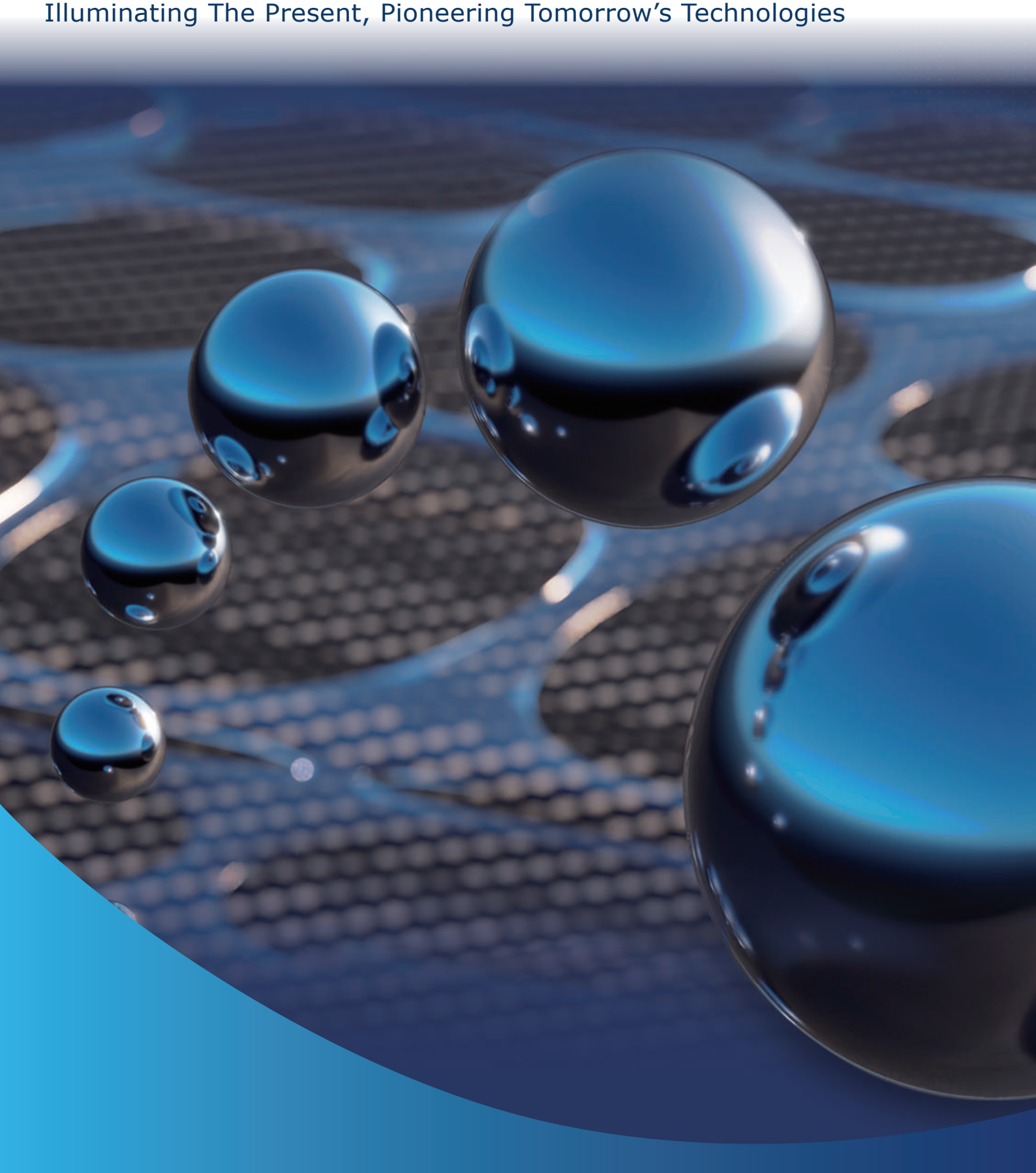
NTI® NanoFilm
ADVANCING TECHNOLOGY SOLUTIONS

Leading Provider of Nanotechnology Solutions

Illuminating The Present, Pioneering Tomorrow's Technologies



About Us

Nanofilm Technologies International Limited is a leading provider of nanotechnology solutions, leveraging its proprietary technologies, core competencies in R&D, engineering and production, to provide technology-based solutions across a wide range of industries.

