity while achieving the required optical precision.

One of the most demanding performance requirements was achieving a surface roughness of ≤ 40 nm. Reaching this specification required iterative refinement of polishing parameters and frequent intermediate measurements to ensure conformance with the specified aspheric form. The process demanded close coordination between fabrication and metrology teams to prevent error accumulation and maintain dimensional fidelity.

The optic was not designed as an isolated element but as part of an integrated optical assembly. This elevated the importance of mechanical tolerances, alignment features, and interface precision. Any deviation at the component level could propagate through the system, potentially affecting overall

telescope performance. Consequently, dimensional consistency and repeatability were treated with the same rigor as optical surface quality.

A key milestone in the program was the successful realization of a monolithic telescope architecture integrating both primary and secondary reflective surfaces within a single fused silica substrate. This configuration required the implementation of a selective multi-coating strategy applied with high spatial precision. The coating system comprised two protected silver reflective coatings for the mirror surfaces and two broadband anti-reflective coatings applied to the entrance and exit planes.

Achieving sharply defined coating boundaries on a complex monolithic geometry required the development of a high-precision masking methodology. Custom masking solutions and dedicated tooling were engineered to isolate functional zones, prevent overspray, and maintain uniform coating thickness across all surfaces. The broadband anti-reflective coatings were optimized to achieve $\leq 0.5\%$ reflectance across the visible and near-infrared spectrum, while the protected silver coatings delivered reflectivity exceeding 85% and satisfied environmental durability requirements in accordance with MIL-M-48497A, including abrasion and environmental exposure testing.

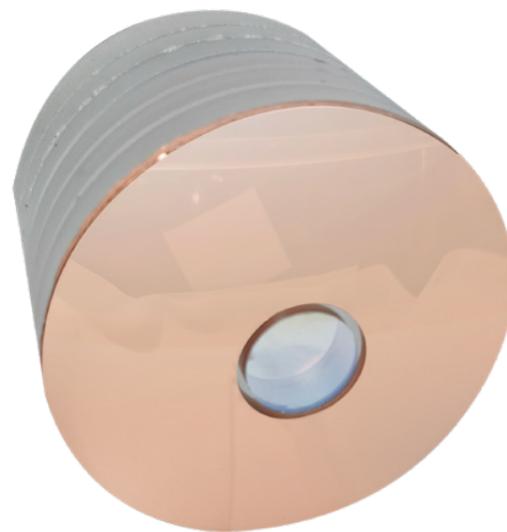


Fig.1. Monolithic Aspherics Lenses

Singleblock Periscope Prisms

The development of a large-format singleblock periscope prism in BK7 optical glass (260 mm × 200 mm) represented a significant technical achievement.

Its scale introduced complex challenges in handling, alignment, and process stability, requiring rigorous control across fabrication, polishing, coating, and finishing operations.

Precision Fabrication

Maintaining tight angular accuracy, collimation, and surface parallelism across a large aperture demanded enhanced machining tolerances and optimized polishing strategies. Uniform groove integrity and low surface roughness were achieved through controlled material removal and iterative in-process inspection, ensuring high optical performance without subsurface damage.

Finishing operations—including surface preparation and protective painting—were carefully managed to achieve uniform coating thickness, reliable adhesion, and consistent cosmetic quality across complex geometries.

Advanced Coating Solution

A customized aluminium thin-film process was engineered to integrate high-reflection and anti-reflection functions within the same prism body. Key performance targets included:

- 85% backside reflectivity
- Uniform deposition on a polished inclined surface
- High thickness uniformity across a large aperture

Process optimization, controlled substrate positioning, and a dedicated masking methodology enabled precise selective coating while preventing cross-contamination. Enhanced chamber cleanliness and refined pre-treatment minimized pinhole formation, improving film density and adhesion without additional interlayers.



Fig.1. Singleblock Periscope Prisms

Eon Space Strategic Investments

Hyderabad, India | August 06, 2025 — HHV Advanced Technologies Pvt. Ltd. (HHVAT), a global leader in thin-film and precision optics technology, has announced a strategic investment and long-term partnership with Eon Space Labs, a Hyderabad-based deep-tech startup specializing in advanced imaging technologies. This collaboration forms part of a US\$ 1.2 million pre-Series A funding round, which also includes MGF Kavachh.



Through this investment, Eon Space Labs will scale up manufacturing of its AI-driven electro-optical and infrared payloads, expand its engineering team, and support the launch of new products, including its first ultra-lightweight space telescope, MIRA, scheduled for the end of 2025.

Founded in 1965, HHVAT brings decades of expertise in advanced vacuum systems, thin-film technology, and precision optics, serving prominent organizations such as ISRO, DRDO, and international aerospace missions. Leveraging HHVAT's deep industry knowledge, this partnership will accelerate product innovation and market growth for Eon Space Labs.

