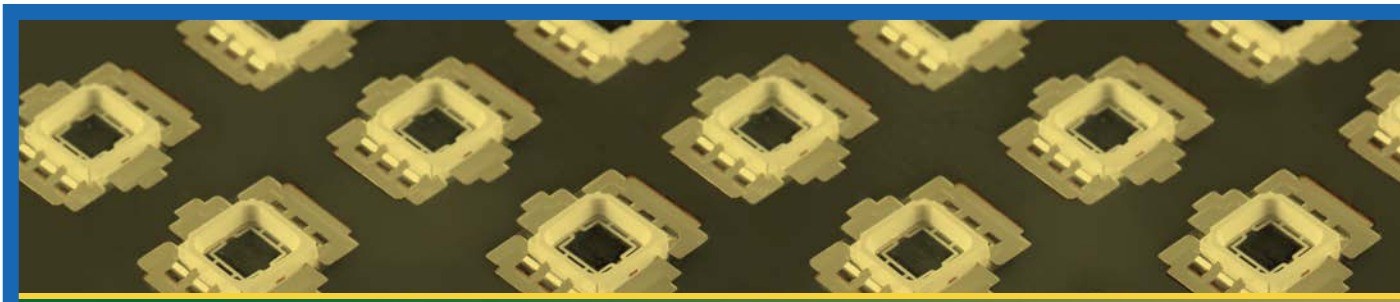
surface performance



LEADING REEL TO REEL MANUFACTURER GETS 10X THE SULFIDE RESISTANCE WITH SEALING 691 FROM UYEMURA

Uyemura was recently invited to a major reel-to-reel processor where a silver application was "barely passing" the standard 30-second potassium sulfide dip test. Specifically, surfaces browned in 25 to 35 seconds, causing frequent rejects.

The processor agreed to test Sealing 691, Umicore's higher-performing successor to its successful Antitarnish 616 process, along with two other competitive products. In these head-to-head tests, where samples were immersed in the 2% K2S solution at 25ºC, both competitor products exhibited visible corrosion after 30 seconds.

The Sealing 691 samples were corrosion-free at 5 minutes, a result identical to results published in *Products Finishing* magazine (March, 2016.)

(cont'd p.2)

A Proven Solution for Southbound Silver

One of our suppliers recently calculated that more than 60% of US-made silver plated parts are shipped to assembly plants in Mexico, where warm, humid storage conditions are common.

"Many parts are subsequently used in assemblies, so tarnish is a serious issue," according to Umicore Product Manager Rich DePoto. "Fortunately," he says, "there is a practical solution, and UIC is reaching out to OEMs, as well as our customers who supply them, with the proof.

"Clearly, the original specification regarding tarnish resistance was generated based on what was possible in the past," says DePoto. "Sealing 691 has changed that – and dramatically. Sealing 691 establishes a new standard for OEM antitarnish protection, and its low dwell formulation actually speeds up the line.

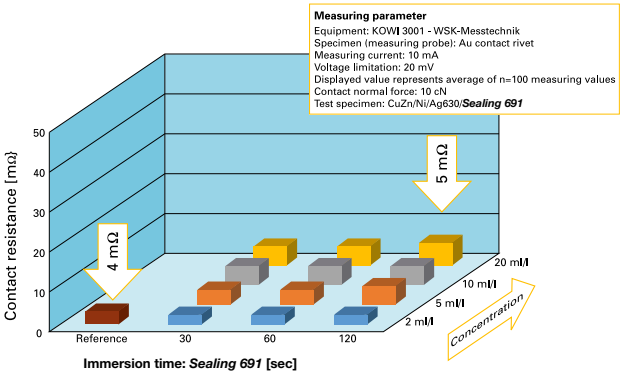
"We feel the (existing) OEM spec of 30 seconds can be dramatically increased," he adds. "There is no doubt that storage and shelf life in warmer, wetter climates, including Mexico, can now be managed - with benefits for everyone in the supply chain."