Nanofilm's solutions serve as key catalysts enabling customers to achieve high value-add advancements in their end products, in an environmentally sustainable manner.

25
YEARS OF EXPERIENCE

>8%
R&D SPENT

< 100
PATENTS

300+
R&D STAFF

Our Mission

The Key Catalyst To Enable Advancement Of Our Customers' Products In A Sustainable Manner.

Our Vision

Integrating Nanotechnology In Advanced Materials And Nanoproducts Into Our Daily Lives.

Global Footprint

We Innovate, Transform, Grow

Our commitment to personal and professional development ensures that every employee not only contributes to our mission but also grows with us.

At Nanofilm, we foster an inclusive culture where continuous learning and mutual support are paramount, empowering our team to excel and innovate in all aspects of their careers.

Why Nanofilm?

Diversified & Vibrant Culture

Strong Innovative DNA

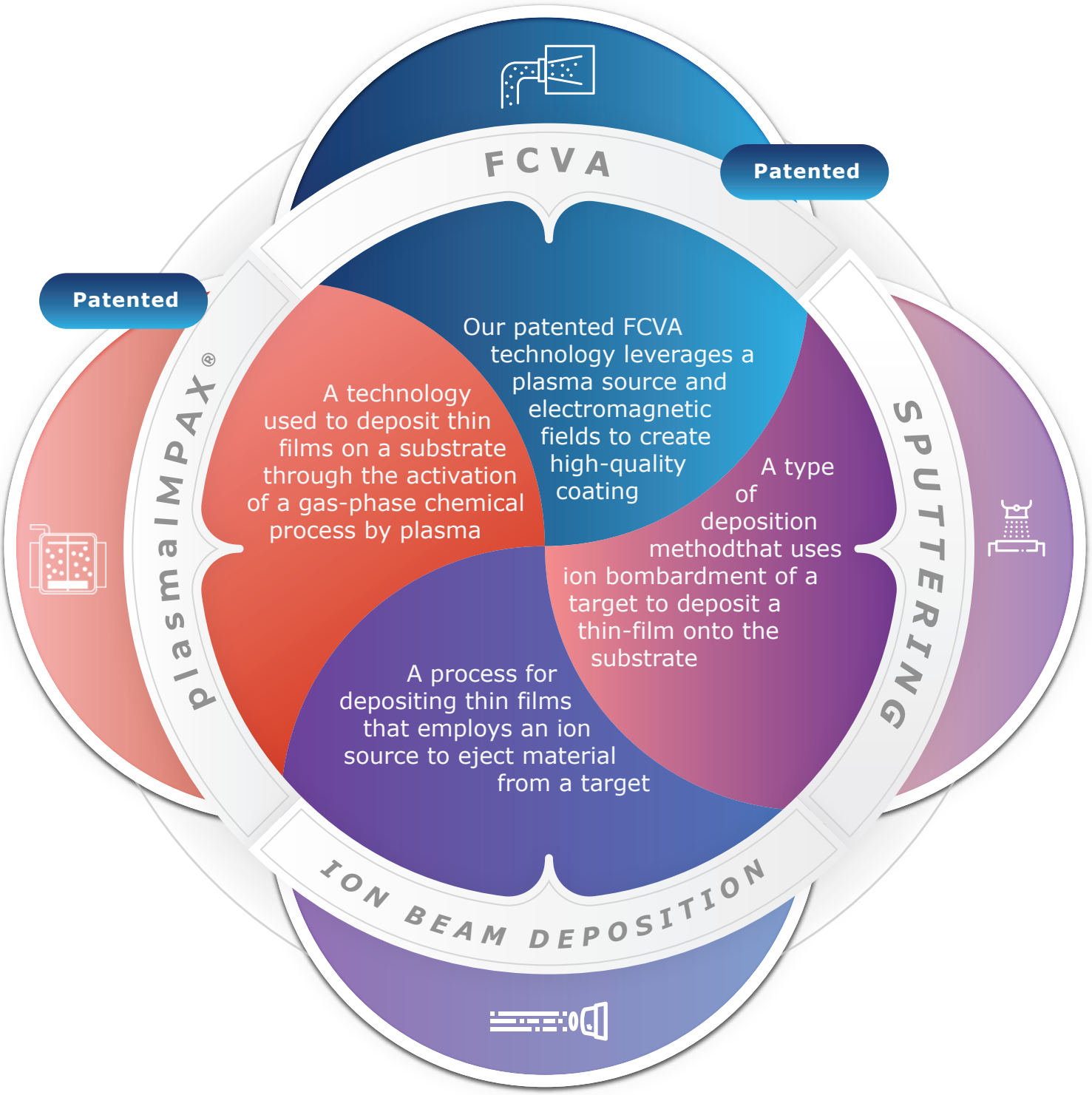
Competitive Compensation

Coating Technologies

Nanofilm is a leader in Physical Vapour Deposition (PVD) coating. Our coating technology portfolio includes our patented Filtered Cathodic Vacuum Arc (FCVA), plasmaIMPAX®, Sputtering and Ion Beam Deposition.