Eon Space Labs, founded in 2022 by Sanjay Kumar, Punit Badeka, and Manoj Kumar, designs miniaturized, high-resolution imaging systems for satellites, drones, aerial systems, and fixed ground platforms.

Prasanth Sakhamuri, Managing Director, HHVAT, stated, "Our partnership with Eon is built on a shared commitment to advance India's high-precision

optics manufacturing capabilities. This investment marks the beginning of a strategic collaboration to bring deep-tech imaging solutions to market."

Sanjay Kumar, Co-Founder, Eon Space Labs, added, "With HHVAT's unmatched expertise in optics and thin-film technology, we can accelerate both product development and large-scale manufacturing. This partnership is crucial to building a globally competitive optical payload ecosystem right here in India."

Manoj Kumar, Co-Founder, Eon Space Labs, emphasized, "With the support of our strategic investors, we are one step closer to creating a globally competitive optical payload ecosystem."

This strategic partnership is set to deliver homegrown, globally relevant precision technology across multiple industries, further positioning India as a leader in space and drone research.

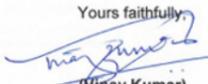
Article Courtesy: <https://timesofindia.indiatimes.com/city/hyderabad/hyd-startup-eon-space-labs-raises-1-2m-in-pre-series-a-funding/articleshow/123126205.cms>

HHV Advanced Technologies Receives DSIR Recognition for In-House R&D Facility

Bengaluru, India | October 07, 2025 — HHV Advanced Technologies Pvt Ltd. has been formally recognized by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India, for its in-house Research and Development facility. This prestigious recognition reaffirms HHV's strong focus on scientific research, technology development, and innovation excellence.

Granted under Certificate Registration No. TU/IV-RD/5148/2025, the DSIR certification validates HHV's compliance with national standards for systematic industrial research and experimental development. The recognition is valid until 31 March 2027, subject to periodic renewal as prescribed by DSIR.

This milestone enhances HHV Advanced Technologies' eligibility for government incentives, research funding, and regulatory benefits, while strengthening its position as a trusted contributor to India's advanced manufacturing and technology ecosystem.

<p>दूरभाष/Tel : 26962819, 26567373 (EPABX) : 26565894, 26562133 दूरभाष का अधिकार RIGHT TO INFORMATION : 26565887, 26562144 फैक्स/FAX : 26562134, 26562122 वेबसाइट/Website : 26960629, 26529745 http://www.dsir.gov.in</p>	 <p>भारत सरकार विज्ञान और प्रौद्योगिकी मंत्रालय वैज्ञानिक और औद्योगिक अनुसंधान विभाग टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली - 110016 GOVERNMENT OF INDIA MINISTRY OF SCIENCE AND TECHNOLOGY, Department of Scientific and Industrial Research Technology Bhavan, New Mehrauli Road, New Delhi - 110016</p>
	
<p>F. No. TU/IV-RD/5148/2025 Date: 07th October, 2025</p>	
<p>To M/s HHV Advanced Technologies Pvt. Ltd. Nos. 31-34 & 37, KIADB Industrial Area, Phase-1, Dabaspeta, Bangalore Rural-562 111 Karnataka</p>	
<p>Subject: Demerger of in-house R&D unit of M/s Hind High Vacuum Company Pvt. Ltd. and Renewal of Recognition beyond 31.03.2024.</p>	
<p>Dear Sir,</p> <p>This has reference to your applications on the subject cited above. The department has taken on record that on implementation MCI Order No. 3/Kar/15/RD(SER)/CAA-11/233/2023/1339 dated 23.05.2023 the in-house R&D unit of M/s Hind High Vacuum Company Pvt. Ltd. located at Site No. 17, Phase-I, Peenya Industrial Area, Bangalore, Karnataka has been bifurcated at i) No. 17, Phase-I, Peenya Industrial Area, Bangalore, Karnataka and ii) No. 31-34&37, KIADB Industrial Area, Phase-1, Dabaspeta, Bangalore, Karnataka. As per the MCI Order the scheme shall be effective from the appointed date i.e. 01.10.2022.</p> <p>2. It is to inform you that in-house R&D unit(s) of your company at No. 31-34&37, KIADB Industrial Area, Phase-1, Dabaspeta, Bangalore, Karnataka is recognized upto 31.03.2027. Terms and conditions pertaining to this recognition are given overleaf.</p> <p>3. This letter is being issued in lieu of the original renewal of recognition letter No. TU/IV-RD/330/2021 dated 31.01.2022 issued to M/s Hind High Vacuum Company Pvt. Ltd. by this Ministry.</p> <p>4. Kindly acknowledge the receipt of this letter.</p> <p style="text-align: right;">Yours faithfully,  (Vinay Kumar) Scientist 'F'</p>	

Driving Inclusion as Strategy: HHV Advanced Technologies Wins CII Women in STEM Award

Delhi, India | December 17, 2025 – HHV Advanced Technologies has been honoured with the CII Award for Excellence in Women in STEM – Top 50 MSME, recognizing the company’s commitment to fostering gender equity and empowering women across technical and leadership roles.

