HAUZER

TOOL COATINGS

INDUSTRIAL PLASMA SOLUTIONS

IHI GROUP

INDUSTRIAL PLASMA SOLUTIONS

"Hauzer has been the pioneer in vacuum plasma coatings since 1983. Creative solutions are part of our DNA. Our engineers have used the experience to develop a broad technology portfolio. We supply various deposition and etching technologies to deposit Physical Vapour Deposition (PVD), Plasma Assisted Chemical Vapour Deposition (PACVD) and nitriding layers. We integrate these in our industrial batch and inline equipment. Tailor-made machine concepts for our customers are created continuously. With IHI-Bernex joining the Hauzer group recently, CVD Technology has been added to our product portfolio. Visit ihi-bernex.com for more information."

"The basics for our success are our people, our experience and joint development with our customers. Hauzer has 200 employees. In the future we will continue to expand our expertise, developing our technologies and material properties in line with our customers' sustainable goals. Combining these technologies with application knowledge, we can build the most efficient, highly productive equipment that markets need. Hauzer is your partner for industrial plasma solutions."

Dave Doerwald
CEO

PARTNERSHIPS, RECIPE FOR SUCCESS

Cooperation is essential for Hauzer. A broad technology portfolio and mass production equipment are most valuable when combined with our customers' application knowledge. Some customers use our ready-made recipes for coatings that surpass the competition. Other customers use our industrial plasma solutions to develop their own unique products. Their success is our triumph.

Global Leader

Partnerships make Hauzer strong. They give us the position of global leader in tribological coatings for the automotive market, they provide the competitive edge in tool coating technology and they ensure that we build sustainable factories for decorative coatings, such as Cromatipic. Due to its large installed base of hundreds of machines, Hauzer offers an extensive customer support package, including upgrades with new technologies and consumables.

Global Presence

From our competence centres and offices in the Netherlands, Spain, China and Japan, we offer our customers the support necessary to be a real partner. Our engineers will provide local assistance in process development, maintenance, training, trouble shooting and delivery of spare parts and consumables.

Research Collaboration

Due to Hauzer's pioneering position and the consecutive decades of technology development and equipment building, we have built a close relationship with many research departments in industrial companies and scientific institutes. Our research, combined with our engineering experience guarantees excellent industrial plasma solutions.

Development for Future

Plasma technology and robust mass production equipment will be needed in many more markets. Hauzer will be your partner to develop the industrial plasma solutions for the future.

MACHINE PORTFOLIO BATCH

Hauzer Flexicoat batch machines are built in mature modules that combine a high degree of flexibility with a reliable production output. Multiple plasma technologies can be combined in one machine. The design makes upgrading of existing equipment with new technologies always possible. Mass customization enables the supply of unique equipment with proven plasma concepts. The flexible design gives you to the opportunity to adapt your machine to future needs of the market. By discussing your market, applications and requirements we create an understanding how to match our system configuration with your future success.

GENERAL ADVANTAGES OF THIS MODULAR APPROACH

- COMPETITIVE COST OF OWNERSHIP
- CUSTOMIZED EQUIPMENT SOLUTIONS
- MULTIPLE PLASMA TECHNOLOGIES IN ONE MACHINE
- QUICK TROUBLE SHOOTING

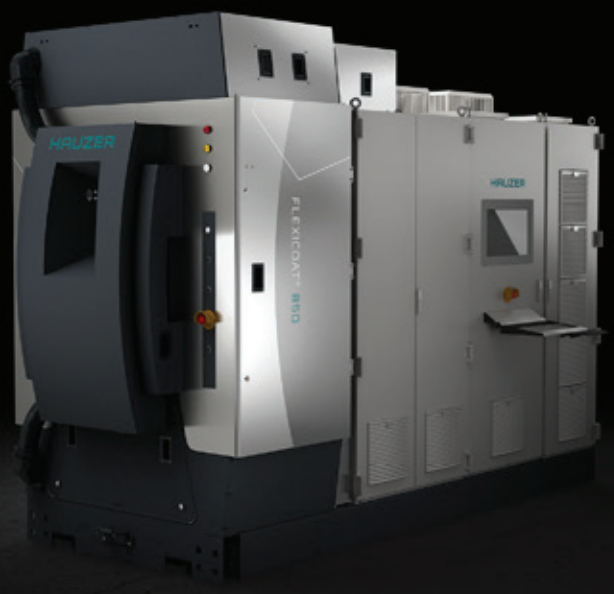
HAUZER FLEXICOAT® 850

Technical Specifications:

