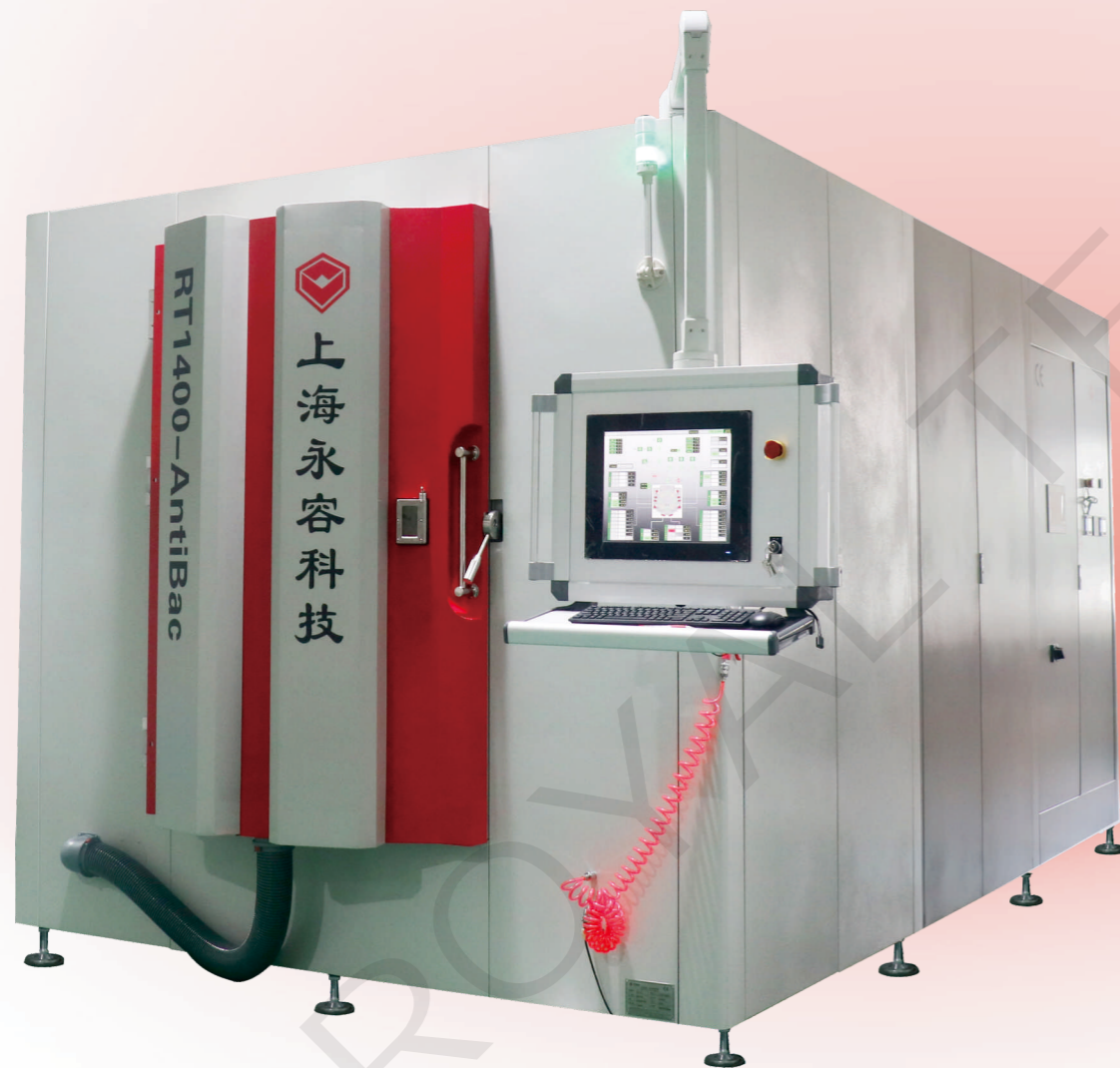


RT1400- AntiBac

Antibacterial Coatings by PVD
Innovative Technology
PVD防细菌镀膜技术



99.99%

24小时内杀死99.99%的
大肠杆菌和金黄色葡萄球菌。

Technology Background

The demand for antibacterial coatings on frequently touched surfaces has long existed. With the rising public health and domestic hygiene awareness, decorative coatings on SS and ceramic products, such as taps, door handles, handrails, tiles, faucet and bathroom fittings with antibacterial performance, may attract more attention from consumers than ever.