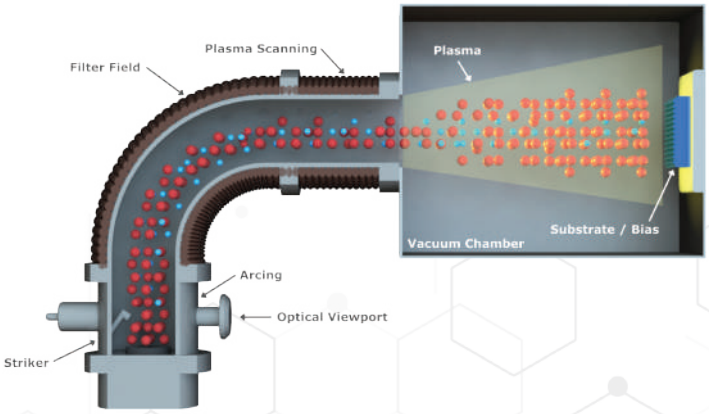
Our wide range of coating technologies allow us to offer bespoke solutions to our clients, catered to their needs in substrate materials, performance requirements, cost benefits and other factors in consideration.

Coupled with our top-notch service, our strong deep tech foundation puts us as the world leader and preferred supplier in vacuum coatings.



Our Core Technology - Filtered Cathodic Vacuum Arc (FCVA)

Patented



*Filtered Cathodic Vacuum Arc

The FCVA* technology delivers coatings with unmatched purity and density, leading to superior electrical performance with minimal signal loss. In additional, the exceptional adhesion ensures enduring reliability and the low coating temperature allows a wide range of substrates such as glass, ceramic, rubber, plastic to be coated.

Benefits

- High Hardness and Strength
- High Durability
- Low Friction Coefficient
- Electrochemistry Properties
- High Corrosion Resistance
- High Melting Point Products
- Low Melting Point Products
- Sp3 Diamond Content

