METAPLAS.DOMINO
EFFICIENT SOLUTIONS
FOR THIN FILM EQUIPMENT

Coating Equipment
THIN FILM EQUIPMENT
YOU ARE DRIVEN BY DEMANDS FOR …

- High process reliability
- Short cycle times
- Low costs per piece
- Flexibility, various modular expansion options
- Individually tailored coatings
- Minimised maintenance and demand of spare parts
- Efficient after-sales service

METAPLAS.DOMINO
One technology platform – various possibilities
Tailoring multiple modules to individual demands and building a great unit – this is the basis of the METAPLAS.DOMINO. State-of-the-art thin film equipment has been developed with the knowledge of nearly 30 years of experience in tool manufacturing industry. For Oerlikon Balzers, this means offering efficient system solutions and even setting trends in surface treatment. The modular and flexible concept of the thin film equipment allows further expansions and upgrades.

- Diverse combination possibilities
- Future expansions possible
- Patented processes and coatings
- Production and R&D support

MAIN MODULES
FOR METAPLAS.DOMINO PLATFORM

Arc
The innovative APA evaporator technology (Advanced Plasma Assisted) is based on cathodic vacuum arc and offers diverse development possibilities for new layer architectures.

Benefits:
- High target utilisation result in low target costs
- High deposition rates
- Adjustable magnetic fields
- Short target changing times
- High plasma density
- Reduction of macro-particles
- Excellent coating adhesion

HIPIMS
HIPIMS stands for High-Power Impulse Magnetron Sputtering

Benefits:
- High ionisation rate (similar to arc)
- High power densities from 100 to 1000 W/cm²
- Very high plasma density
- Layer structures adjustable by plasma parameter settings
- Very smooth coatings
- Excellent coating adhesion
- Deposition of dense coatings at low substrate temperatures

HI3 – High Ionization Triple
Hybrid Technology (Arc+HIPIMS) combined with AEGD plasma etching:

Benefits:
- Combined strength of 3 processes in one PVD system
- Excellent adhesion, high deposition rate, smooth coatings, economic production
- Innovative approach to the next generation of PVD coatings for various applications
- HI3 technology allows to achieve a variety of layer architectures
- With HI3 technology coatings can be tailored by a wide range of materials, by micro alloying, by doping and by design of layer architecture … combined with economical production!

ADDITIONAL MODULES

Sputter
In the sputtering process, atoms are extracted from a target by bombardment with high-energy ions (Ar) and transformed into the gas phase. By combining the sputtered material with additional gases, a coating is deposited on the substrate.

Benefits:
- A wide range of materials can be sputtered
- Diverse process variants available
- Smooth coatings
- Good coating adhesion on combination with power etching processes AEGD

Nitriding
With the nitriding module, a plasma nitriding process can be performed before a PVD and/or PACVD coating process in one system and one batch. Thereby a hardened layer can be produced which offers excellent support for the subsequent PVD/PACVD coating.

Benefits:
- Optimisation of tool and component properties
- Substitution of expensive base materials
- Significantly longer lifetimes
- All PVD coatings can be applied

DLC
DLC stands for Diamond-Like Carbon and refers to a group of extremely low friction amorphous carbon coatings. With the DLC module, different DLC coatings can be produced by using PVD and/or PACVD processes. Standard DLC coatings consist of metal free or metal containing carbon coatings.

Benefits:
- Excellent coating adhesion
- High wear resistance
- Low coefficient of friction
- Smooth coatings

ta-C
ta-C stands for tetrahedral amorphous carbon without hydrogen and refers to a group of extremely hard and low friction amorphous carbon coatings. With the ta-C module different ta-C coatings can be produced.

Benefits:
- For higher temperature environments than DLC
- Very high wear resistance
- Excellent coating adhesion
- Smooth coatings
THIN FILM EQUIPMENT
VARIANTS AND CHARACTERISTICS
OF METAPLAS.DOMINO EQUIPMENT

Equipment with integrated chamber
Compact equipment in different sizes for all production needs.

Equipment with free chamber and two doors
The flex versions are perfectly designed for future integration of newly developed technology as well as for example integration into automated production processes.

METAPLAS.DOMINO – HIGH CAPACITY FOR REDUCED COST PER PIECE

The costs per piece of a coating process are mainly defined by the loading capacity of the machine. At the same time, a high loading capacity influences the plasma conditions and therefore also the coating quality. For a high loading capacity combined with an excellent coating quality we offer a variety of standard substrate holder solutions for tools.

The table below shows some examples of different tools with 3-fold rotation on a standard substrate holder. We also offer customised substrate holders for optimised loading capacities.

