

It's OWL 3P: Prevention of Product Piracy

In a fast moving age manufacturers of innovative products and products of exceptional quality are often victims of product piracy. Imitators enter the market just copying extensively developed products and reducing the deserved turnover of the original creators. To fight this current threat conscious behavior and reliable protection measures are required. As part of the technology network "Intelligent Technical Systems" OstWestfalenLippe (it's OWL) funded by the Federal Ministry of Education and Research (BMBF) the project "It's OWL 3P: Prevention of Product Piracy" focuses on raising the awareness that legal measures are not the only way to protect innovations and products against product piracy.

1. Objectives

The main objective of the DMRC's part of this project is to show potentials of Additive Manufacturing to protect product from being copied. To ease the application of those potentials measures will be developed and merged in a catalog that can be used during product developed as a kind of guideline for "design for protection". This project aims at ensuring the sustainability of investments in research and development of companies participating in the technology network.

2. Procedure

Starting with a deep analysis of the main reasons and origins of product piracy the usual procedure of copying a product will be investigated to understand a pirates' mind. Combined with the potentials of Additive Manufacturing protective measures will be developed to increase the hurdle for pirates' activities. To provide a benefit for potential users of those measures, real world application are taken into account. Measures will be applied to real products during projects runtime to generate best practices and success stories so that interested companies can be supported by examples. Finally all the measures, a selection methodology and experiences in terms of examples will end up in a guideline for companies.

3. Latest results

One main potential of Additive Manufacturing is that individualization of products becomes possible in a very economical way. Marking a product with a very individual number or a QR or Datamatrix code is just a kind of individualization and will not increase manufacturing costs using AM but allow traceability usable in case of liability or product optimization aims during products lifecycle etc. Traceability of products is very often mention as one requirement to achieve the main goals of Industry 4.0.

Other beneficial measures to avoid product piracy by the use of Additive Manufacturing are for example the following: Blackbox design to hide the main functionalities of a product; Functional integration to increase the complexity of a products' structure are therefore to complicate reverse engineering; Lightweight design very often comes up with bionic structures so that also the reverse engineering is complicated as usual 3D scanning is not able to record the whole product.

Seminars at the University of Paderborn served to validate those measures in groups of representa-



Figure 32: Production integrated marking using AM

tive subjects. All of the participants had a degree in mechanical engineering or similar and has been familiar with the use of CAD software.

They tried to act like a product pirate and documented their time needed for the specific step in the Reverse Engineering process. The results

are very useful to show the given protective effect when considering the “design for protection” already during product development or at least in the products’ redesign. Reverse engineering as the most important information source of product imitators has been complicated in each case.

4 Outlook

To fulfill the requirements of Industry 4.0 product markings in terms of machine-readable codes, the development of specification of codes is currently

ongoing. Influencing factors like orientation and position of the parts inside the build chamber of Additive Manufacturing machines will be analyzed to come with recommendations.

During the last months of it's OWL 3P protective measures will be validated further in real products to enhance the guideline with a best practice and success story section.

We are continuously looking for applications. You have one? Just get in contact with us!

Project Manager *Prof. Dr.-Ing. Rainer Koch*
Scientific Associate/s *Dipl.-Ing. Ulrich Jahnke*

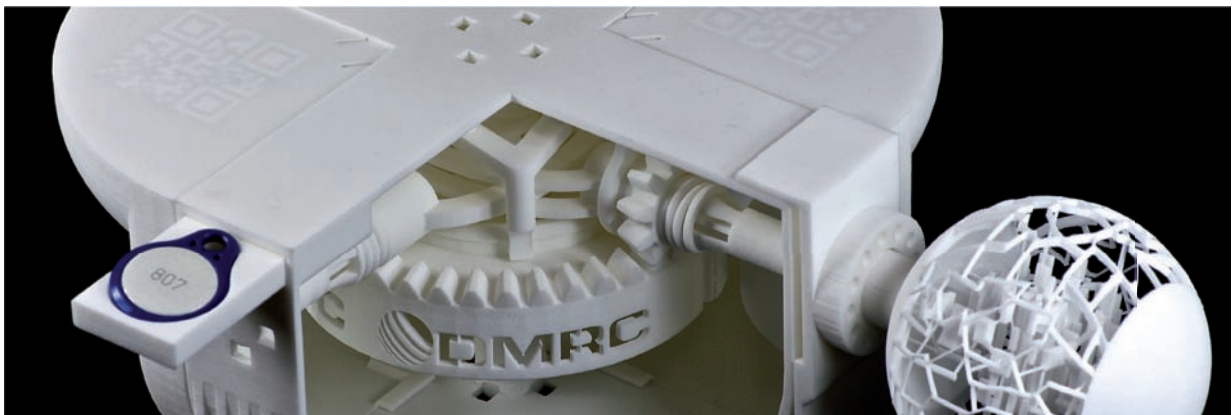


Figure 33: Demonstration of various protective measures in one fictitious product.