



# Umicore Sealing

## Reliable protection for technical precious metal surfaces

Umicore Sealing is a post-treatment process specially designed for technical precious metal surfaces. The result is a protective, transparent layer just a few nanometers thick. Depending on the application, this layer specifically prevents tarnishing, discoloration and corrosion.

In addition, the product quality is increased by appropriate properties. Umicore Sealing, for example, impresses with a significant reduction in the coefficient of friction, which results in a significant reduction in mating forces for plug contacts.

The technical layer properties, such as the contact resistance, are retained compared to an untreated surface. Subsequent processing (e.g. soldering) is also possible without hesitation.

All our protective coatings do not contain any environmentally harmful components such as solvents, CFCs, CHCs, hydrocarbons or chromium compounds. They are therefore biologically harmless.



## Overview Umicore Protective Layers

All Umicore protective layers (technical and decorative) can be found on the overview page: [Protective Layers for Precious Metal Surfaces](#)

## Advantages

- Wide range of products enables targeted protection for a variety of applications
- Protects against corrosion, tarnishing, discoloration, dirt, abrasion and scratches
- Reduces insertion and withdrawal forces
- Electrochemical and electroless processes possible
- Optimized for rack, barrel and reel-to-reel systems
- Very short treatment times possible

- Easy to use
- Do not contain any environmentally harmful components such as solvents, CFCs, CHCs, hydrocarbons or chromium compounds
- No influence on colour or gloss of the final layer

## Applications

- Plug connectors (also in the automotive sector)
- Lead frames
- Smart cards

		Sealing				Topseal
		691	691 EL	692	692 EL	693
Precious metal base	Au	⊙	●	●	●	○
	Ag	●	●	●	●	●
	Pd	⊙	●	●	●	⊙
	Other	Other metals on request (e.g. selective precious metal plating, mixed plating, etc.)				
Protective effect	NSS <sup>6</sup>	■■■□	■■■■	■■■□	■■■■	■■■□
	K2S <sup>2</sup>	■■■□	■■■■	■■■□	■■■■	■■■□
Layer characteristics	Contact resistance <sup>7</sup>	■■■■	■■■■	■■■■	■■■■	■■■■
	Coefficient of friction <sup>8</sup>	■■■□	■■■■	■■■■	■■■■	■□□□
	Soldering/bonding <sup>7</sup>	■■■■	■■■■	■■■■	■■■■	■■■■
Usage	Rack	●	●	●	●	●
	Barrel	●	●	●	●	●
	Reel-to-reel	⊙	●	⊙	●	⊙
Information				Simplified handling	Simplified handling	Organic-free
	Hints and special characteristics		Excellent suitable for reel-to-reel lines		Excellent suitable for reel-to-reel lines	Extremely temperature-resistant protection
			Electrochemical		Electrochemical	

### Legend precious metal base and usage

- Optimized
- ⊙ Useable
- Not useable

### Legend protective effect and layer characteristics

- Excellent
- Very good
- Medium
- Weak
- None

- 1) Thioacetamid test
- 2) Potassium sulphide test
- 3) Ammonium sulphide test
- 4) Sodium sulphide test
- 5) Protective effect in reality

- 6) Neutral salt spray test
- 7) Indication of stability
- 8) Indication of reduction

## Excellent Silver Passivation ( $K_2S$ -Test 2%)

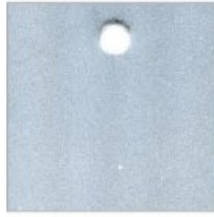
Sealing 692 Concentrate 10 ml/l, 55°C applied to silver



Reference  
without Sealing



3 Minutes  
with Sealing



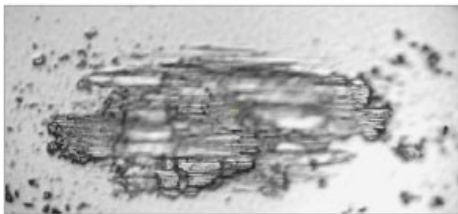
5 Minutes  
with Sealing



7 Minutes  
with Sealing

## Umicore Sealing 692 reduces friction forces

Friction marks after 500 friction cycles



COF\*: 0,76  
Pure silver without Sealing

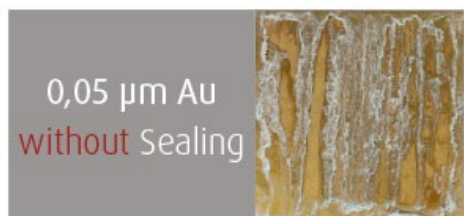


COF\*: 0,04  
Pure silver with Sealing

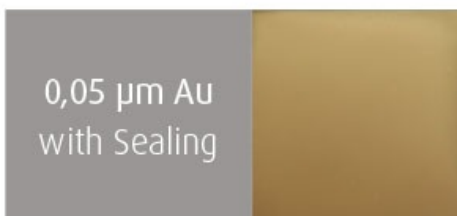
\* COF = Coefficient of Friction

## Excellent Resistance in Salt Spray Test

72h NSS Test (Ni/Au plated)



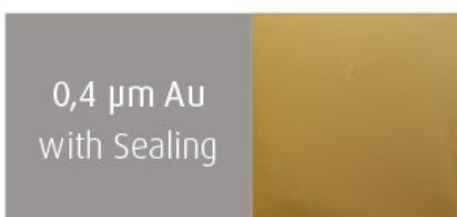
0,05 µm Au  
without Sealing



0,05 µm Au  
with Sealing



0,4 µm Au  
without Sealing



0,4 µm Au  
with Sealing

## Your contact person



### **Markus Legeler**

Manager Sales International

T: +49 7171 607 204

F: +49 7171 607 316

[markus.legeler@eu.umicore.co](mailto:markus.legeler@eu.umicore.com)  
[m](mailto:markus.legeler@eu.umicore.com)