Comparison Between Coating Technologies

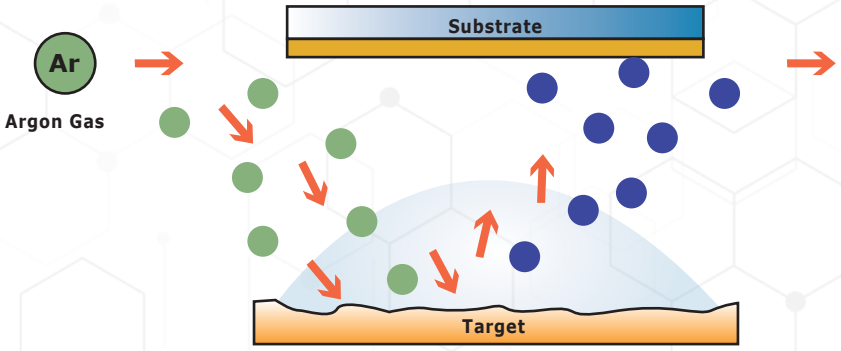
Configuration	PVD (Sputtering)	CVD (PECVD)	FCVA
Coating Species	Atoms	Radicals	Ions
Peak Energy	≈ 0.1 eV	≈ 1 eV	20 to 5,000 eV
Coating Pressure	7 E^{-1} PA	1 Pa	1 E^{-3} PA
Adhesion	Fair	Fair	Excellent
Film Density (DLC Film)	≈ 2.2 g/cm^3	≈ 2.0 g/cm^3	≈ 3.4 g/cm^3
Coating Uniformity	Not Adjustable	Not Adjustable	Adjustable
Target Material	Solids	Gases	Solids
Deposition Temperature	High	High	Room Temperature

Sputtering

Sputtering is a process that uses plasma of ionised gas (typically Argon) in a vacuum chamber, to deposit material (target) onto a substrate.

When the ions in the plasma are accelerated by the electric field, the collision with the target material creates an impact that generates energy to eject (sputter) atoms or molecules from the target material.

These ejected atoms or molecules will then travel through the vacuum and land on the substrate, forming a thin film.



Benefits

- Uniform Deposition
- Consistent & Durable Coating

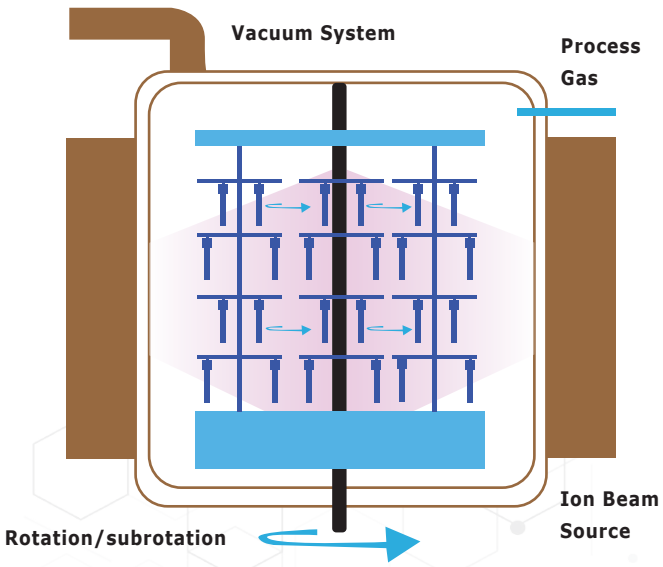
Coatings

- Decorative Coating for 3C Components
- EMI Coating
- Metallic Seed Layer Deposition

Ion Beam Deposition

A specially-designed ion beam source using a plasma deposits a thin film of Diamond-Like Carbon (DLC) coating onto a substrate.

Using hydrocarbon gas as the raw material, the ion beam dissociates the gas molecules, creating a stream of ions directed at the substrate. This process forms a uniform, dense DLC layer with excellent hardness, wear resistance, and low friction, making it ideal for various applications. The precision of the ion beam ensures optimal coating quality and performance.



