PRESS INFORMATION FOR IMMEDIATE PUBLICATION

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Metal Deposition Solutions

ARGUNA® C-100 meets the technical requirements of the industry

SILVER-GRAPHITE COATING AS NEW STANDARD FOR PLUG CONTACTS IN HIGH-POWER APPLICATIONS

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Umicore MDS has developed a silver-graphite dispersion electrolyte specifically for coating connector contacts in high-power applications (e.g. high-power charging / HPC). The electrodes coated with silver dispersion layers deposited with the electrolyte (ARGUNA® C-100) prove to be extremely stable even at elevated temperatures and enable maximum charging power the entire service life of the charging plugs.

Silver coatings deposited with ARGUNA® C-100 thus meet the increased requirements of the industry in terms of reliability and durability for connector contacts. This coating has the potential to become the new standard for high current applications.

TECHNICAL REQUIREMENTS FOR SILVER COATINGS HAVE SO FAR BEEN NOT FULFILLED

The longevity of previous connector contacts for transferring high charging power from the power source to the application or battery is not yet satisfactory for manufacturers or suppliers. Coatings with fine silver are of course state of the art in terms of electrical and thermal conductivity. The tendency to cold welding in conjunction with low hardness and a high coefficient of friction leads to rapid wear of the silver coatings when mated frequently. In order to achieve the required mating cycles and to minimize wear, additional contact lubricants are therefore used on the silver surfaces. Due to the accumulation of dirt and dust particles, corrosive or abrasive foreign layers can form here over time, which can lead to an increase in temperature and a reduc-

tion in charging performance.

Hard silver coatings (silver alloys) have a significantly higher hardness and show noticeably improved vibration resistance in some applications. However, added metals have a detrimental effect on electrical conductivity and the coefficient of friction is usually close to the fine silver level.

The desire for durable and high-performance silver coatings for such high-power applications is obvious. Particularly in the field of electromobility, a shortened service life of charging plugs can not only cause enormous costs due to material, time and service expenditure - the image also suffers. If a permanently installed vehicle inlet of an electric car has to be replaced at an early stage and at great expense, or if the charging performance of the charging infrastructure continuously decreases, the reliability and quality of the supplier is often quickly called into question.

Exceptional abrasion resistance at maximum loading performance

ARGUNA® C-100 achieves extraordinary abrasion resistance through embedded graphite particles in the silver layer and thus the high reliability and durability of the contact coating and the charging plug desired by the industry. This is made possible by an optimized graphite component, which is embedded in the silver matrix and acts as a solid lubricant. With each friction process, a new surface is new surface is created and the abraded tips of the graphite lamellae are distributed over the friction surface. The usual abrasion of the silver surface is prevented, the contact resistances are kept small and thus a continuously high charging performance is ensured.

"Under laboratory conditions, an end-of-life tribometer test proves the low and stable coefficient of friction of the ARGUNA® C-100 coating system. Even after more than 50,000 mating cycles, an intact silver graphite layer can be and cross-compatibility with other mating con-

tact materials (e.g. fine, hard or dispersion silver coatings) completes the required functionality in the field," explains Friedrich Talgner (Head of Technical Applications).

ARGUNA® C-100 thus combines and extends the positive properties of fine and hard silver. On the one hand, the fine silver matrix has excellent electrical conductivity; on the other hand, the maintenance-free solid lubrication of the graphite simultaneously increases abrasion resistance and thus reduces wear even with a high number of mating cycles.

SOURCES AND MORE INFORMATION ONLINE:
http://mds.umicore.com/arguna-c-100

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ARGUNA® C-100 is not only convincing in electromobility. The silver-graphite dispersion electrolyte can also increase the service life of plug contacts many times over in other industrial applications of connectors and high power transmission.

Image: Shutterstock

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ARGUNA® C-100 was developed especially for high-current applications such as high-power charging (HPC).