Effective coating volume
ø 500 mm x 500 mm height

Number of cathode positions
4

Maximum load mass
400 kg



HAUZER FLEXICOAT® 1000

Technical Specifications:

Effective coating volume
ø 650 mm x 650 mm height

Number of cathode positions
6

Maximum load mass
1000 kg

HAUZER FLEXICOAT® 1250

Technical Specifications:

Effective coating volume
ø 810 mm x 850 mm height

Number of cathode positions
7

Maximum load mass
1000 kg

HAUZER FLEXICOAT® 1500

Technical Specifications:

Effective coating volume
ø 900 mm x 1500 mm height

Number of cathode positions
6

Maximum load mass
3000 kg

MACHINE PORTFOLIO INLINE

Hauzer inline machines coat millions of components every day. They are built for 24/7 mass production of three dimensional components and can easily be integrated in highly automated factories. Modular design enables the equipment to be expanded whenever production growth is needed.

GENERAL ADVANTAGES

LOW COST OF OWNERSHIP

INTEGRATION IN HIGHLY AUTOMATED FACTORY

HIGH UPTIME, HIGH YIELD

TRACEABILITY OF PRODUCTS

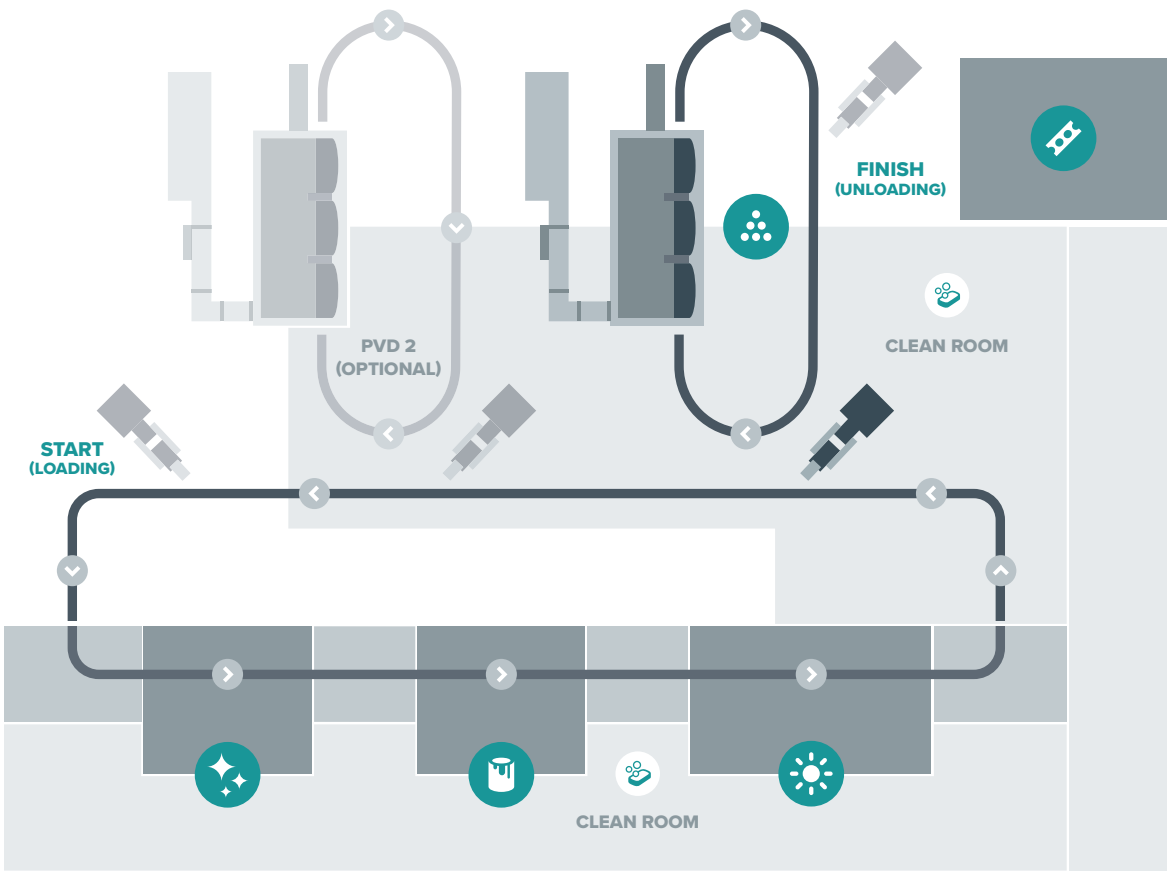
HAUZER Inline Concepts

The inline solutions can be built with or without rotating vertical or horizontal fixturing concepts passing the cathodes. Some of them are supplied with fixtures on a rack with dimensions of 1.5 m height, 1.2 m width, 0.2 m depth. Some of the inline platforms are built for coating bulk products. We challenge you to tell us about your products and coating issues, so we can produce tailor-made, highly productive inline machines for your specific requirements.

Cromatipic® Factory

The alternative for electroplating in the automotive industry is called Cromatipic. Beautiful, high performance Cromatipic coatings can be made safely and environmentally-friendly in a cost-effective way. The state-of-the-art plant and competence centre is located in Barcelona. Hauzer supplies the complete factories for this technology.

More information can be found in the separate Cromatipic brochure.



PLASMA COATING TECHNOLOGIES

Technologies are the foundation of every effective coating, whether it is on a tool, a component or a decorative product. Hauzer offers a broad range of technologies, which can all be combined.

CARC⁺

CARC⁺ is a circular arc evaporation, PVD technology. It produces very smooth coatings, including TiAlN, AlCrN and Si-containing nanocomposite coatings and state-of-the-art hydrogen-free carbon coatings at very high deposition speeds and low cost of ownership.

CARC⁺ Flex

CARC⁺ Flex gives increased flexibility in magnetic field design. This gives more control over ionization and coating properties. It also offers uniform target erosion, thicker coatings for special applications and the possibility to program parameters during the coating process, so you will have adequate parameters for different steps in your coating design.

Advanced Controlled Arc