"After a full year of research and development, the test results eventually turned out excellent," said Zhou Xin, the marketing director, "adding only several minutes based on traditional PVD decorative coating process, the products will be able to kill 99.99% of E. coli and S. aureus within 24 hours without affecting other PVD important performances."

We are ready to share this advanced technology with our customers, anyone who is interested in providing higher extra value to the products and to make a contribution to the public's health, please consult us.

技术背景

频繁接触的产品表面具有抗菌涂层的需求早已存在，随着人们对公众健康和家庭卫生意识的不断提高，一些公共场所的用品如：水龙头、门把手、陶瓷瓷砖、五金卫浴及不锈钢生活用品等会比以往更受消费者的关注。

经过近一年的研发，我们取得了理想的测试结果。利用这一新开发的PVD镀膜技术所获得的抗菌涂层，在不影响装饰性膜层的特性外，可在24小时内杀死99.99%的大肠杆菌和金黄色葡萄球菌。

我们已经准备好与客户分享这项技术。任何有兴趣为您自己的产品提供更高附加值并为公众健康做出贡献的人，请咨询我们。

Benefits 优点

Green coating technology 绿色环保技术

Low production cost 生产成本低

High antibacterial- and long-lasting effect 抗菌效果好，持久

Scratch resistant 防刮擦

Corrosion & wear resistant 耐腐蚀和耐磨

Applications 应用领域

Kitchen implements like SS sinks 厨房用具如 不锈钢水槽

SS tableware 不锈钢餐具

Sanitaryware: faucets, bathroom fittings 卫浴产品如 水龙头，洁具

Door handles 门把手

Ceramic tiles, ceramicware 瓷砖，瓷器等



PVD Finish Properties PVD涂层性能

Exceptional aesthetic finish
Uniform coating thickness and colors
Superior resistance to wear and corrosion
PVD coating has a high level of hardness
PVD coating does not discolour or tarnish with a proper daily care
产品外观更漂亮
膜层厚度和颜色更均匀
很好的耐磨性和耐腐蚀性
PVD涂层具有高硬度性能
加以日常适当的护理，PVD涂层不会变色或失去光泽

| The Test Microorganism | The Average Plate Count Of Blank Control Samples Recovered Over 24h(cfu/pieces) | The Average Plate Count Of Test Samples Recovered Over 24h(cfu/pieces) | Antibacterial Rate (%) |
|--------------------------------|---|--|------------------------|
| Escherichia Coli (as1.90) | 9.2×10^6 | <20 | >99.99 |
| Staphylococcus Aureus (as1.89) | 8.8×10^5 | <20 | >99.99 |

The above testing report is only for reference, actual value might vary when substrate material and/or testing methodology changes.
Complied with standard of GB/T21866-2008 standard requirement (I) $\geq 99.00\%$

| 测试微生物 | 空白对照样品24h后平均回收菌数 (cfu/片) | 抗菌涂层样品24h后平均回收菌数 (cfu/片) | 抗(细)菌率 (%) | GB/T21866-2008 标准要求 (I级) |
|------------------|--------------------------|--------------------------|------------|--------------------------|
| 大肠杆菌(AS1.90) | 9.2×10^6 | <20 | >99.99 | $\geq 99.00\%$ |
| 金黄色葡萄球菌 (AS1.89) | 8.8×10^5 | <20 | >99.99 | $\geq 99.00\%$ |