The award was received by Smriti Sakhamuri, Executive Director, whose leadership philosophy emphasizes that women’s employment and growth are not initiatives, but essential drivers of organizational progress. Under her guidance, HHV has cultivated an inclusive culture that nurtures equitable opportunities across engineering, manufacturing, and management functions.

As highlighted by Dr. (Smt) Chandrika Kaushik, Production Coordination & Services Interaction, Distinguished Scientist & Director General, DRDO, during the event: “Inclusion is not a compliance requirement – it is a strategic decision.” This

sentiment mirrors HHV’s enduring commitment to translating inclusion into tangible action.

HHV continues to champion initiatives that enable women to learn, lead, and innovate at every level of the organization, reinforcing the company’s dedication to advancing both industry and society.



HHVTT Reaffirms ISO Certifications

Bengaluru, India | December 19, 2025 – HHV Thermal Technologies Pvt. Ltd. (HHVTT) successfully renewed its ISO 9001, ISO 45001, and ISO 14001 certifications, reaffirming its continued commitment to quality management, occupational health & safety, and environmental responsibility.

The re-certification reflects HHVTT’s consistent adherence to international standards and its focus

on maintaining robust systems, safe work practices, and sustainable operations. This achievement highlights the ongoing efforts of the HHVTT team toward operational excellence and continuous improvement.

HHVTT thanks its employees for their sustained dedication and remains committed to upholding these standards across all its activities.

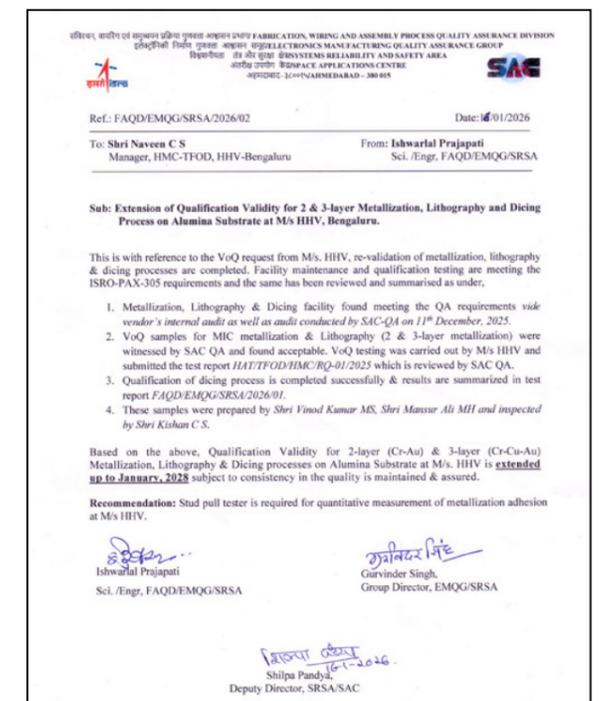


SAC-ISRO Extends Process Qualification for HHVAT

Bengaluru, India | January 16, 2026 – The Space Applications Centre (SAC), ISRO has officially extended the qualification validity for 2-layer (Cr–Au) and 3-layer (Cr–Cu–Au) metallization, lithography, and dicing processes on alumina substrates at M/s HHV Advanced Technologies (HHVAT), Bengaluru, up to January 2028.

The extension follows successful audits, VoQ sample testing, and comprehensive process qualification reviews conducted by SAC–Quality Assurance. The facility continues to meet stringent quality and reliability requirements.

This milestone reflects HHVAT’s consistent quality standards, process reliability, and the strong collaborative efforts between HHVAT and SAC, further strengthening India’s space MIC manufacturing capabilities.



Building a Safer Tomorrow: HHVAT Completes First Aid Training Program

Bengaluru, India | August 12, 2025 — HHV Advanced Technologies Pvt. Ltd. (HHVAT) reaffirmed its commitment to workplace safety and employee development with the successful completion of a certified First Aid Training Program by 30 team members.

The training equipped participants with essential life-saving skills, covering emergency response, fracture and wound management, burn treatment, care for bites and stings, handling foreign bodies in eyes, ears, and nose, and managing unconsciousness and vital functions.

This initiative highlights HHVAT's culture of safety, preparedness, and care—not just for its people but for the wider community. The certified participants set a strong example, demonstrating the company's dedication to creating a secure and responsible workplace.



HHV Advanced Technologies Hosts Technical Webinar on Ion Beam Sputtering

Bengaluru | August 14, 2025 — HHV Advanced Technologies Pvt. Ltd. successfully conducted an exclusive live webinar titled “Ion Beam Sputtering: Industry & Application in Opto-Electronics,” bringing together leading scientists, researchers, and industry professionals to discuss the latest advancements and applications of Ion Beam Sputtering (IBS) technology.

