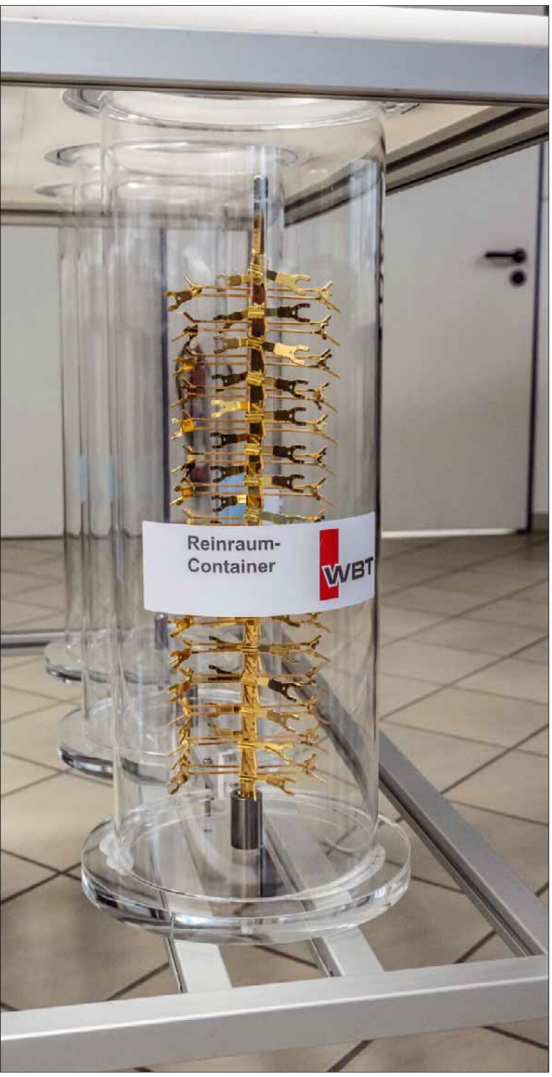
News from the Plug Pros

No one would seriously doubt that the audio connectors from the Essen-based manufacturer WBT are in a class of their own. There are reasons for this, and there are more and more: At WBT, constant progress is the order of the day.

Here, the air is extracted from the new vacuum transport containers

Preface

Fortunately, it only takes 20 minutes to reach the hallowed halls of WBT in the Kettwig district of Essen from Duisburg. And even if there is no brand-new product in the starting blocks, it is worth asking how things are going here from time to time. Company boss and name-giver Wolfgang B. Thörner, an engineer and product developer through and through, has taken up the cause of „process development." In other words, the aim is to optimize existing processes. It's about making them faster, more effective, and – he attaches great importance to this – more environmentally compatible.



In the clean room containers, polished parts can be stored temporarily without problems before coating

Electroplating vs. PVD technology

We remember the last major innovation with which WBT supplied the hi-fi world. It concerned how the gold surface is applied to the connectors. Gold is still an optimal solution due to its corrosion resistance, but applying it to contact surfaces is difficult. The entire connector world market - not just the tiny hi-fi corner - gilds its surfaces electrochemically (galvanically). For this to work well, a nickel intermediate layer must still be applied to the carrier material. This is not optimal because of the magnetic properties of nickel, and the two additional „microstructure transitions“ also have a detrimental effect.

For this reason, WBT made considerable investments a few years ago to deposit gold directly onto the substrate using the „PVD“ (Physical Vapor Deposition) process. The advantages of the process are undisputed: The coating is more durable, thinner, and more homogeneous. It is also far less harmful to the environment than electroplating processes, which use more troublesome chemicals.

The electropolishing system creates perfectly smooth surfaces and operates very energy-efficiently

Brand new: this plant is for the recovery of "misdirected" gold

The process is running smoothly, and all WBT gold surfaces are now produced this way. We reported in detail on the process and its advantages at the time.