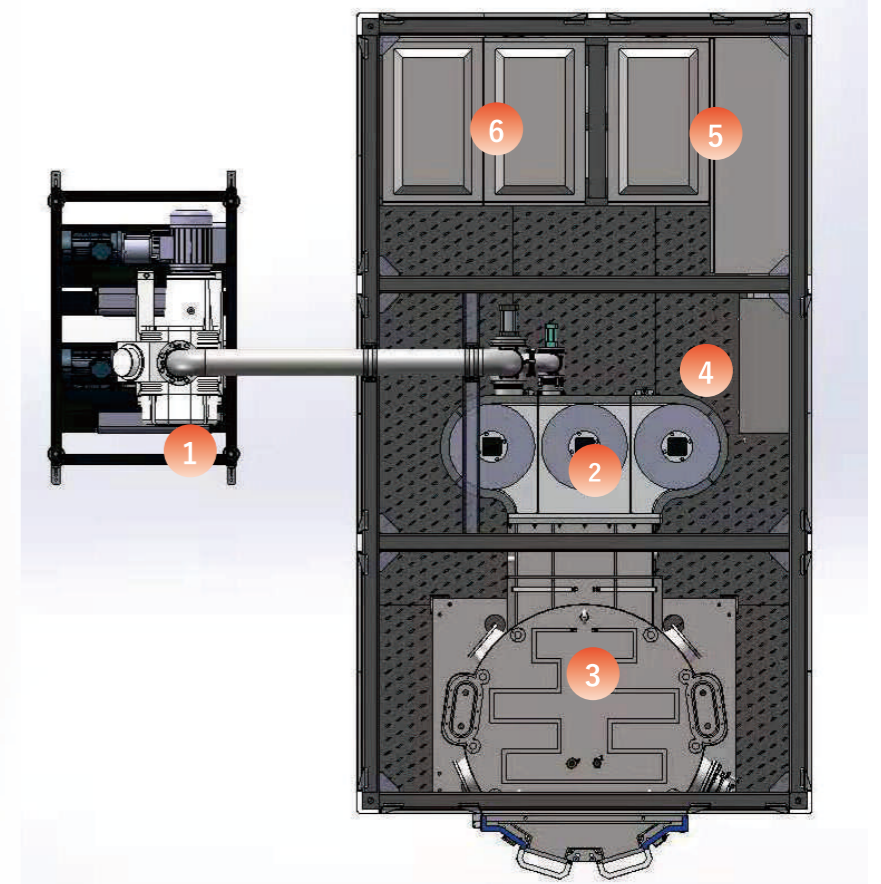


Design Advantages 设计优势

Plug-in modules for easy maintenance 插拔式模块化设计, 方便维保
Integrated design system for quick installation 一体化设计, 快速安装
IPC control & operation system, available for remote monitoring and diagnosis 工控机操控可远程诊断
Multiple cathodes for fast deposition coating 多种膜沉积源, 可减少镀膜周期
Flexible, ready for upgrading 灵活性高, 可升级
Stable, operating 24/7 稳定性强, 可每周7天, 每天24小时不间断运行

Key Configurations 主要配置

- 1# Forevacuum pumps 前级真空机组
- 2# High vacuum pumps 高真空泵
- 3# Vacuum chamber and deposition cathodes 镀膜腔室和膜沉积源
- 4# Air & cooling water cabinet 压缩空气和冷却循环水柜
- 5# Power supplies cabinet 镀膜电源柜
- 6# Central control cabinet 电控柜
- 7# IPC & operation keyboard 工控机操作单元



The machine final configuration is determined by customer requirements.
最终配置可根据客户要求定制。



