



# INNOVATIVE COATING SOLUTIONS FOR INDUSTRY



# Welcome to Advamat Ltd.

"We help manufacturing companies increase efficiency with innovative PVD coatings."

At AdvaMat Ltd. we specialise in the development and application of PVD (Physical Vapor Deposition) coatings. Our mission is to provide unique solutions, based on the latest scientific knowledge, that not only deliver significant savings to manufacturing companies, but also optimise their production processes. We provide coatings that set new standards in durability, performance, wear and corrosion resistance, all with minimal environmental impact.



# Reasons to trust AdvaMat:

- In-depth knowledge of tribological DLC and MoS2 applications
- Specialist in high performance PVD coatings using HiPIMS technology
- Focus on the most demanding PVD applications
- Optimisation for better performance
- Customised solutions



## Procedure:

- Testing of the prototype coating
- preparation of the tender
- Implementation



## Reduction:

Significant reduction in technology purchase price due to precise device definition

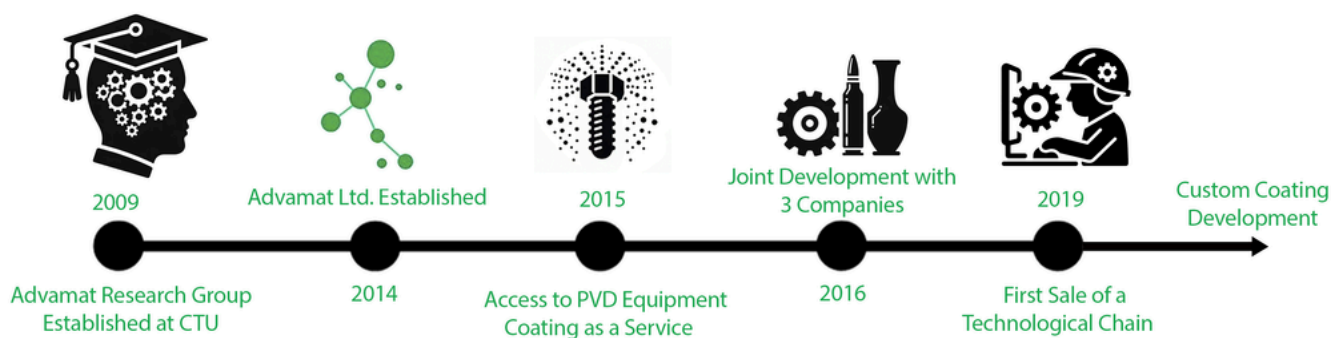


## Savings:

Estimated savings for customer = at least 20% of tool cost

## Our story

AdvaMat Ltd. is a company born on Czech academic soil. In 2009, a research group was established at the CTU under the leadership of Professor Tomáš Polcar, which five years later transformed into the company AdvaMat s.r.o. Today, AdvaMat is at the forefront of offering innovative PVD and DLC technologies for companies addressing challenges in friction, tool life and functional surface properties.



# Alternative to Chrome Plating

## The Safe, Stylish Alternative to Chrome Plating

Advamat Ltd. provides a groundbreaking PVD coating solution as an eco-friendly alternative to traditional chrome plating, aligning with the strict European **REACH legislation**. Our technology ensures compliance without sacrificing quality or aesthetics, delivering a brilliant chrome-like finish. Ideal for diverse applications, it eliminates the environmental and health risks of hexavalent chromium, paving the way for safer, sustainable manufacturing practices.



### Key Benefits



**Corrosion Resistance:** Offers excellent resistance against corrosion, critical for maintaining the quality and longevity of tools in harsh working conditions.



**Enhanced Durability:** Provides excellent resistance to corrosion, wear, and tarnishing, extending the life of treated surfaces.



**Eco-Friendly:** Meets global environmental standards by eliminating the use of harmful chemicals typical in traditional chrome plating processes.



**Superior Aesthetics:** Delivers a high-gloss finish that mimics the bright, reflective appearance of chrome plating.



**Cost-Effective:** Reduces long-term costs associated with environmental compliance and waste management in traditional chrome plating.

### Corrosion testing of our coatings



**Our technology**



# HiPIMS CrN high performance coatings and tungsten for forming tools

**Save 5 - 500 %: discover HiPIMS coatings from AdvaMat!**

Our innovative nanotechnology increases the life of forming tools and reduces the cost of necessary service by 5 to 500 percent, maximizing your production efficiency.

## Key benefits

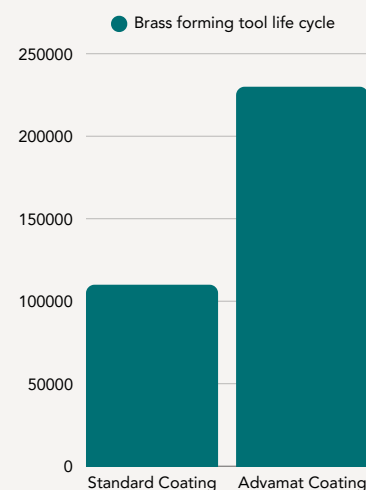
**Anti-adhesive properties:** Coatings prevent materials from sticking to the surface of the tools.