The session explored the principles of IBS and its vital role in achieving high-precision optical coatings, including laser facet AR/HR coatings and transparent conducting oxide films for electrochromic smart windows. Participants gained valuable insights into the technology's relevance across lasers, optics, and emerging smart material applications.

The expert panel provided an in-depth perspective on IBS and PVD methodologies, ITO coating applications, and future trends in the opto-electronic industry. The event concluded with an engaging live Q&A session, where participants interacted directly with the speakers to deepen their understanding of this precision deposition technique.

Featured Speakers:

- » Dr. Girish Gouda – Thin Film Division, LEOS, ISRO
- » Dr. Ashutosh Kumar Singh – Scientist C, CeNS, Bangalore
- » Dr. M. G. Sreenivasan – CTO, R&D, HHV Advanced Technologies

HHV Advanced Technologies extends its appreciation to all attendees and collaborators for making the session a success and reaffirms its commitment to advancing thin-film technologies that empower innovation across industries.

HHV Celebrates India's 79th Independence Day

Bengaluru | August 15, 2025 — Hind High Vacuum Company Pvt. Ltd. (HHV) proudly celebrated the 79th Independence Day, honouring the enduring spirit of freedom, unity, and progress that defines our nation.

The celebration began with the ceremonial flag hoisting, followed by moments of reflection on India's remarkable journey of growth and innovation. Team members came together to reaffirm HHV's commitment to advancing the nation's technological self-reliance through pioneering vacuum and thin-film technologies.

HHV extends warm wishes to everyone on this special day and celebrates the collective spirit that continues to inspire India's path toward excellence and innovation.



Connecting Classroom to Industry: Dayananda Sagar Engineering Students Visit HHVAT

Bengaluru, India | August 21, 2025 — HHV - Hind High Vacuum Company Pvt. Ltd. Advanced Technologies (HHVAT) hosted an industrial visit for over 50 students from the Department of Electronics & Communication Engineering, Dayananda Sagar College of Engineering, Bangalore.

The visit was initiated by Dr. Basavaraj S. S., Associate Professor, and Dr. Madhura R., Assistant Professor, providing students with a hands-on opportunity to explore advanced engineering practices.

HHVAT extended its best wishes to all students for a bright future in STEM careers, reaffirming the company's commitment to nurturing talent and fostering learning opportunities for the next generation of engineers.

Students attended a group presentation and visited the HMC, TFOD, and TFED divisions in batches, gaining insights into HHVAT's expertise in precision vacuum systems, thin-film technology, and advanced electronics. The visit allowed participants to connect classroom concepts with real-world applications, enhancing their understanding of industry processes and technological innovation.



SVN Lecture Series: Honouring Vision, Celebrating Legacy

Bengaluru | September 27, 2025 – HHV – Hind High Vacuum Company Pvt. Ltd. celebrated the birth anniversary of its visionary founder, Shri S. V. Narasaiah, by organizing the annual Founder’s Day Lecture at the S. V. Narasaiah Auditorium, Indian Institute of Science (IISc).

The lecture, a long-standing tradition at HHV, reflects the company’s commitment to nurturing scientific thought and innovation – values deeply rooted in its founder’s legacy.

This year’s distinguished speaker, Dr. Anil Kumar, Associate Director, Defence Research and Development Organisation, delivered an engaging talk on “Materials for Strategic Applications.”

The session offered valuable insights into emerging materials technologies in the field of flight systems and thermal protection, drawing participation from scientists, engineers, and academicians.

Founder’s Day remains a tribute to Shri S. V. Narasaiah’s pioneering vision, celebrating his lifelong dedication to advancing science and

engineering in India. Through this annual gathering, HHV continues to uphold the principles he embodied – innovation, integrity, and excellence.



Honouring the Tools of Excellence: Ayudh Puja 2025 at HHV

Bengaluru, India | October 1, 2025 – HHV - Hind High Vacuum Company Pvt. Ltd. (HHV Group) observed Ayudh Puja 2025, a tradition celebrating the tools and instruments that enable innovation and excellence in the workplace.

The event brought together employees across departments to reflect on the importance of safety, precision, and dedication in daily operations.

The celebration included a puja ceremony, where employees offered their respects to work tools and equipment, followed by interactions and discussions highlighting teamwork, operational excellence, and shared commitment to quality. The event fostered a sense of unity, gratitude, and respect for the craft that drives HHV’s success.

HHV expressed its appreciation to all employees and organizers for participating in the observance, emphasizing the company’s values of collaboration, inclusivity, and a culture of excellence.



Bridging Academia and Industry: IISc Students Visit HHV Advanced Technologies

Bengaluru, India | November 20, 2025 — HHV Advanced Technologies (HHVAT) welcomed a group of 36 students from the Materials Engineering Department of the Indian Institute of Science (IISc), Bengaluru, accompanied by faculty member Dr. Sachin R. Rondiya, for an industry-focused learning visit.