Advanced controlled arc evaporation technology uses rectangular arc cathodes to produce metal nitride, carbonitride and oxide coatings. It is used for coating temperature sensitive products and when a range of attractive colours is required.

Focussed Ion Rapid Etch (FIR Etch)

FIR Etch is based on Hauzer's plasma source etching technology. The ion beam is enhanced and steered in the chamber, resulting in higher etch rates, perfect adhesion and an increased productivity.

Magnetron Sputtering

Magnetron sputtering technology is used to produce smooth and well-adhering coatings for applications where friction needs to be reduced. It can also be used for materials with poor electrical conductivity of for special colour requirements. It is often used in combination with PACVD technology for diamond like carbon (DLC) coatings.

Plasma Assisted Chemical Vapour Deposition (PACVD)

Different from PVD, PACVD does not use metallic targets. With PACVD, a plasma is used to crack pre-cursor gasses at relatively low temperatures. The technology is mainly used in combination with hydrocarbon gasses to produce highly wear resistant carbon coatings. DLC coatings can be doped with Si or other elements to tune the coating properties.

High Power Impulse Magnetron Sputtering (HiPIMS)

HiPIMS is a specific kind of sputtering that combines the advantages of high ionization like arc evaporation with the smoothness of magnetron sputtering. This technology opens up extra possibilities to fine-tune the coating properties, such as internal stress and coating structure, of layers that cannot be produced with other existing technologies.

Dual Magnetron Sputtering (DMS) and T-mode

DMS technology is used for the deposition of materials that show very low electrical conductivity. Together with Hauzer's T-mode technology for fast control of reactive gas flow, this enables the deposition of metal oxide coatings like Al_2O_3.

Microwave Technology

PACVD can be further enhanced by using a microwave plasma source for more tuneable properties, higher deposition rates and therefore lower coating cost.

Hybrid Technologies

Because the Hauzer Flexicoat equipment can combine many technologies in one machine, highly effective combination layers can be produced. An example of a hybrid technology is Nitrocoat, a combination of plasma nitriding and coating. Because the technology can be combined in one batch, the typical white layer can be avoided and a strong adhesion is the result. Other examples are CARC⁺ and DMS or nitride coatings and DLC. Please discuss with us the best combination for your application!

CROSS-OVER DEVELOPMENT

Hauzer is developing its technologies and coatings for several markets, in which we are recognized as technology leaders. This provides advantages for our customers. For example in the tool and decorative markets our customers can benefit from the fact that we have developed our DLC and ta-C coatings for years for tribological applications. Using effective technologies and building deep knowledge about the coating characteristics makes tuning for new applications much easier.

