BALIMED

Make a healthy choice with the medical PVD coatings from Oerlikon Balzers
Our experience and knowledge in the development of medical application-specific solutions in the medical industry is based on many years of cooperation with medical experts and universities/university clinics. Oerlikon Balzers’ PVD coating solutions improve patient outcomes and add economic value to healthcare products. Through consistent procedures we are therefore able to transfer these solutions globally.

All our coating centres hold the ISO 9001 certification. Our coating centres in Balzers, Liechtenstein; Brügg, Switzerland; Cluses, France and Elgin, USA are specialised in coating medical products and are specifically certified for ISO 13485. All our BALIMED coatings meet the highest industry standards and hold the following specific medical certificates:

**Cytotoxity:** MEM Elution, 72 hours (according to USFDA 21 CFR Part 58)

**Sensitisation:** Maximisation, Magnuson-Kigman Method (according to ISO 10993)

**Irritation:** Intracutaneous Reactivity (according to ISO 10993)

Innovative coatings deliver noticeable advantages

How can the high incidence of nosocomial infections be reduced? What makes the fight against MRSA more successful especially in conjunction with orthopaedic and medical devices? Oerlikon Balzers knows how to handle these and other challenges with their BALIMED medical coatings. The functional colours of BALIMED coatings incorporate vital properties:

- Anti-glare properties
- **Black coatings help surgeons work faster and with greater comfort**

- Coated instruments
- **Retention of sharp cutting edges, scratch resistance and prevention of scuffing**

- Reduced friction
- **Eliminates or reduces the need for lubrication**

- Proven biocompatibility of medical coatings
- **Protects patients against damages or impairments**

- Resistance to repeated autoclave cycles
- **Advanced coating adhesion through repeated thermal cycling**

- Corrosion resistance
- **Protection against cleaning liquids and sterilisation**

**BALIMED Coatings:**
Higher cost-efficiency and higher quality of patient’s life

### Optimised performance

<table>
<thead>
<tr>
<th>Optimised performance</th>
<th><strong>BALIMED A</strong></th>
<th><strong>BALIMED ALTINA</strong></th>
<th><strong>BALIMED FUTURA</strong></th>
<th><strong>BALIMED DLC</strong></th>
<th><strong>BALIMED C</strong></th>
<th><strong>BALIMED CNI</strong></th>
<th><strong>BALIMED ARGENTA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Microhardness (Hv 0.05)</td>
<td>&gt; 2,300</td>
<td>3,300</td>
<td>3,300</td>
<td>&gt; 2,000</td>
<td>1,000</td>
<td>1,750</td>
<td>&gt; 2,000</td>
</tr>
<tr>
<td>Colour</td>
<td>Gold</td>
<td>Black</td>
<td>Bronze</td>
<td>Black</td>
<td>Grey</td>
<td>Silver-grey</td>
<td>Gold</td>
</tr>
</tbody>
</table>

***BALIMED provides excellent coating properties***

<table>
<thead>
<tr>
<th>Coating material</th>
<th>TiN</th>
<th>TiAlN</th>
<th>TiAlN</th>
<th>TiA</th>
<th>TiA-W</th>
<th>CrN</th>
<th>TiAg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Gold</td>
<td>Black</td>
<td>Bronze</td>
<td>Black</td>
<td>Grey</td>
<td>Silver-grey</td>
<td>Gold</td>
</tr>
</tbody>
</table>

All given data are approximate values, they depend on application, environment and test condition.

**More than 50 years of knowledge and expertise**

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Applications of BALIMED Coatings

Medical instruments with BALIMED coatings contribute to making a patient’s life better. Sharp cutting edges on medical instruments make wounds heal faster while antimicrobial properties reduce infections and avoid revision surgery. Anti-glare properties help surgeons work faster and more easily. Take a look at BALIMED medical application possibilities:

**Dental instruments**
The gears of high-speed dental drills operate with no oil.

**Bone drills and reamers**
Wear-resistant ceramic coatings provide long-term cutting edge sharpness.

**Bone repositioning instruments**
Wear protection combined with anti-glare properties.

**Micropituitary rongeurs**
Bone punches with wear resistant cutting edges and black DLC antiglare coating.

**Dental screws**
Improved screw adjustability. Reduction of torque during the assembly of the screws combined with a higher holding force.

**Minimally invasive keyhole operations**
The Knotless Fixation System – recipient of the Frost & Sullivan Product Innovation award – uses BALIMED ALTINA to indicate the depth of insertion.

**Surgical instruments**
Scratch and wear resistance, anti-glare and antimicrobial properties.

**Bone saws**
Coatings provide oil-free lubrication and high-speed operation at low remaining temperatures.

**Surgical instruments**
Dental screws
Minimally invasive keyhole operations
Dental instruments
Bone repositioning instruments
Bone drills and reamers
Micropituitary rongeurs
Surgical instruments
Bone saws
Applications of BALIMED Coatings

Minimally Invasive Surgical (MIS) Instruments

Minimally invasive surgeries, such as laparoscopy, continue to see growth, driven by improved patient outcomes and reduced healthcare costs. Improvements to MIS instrumentation, as well as the continued expansion of robotic surgical platforms using MIS instrumentation, provide both opportunities and challenges to medical device manufacturers. As medical OEM’s push the boundaries of these new technologies, Oerlikon Balzers is helping to provide coating solutions to some of this industry’s most demanding problems.

Surgical site infections demand for safe and efficient solutions that reduce bacterial biofilm formations. All invasive surgery devices bypass the body’s natural lines of defense and therefore provide easy routes for infection. BALIMED ARGENTA offers unprecedented antimicrobial surface properties for these devices.

The bacterial log reduction test method has shown high antimicrobial efficiency of the new PVD-Ag-doped coatings. The unique properties of BALIMED ARGENTA at a glance:

- High antimicrobial efficacy: Log 3 reduction with SA (staphylococcus aureus) and MRSA strain (methicillinresistant staphylococcus aureus)
- No influence on the antimicrobial activity after autoclave sterilisation
- Log 3 reduction after autoclave cycles (50 times)
- No cytotoxic effect (ISO 10993-5)
- New-generation PVD coatings doped with 2 to 5% silver
- Film thickness of 2 µm
- Antimicrobial activity confirmed by ASTM 2180
- Autoclave stability

Benefits of using BALIMED Coatings on MIS Instruments

- Improves wear resistance and reduces friction on instrument components (for example: axle pins/shafts & pulleys for “jawed” instruments, such as graspers)
- Improved edge retention on shears and other sharp-edge instruments
- Eliminates “char” from bipolar and monopolar electro-surgical instruments
- Combines insulating and wear resistant properties for electro-surgical instruments
- Improved performance characteristics help OEM’s achieve multi-use goals
- Eliminates the need for lubrication in some devices

<table>
<thead>
<tr>
<th>Sample</th>
<th>t₀h</th>
<th>t₁h</th>
<th>t₂h</th>
<th>t₃h</th>
</tr>
</thead>
<tbody>
<tr>
<td>metal plate 4 x 4 cm blank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BALIMED ARGENTA Antimicrobial coating</td>
<td></td>
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</table>
Count on a powerful network of over 100 sites in 35 countries

There's much more to talk about – please get in touch to discuss what we can do to improve your business

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