The session began with an overview of HHVAT's advanced technologies, followed by a guided tour of the company's factory and laboratory facilities. Students had the opportunity to observe real-world engineering practices, gaining exposure to precision manufacturing processes, thin-film technologies, and the role of high-vacuum systems across various industry sectors.

The visit was coordinated through close collaboration between IISc and HHVAT teams from engineering, production, and operations, who conducted the technical presentations and walkthroughs.

Such industry-academia engagements play an essential role in helping young engineers bridge the gap between classroom concepts and practical implementation. HHVAT remains committed to supporting educational initiatives that inspire and prepare the next generation of science and engineering professionals.



Quality Awareness Month at HHV – A Commitment Reinforced

Bengaluru, India | November 2025 — At Hind High Vacuum Company Pvt. Ltd. (HHV), quality is not just a process—it is a core promise that shapes every aspect of our work.

This year's Quality Awareness Month began with an engaging company-wide session that set the foundation for a month focused on strengthening HHV's culture of excellence.

Throughout the month, employees across departments participated in a range of activities, learning sessions, and team engagements designed to deepen quality awareness, encourage best practices, and inspire every individual to uphold the highest standards in their daily contributions.

The initiative fostered collaboration, supported continuous improvement, and reaffirmed HHV's commitment to delivering reliable, high-performance solutions to customers worldwide.

Quality Awareness Month concluded with renewed enthusiasm and shared responsibility, underscoring HHV's belief that quality is not merely a standard, but a collective mindset that drives the organization forward.



HHV Annual Sports Day 2025: Beyond Work, United in Spirit

Bengaluru, India | December 20, 2025 — HHV - Hind High Vacuum Company Pvt. Ltd. (HHV Group) hosted its **Annual Sports Day 2025**, bringing together employees from across the organization and reinforcing the spirit of **One HHV** beyond the workplace. The event celebrated sportsmanship, teamwork, and shared experiences both on and off the field.

Employees enthusiastically participated in **cricket, volleyball, and throwball**, while families and children joined in with fun games, cheers, and laughter, turning the day into a true community celebration. From **friendly competitions and tug-of-war** to music, dancing, and prize distribution, the event showcased HHV's core values of **connection, collaboration, and an inclusive culture**.

A special thanks was extended to the **HR team, volunteers, and all participants** who contributed to making the day memorable. The event underscored HHV's belief that **strong teams are built together—on the field and beyond**, fostering both professional and personal connections within the organization.



HHV Marks the Beginning of 2026 with a Unified New Year Celebration

Bengaluru, India | January 1, 2026 — HHV - Hind High Vacuum Company Pvt. Ltd. (HHV Group) celebrated the New Year 2026 with a special gathering that brought together employees, families, and partners, reinforcing the spirit of **One HHV**.

The celebration featured a cake-cutting ceremony, along with informal meetups and interactions among employees across departments. The event provided a relaxed setting for colleagues to connect, share experiences, and strengthen professional and personal bonds, marking the beginning of the year on a positive and unified note.

HHV extended its appreciation to all employees, volunteers, and organizers for making the celebration a memorable start to 2026, highlighting the company's commitment to collaboration, inclusivity, and collective growth.



HHV Celebrates India's 77th Republic Day

Bengaluru | January 26, 2026 — Hind High Vacuum Company Pvt. Ltd. (HHV) proudly celebrated the 77th Republic Day of India, commemorating the values of democracy, integrity, and unity enshrined in our Constitution.

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On this momentous occasion, HHV extends its warm greetings to all and celebrates the shared responsibility of building a stronger, progressive, and self-reliant India.

The celebration commenced with the ceremonial flag hoisting, followed by reflections on India's constitutional journey and its continued progress as a resilient and innovative nation. Employees came together to reaffirm HHV's commitment to contributing to India's technological advancement and self-reliance through cutting-edge vacuum and thin-film solutions.



HHV at SEMICON® India 2025: Powering the Future of Semiconductors New Delhi, India | September 2–4, 2025

HHV Advanced Technologies Pvt. Ltd., in collaboration with ASM, successfully participated in SEMICON® India 2025 at Yashobhoomi (IICC), New Delhi.

Over the three-day event, HHV showcased its advanced semiconductor fabrication and research solutions, engaging with scientists, technologists,

and industry leaders from across the ecosystem. The company's presence at Booths 482 and 484 highlighted its capabilities in precision deposition, etching, and thin-film engineering technologies supporting next-generation semiconductor manufacturing.



HHV Advanced Technologies Participates in NC-SET 2025 at CSIR-NIIST, Thiruvananthapuram. Thiruvananthapuram, India | September 15–16, 2025

The National Conclave on Sustainable Energy Technologies (NC-SET 2025), hosted by the Council of Scientific and Industrial Research – National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), brought together leading scientists, researchers, and industry professionals to discuss advancements in sustainable energy technologies and clean energy solutions.