Image: Shutterstock

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Contact socket and contact pin for EV charging plug coated with the silver-graphite dispersion electrolyte ARGUNA® C-100 from Umicore

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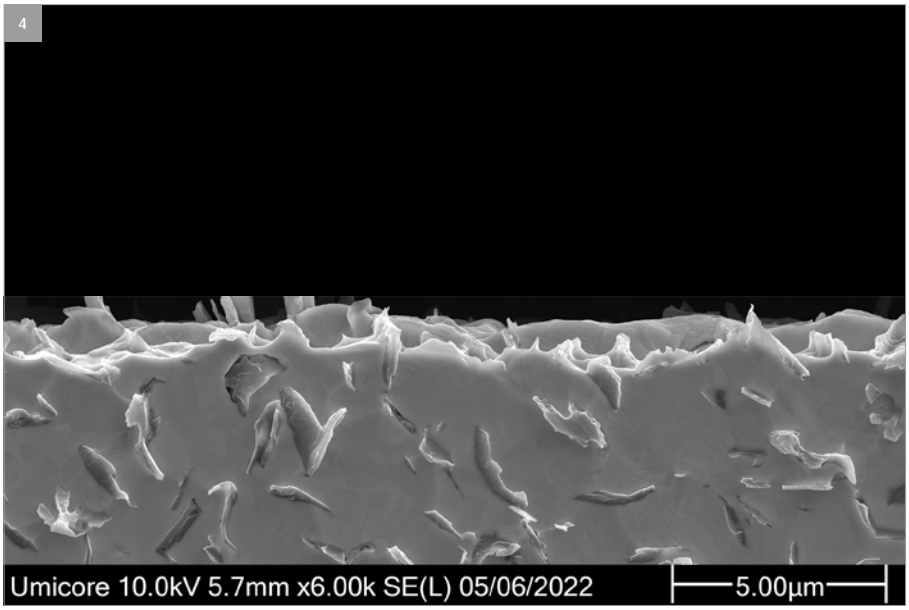

The statistically random distribution and incorporation of the graphite lamellae in the electrodeposited silver matrix is shown by a prepared ARGUNA® C-100 layer under a scanning electron microscope. Here, the silver matrix was selectively etched back and the incorporated graphite lamellae remain in their position.

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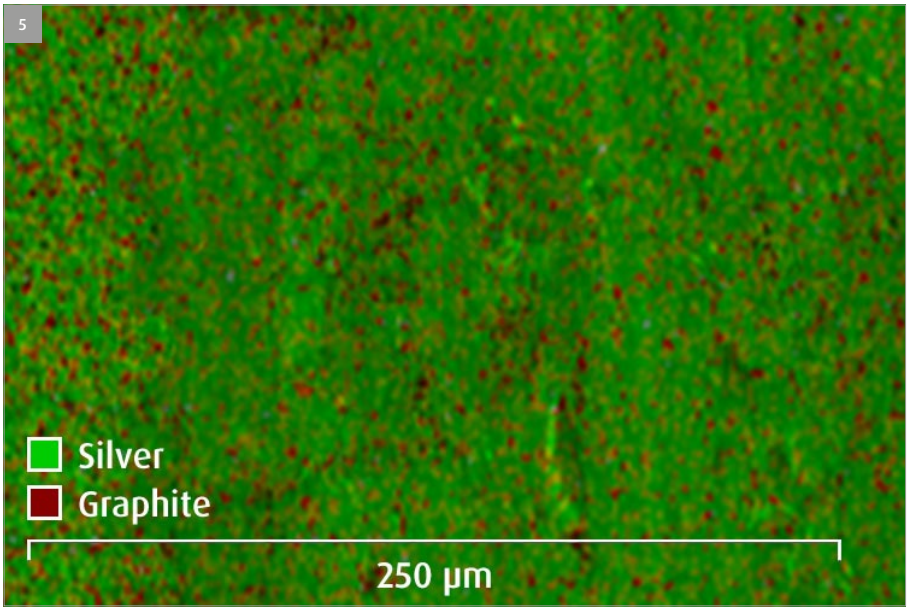

A view via element scan (EDX X-ray spectroscopy) of the contact surface shows the uniform and fine distribution of the graphite over the surface.

