PRESS INFORMATION FOR IMMEDIATE PUBLICATION

umicore
Metal Deposition Solutions

Abrasion resistance of RHODUNA® Alloy confirmed by the independent professional committee for economic development FRANCÉCLAT in Paris (France)

ABRASION RESISTANT LIKE NO OTHER BRIGHT WHITE RHODIUM COATING

29. March 2023
Schwaebisch Gmuend

Words: 457
Characters: 3725

mds.umicore.com

The surface alloy RHODUNA® Alloy, already developed by Umicore Metal Deposition Solutions in 2010, has established as the standard for an alternative rhodium coating. The reasons why the electrolyte is used by renowned manufacturers worldwide are manifold. First and foremost, the company itself names the outstanding abrasion resistance, the degree of whiteness identical to that of pure rhodium and the clear cost advantage. The qualitative properties in particular have now been examined and impressively confirmed by FRANCÉCLAT (Paris / France), an independent expert committee for economic development serving, which serves the jewelry industry, among others.

RHODUNA® ALLOY IS MORE THAN AN ALTERNATIVE

The goal in developing the rhodium-ruthenium electrolyte (composed of 75 % rhodium and 25 % ruthenium) was to achieve maximum cost savings without having to compromise on quality. At the same time, the rhodium-ruthenium alloy, similar to pure rhodium, should also be able to be deposited in layer thicknesses between 0.05 µm and 0.2 µm without any difficulties. The fact that the goals set could be achieved and that some qualitative properties could actually be improved is also independently confirmed in the FRANCÉCLAT test report now published.

The focus was on the better abrasion resistance of the alloy electrolyte compared to pure rhodium, which was always claimed by Umicore and proven by an internal Bosch-Weinmann test. However, the committee took the Turbula abrasion test, which is commonly used in the jewellery industry. Here, the L^*-values (brightness in the CIELAB colour

space) of the 0.1 µm cover layers were checked in two tests on the substrates palladium and ruthenium. Already after 2 hours, the first signs of dissolution of the pure rhodium layer were recognisable from the decreasing L*-value and after 5 hours the layer was almost completely removed. The L*-value was approx. 30 points lower and thus almost corresponded to the brightness value of the substrate used in each case. In contrast, the RHODUNA® Alloy top layer was still mostly intact after 10 hours in the same test run and showed an L* value loss of only 10 points regardless of the substrate type.

RHODUNA® ALLOY IS VISUALLY INDISTINGUISHABLE

Through targeted electrolyte development, Umicore has succeeded in developing a coating whose whiteness is almost equivalent to that of a pure rhodium coating. Thus, the L*-value (whiteness) of the RHODUNA® Alloy coatings in the FRANCÉLAT test report is only 0.3 points below that of pure rhodium electrolyte coatings. With the naked eye, this marginal difference is not even noticeable to experts.

FURTHER ADVANTAGES IN THROWING BEHAVIOUR AND ECONOMIC EFFICIENCY

For pure rhodium electrolytes, deposition in complex-shaped applications is usually difficult. This is particularly evident, for example, in recesses in jewellery, e.g. for embedding gemstones. The low deposition in these areas leads to less bright surfaces, which makes gemstones appear dull and pale. In direct comparison, RHODUNA® Alloy shows a significantly better throwing power, which has a direct effect on the brightness of the recesses - the application not only appears more valuable, but is also qualitatively so.

However, RHODUNA® Alloy does not only offer qualitative advantages. The alloy partner ruthenium has also been considerably cheaper than rhodium for many years due to occurrence and demand, which gives the rhodium-ruthenium alloy a price advantage. Compared to conventional rhodium electrolytes, RHODUNA® Alloy saves about 25 percent

of the costs*.

RHODUNA® ALLOY IS ALSO INTERESTING FOR TECHNICAL APPLICATIONS

Gold-plated charging contacts & connectors (USB-C, Pogo Pin, etc.) cannot meet the expectations of wearables and mobile phones. They corrode during charging if they have previously come into contact with salt water, swimming pool water, sweat or beverages, leading to numerous complaints and thus the expensive replacement of damaged devices.

Rhodium is significantly more corrosion resistant than gold and is the precious metal of choice here when it comes to the highest quality and safety. The corrosion behaviour of RHODUNA® Alloy coatings does not differ from a coating with pure rhodium, as proven by the sulphide and welding resistance in independent tests by FRANCÉCLAT. If the contacts are coated with RHODUNA® Alloy, they are therefore equally protected against corrosion. The fast-charging capability of the devices is also not impaired by the alloy.

NO REASON TO USE PURE RHODIUM

Also included in the FRANCÉCLAT test report was RHODUNA® PT, a rhodium-platinum alloy. This also achieved excellent abrasion values compared to pure rhodium coatings and currently offers a cost advantage of over 55 percent due to the precious metal ratio (20 % rhodium, 80 % platinum). Another alternative, considering that the L*-value in the test is only barely 2 points below that of pure rhodium.