HHV Advanced Technologies (HHVAT) actively participated in the conclave with a dedicated exhibition booth, showcasing its advanced vacuum and thin-film technology solutions relevant to energy and materials research. The booth witnessed strong engagement from researchers, industry stakeholders, and academic collaborators.

NC-SET 2025 featured technical sessions and expert talks from distinguished speakers, reinforcing its role as a key platform for fostering industry-academia collaboration in the field of sustainable energy and emerging technologies.



HHV Advanced Technologies at Laser World of Photonics India 2025 Bengaluru, India | September 17–19, 2025

HHV Advanced Technologies Pvt Ltd. participated as a Gold Sponsor at the Laser World of Photonics India 2025, held at the Bangalore International Exhibition Centre (BIEC). The event brought together global leaders, innovators, and researchers from the photonics and optics industries to explore the latest advancements shaping the future of light-based technologies.

At Booth LD 31, HHV showcased its optical coating, high-vacuum, and thin-film deposition solutions, attracting keen interest from industry professionals, researchers, and partners. The

company's participation reaffirmed its pivotal role in supporting innovation across photonics, defence, and precision optics applications.

As the exhibition concluded, HHV expressed its gratitude to all visitors, collaborators, and stakeholders for their engagement and support. With a continued focus on excellence and innovation, HHV remains committed to driving India's leadership in photonics and advanced manufacturing technologies.



EPIC Delegation Visit to HHV Advanced Technologies Bengaluru, India | September 18, 2025

HHV Advanced Technologies Pvt. Ltd. had the pleasure of welcoming the EPIC – European Photonics Industry Consortium delegation to its Bengaluru facility. The visit marked a significant step toward fostering global collaboration and innovation in the field of optics and photonics.

The meeting served as a platform for meaningful discussions on shared goals, technological

synergies, and sustainable solutions for the future of photonics. Both HHVAT and EPIC emphasized the importance of partnership-driven progress, mutual respect, and the exchange of expertise across international borders.



Indo-German Workshop on Advanced Conduction Materials | Bengaluru Bengaluru | October 6–7, 2025

HHV Advanced Technologies Pvt. Ltd. participated in the Indo-German Workshop on Electronic-, Ionic-, and Mixed Conduction: Materials, Processes and Devices, held at JNCASR, Bengaluru, bringing together leading researchers from India and Germany from academia and industry.

As part of the workshop, HHV Advanced Technologies sponsored the networking dinner

at Big Brewsky, creating an informal setting for meaningful interactions among delegates. The evening encouraged open dialogue, idea exchange, and strengthened Indo-German research connections, reflecting HHV's continued support for collaboration, knowledge sharing, and innovation in advanced materials and energy technologies

Strengthening India–Czech Defence Industry Partnerships Prague, Czech Republic | October 7–9, 2025

HHV Advanced Technologies Pvt. Ltd. proudly represented India's growing defence innovation ecosystem during the India–Czech Defence Industry Delegation, organized by the Ministry of Defence, Government of India, and the Embassy of India in Prague, in collaboration with the Society of Indian Defence Manufacturers (SIDM).

The visit aimed to deepen bilateral cooperation and explore new opportunities for collaboration between India and the Czech Republic in the field of defence manufacturing and technology. Mr. Suman R, AGM, Marketing, participated in the delegation on behalf of HHV Advanced Technologies, contributing to discussions and networking sessions focused on advancing joint capabilities.

The programme included the India–Czech Defence Industry Seminar, which brought together defence officials, industry leaders, and technology innovators from both nations. Key themes included drone and counter-drone systems, AI and cyber defence applications, ammunition manufacturing, and vehicle technologies.

HHV – Hind High Vacuum Company Pvt. Ltd. is honoured to be part of this strategic initiative that strengthens international partnerships, promotes technology exchange, and supports India's vision for a self-reliant and globally connected defence industry.



HHV Showcases Advanced Optical Solutions at SPIE Optifab 2025 Rochester, New York | October 21–23, 2025

HHV Advanced Technologies Pvt. Ltd. participated in SPIE Optifab 2025, North America’s leading optical manufacturing conference and exhibition, organized by SPIE – The International Society for Optics and Photonics.

At Booth 1112, HHV presented its advanced equipment and solutions for optical fabrication and coating processes, highlighting innovations designed to enhance precision, reliability, and efficiency in modern optical manufacturing.

The event brought together researchers, manufacturers, and industry leaders from across the globe, fostering valuable interactions and knowledge exchange. HHV’s presence reinforced its position as a trusted partner in the optics and photonics ecosystem, committed to empowering customers with world-class technologies and engineering excellence.



HHV Advanced Technologies at SEA-2025 Bengaluru, New York | October 30–31, 2025

HHV Advanced Technologies Pvt. Ltd. made a strong impression at the National Conference on System Engineering in Automation (SEA-2025), organized by the ISSE – Bangalore Chapter in association with the Indian Space Research Organisation (ISRO).