**Cost efficiency:** PVD coatings reduce maintenance and tool replacement costs by 5 to 500%, increasing overall efficiency.

**Extended lifespan:** Coatings prolong the service life of forming tools thanks to their hard, durable surface.

**Reduced friction:** Coatings enhance tool performance by reducing friction and wear, resulting in smoother operation.

**Tailored solutions:** Various coating thicknesses and surface finishes are available to meet specific operational requirements and applications.



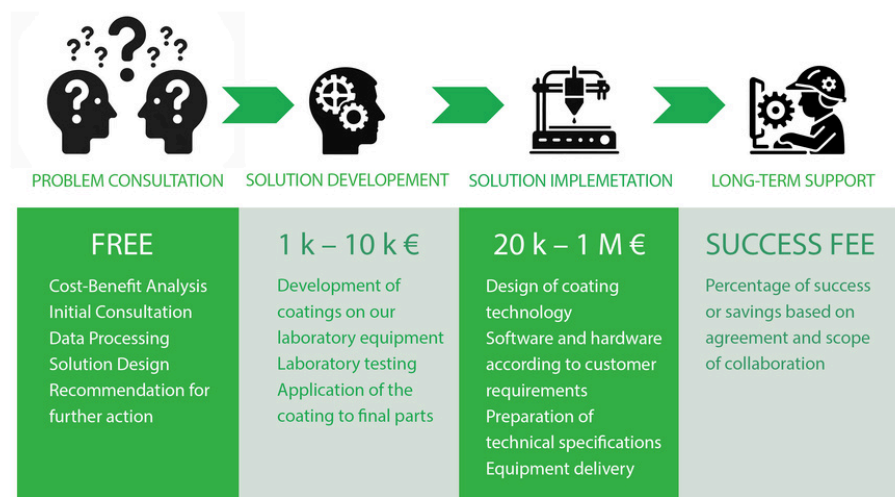
## Price of coating

Coating prices range from €2 to €2,000, depending on the size and complexity of the tool.

Small drill bit – around €2 per piece



Large screw – €2,000



Property	HiPIMS CrN
Hardness	2000 HV
Coating thickness	1-5 µm
Adhesion of brass	Very low
Friction coefficient	0,5
Coating adhesion	High

# Decorative PVD Coatings

## Crafting Beauty with Advanced Technology

Discover Advamat Ltd.'s High-Performance Decorative PVD Coatings — where technology meets style. Our advanced technology ensures precision application, superior color consistency, and a flawless finish, making every surface not just durable, but stunningly beautiful. Elevate your aesthetics with our state-of-the-art coatings.

### Key Benefits



**Superior Aesthetics:** Achieve brilliant, vibrant colors and effects that are not possible with traditional coatings.



**Exceptional Durability:** Our coatings provide excellent wear and corrosion resistance, maintaining their appearance over time even under harsh conditions.



**Environmentally Friendly:** Unlike conventional plating methods, our PVD process is environmentally friendly, releasing no harmful byproducts.



**Versatility:** Suitable for a wide range of applications, including consumer electronics, automotive parts, and architectural elements.



**Customization:** We offer a variety of colors and finishes, tailored to meet the specific design needs of our clients.



Property	Specification
Technology	High Power Impulse Magnetron Sputtering (HiPIMS), Arc, Magnetron
Substrate Materials	Metals, Plastics, Glass, Ceramics
Color Range	Gold, Rose Gold, Silver, Copper, Black, Custom Colors Available
Thickness	0.1 – 5 µm
Operating Temperature	Up to 400°C
Corrosion Resistance	High



# Surface Treatment of Glass Molds

Crystal Queen – Elevating Glass Manufacturing to Perfection

Enhance your glass production with AdvaMat's Crystal Queen advanced PVD coating. Our innovative surface treatment ensures flawless, high-quality glass by preventing adhesion and surface damage. With superior hardness and high-temperature resistance, Crystal Queen extends mold life and boosts production efficiency. Say goodbye to frequent lubrication and maintenance, and achieve consistently beautiful glass products with AdvaMat's cutting-edge technology.

## Key Benefits



Eliminates the need to lubricate glass moulds during the production process.



Extends mould life by up to 100%, reducing maintenance costs.



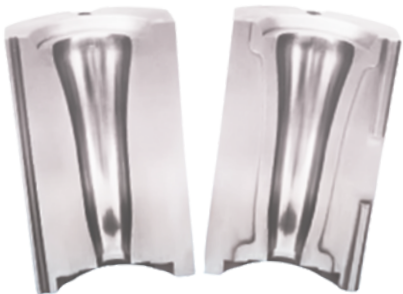
Reduces energy consumption in production by up to 30%.



