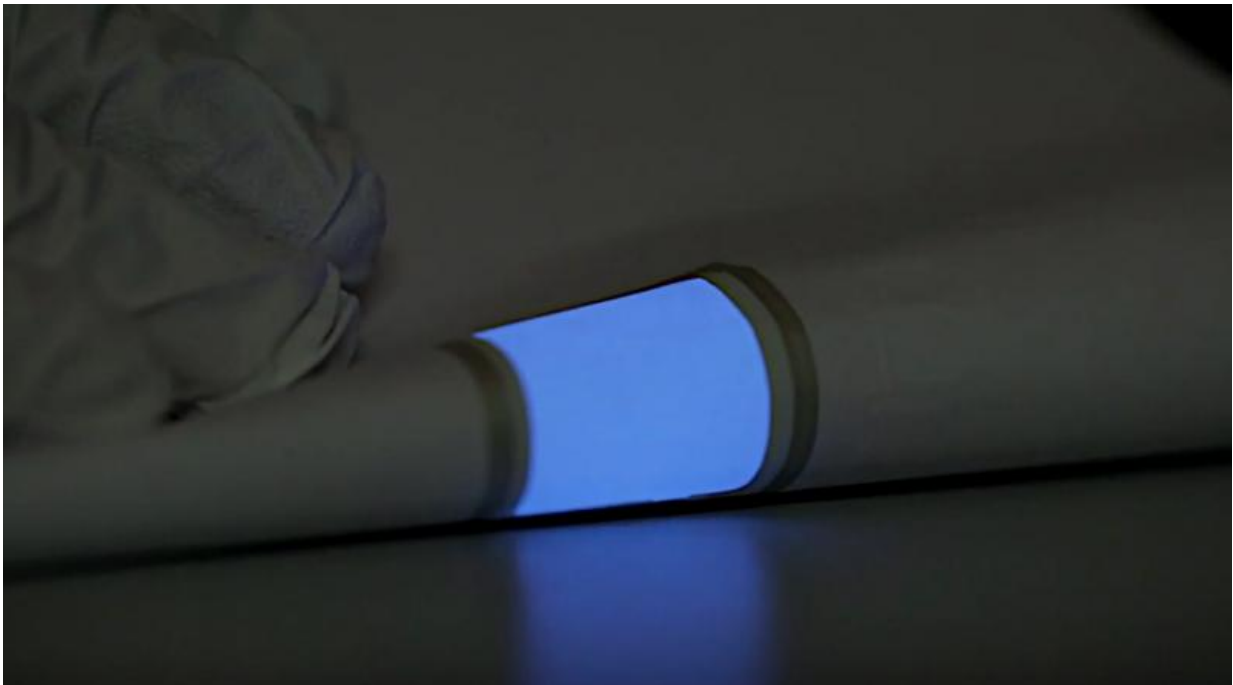


New printing process makes three-dimensional objects glow

May 20 2015



Bent and flexible surfaces of various materials, such as paper and plastic, can be provided with a coating to make them glow. Credit: S. Walter/Binder Group

Conventional electroluminescent (EL) foils can be bent up to a certain degree only and can be applied easily onto flat surfaces. The new process developed by Karlsruhe Institute of Technology (KIT) in cooperation with the company of Franz Binder GmbH & Co. now allows for the direct printing of electroluminescent layers onto three-dimensional

components. Such EL components might be used to enhance safety in buildings in case of power failures. Other potential applications are displays and watches or the creative design of rooms.

"By means of the innovative production process we developed together with our industry partner, any type of three-dimensional object can be provided with electroluminescent coatings at low costs," Dr.-Ing. Rainer Kling of the Light Technology Institute of KIT says. Usually, the luminescent material is located between two plastic layers in EL carrier foils. By means of the new printing process, however, the electroluminescent layers are directly printed onto the object without any intermediate carrier. In this way, convex and concave surfaces of various materials, such as paper or plastic, can be made glow.

The different components of the coating, including the electroluminescent and the electrically conductive materials, are applied by a novel pad [printing process](#). The pad printing machine is equipped with an elastic rubber pad that is easily deformable and, hence, excellently suited for the coating of curved surfaces.

"In this way, it is possible to provide surfaces and even spheres with homogeneous coatings at low costs," says engineer Elodie Chardin, who works on this research project. "Homogeneity of the coating of about one tenth of a millimeter in thickness was one of the challenges of this project," says the executive engineer of the industry partner, Elisabeth Warsitz. The process requires a few production steps only and, hence, is characterized by a low consumption of resources. By using various luminescent substances, various colors may be applied to the same surface.

The research and development project of KIT in [cooperation](#) with the Binder Connector Group, headquartered in the German town of Neckarsulm, took about two years and was funded with EUR 125,000 by

the Deutsche Bundesstiftung Umwelt (German Foundation for the Environment).

Provided by Karlsruhe Institute of Technology

Citation: New printing process makes three-dimensional objects glow (2015, May 20) retrieved 17 July 2024 from <https://phys.org/news/2015-05-three-dimensional.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.