

REMANUFACTURING UPDATE SEPTEMBER 2013

RESEARCH & DEVELOPMENT NEWS FROM BAYREUTH



Editorial

Dear Readers,

an international remanufacturing conference in Seoul / Korea on 4th September 2013, the BIG R Show in Las Vegas / USA from 2nd to 4th November 2013, the next World Remanufacturing Summit on 4th December in Shanghai / China - we will meet there if you plan to attend one or more of these events.

But whenever you travel between Munich and Berlin, plan a stopover halfway in Bayreuth and have a look onto our work for the reman industry presented in this edition of our newsletter.

Enjoy reading!

Rolf Steinhilper



→ **Rolf Steinhilper**
University Professor
rolf.steinhilper@uni-bayreuth.de

Meet us worldwide

02 - 04/11/2013, Las Vegas (USA):

International BIG R Show, Tropicana Hotel
Visit our seminars on cleaning electronic components and operational excellence in remanufacturing

16 - 21/11/2013, Shenzhen (CN):

China Hi-Tech Fair
Shenzhen Convention and Exhibition Center
Meet us at our booth in Hall 9 at the Bavarian Pavilion

BIG R Seminar on Electronic Component Cleaning

Automotive engineering is currently undergoing a significant change: purely mechanical systems are gradually exchanged by mechatronic and electronic systems. This change in technology is accompanied by a need for new processes and services in manufacturing as well as in remanufacturing. As sensitive electronic systems have to be protected from influences such as mechanical and thermal stress, corrosion or electrostatic effects, the printed circuit boards (PCBs) are sealed with silicone gels or epoxy resins. For repairing or remanufacturing the circuit boards these sealants have to be removed. The process for removing the sealants has to be quick, residue-free, non-destructive and economic. This describes one example of manifold challenges which are facing the remanufacturing industry in the future.



Therefore, the Chair Manufacturing and Remanufacturing Technology established the project eCleanER (electronic component cleaning engineering for remanufacturing) together with leading partners from research and industry. It aims on developing processes and defining the conditions for cleaning electronic components. The project has started in March 2013 and is structured into the following work packages:

1. Definition of (cleanliness-) requirements

for technical cleanliness in remanufacturing of electronic systems

2. Development of innovative cleaning processes tailored to the requirements of electronic systems
3. Creation of specified technical cleanliness by optimized existing and developed new cleaning processes
4. Development of measuring methods and procedures to assess technical cleanliness of electronic systems
5. Development of a classification model to classify the generated technical cleanliness

In a first step representatives for different automotive electronic systems and different types of sealants were chosen. For selecting the latter, the Analytic Hierarchy Process (AHP) was used considering the criteria costs (material and labour costs), quantity (nowadays and in five years) and sealant structure (thickness, consistency, chemical characteristics). Innovative solvents and techniques will be used for running cleaning experiments, e.g. supercritical CO₂ or ultrasonic based liquid cleaning. To assure the equality of the results, standardized PCBs were developed and produced.

First outcomes will be presented at the international Big R Show 2013 in Las Vegas.

SPONSORED BY THE Federal Ministry of Education and Research We are looking forward to meet you there!



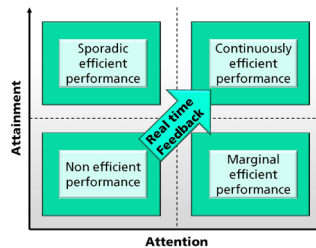
→ **Marco Bauer**
marco.bauer@uni-bayreuth.de





Motivated Process Optimization - The Next Step in Remanufacturing?

Due to the global competition, manufacturing companies have to reduce their production costs constantly while increasing the quality of their products at the same time. To meet this challenge investment in technical optimization is one expensive possibility. Another option to solve the conflict between savings and quality improvement is to involve the employees by deepening their knowledge about processes and the process performance. This can be reached by visualizing operating indicators in real time by the use of modern information and communication technologies. This real time feedback achieves an intrinsic and extrinsic motivation of the employees. The attainment of the process is increased and the workers' attention is directed to an optimal performance. This is the major outcome of the project REVisER which was launched by the Chair Manufacturing and Remanufacturing Technology in corporation with one further research institution and five companies. The project aims on the development of measures with a short pay-off time and the analysis of the influence of the Motivated Process Optimization. Within the REVisER project 209



Approach of the Motivated Process Optimization

Motivated Process Optimization is most effectually used in processes with a high variety and a low automation level which meets the characteristics of the remanufacturing industry perfectly. Especially in disassembly, reconditioning and reassembly, significant process improvements can be achieved.

The new approach presented above helps to save time and money with a short time amortization. Get in contact with our experts and make Motivated Process Optimization to an advantage in your remanufacturing company.

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DBU
Deutsche Bundesstiftung Umwelt

REVisER

→ Mark-Andre Nix
mark-andre.nix@uni-bayreuth.de



Resource Conservative Manufacturing ResCoM

We are one of 12 industrial and scientific partners of the European project ResCoM which is coordinated by the KTH in Stockholm and will start in November 2013. ResCoM aims on transforming waste into a resource through closed-loop product systems. Our part is to bring in our knowledge and experience in the field of remanufacturing which is one major strategy for closing product loops.

Two main developments will be the outcomes of ResCoM: 1. A software platform which will help companies to guide design decisions on closed-loop products and production processes by illustrating the benefits over conventional products and 2. a framework of methodologies and tools that take into account the complex interaction between product design, supply chain management, business model development and remanufacturing processes.

ResCoM will equip industries with the tools required to design and distribute closed-loop products and thus promote remanufacturing.

→ Sandra Seifert
sandra.seifert@uni-bayreuth.de



Meet one of our Experts - Today: Dipl.-Ing. (FH) Joachim Kleylein

Today we would like to introduce Dipl.-Ing. (FH) Joachim Kleylein-Feuerstein to you. Joachim is our expert in reverse engineering and remanufacturing of electronic and mechatronic components.

Joachim Kleylein-Feuerstein

Age: 29

Nationality: German



Career: 2006-2011 degree in electrical engineering and information technology, since **2011** research assistant at Prof. Steinhilper's Chair Manufacturing & Remanufacturing Technology

What are your activities in remanufacturing research?

My personal research interests are reverse engineering of electronic components as well as process development for the remanufacturing of electronic and mechatronic components.

How did you come to remanufacturing?

2011 I met experts of the Chair Manufacturing and Remanufacturing Technology at an exhibition. They described the idea of remanufacturing to me. The technical challenges sounded very interesting, so I started my career at the Chair of Professor Steinhilper where I joined the CAN-Reman project team.

What do you do in your free time?

I like sports, travelling and watching movies.

What gives you pleasure?

I like the variety of our research projects and the related challenges.

What are your wishes for the reman branch?

I hope the reman branch keeps growing and thus helps to reduce production costs and to save resources.

Imprint

Chair Manufacturing and Remanufacturing Technology
University of Bayreuth
Universitaetsstr. 30
D-95447 Bayreuth

Contact
Prof. Dr.-Ing. Rolf Steinhilper
Phone +49 (0) 921 55-7301
sekretariat.lup@uni-bayreuth.de
www.lup.uni-bayreuth.de