Umicore sees FRANCÉCLAT's independent test result not only as a confirmation of the product's properties. "The advantages of RHODUNA® products for the coating of technical and decorative surfaces have always been obvious. Now we have independent confirmation that with RHODUNA® Alloy there is no longer any objective reason to use pure rhodium coatings", Martin Stegmaier (Division Manager Decorative Applications) is pleased about the test result and especially about the

fact "that RHODUNA® Alloy is and remains the 'bright queen' among rhodium coatings".

SOURCES AND MORE INFORMATION ONLINE:
https://mds.umicore.com/bright-queen
https://mds.umicore.com/storage/mds/rhoduna-alloy-test-report-francelat-2022.pdf
https://www.youtube.com/watch?v=3Xk5wc1xwR4&t=24s
https://www.franceclat.fr

Price and savings information as of 04 April 2023.

IMAGES

1

Umicore's RHODUNA® Alloy has earned the title of "bright queen" due to its superiority over other rhodium coatings on the market. In addition to its bright white final layer, it not only has all the other positive properties of pure rhodium layers - it also shines with a clear cost advantage and unsurpassed abrasion resistance, which has now been impressively confirmed by the independent professional committee for economic development FRANCÉCLAT in Paris (France).

2

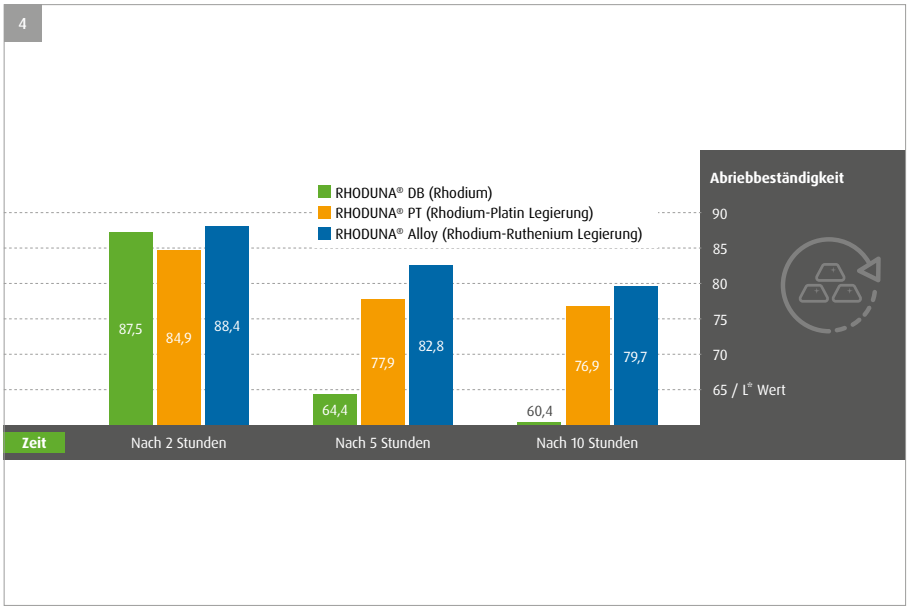
The corrosion behaviour of RHODUNA® Alloy coatings is equivalent to those with pure rhodium, as confirmed by sulphide and weld resistance in FRANCÉCLAT's independent tests.

IMAGES

3

In a direct comparison, RHODUNA® Alloy shows significantly better scattering behaviour, which is especially evident in complexly shaped jewellery with recesses.

4

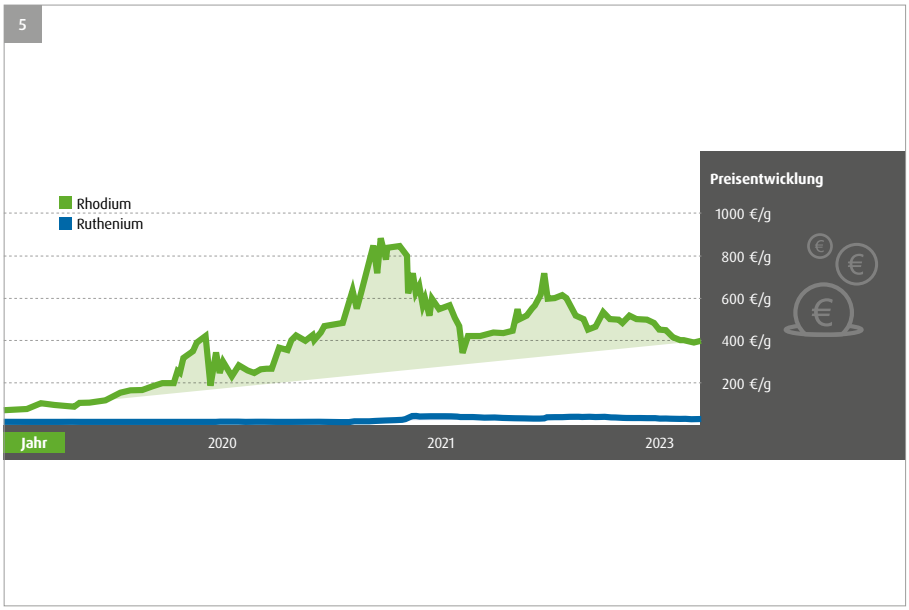


The consistently high L*-values (whiteness) in FRANCÉCLAT's Turbula abrasion test prove that RHODUNA® Alloy has significantly better abrasion resistance than pure rhodium.

