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Laser4Fun with DLIP

The Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS is receiving an EU grant for a Marie Sklodowska-Curie project titled 'Laser4Fun' involving the machining of surfaces with lasers. Researchers of the Fraunhofer IWS are becoming increasingly successful in adding a particular function to an existing surface using direct laser interference patterning (DLIP). This results, for example, in bacteria-free medical equipment in hospitals, or water and oil repellent products in the packaging industry.

In Laser4Fun (fun = functional), laser sources with an extremely short pulse duration will be applied. The major advantage of such an extremely short laser pulse is that there is very little thermal response from the material processed. The material therefore does not melt, but is removed in a 'cold'manner, since chemical bonds are broken. As a result, it is as if atoms 'break' from the material, rather than melting, vaporizing and being blowing away.

Using the latest laser techniques, many surfaces of existing products can be accurately treated. The technique can replace the special coatings that are currently applied to existing materials for surface improvement. The biggest challenge in the project is to realize a higher laser processing speed. In order to apply the latest techniques further on an industrial scale, scaling-up is required. Therefore, techniques such as Direct Laser Interference Patterning (DLIP), in which multiple laser beams are combined to create an interference pattern of multiple 'laser spots', will be studied. This allows performing the operation much faster than it is done with one single laser spot. In the project, also hybrid technologies will be developed, in which the laser treatment will be combined with other techniques. For example, it is possible to first treat the material with a laser beam and in a subsequent step, to remove the treated material using a chemical etchant.

Further information

Laser4Fun is receiving an European Marie Curie “European Training Network” grant of 3.5 million euros. From the grant as many as 14 Early Stage Researchers will be recruited for research positions in the frame of a PhD doctoral programme, targeting a PhD degree. This European Training Network involves joint research training of the PhD-candidates at 10 partners from in and outside academia. The researchers’ aim is to experience different sectors and develop their transferable skills by working on this joint research project. Besides the Fraunhofer IWS, other well-known universities and institutes, participating in the project, are University of Twente (The Netherlands), Technical University of Madrid (Spain), University of Bari Aldo Moro (Italy), University of Birmingham (UK), Leibniz-Institut für Polymerforschung (Germany). Industrial partners in the project are BSH Electrodomésticos (Spain), Alphanov (France), Robert Bosch (Germany) and Airbus (Germany).

The project will run for four years and starts on September 1, 2015.

Project participants at the EU kick-off meeting, September 4, 2015

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