PRESS RELEASE

Environmentally friendly steel coatings: Fraunhofer ILT wins Steel Innovation Award

Once every three years, the German steel industry presents its Steel Innovation Awards. The purpose of this initiative is to recognize innovations that are helping to ensure this material remains a viable choice for the long term. The jury considers not just products made from steel, but also innovative processes such as Extreme High-speed Laser Material Deposition (EHLA). For the development of the EHLA process, researchers from the Fraunhofer Institute for Laser Technology ILT in Aachen won the Joseph von Fraunhofer Prize in 2017. On June 13, 2018, the researchers were honoured with the 2nd Prize of the Steel Innovation Award in the "Steel in Research and Development" category for their eco-friendly laser-based alternative to chromium(VI) plating.

Heidelberg-based artist Stefanie Welk describes how steel wire is transformed in her hands into "highly dynamic three-dimensional drawings permeated with light and air". On June 13, 2018, one of these coveted trophies, featuring the wire sculpture of a runner, was presented to Thomas Schopphoven, head of the Productivity and System Technology team in the Laser Material Deposition group at Fraunhofer ILT, and Gerhard Maria Backes, scientist from the Chair for Digital Additive Production DAP at RWTH Aachen University.

High-speed deposition of thin coatings using laser light

Welk's dynamic works of art are the perfect match for the EHLA process. This award-winning technology represents a huge leap forward in efforts to protect highly stressed metal components against wear and corrosion – a job that used to primarily fall to hard chrome plating. The extremely fast Aachen variant of the well-known laser material deposition process has recently led to a rethink in the surface engineering industry concerning the use of coatings based on controversial chromium(VI) compounds. EHLA melts metal powder particles directly in the laser beam and boosts the process speed from the current maximum of several meters a minute to speeds as high as 500 meters a minute. And as well as being extremely fast, EHLA also scores highly for its very economical use of materials. The process reduces the producible layer thickness from over 500 micrometers to between 25 and 250 micrometers.

The EHLA concept has already made some major inroads. Since 2015, the company IHC Vremac Cylinders B.V. – headquartered in Apeldoorn in the Netherlands – has used EHLA to coat hundreds of hydraulic cylinders for offshore applications all over the world. Measuring up to 10 meters in length and with diameters of up to 500

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millimeters, the cylinders are coated with alloys that protect them from wear and corrosion even under the toughest conditions. The Ditzingen-based company TRUMPF Laser- und Systemtechnik GmbH now offers laser systems in its TruLaser Cell range that can apply the EHLA process to components of varying sizes.

Success in the Far East: four EHLA systems already in use

Many of the customers ordering this new system are based in China. In 2017, Aachen-based ACunity GmbH – a spin-off of Fraunhofer ILT – supplied various machines to the Advanced Manufacture Technology Center in Beijing, including a 5-axis system with specially tailored EHLA nozzle technology. The government research institute is heavily involved in research into new, environmentally friendly processes that make economical use of resources. Based on the preliminary test results, a Chinese company recently decided to purchase three large-scale EHLA systems to apply eco-friendly coatings to offshore hydraulic cylinders. And plenty more orders are likely to follow, says ACunity managing director Chen Hong optimistically: "Demand for the EHLA process is huge, because China is also set to emulate the European model by regulating hard chrome plating over the course of the next two years."

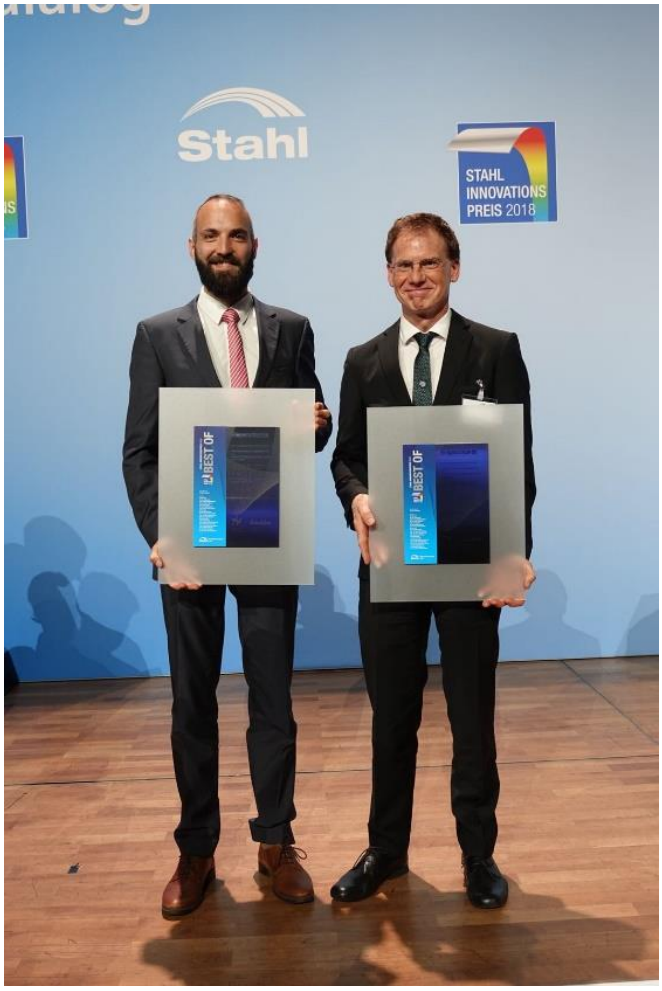

Image 1:
On June 13, 2018, the Fraunhofer ILT team took 2nd place at the Steel Innovation Awards in Berlin in the "Steel in Research and Development" category for their Extreme High-speed Laser Material Deposition (EHLA) process.
Left: Thomas Schopphoven (Fraunhofer ILT), right: Gerhard Backes (Chair for Digital Additive Production DAP at RWTH Aachen University).

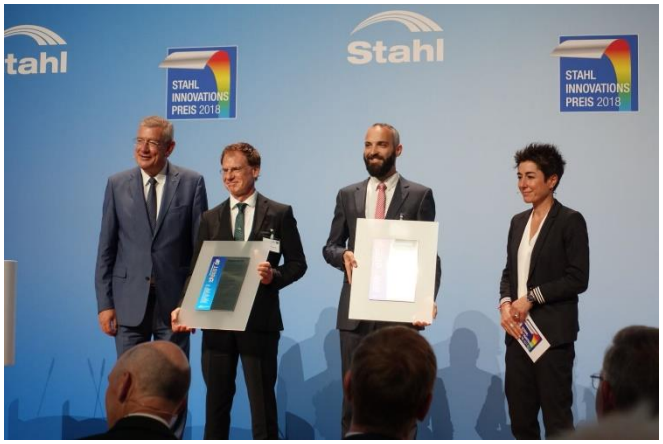

Image 2:
l.t.r.: Arndt G. Kirchhoff (Kirchhoff Automotive Deutschland GmbH and patron of the event), Gerhard Backes (Chair for Digital Additive Production DAP at RWTH Aachen University), Thomas Schopphoven (Fraunhofer ILT) and presenter Dunja Hayali.
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Image 3:
EHLA can be used to apply protective metal coatings at extremely high speeds.
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