Benefits

- Tunable Thickness
- High Quality
- High Density

Coatings

- Optical coating
- a-C:H DLC coating
- Other types of reactive PVD process

plasmaIMPAX® for Diamond-Like Carbon (DLC) Coatings

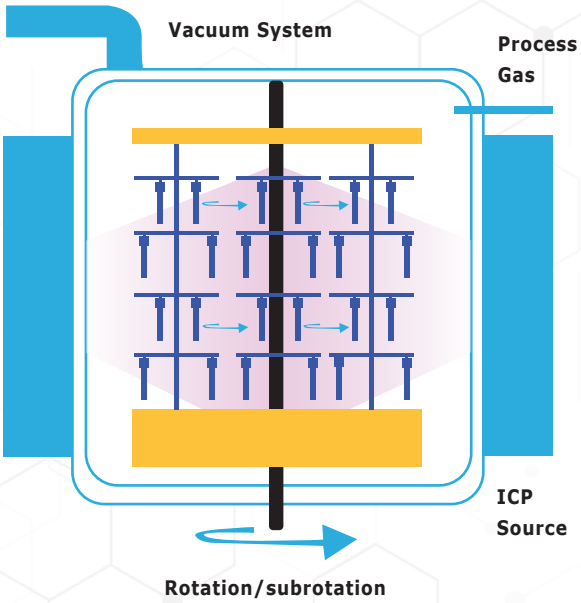
Patented

The innovative and patented plasmaIMPAX® technology uses high-energy particles and high-voltage pulse technology for the 3-dimensional modification and coating of Diamond-Like Carbon (DLC) thin films on surfaces of components and tools.

DLC coatings are know to possess excellent mechanical and chemical properties. PlasmaIMPAX® produces our signature DLC coatings (trademarked 'axyprotect' and 'axynit') with high hardness, low friction and chemical resistance, making it an ideal and preferred solution for automotive, tribology and medical applications.

The plasmaIMPAX® coating technology is based on the Plasma Assisted Chemical Vapour Deposition (PACVD) technology where several linear radio frequency ICP sources are used to generate the plasma. By applying an electrical voltage to the components, the plasma can be used to clean the surfaces as a step prior to coating. The actual coating then takes place after adding hydrocarbons over a process time of several hours. By controlling various parameters such as gas composition and energy input, individual single adhesion and functional layers or multi-layer systems can be created.

The plasmaIMPAX® technology can also be used to carry out a plasma immersion ion implantation before coating - this prepares the substrate surface with a hard DLC layer.



Benefits

- High Hardness
- Low Friction
- High Wear Resistance
- High Bio-Compatibility
- Excellent Aesthetics

Coatings

- Mechanical Engineering
- High-Performance Racing
- Tools and Die
- Aesthetics

OUR CAPABILITIES

Being a deep tech company, R&D is our core and the backbone of our success. We foster creativity and exploration, allowing our team of skilled researchers to develop new coating technologies and improve existing ones. With cutting-edge tools and a collaborative environment, we pursue advancements that set industry standards. We ensure that our solutions stay at the forefront of technological progress and market relevance.

Harnessing our own manufacturing and coating capabilities, we ensure seamless transitions from design to production. This proximity to R&D and coating production allows for rapid prototyping, agile responses to any design changes, and a higher control over quality.

Operated by a team of highly skilled engineers, upholds precision and excellence, thereby reducing time-to-market for all our product lines.

Every product is put through a rigorous set of procedures designed to ensure reliability, safety, and performance. Our testing processes are comprehensive and simulate real-world conditions to validate the durability and functionality of our products.

We adhere strictly to industry standards and regulatory requirements, and our meticulous approach to testing underscores our commitment to delivering products that our customers can trust unconditionally.

Coating equipment components manufactured in-house and sourced from trusted partners are carefully put together by our skilled assembly team. Each member of the team is an expert in precision and craftsmanship, ensuring that every product meets our high-quality benchmarks.

Our systematic assembly process is optimised for efficiency and accuracy, ensuring that each unit is built to specification and ready for integration.

Our integration specialists ensure that all components work seamlessly together, delivering optimal performance and reliability. This stage also involves firmware and software configuration, final performance testing, and quality assurance checks.

Our holistic approach guarantees that the final product not only meets the design criteria but also exceeds the expectations of our customers in terms of functionality and user experience.