The event brought together leading scientists, engineers, and industry experts to discuss the latest developments in systems engineering and automation. A highlight of the conference was the visit of Dr. Narayanan, Chairman of ISRO, and Dr. Sankaran, Director of URSC – U R Rao Satellite Centre, to the HHV Advanced Technologies stall. They interacted with the HHVAT team, acknowledging the company’s significant contributions to space research and scientific instrumentation.

Throughout the day, HHVAT engaged with representatives from research institutions and industries exploring vacuum technologies, thin-film deposition systems, and automation solutions. The interactions reflected HHVAT’s ongoing commitment to advancing India’s technological capabilities in both industrial and scientific domains.



HHV Thermal Tech Showcases Innovation at India Manufacturing Show 2025 Bengaluru, November 6–8, 2025

HHV Thermal Tech marked a dynamic presence at the India Manufacturing Show 2025, held at the Bangalore International Exhibition Centre (BIEC). The event brought together leading innovators and industry pioneers shaping the future of Indian manufacturing.

Visitors to Booth B28 explored HHV Thermal Tech’s advanced vacuum thermal systems, engineered to perform in extreme environments while ensuring exceptional reliability and precision. The showcase reflected HHV’s ongoing commitment to enabling high-performance technologies that drive industrial progress.

The three-day exhibition witnessed enthusiastic participation from professionals, partners, and technology enthusiasts. HHV Thermal Tech reaffirmed its mission to build the future of Indian manufacturing through innovation, quality, and collaboration.



HHV Advanced Technologies at EOP 2025 Dehradun, India | November 18-20, 2025

HHV Advanced Technologies (HHVAT) participated in EOP 2025, showcasing its latest advancements in electro-optic systems, advanced sensing, photonics technologies, and intelligent optical solutions. At Booth 4, visitors and delegates engaged with the HHVAT team to explore technologies tailored for defence, aerospace, security, and high-precision industrial applications.

EOP 2025 brought together leading researchers, technologists, and industry experts to discuss emerging trends in electro-optics and photonics. The forum served as an excellent platform for HHVAT to demonstrate its capabilities, share technical insights, and strengthen collaborations in this rapidly evolving field.

The event concluded on a promising note, with strong interest in HHVAT’s solutions and several fruitful discussions that underscore the company’s expanding role in shaping next-generation electro-optic technologies.



HHV Thermal Tech Shines at VINAMAC Expo 2025 Ho Chi Minh City, Vietnam | November 27–29, 2025

HHV Thermal Tech (HHV TT), a global leader in vacuum science and thermal engineering, successfully showcased its advanced thermal-vacuum technologies at VINAMAC Expo 2025, held at the Saigon Exhibition and Convention Centre (SECC).

Throughout the event, HHV TT welcomed visitors to Booth B250, engaging with industry professionals, researchers, and partners from across Vietnam and the ASEAN region. The exhibition provided a valuable platform to highlight HHV TT's strengths in precision thermal-vacuum engineering and reaffirm its commitment to supporting evolving manufacturing and materials-research ecosystems worldwide.

Visitors connected closely with the HHV TT engineering team, exploring the company's decades of expertise in designing high-vacuum thermal systems, comprehensive end-to-end solutions for advanced manufacturing, and collaborative opportunities aimed at enhancing industrial capabilities across sectors. The interactions offered firsthand insights into the robust engineering, reliability, and performance that define HHV TT's systems — technologies built to deliver consistent results even in the most demanding operational environments.



Leadership in Action: HHV Advanced Technologies at the SIDM Indian Defence Industry Delegation Brussels, Belgium | December 2-3, 2025

HHV Advanced Technologies, part of HHV – Hind High Vacuum Company Pvt. Ltd., participated in the Society of Indian Defence Manufacturers (SIDM)-led Indian Defence Industry delegation to Brussels. The delegation was organized in collaboration with the Ministry of External Affairs and the Embassy of India to Belgium, Luxembourg, and the European Union, engaging with key European defence stakeholders to strengthen India-EU industrial cooperation, enhance supply-chain resilience, and explore opportunities in defence manufacturing and advanced technologies.

Ms. Smriti Sakhamuri, ED, HHVAT represented HHV Advanced Technologies during the delegation, highlighting the organization's leadership-level commitment to global engagement and the growing role of women leaders in shaping India's defence and advanced manufacturing ecosystem.

Through such leadership-driven international engagements, HHV Advanced Technologies remains committed to co-development, co-production, and sustainable global collaboration, contributing meaningfully to the evolving global defence value chain.



Sharing Industry Insights: HHVAT at Vacuum Technology & Process Applications Course Bengaluru | December 8-13, 2025

HHV Advanced Technologies Pvt. Ltd. participated in the Short-Term Course on “Vacuum Technology & Process Applications” organized by IIT Tirupati and GITAM (Deemed to be University), Bengaluru Campus.