Progress in detail

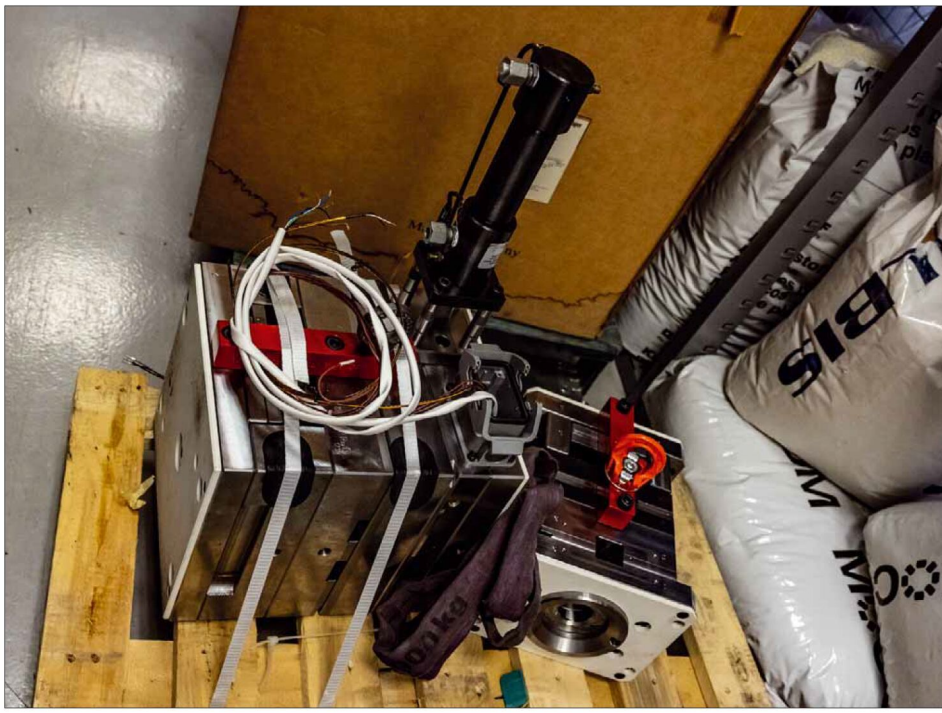
For the PVD process to show truly perfect results, the „substrate," i.e., the surface to be coated, must be clean and smooth. In addition to the coating itself, cleaning and polishing processes are the two other crucial procedures in which WBT has made significant progress in the recent past.

And what do you, as a user, get out of it? A better product and a cleaner conscience. The former is because the electrically polished surfaces are now so smooth that they form an alloy-like bond with the gold coating. No other technology allows two mate-

Overmolding metal parts with plastic is a process that WBT has perfected over the years

rials to bond so intimately, which benefits both signal transfer and long-term stability. Adding to the conscience is that WBT can deposit 80 percent of the gold used on the workpiece. Elsewhere, PVD technology achieves just 20 percent, representing a considerable cost factor in production. But that's not all: WBT has now put a gold recovery system into operation that further minimizes material losses.

The electropolishing process is also interesting: Although it operates at high voltage (330 volts) and high current (600 amperes), the process takes only 40 seconds for 70 connectors. The resulting energy requirement is 2.2 kilowatt hours, so the energy requirement per component is gratifyingly low.



The injection molding tool for the new RCA connector, which is not quite finished yet

The cleaning procedure for the contact elements also includes a pass in the ultrasonic bath

This is the new RCA connector WBT 0120: Series production is expected this year

Outlook

WBT has come a long way in optimizing its processes, in many respects, farther than any other user of PVD technology. Of course, this does not remain without consequences for product development: Why does it always have to be gold on copper? Efforts are being made to coat non-conductive materials with gold, which opens up new possibilities in the small-signal range. Moreover, anyone who can transport electricity via contacts as efficiently as WBT is naturally also thinking about applications other than those in the audio sector: electromobility is a huge topic here.

For the time being, the Essen-based manufacturer will remain committed to euphony and continue to develop its products. The most recent example is the WBT0120 nextgen RCA connector, where the collet locking mechanism, which can be locked by turning, has been replaced by an uncomplicated clamping lever on the side. The prototypes are already feeling good, and series production is scheduled to begin this year.

Holger Barske

Here, WBT is carrying out tests with anodized aluminum as a contact carrier – it doesn't always have to be copper

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