Coating Portfolio

Coating Solutions	TiN	MiCC®	CRN	ATN	ACN	ATS
Coating Compositions	TiN	CrN_x	CrN	AlTiN	AlCrN	AlTiSiN
Coating Thickness (µm)	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4	1 - 4
Micro-hardness (Hv)	2,300	1,800	2,000	3,300	3,200	3,000
Coefficient. of Friction vs Metal (Dry)	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Coating Temperature (°C)	< 500	< 150	< 500 / < 150	< 500	< 500	< 500
Maximum Service Temperature (°C)	600	700	700	900	1,100	1,000
Colour	Gold - Yellow	Silver	Silver - Grey	Violet - Grey	Blue - Grey	Bronze
Applications	Cutting tools, Plastic Moulds, Punch and Dies	IC Packaging, Plastic Moulds, Polymer Lens Mould	Plastic Moulds, Rubber Moulds, IC Packaging	Cutting Tools, AI Diecast Mould, High Temperature Applications	Cutting Tools, AI Diecast Mould, Punch and Dies	High Performance Cutting Tools

ACS	TAC-ON®	Rainbow-TAC	i-TAC®	F-TAC	STAR-TAC®	ASD	EMI
AlCrSiN	taC	taC	taC	F doped taC	CrWc + taC	taC + DLC	Metallic
1 - 4	1 - 4	1 - 2	5 - 20	1 - 4	1 - 4	4 - 6	1 - 4
3,000	3,000	5,000	2,500	1,500	2,000	2,500	~ 600
< 0.13, < 0.03 (with oil)	< 0.13, < 0.03 (with oil)	< 0.13, < 0.03 (with oil)	< 0.13, < 0.03 (with oil)	< 0.08, < 0.08 (with oil)	< 0.13, < 0.03 (with oil)	< 0.13, < 0.03 (with oil)	< 0.4
< 150	< 150	< 150	< 150	< 150	< 150	< 150	< 150
500	500	500	400	300	400	400	400
Deep - Grey	Deep - Grey	Rainbow	Deep - Grey	Dark	Deep - Grey	Brown	Silver
Cutting Tools, Trim and From Components	Cutting Tools, Trim and Form Components	Cutting Tools, Non-Femous Graphite / CFRP	Components, Piston Rings, Wearable Device Components	Lead Frame Carriers, Nose Cone, Blood-contacting Devices	Thread Cores, Ejectors / Sleeves, Pungers	3C, Semiconductor IC Packaging and Testing	3C, Semiconductor

Business Units

Advanced Materials

Provides advanced materials through surface solution services based on our proprietary vacuum coating technologies and processes.

Our surface solutions involve the use of our Filtered Cathodic Vacuum Arc ("FCVA") and FCVA-hybrid with physical vapour deposition ("PVD") coating equipment to deposit materials on key components and parts of the global supply chain, thereby enabling our customers to achieve their desired functional and/or decorative requirements for their end-products.

Industrial Equipment

Manufactures and supplies turnkey equipment systems, ranging from coating equipment to auxiliary equipment (such as cleaning lines) to automation systems, which are installed at customers' production lines.

We provide customers with not just the physical equipment, but also customised operating software for our systems and training, as well as spare-parts, customer service and other forms of after-sales support.

Nanofabrication

Manufactures and supplies of nanoproducts which, due to their nanoscale and/or nanofeatures, are used by customers as components for the smooth functioning and performance of their end-products.

We utilise our nanofabrication technology and software to fabricate nanoproducts designed to meet the dimensional specifications of customers as well as provide the required functional properties of their end-products.

Sydrogen Energy

Offers complete fuel cell solutions to realise the emerging hydrogen energy market. Sydrogen provides coating services and equipment to fuel cell stack manufacturers, and fuel cell products and integration services for market applications.

Our technology is built on a foundation of proprietary conductive diamond-like coatings with enhanced material properties such as corrosion resistance, high conductivity and ion- leaching prevention.

Contact Us Now!

Singapore

11 Tai Seng Drive,
Singapore 535226

Japan

2-15-19-705 Kami-Osaki Sinagawa,
Tokyo 141-0021 Japan

+65 6281 1888

enquiry@nti-nanofilm.com

China

No.399 Songhui Road,
Qingpu District, Shanghai, China
Contact:+49 821749052913

Germany

Am Mittleren Moos 36/1/2,
86167 Augsburg, Germany
Contact:+49 821749052913

Vietnam

Lot CN10, Tan Truong Industrial Zone, Tan Truong Commune,
Cam Giang District,
Haiduong Province, Vietnam

Scan QR Code for website
www.nti-nanofilm.com

NTIC/EN/052024