(cont'd from p.1)

The widely anticipated introduction of Sealing 691 is significant on several fronts:

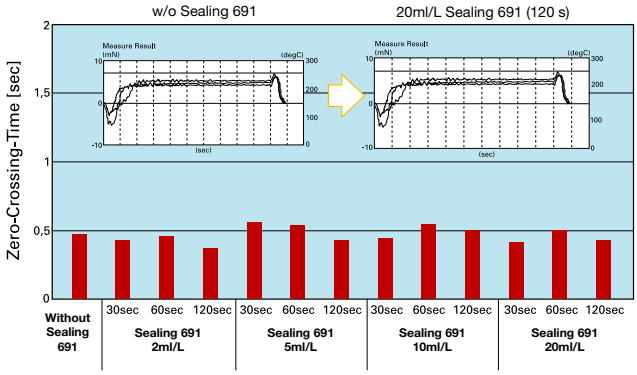
- Most notable for R2R processors, the coating has an application cycle under 5 seconds.
- Enhanced nanoscale layers can be applied with standard aqueous immersion processing.
- New additives have boosted corrosion protection.
- Layers applied with an electrical potential can be deposited at high density (low porosity), resulting in even greater corrosion performance.*
- Sealing 691 maintains contact resistance ≤ 10MΩ: there is no degradation of electrical properties.
- Sealing 691 is fully compatible with soldering.

***Sealing 691* Maintains Contact Resistance Well Below 10MΩ**



In addition to silver, performance has been studied on ultra-thin hard gold. Brass samples with a 2-3 micron layer of nickel and a 0.08 micron layer of gold-cobalt were subjected to a Neutral Salt Spray

Sealing 691 Solderability Zero-Crossing is Well Below 1 Sec.



test. After a 10-second exposure at standard concentrations with current, samples with a layer of Sealing 691 exhibited no visible corrosion after 72 hours. Patterns on which a monolayer was applied showed minimal corrosion. Untreated samples had multiple corrosion sites at 72 hours.

Sealing 691 is Umicore's new generation of nanotechnology-based anti-tarnish processes. It provides high levels of protection from tarnish and corrosion, and more robust technical properties than alternatives available anywhere in North America, Europe or Asia. For details and test processing, contact Uyemura.

* When silver patterns were immersed in a 2% K2S solution for 10 seconds and electrolytically treated with 5V, there was no change after 5 minutes. Samples without current exhibited clear evidence of corrosion.

Sealing 691 is now available throughout North America exclusively from Uyemura.

The air pollution in much of Mexico contains significant concentrations of sulfide in the form of H2S - hydrogen sulfide. H2S is a highly corrosive pollutant, and Mexico has many sources: industrial emission stacks, vapor ducts, noise silencers, cooling towers, geothermal wells, municipal sewage systems.

It is a by-product in the purification of natural and refinery gases, and kraft pulp and paper manufacturing.

In addition to tarnishing, corrosion films form an insulating layer on silver surfaces that causes electrical failures in microelectronic devices.

"Reel to Reel processors now have 3 more powerful allies in their push for greater productivity"

High Speed R2R Offerings Expand with Zero-Ammonia Zero-Chloride Pd Electrolytes

Increased bath stability, low odor, ability to plate higher thicknesses, chloride elimination are key benefits

Palluna ACF-800 neutral pure palladium electrolyte plates directly on nickel or copper within a wide operating window. Most important, it solves the issue of palladium cracking. ACF-800 is a certified crack-free ammonia and chloride free palladium electrolyte. Without ammonia, off-gassing ceases to be an issue, stability is high and odor is non-existent. Ductile, ultra-bright deposits have a hardness of 280 HV. Ideal for PCBs, contacts on plug-in cards, smartcards.

Palluna ACF-100 palladium nickel electrolyte also produces ductile, crack-free deposits that resist abrasion. With contact properties comparable to hard gold, it is a cost-effective option; the electrolyte deposits alloy coatings of approximately 80% Pd; hardness is 500-550 HV. ACF-100 is ideal for electrical contacts.

