

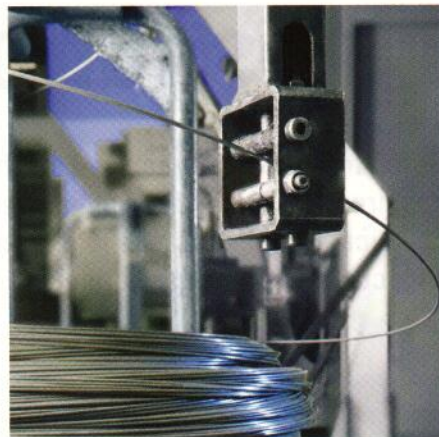
conventional multiple-layer to the single-layer process results in a considerably lower drag-in of solids during the forming process and thus in improved cleanliness of the machine. The considerably reduced contamination of the whole system guarantees an extended oil lifetime. There's even more: "The forming tools' service life will increase, too", explains Bechem sales engineer Jürgen Schoppe: "In practice, up to 20% longer forming tool lifetime is possible".

#### Cleaner machines

This is also confirmed by the machine constructor and development partner Jankowski GmbH + Co. KG, Horhausen, Germany. The products are currently successfully used in various industrial applications, whether in rod wire production or in the production of screws, bolts, and other connecting elements. This demonstrates the flexible applicability of the product. The new lubricant can be applied by coating of, for example, individual wire sections, by dip coating of complete rod wire coils or in the drawing box in wire drawing processes. In wire drawing the annealed wire is coated with the lubricant in the final draft. The special

mixture of organic and inorganic components offers excellent corrosion protection, which in turn allows long storage life without quality loss. Intermediate storage is, however, no longer necessary. For the first time a process-reliable inline manufacture is conceivable, says Jens Ostrowski, head of R&D oil/forming technology at Bechem. In this process, untreated semi-finished parts are mechanically cleaned. After a calibration process, using the Beruforge 150 coating system, the parts will undergo the forming process.

After the forming process the lubricant residues can be easily removed. "Besides the technical advantages, the biggest potential is process optimisation", says Ostrowski. In addition to energy savings, this also means considerable reductions in declarable disposal costs in many cases. Considering the huge market volume of steel wire semi-finished parts in the various industries and the efforts of industry with regard to sustainability and resource efficiency, the enormous market potential becomes evident. The application possibilities of this lubricant in forming technology are still at the very beginning. However, the dimensions of



The semi-finished part is cleaned and, coated with Beruforge, will undergo the forming process after calibration.

this new technology can be already recognised today, and they are a clear sign of big changes – not only in wire production.

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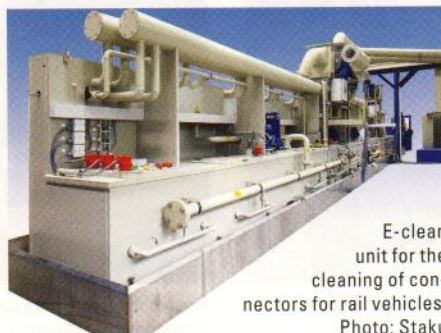
## Electrolytic pre-treatment and finishing

At the international "wire 2012" exhibition, Staku Anlagenbau unveiled its new electrolytic processes for the cleaning and coating of metal and non-metal surfaces marketed under the trade name "e-systems". e-systems is the new umbrella brand of Staku's tried and tested e-phos, e-clean and e-copp systems that have been perfected over the years. It has been shown that e-clean technology currently used in more than 14 in-line plants as well as coating with e-phos (12 plants) and e-copp (26 units) provide for products of unrivalled quality.

The e-systems methods are effective and fast. Surface cleaning takes only 4 seconds, which is a fraction of the time required for conventional methods such as HCl pickling, which is around 8 minutes. e-clean simply removes unwanted particles such as scale or stearate are simply blasted away by the gas bubbles formed on the surface of the metal by electrolysis. The surface is perfectly clean and meets even the most stringent standards. The patented e-phos technique is particularly recommended for the production of parts made from cold-headed wire, for spring wire products and the drawing of steel wires. The extremely dense, microcrystalline

zinc-calcium phosphate layer produced on the wire surface guarantees not only excellent sliding properties and high compressive strength, but also great protection against corrosion. The technology does away with phosphate sludge and the need for wastewater neutralisation as is the case with pure chemical phosphate immersion treatment. As no sludge of any kind is produced in the electrolytic e-phos process, there is no need for routine cleaning of the plant or the disposal of hazardous waste. The main advantage of the e-copp electrolytic copper plating process is the short treatment time. Operators also appreciate the fact that the bath remains clean and does not become

contaminated by an increase in the iron concentration as is the case with conventional, non-electric methods. e-copp thus does away with the costs for the safe disposal of the bath content, which often contains substantial amounts of unused copper. Electrolytically applied copper layers are also more compact and homogeneous and less porous. All methods of the e-systems range offer excellent product quality at extremely short treatment times, use less chemicals and are more energy-efficient. The processes do not lead to contaminated baths. e-systems thus protect the environment, improve productivity and help reduce production costs, as has been confirmed by many customers of Staku Anlagenbau GmbH. Since the launch of the e-systems plants, orders have increased from Euro 1.9m to 3.6m.



E-clean unit for the cleaning of connectors for rail vehicles. Photo: Staku

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