umicore
Metal Deposition Solutions

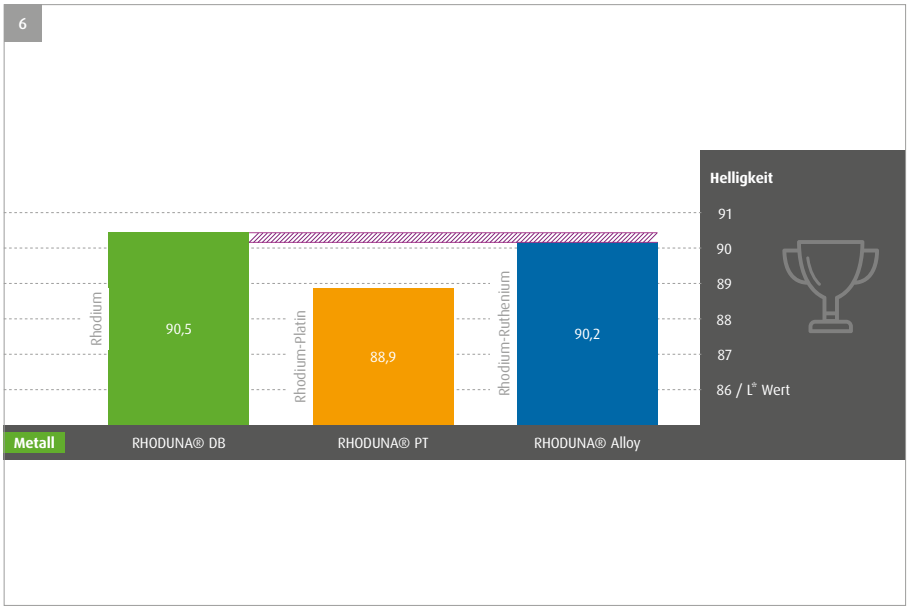
IMAGES

5



Ruthenium is considerably cheaper than rhodium, which currently gives RHODUNA® Alloy a cost advantage of about 25 percent compared to pure rhodium electrolytes.

6



The whiteness of a RHODUNA® Alloy final layer is almost the same as that of a pure rhodium layer and is not visible to the naked eye.

umicore
Metal Deposition Solutions

IMAGES

7

Contacts plated with RHODUNA® Alloy are protected against corrosion without impairing the fast-charging capability of the devices.

8

Gold-plated charging contacts cannot meet the expectations of wearables due to a lack of corrosion resistance - RHODUNA® Alloy extends the durability of the charging contacts many times over in comparison and thus prevents complaints or the expensive replacement of damaged devices.

IMAGES

9

Martin Stegmaier
Division Manager Decorative Applications

10

umicore
Metal Deposition Solutions

Logo
Umicore Metal Deposition Solutions

CONTACT

Martin Stegmaier
Division Manager Decorative Applications
Business Line Electroplating
Phone: +49 (0) 72 31 / 776 93 84
Mobile: +49 (0) 171 / 273 62 60
Email: martin.stegmaier@eu.umicore.com

Thorsten Klopfer
Manager Communications
Business Line Electroplating
Phone: +49 (0) 71 71 / 607 - 218
Mobile: +49 (0) 172 / 730 26 95
Email: thorsten.klopfer@eu.umicore.com

Umicore Galvanotechnik GmbH
Klarenbergstrasse 53 - 79
73525 Schwaebisch Gmuend
Germany

ABOUT UMICORE METAL DEPOSITION SOLUTIONS

Within the Umicore Group, the Metal Deposition Solutions (MDS) business unit is the business headquarters for the two established business lines Electroplating and Thin Film Products. Metal Deposition Solutions is one of the world's leading suppliers of products for the (precious) metal-based coating of surfaces in the nanometer and micrometer range - with the expertise of the two divisions we combine the two highest-quality processes: Electroplating and PVD coatings.

The business unit's solutions are used in many everyday products or make their production possible in the first place. Almost all well-known manufacturers in the electronics, automotive, optics and jewelry industries source components coated with our Umicore products either directly or indirectly.

In addition to development and production, Metal Deposition Solutions offers a comprehensive service for their products. This includes, for example, recycling or precious metal management in addition to consulting and on-site technical support.

Further information: mds.umicore.com

###