Both Palluna electrolytes meet high speed plating specs of 12 to 25 ft./minute.

Miralloy 2841 was engineered for R2R equipment. Copper-tin-zinc alloy deposits up to 2 µm at .9 µm/minute. 2841 is low foaming, and maintains the brilliance of base materials. Deposits are diamagnetic, with abrasion resistance and hardness equal to electroplated nickel.

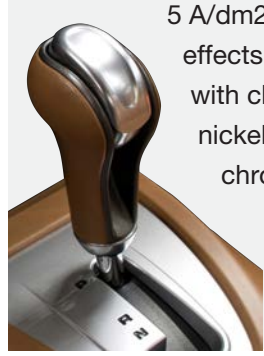
Reel to reel plating electrolytes are a UIC specialty. For details and options for your applications, contact Uyemura.

Satin Nickel Goes the Distance to Minimize Downtime

Solution Operates 16 Hours Before Filtration is Needed

Users of CL Satin Nickel from UIC benefit from two full shifts of production between filtration / solution purification, substantially reducing the downtime that's typical of competitors' products.

CL Satin Nickel produces uniform nickel deposits with a fine, coarse or extra coarse grain; the 3 are interchangeable within the same solution and can be top-coated. Deposition rate is 1 µm/minute at 5 A/dm2. Various color effects can be achieved with chrome, antique nickel, black nickel, black chrome and gold; resistance to fingerprinting is exceptional.



Sur-Fin Talk: 2 Steps Defeat Tin Whiskers

Al Gruenwald (left) and Masanobu Tsujimoto will present *"The Elimination of Whiskers from Electroplated Tin."* Monday, June 6. New data will be presented showing that controlled micro roughening of the substrate and the use of plating additives controls the growth in thickness and propagation of the IMC and modifies the tin deposit crystal structure, limiting whisker formation.

Major Appointments Announced for the Midwest, East and West Coast

Robert Coleman is UIC's new Midwest Sales Manager. Coleman will be based in Chicago, with responsibility for UIC activities throughout Illinois, Wisconsin, Minnesota, Colorado, Texas, Ohio and Michigan.

Coleman is a 33-year veteran of the PCB industry, with extensive experience in manufacturing and operations as well as global account management. He is recognized as an expert in wet process chemistries and through-hole metallization.

Coleman was most recently Vice President of Operations for American Standard Circuits and, previously, Managing Director of Asia for RBP Chemical Technology.

Says Coleman, "The decision to join UIC was an easy one: it is widely viewed as the industry's leading value-added company. It's also in a solid upward trajectory, due to its superior technology. Frankly, no sales manager could ask for more."

Joanna Rafalowicz is the Tech Center's new Quality Assurance Specialist. Ms. Rafalowicz has a strong background in manufacturing, including both lean technology and quality management.

Her primary responsibility will be the statistical management of finished products; she will also qualify raw materials against UIC specifications and manage audits, both internal and external.

Rafalowicz was previously a Quality Control Analyst at Roche Applied Science. She has extensive experience with ISO 9001, advanced training in HPLC (High Performance Liquid Chromatography and DQM (Design for Manufacturability) and holds a Lean Six Sigma Yellow Belt Certificate.

April Labonte is the new Tech Service Engineer for Southern California.

Her responsibilities include line audits, troubleshooting, installations and a full complement of customer service tasks.

LaBonte was formerly a Wet Process Engineer for Viasystems/TTM, where she worked with product design and process methodology, monitored process operations, performed root cause analyses and provided ongoing support for manufacturing operations.

More Great Reasons to Attend... SUR/FIN

UIC's Rich DePoto and Umicore's Robert Ziebart will deliver a talk at Sur-Fin titled ***"Advanced Nano Chemistry Coating Achieves Low Dwell Time and Anti Corrosion Protection for High Speed Plating Applications."***

The talk, scheduled for Monday, June 6, will focus on compatibility with reel to reel applications, and will include the developmental criteria and mechanism of this technology, which uses hydrophilic and hydrophobic reactions.

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