Another example is the development of CARC⁺ technology for the tool market. Now that we have become supplier of benchmark coatings in this field, other markets can benefit and find the coatings that fit their needs, developed and produced with our broad technology portfolio.

A strong focus on technology development gives our customers their competitive edge!

Photo in courtesy of Dörrenberg

TOOL APPLICATIONS

Hauzer offers a full range of tool coatings, from benchmark nitride coatings to special layers for specific cutting or forming tools.

Development and recipes

With more than 30 years of experience, Hauzer develops many coatings together with tool makers and job coaters to give them a unique advantage in their market. However, also customers who want ready-made recipes are happy with Hauzer's machines. Because of a broad technology range and flexible equipment, many tool coatings can be combined in one machine, ensuring efficient batches. The range of Hauzer Flexicoat equipment combines low cost of ownership with the best performance.

Cutting Tools

PVD coatings are applied on cutting tools to extend the lifespan of the tools many times over. The choice of coating is depending on the kind of tool and its use. With regard to technology we supply a strong range of general machining coatings produced with CARC^{+} technology, such as TiAlN and AlCrN. Additionally there are hybrid technologies on offer that create extra options for niche markets such as machining non-ferrous metals, Ti- and Ni-alloys and creating multi-layers for various applications. A full range of excellent functional cutting tool coatings is available for tool makers and job coaters.

Forming Tools

The requirements of coatings on forming tools and moulds are different from those on cutting tools. Hardness is still important, but forming tool coatings also need to be smooth, anti-sticking and corrosion-resistant. For this purpose, Hauzer has developed a range of outstanding coatings, all available on the Hauzer Flexicoat equipment.

Batch Versus Inline

Cost of ownership is an important deciding factor and inline platforms have a lot to offer because of their productivity increase. Hauzer's inline platforms come with a high degree of automation. And they gather more and more interest from tool makers. Our inline equipment choices come in many different forms and sizes, although they have one thing in common: they all combine high productivity with the broad technology portfolio that we built up over the years and are still improving upon.

COATINGS CUTTING TOOLS

MATERIAL GROUP	SHAFT TOOLS						
	End Milling		Drilling		Thread Tapping	Thread Forming	Thread Milling
	WC/Co	HSS	WC/Co	HSS	WC/Co - HSS	WC/Co - HSS	WC/Co - HSS
P01-P50	AlCrN	AlCrN	-	AlCrN	TiCN-ML	TiCN	TiN
H01-H30	AlCrN/TiSiN	n.a	AlCrN/TiSiN	n.a	TiCN-ML	TiCN	AlCrN/TiSiN
M01-M40	TiCN-ML	TiCN-ML	AlCrN	AlCrN	TiCN-ML	TiCN	TiN
K01-K40	AlCrN	AlCrN	AlCrN	AlCrN	TiCN-ML	TiCN	TiN
N01-N30	ta-C	ta-C	ta-C	ta-C	ta-C	ta-C	ta-C
S - Ni alloys	AlTiN	AlTiN	AlCrN	AlTiN	TiCN-ML	TiCN	-
S - Ti alloys	AlCrN	AlCrN	AlCrN	AlTiN	TiCN-ML	TiCN	-
CFRP	ta-C	ta-C	ta-C	ta-C	ta-C	ta-C	ta-C