It is applied using PVD technology and does not change the dimensions or surface roughness.



Material	m-CrAlTiN
Hardness	2 400 HV
Thickness	3 µm
Maximum verified time without lubrication	160 hours
Maximum operating temperature	1 100 °C



Substitution of HVOF coating for PVD  
Shorter cooling cycle  
30% cooling energy savings



# Coatings for Tokamaks and Nuclear Fusion Devices

## AdvaMat's Advanced Coating Technology

AdvaMat has developed cutting-edge coating technology specifically for use in nuclear fusion and advanced scientific experiments. Our services include the application of tungsten, molybdenum, chromium, and zirconium layers designed for Tokamaks. Utilizing the latest methods, we can apply coatings **up to 20 microns** thick, ideal for devices requiring maximum resistance to extreme temperatures and corrosive environments typical of nuclear fusion experiments. This technology not only enhances the efficiency and lifespan of components but also significantly contributes to the overall safety of the system.

### Key Benefits



**Extreme Temperature Resistance:** Coatings can withstand the harsh conditions of nuclear fusion experiments.



**Corrosion Protection:** Advanced materials provide superior resistance to corrosive environments.



**Enhanced Component Longevity:** Increased durability extends the lifespan of critical components.



**Improved Safety:** Robust coatings contribute to the safety and reliability of fusion devices.



**Customization:** Tailored solutions to meet specific project requirements and specifications.

### Services Offered

- Individual Consultations: Expert advice tailored to your project needs
- Customized Coating Solutions: Adaptation of technology to specific requirements

### Materials

- Tungsten (W)
- Molybdenum (Mo)
- Chromium (Cr)
- Zirconium (Zr)



# Discover the Future of Coatings with Advamat Ltd.

Ready to enhance your products and reduce environmental impact? Connect with us at Advamat Ltd. and explore our advanced PVD coating solutions. Our team is eager to assist you in implementing our technology, optimizing your processes, and achieving significant cost savings. Join us in setting new standards for sustainable excellence. Contact us today — we're here to help you succeed!



# Contact us!

Contact our sales team today to discuss how our HiPIMS PVD Coatings can elevate the aesthetics of your products while ensuring longevity and performance.

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# COMPARISON OF PVD TECHNOLOGIES



PVD Technology	ARC EVAPORATION	MAGNETRON SPUTTERING	HiPIMS High Power Impulse Magnetron Sputtering
<b>Advantages</b> ✓	<ul style="list-style-type: none"><li>• Greater Coating Hardness</li><li>• High Adhesion and Density</li></ul>	<ul style="list-style-type: none"><li>• Low Internal Stress</li><li>• Smooth Surface</li><li>• Precise Control of Coating Thickness and Composition</li></ul>	<ul style="list-style-type: none"><li>• High Hardness, Wear and Corrosion Resistance</li><li>• Low Internal Stress</li><li>• Smooth Surface without Droplets</li></ul>
<b>Disadvantages</b> ✗	<ul style="list-style-type: none"><li>• Produces Droplets (Macro Particles)</li><li>• Low Corrosion Protection</li><li>• High Internal Stress</li></ul>	<ul style="list-style-type: none"><li>• Lower Coating Adhesion Compared to Arc or HiPIMS</li></ul>	<ul style="list-style-type: none"><li>• Approx. 20% Lower Deposition Rate</li></ul>
<b>Typical product</b>	<ul style="list-style-type: none"><li>• Cutting Tools (Drills, End Mills)</li><li>• Metal Forming Tools</li></ul>	<ul style="list-style-type: none"><li>• Forming Tools</li><li>• Machine Parts Requiring Low Friction</li><li>• Parts with Specific Optical Properties</li><li>• Decorative Applications</li></ul>	<ul style="list-style-type: none"><li>• Cutting and Forming Tools</li><li>• Aerospace Components</li><li>• Medical Instruments and Implants</li><li>• Decorative Coatings</li></ul>
<b>Reason for Suitability</b>	<ul style="list-style-type: none"><li>• Ideal for applications requiring highly hard and durable coatings, such as AlCrN or AlTiN coatings</li><li>• It can create coatings with high adhesion to the surface, which is crucial for improving the lifespan and performance of cutting tools</li></ul>	<ul style="list-style-type: none"><li>• Enables the creation of very uniform and homogeneous coatings with very low roughness over large surfaces, ideal for manufacturing thin films for electronic displays</li><li>• Creation of extremely dense coatings and diffusion barriers</li></ul>	<ul style="list-style-type: none"><li>• Excellent adhesive properties, low friction coefficient, and high corrosion resistance</li><li>• Creation of dense and hard coatings</li><li>• Excellent mechanical and chemical properties</li></ul>

# How the coating process works