Technical Specifications

技术参数

1# Faucets
水龙头



2# Door handle
门把手



3# Bathroom supplies
卫浴用品



4# Ceramic Tiles
瓷砖



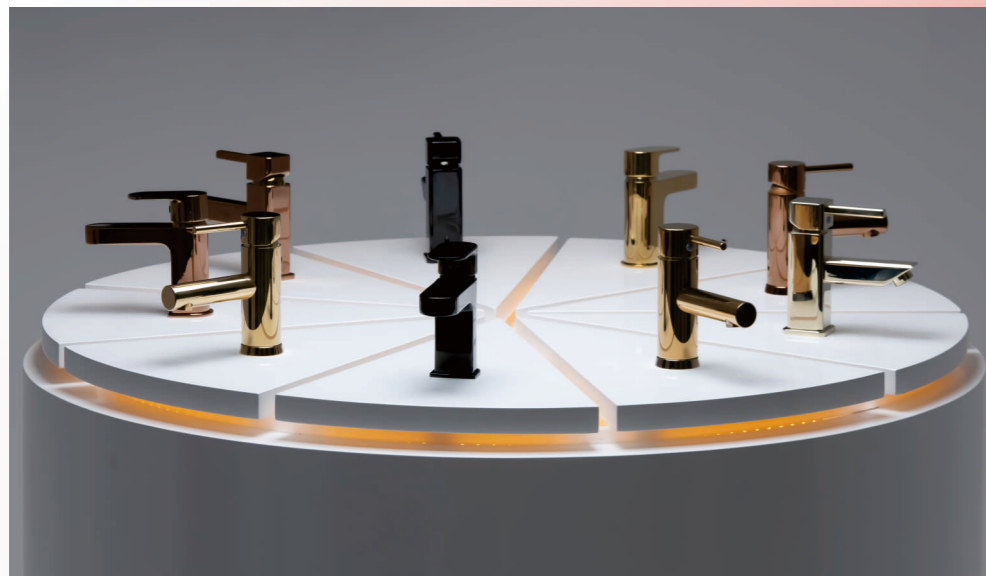
| Description | RT1400-AntiBac | RT1400-M | RT1600-L |
|--------------------------------|---|---|--|
| Deposition Chamber | φ1400*H1600mm | φ1400*H1600mm | φ1600*H1800mm |
| Deposition Sources | 14 arc + 2 pairs of MF cylinder sputter + antibacterial coating cell | 14 arc + 2 pairs of MF cylinder sputters | 18 Arc |
| Effective Loading Space (max.) | 6*φ370*H1200mm 8*φ300*H1200mm | 6*φ370*H1200mm 8*φ300*H1200mm | 8*φ350*H1400mm 10*φ300*H1400mm |
| Technical Advantages | <ul style="list-style-type: none"> Antibacterial coating layer can be generated High uniformity for various of 3D shape parts High throughput for small and medium size workpieces | <ul style="list-style-type: none"> More competitive in stability Focus on lowest production cost High homogeneity for rose gold color Deep black color for 3D and 2D shape Blue, green, purple and red for 2D shape workpieces | <ul style="list-style-type: none"> Larger volume Higher productivity Especially for larger workpiece, shower hose up to 150cm long is available Suitable for ABS decorative coatings |
| Load Weight (Max.) | 300kgs | 300kgs | 500kgs |
| Sputtering Power | Max. 30kw | Max. 30kw | Max. 40kw |
| Pulsed Bias Power | Max. 30kw | Max. 30kw | Max. 40kw |
| Power Consumption | Max. 90kw Average: 50kw | Max. 80kw Average: 35kw | Max. 130kw Average: 60kw |
| Operation Space(L*W*H) | 7000*6000*4300mm | 7000*6000*4300mm | 7500*7000*4500mm |
| Operation & Control System | CE standard Siemens PLC + Industrial Computer Available for remote operation and diagnosis | CE standard Mitsubishi PLC+ Touch Screen Operation program with backup | |

These configurations are the standard. For a specific developing market and new special coatings, customized configurations and modifications are available on request.