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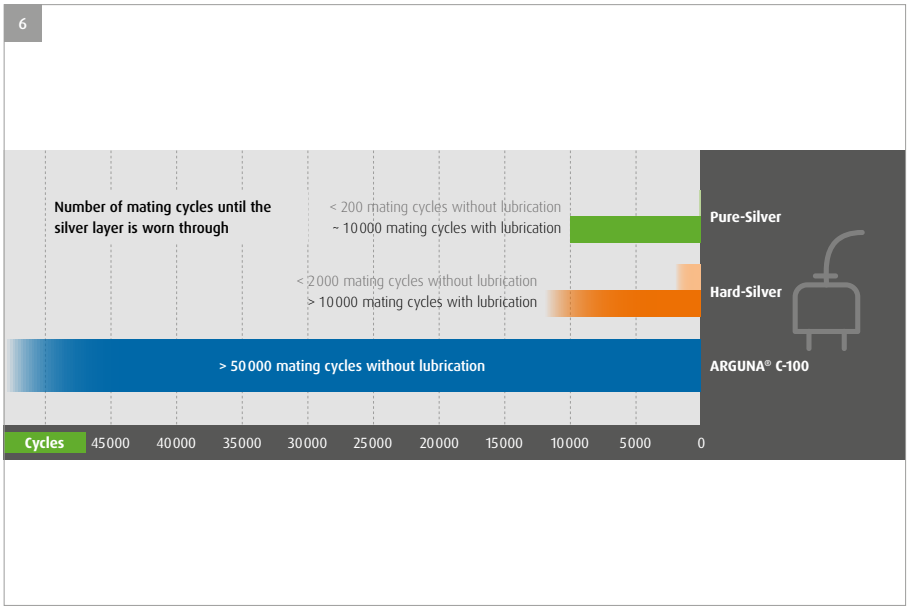

An end-of-life tribometer test shows the low and stable coefficient of friction of the ARGUNA® C-100 coating system. Even after more than 50,000 mating cycles, an intact silver graphite layer is detectable.

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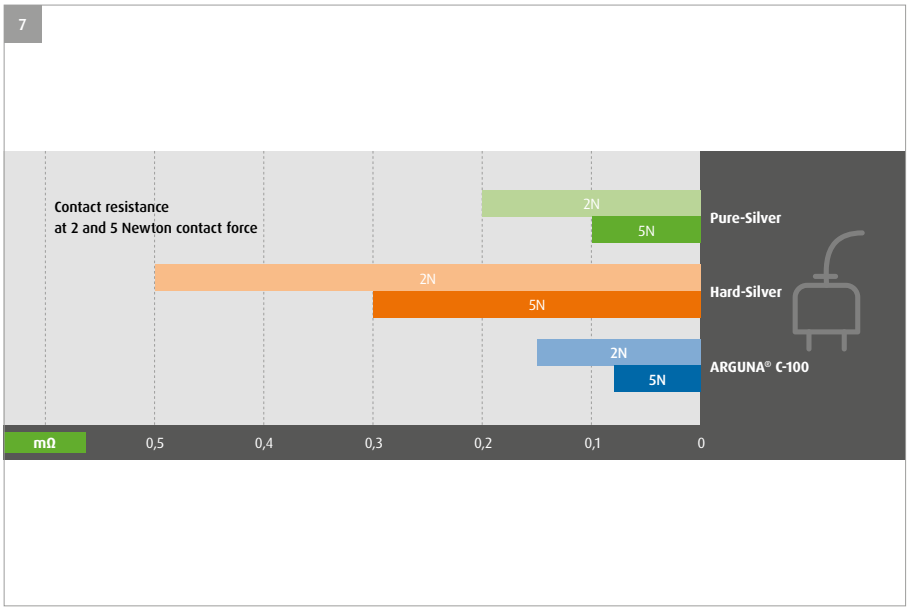

Fine silver has the highest electrical and thermal conductivity of all metals, making it the functionally preferred charging contact coating to date. ARGUNA® C-100 lasts many times longer in comparison and tends to show lower contact resistance.

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Friedrich Talgner
Division Manager Technical Applications

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Product group
ARGUNA® C-100

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ABOUT UMICORE METAL DEPOSITION SOLUTIONS

Within the Umicore Group, the Metal Deposition Solutions (MDS) business unit is the business headquarter 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: www.mds.umicore.com

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