A key highlight was the technical presentation by Dr. M. G. Sreenivasan, Chief Technology Officer, HHV Advanced Technologies Pvt. Ltd., who shared practical insights on applying vacuum technology

concepts to real-world industrial and research applications. Drawing from HHV’s extensive experience, his talk effectively connected academic fundamentals with industry practices.

The session witnessed active interaction with participants from academia and industry, reinforcing HHV’s continued engagement in knowledge sharing and industry-academia collaboration.



HHVAT at ICANN 2025 – Supporting Innovation in Nanotechnology Guwahati, India | December 12–14, 2025

HHVAT proudly participated in and sponsored the International Conference on Advanced Nanomaterials and Nanotechnology (ICANN 2025), held at the Indian Institute of Technology Guwahati.

The conference brought together researchers, scientists, and industry experts from across the globe to discuss advancements in nanomaterials and emerging technologies. HHVAT’s participation reflected its commitment to fostering innovation, strengthening industry-academia collaboration, and supporting platforms that advance scientific excellence.

Through this engagement, HHVAT reaffirmed its dedication to contributing to the evolving landscape of nanotechnology research and applications.



HHV Advanced Technologies Participates in ICNAN-2025 at VIT Vellore

Vellore, India | December 16–19, 2025

The 3rd International Conference on Nanoscience and Nanotechnology (ICNAN-2025), hosted at VIT Vellore, brought together over 800 material scientists from India and across the globe to discuss advances in nanoscale science and technology.

The conference was inaugurated by Nobel Laureate Dr. Mounji G. Bawendi, Professor at MIT, USA. HHV Advanced Technologies (HHVAT) actively participated in the event with a dedicated exhibition booth, engaging with academia and industry stakeholders.

As part of the technical program, Mr. Jagadeeshwar Reddy, Senior Manager, HHV Advanced Technologies, delivered a lecture, sharing industry insights and practical perspectives on nanotechnology.

ICNAN-2025 featured special lectures by distinguished scientists and academicians from leading institutions in the US, Europe, Asia, and premier Indian universities, reinforcing its role as a key platform for academic–industry collaboration.



HHV Showcases Advanced Optical Technologies at IIOO Expo 2026

Navi Mumbai, India | January 10–12, 2026

HHV Advanced Technologies Pvt. Ltd. participated in **IIOO Expo 2026**, a premier exhibition for imaging, optics, optoelectronics, and allied technologies in India.

At **Booth F246**, HHV showcased its advanced optical fabrication, coating, and precision engineering solutions, highlighting capabilities designed to support high-performance imaging and optical systems across space, defence, industrial, and scientific applications.

The exhibition brought together industry professionals, technology providers, and system integrators from across the optics and photonics ecosystem. HHV's participation reinforced its commitment to delivering indigenous, world-class optical technologies and strengthening collaboration within India's rapidly evolving optics and imaging industry.



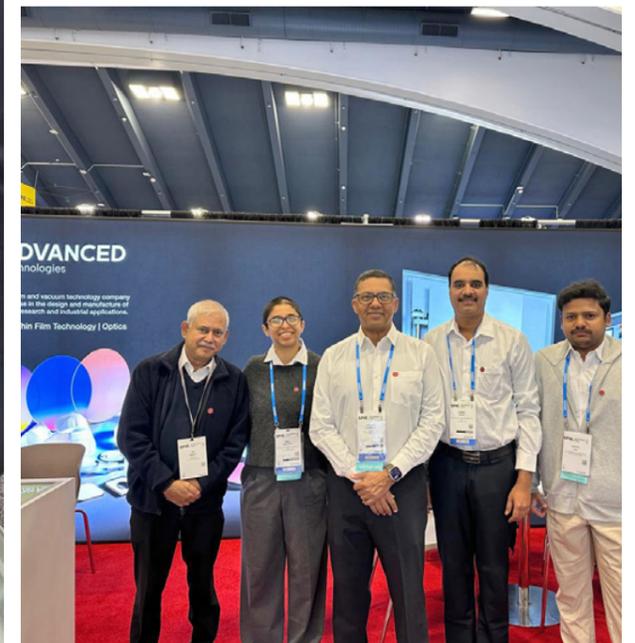
HHVAT Shines on the Global Stage at SPIE Photonics West 2026

San Francisco, USA | January 20–22, 2026

HHV Advanced Technologies Pvt. Ltd. (HHVAT) successfully participated in **SPIE Photonics West 2026**, one of North America's most influential conferences for lasers, optics, and photonics, exhibiting at **Booth No. 2137**.

a strong platform for showcasing emerging photonics technologies. HHVAT presented its latest products and solutions in precision photonics and laser technologies, engaging with international stakeholders and reinforcing its growing presence in the global photonics landscape.

The event brought together global industry leaders, researchers, and innovators, providing





Hind High Vacuum Company Pvt. Ltd.

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 Hind High Vacuum Company

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