<table>
<thead>
<tr>
<th>Tool dimension</th>
<th>METAPLAS.DOMINO pica</th>
<th>METAPLAS.DOMINO micro</th>
<th>METAPLAS.DOMINO kila</th>
</tr>
</thead>
<tbody>
<tr>
<td>End mill Ø 6 x 55 mm</td>
<td>400</td>
<td>720</td>
<td>1296</td>
</tr>
<tr>
<td>End mill Ø 10 x 70 mm</td>
<td>240</td>
<td>480</td>
<td>900</td>
</tr>
<tr>
<td>End mill Ø 14 x 100 mm</td>
<td>120</td>
<td>354</td>
<td>720</td>
</tr>
<tr>
<td>End mill Ø 20 x 120 mm</td>
<td>90</td>
<td>180</td>
<td>360</td>
</tr>
<tr>
<td>Hub Ø 150 x 150 mm</td>
<td>15</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

Low target costs reduce cost per piece
Besides the loading capacity, the target costs are the major factor in the cost per piece calculation. With our innovative APA arc technology, the target costs have been drastically reduced thanks to a significant increase in target utilisation.

<table>
<thead>
<tr>
<th>Coating equipment</th>
<th>M.TEC</th>
<th>M.POWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>METAPLAS.DOMINO pica</td>
<td>0.07–0.08</td>
<td>0.11–0.13</td>
</tr>
<tr>
<td>METAPLAS.DOMINO micro</td>
<td>0.05–0.06</td>
<td>0.08–0.10</td>
</tr>
<tr>
<td>METAPLAS.DOMINO kila</td>
<td>0.04–0.05</td>
<td>0.06–0.08</td>
</tr>
</tbody>
</table>

BENEFIT FROM THE VARIETY

METAPLAS.DOMINO coatings:
Thin film coating types, coating design and architecture

Substrate
 mono layer

Substrate
 hardness

Substrate
 gradient

Substrate
 multi layer

Substrate
 nano layer

Substrate
 nano composite

All given data are approximate values, they depend on application, environment and test conditions.
Oerlikon Balzers not only masters coatings but also sees itself as a “Surface Engineer” that understands coating as a contiguous, coherent process. Apart from the coating, the system engineering and the coating technology, the pre- and post-treatment of tools also play an important role. It takes an overall perspective to achieve an ideal result and to maximise the performance of tools.

Oerlikon Balzers is a solutions provider that offers advanced technologies for every single process step. Rely on us for counsel, planning, and implementation support.

**PARTNERSHIP & SERVICES**

**After Sales**
- Technical support and advice via telephone, the service hotline and e-mail
- Remote diagnostics and control for even faster troubleshooting
- Professional on-site support for installations, upgrades, repairs and maintenance tasks
- Engineer dispatch within 24 hours
- Service agreements
- New and second hand parts, as well as consumables for Oerlikon Balzers equipment
- Upgrades, including the latest technologies and coatings
- Standard and customer-specific fixtures

Our After Sales bases are located in Europe, America and Asia. From these locations, we provide you with services and products. Our service and application engineers worldwide help you keep your equipment up and running. Furthermore our parts warehouses located in Germany, the USA, Japan and China are committed to increasing the availability of your equipment.

**Creating your individual portfolio**
We offer joint developments to create your individual coating for your specific application. Make your products stand out from the competition.

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**THIN FILM EQUIPMENT TOTAL COATING SOLUTIONS**

1. **Cleaning**
   Clean surfaces are essential for coating adhesion. For this reason, Oerlikon Balzers invests a great deal of effort in surface preparation for PVD and offers multi-stage ultrasonic cleaning lines using aqueous alkaline baths without environmentally damaging additives.

2. **Pre-treatment**
   If additional surface preparation is required, Oerlikon Balzers offers the appropriate technologies. Microblasting removes porous surface layers and edge preparation delivers extra performance and superb tool stability.

3. **Coating**
   A broad range of coating technologies is available for almost unlimited cutting, forming, punching, metal die casting or plastics processing applications. Working in close collaboration with our customers throughout the world, our specialists are continuously opening up new applications. Customised coatings are available on request.

4. **Post-treatment**
   Numerous methods are applied to give tools the finishing touches. Over the years, Oerlikon Balzers has gained the extensive experience needed to suggest the best possible solution and equipment to meet your needs.

5. **Quality inspection**
   The success of a coating also hinges directly on the condition and quality of the tool. Visual and mechanical methods are employed to assess the coating compatibility of incoming items and to determine coating quality. The deployment of our technologies in a wide range of industries allows us to optimally consult you as regards appropriate quality assurance resources.
BENEFIT FROM OUR GLOBAL EQUIPMENT SALES AND AFTER SALES ORGANISATION

www.oerlikon.com/balzers