| 描述 | RT1400-AntiBac | RT1400-M | RT1600-L |
|---------------|--|--|---|
| 镀膜腔体 | φ1400*H1600mm | φ1400*H1600mm | φ1600*H1800mm |
| 镀膜阴极 | 14 套弧 + 2对中频圆柱磁控溅射阴极 + 防细菌涂层单元 | 14 套弧 + 2对中频圆柱磁控溅射阴极 | 18 套弧 |
| 最大有效装载空间 | 6*φ370*H1200mm 8*φ300*H1200mm | 6*φ370*H1200mm 8*φ300*H1200mm | 8*φ350*H1400mm 10*φ300*H1400mm |
| 技术优势 | <ul style="list-style-type: none"> 可镀抗菌涂层 适合各种 3D 形状工件，膜层均匀性高 适合小、中尺寸工件，产能高 | <ul style="list-style-type: none"> 设备稳定性更具优势 专注于最低生产成本 高端玫瑰金 各种 3D 和 2D 形状的工件均可获得高质量的深黑色膜层 对 2D 形状工件可以镀制蓝色、绿色、紫色和红色 | <ul style="list-style-type: none"> 装载量更大 产能更高 特别适合较大的工件，可镀制 1.5 米长的淋浴软管 适用于 ABS 工件装饰性镀膜 |
| 最大装载重量 | 300kgs | 300kgs | 500kgs |
| 溅射电源 | 最大 30KW | 最大 30KW | 最大 40KW |
| 偏压电源 | 最大 30KW | 最大 30KW | 最大 40KW |
| 耗电量 | 最大 90KW 平均 50KW | 最大 80KW 平均 35KW | 最大 130KW 平均 60KW |
| 安全使用空间(L*W*H) | 7000*6000*4300mm | 7000*6000*4300mm | 7500*7000*4500mm |
| 操控系统 | CE 标准 西门子 PLC + 工控机 远程操控和远程诊断 | CE 标准 三菱 PLC+ 触摸屏 操作程序备份件 | |

以上列表为设备标准配置，针对特殊的应用领域需要开发新的涂层，可根据所需工艺要求提供定制设备。

The 1st machine built For faucets sanitary industry in Africa 第一台在非洲安家的PVD设备-应用于水龙头卫浴行业



Since the PVD coating technology is very new for SOPAL, our professional technical support makes us stand out among other PVD machine suppliers. We know how to transfer the technology to end users, we understand machine and coating process's stabilities are very critical for users. Thus for the first set machine, RTAS1612 model with a customized configurations had built for SOPAL. Which combined multiple techniques to achieve varieties as many as color ranges.

"A reliable partner you can always count on!" said Mr. Ahmed from SOPAL. "Royal Technology means more than a supplier to us. PVD finishing on faucets and other sanitary hardware are well-known and very popular in the market, it is going to be SOPAL's new trend line."

PVD对SOPAL公司来说是一项新的镀膜技术，永容科技专业的技术支持使我们在其它PVD设备供应商中脱颖而出。

我们的团队知道如何将技术转让给最终用户，我们清楚地意识到设备和镀膜工艺的稳定性对用户是至关重要的。因此，结合SOPAL公司的需求，我们为其成功定制了一台设备-RTAS1612。此设备配有多种镀膜阴极可以获得多种颜色。

"他们是一个你可以永远信任的合作伙伴!"来自SOPAL的艾哈迈德先生说。"永容科技对我们来说不仅仅是一个供应商。PVD涂层在水龙头和其它卫生洁具上的应用在市场上非常受欢迎，这将是SOPAL新的产品趋势"。



"Royal Technology makes us more confident to promote our products in the market. We learned that the Anti-Bacterial coating process has been developed successfully, definitely it is our desired technique for long time. More than decorations, antibacterial coatings on products surface had called on by people, we can not wait to add this technique to our products. We are looking forward to more cooperation with Royal Technology soon."

"永容科技的技术支持让我们更有信心在市场上推广我们的新产品。据了解，他们还成功研发了抗菌涂层工艺，这无疑是我们一直以来很渴望的新技术。除了装饰性涂层，产品表面的抗菌涂层被更多人所追求。SOPAL迫不及待地想把这一生产技术用到我们的产品上。我们期待在不久的将来与永容科技有更多的合作。"