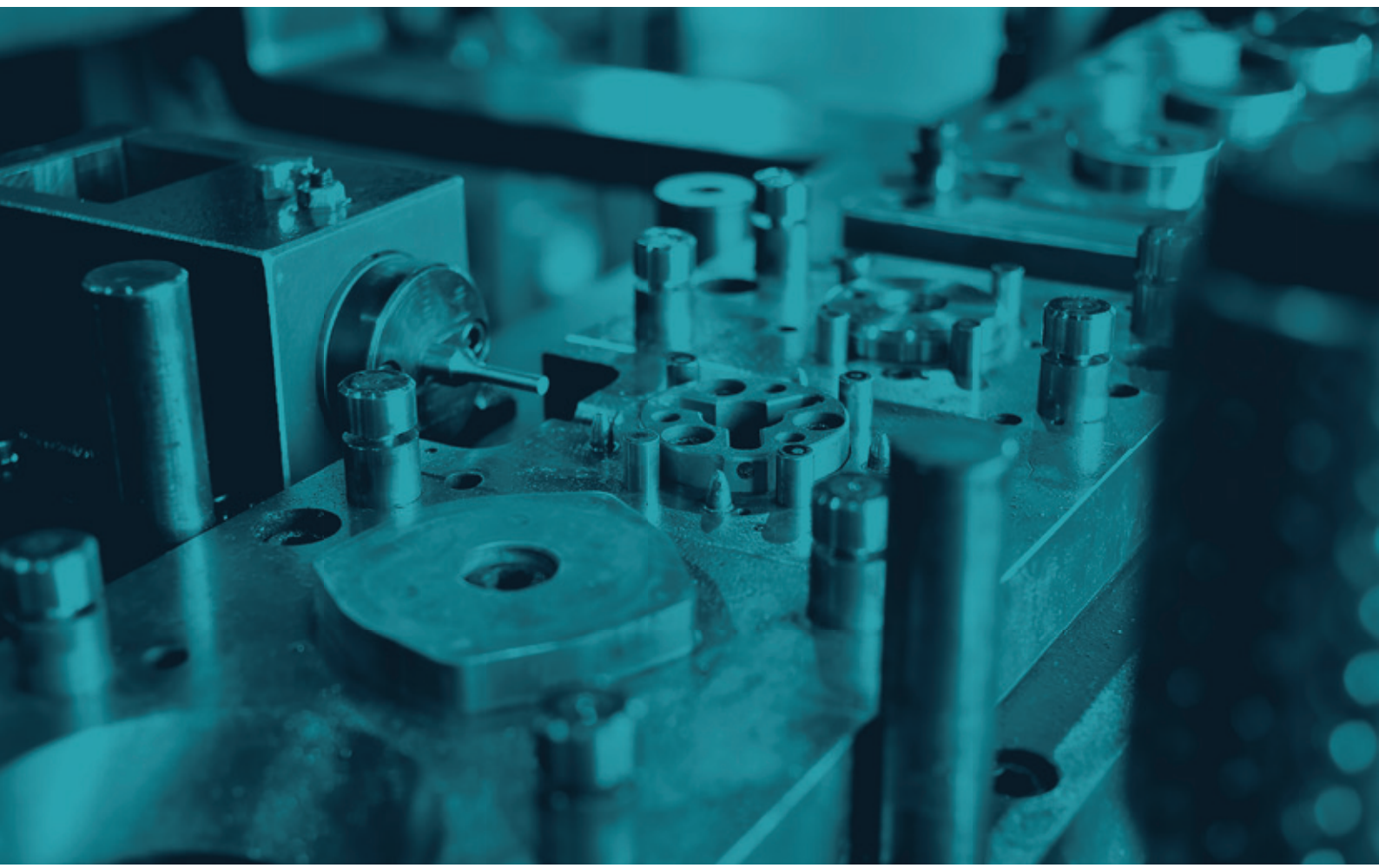
MATERIAL GROUP	INDEXABLES		HOBS	
	Milling	Turning	Milling	
	WC/Co	WC/Co	WC/Co	HSS
P01-P50	AlTiN	AlTiN	AlCrN	AlCrN
H01-H30	AlCrN/TiSiN	AlCrN/TiSiN	AlCrN	n.a
M01-M40	-	AlTiN	AlCrN	AlCrN
K01-K40	AlTiN	AlTiN	AlCrN	AlCrN
N01-N30	ta-C	ta-C	-	-
S - Ni alloys	AlTiN	AlTiN	-	-
S - Ti alloys	AlCrN	AlTiN	AlCrN	AlCrN

COATINGS FORMING TOOLS

Forming tools are used in a very wide range of applications, such as:

- Blanking, drawing and punching
- Hot and cold forming and forging
- Die casting
- Injection moulding and extrusion of plastics

Hauzer offers a wide range of coatings for these applications, such as TiN, TiCN, CrN, AlTiN, AlCrN, DLC and ta-C. For applications that require high load bearing capability, all of the coatings can be offered in the Nitrocoat version. In this case, the mould steel is plasma nitrided before application of the PVD coating. This is done in one and the same cycle without having to perform an intermediate polishing; saving time, effort and cost. The nitrided steel has an excellent support function for the hard PVD coating. The combination of both processes leads to an optimum performance of the forming tool.



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