

REMANUFACTURING UPDATE

JUNE 2014

RESEARCH & DEVELOPMENT NEWS FROM BAYREUTH



Editorial

Dear Readers,

Just ten days ago APRA Europe has held this year's European Symposium in Milano Marittima, Italy - with an exciting company visit and conference program. I have been delighted to hear from around a handful of outstanding speakers that they are meanwhile busy „sniffing“ CAN-Bus-communication in order to understand the in-car-control of components to be remanufactured. My R&D-engineers have pioneered this field around five years ago; then recommending to the industry that this will be an important part of successful remanufacturing operations of the future. Well - that's exactly what our applied R&D should do: deal with things five years ahead...

So what are we dealing with nowadays - for 2019/2020? We'll keep you informed...

Enjoy reading!

Rolf Steinhilper



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BAYREUTH UNIVERSITY
UP **Chair Manufacturing and Remanufacturing Technology**

Remanufacturing Process Assessment – What We Have Learned

Today remanufacturing is a key industrial discipline at the end of a product's life cycle. In terms of the economic potential, remanufacturing enables preserving the value added from the new production. Therefore, labor, material, and energy costs can be saved. Ecologically, this leads to corresponding resource savings, avoidance of greenhouse gas emissions, and waste. Remanufacturing is resource efficient compared to the manufacturing of new products – a fact that has been proven by several studies.



Our engineers at work

Within the last years, engineers of Prof. Steinhilper's Chair Manufacturing and Remanufacturing Technology and the Fraunhofer Project Group Process Innovation have supported remanufacturing companies in more than 100 projects in the scope of technology development and process optimization.

What we have learned during these projects are basically the two following things: On the one hand, most of the remanufacturers have a broad and distinguished knowhow

about their production techniques and products. A lot of them have been in the remanufacturing business for decades.

On the other hand, we have recognized that there is a lack of knowledge when it comes to professional production organization and production control. Like companies from other industrial sectors, remanufacturers face similar challenges e.g. increasing global competition, product variants and cost pressure. Therefore remanufacturing companies will be forced to care about these topics more seriously in the future.

To close this lack of knowledge we established a two-day process assessment, which has been customized for remanufacturing operations. The results of the assessment provide an overview about the current situation of the remanufacturing processes (process transparency) and a list of improvement potentials, which can be used as basis for future process optimization projects to reduce lead times, energy and material consumption as well as to increase productivity, quality and customer satisfaction.

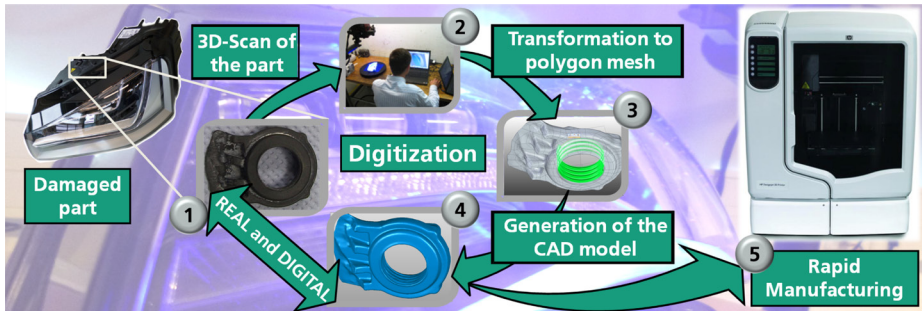
Till this day a lot of companies profited from our remanufacturing process assessment and our knowledge and experience in the field of process optimization in remanufacturing operations. If you are interested to participate in this success story, get in touch with us.

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Reverse Engineering and Rapid Manufacturing – A Future Oriented Factor of Success for Remanufacturing and Vehicle Service Processes



The combination of Reverse Engineering and Rapid Manufacturing offers new possibilities for different fields of application in remanufacturing and vehicle service processes, like condition monitoring, digitization, and spare parts production.

Using the example of a typical service case for a high value headlight, at which a simple suspension was broken from the plastic housing, the potential of the technology becomes understandable. Normally car repair shops would change the whole headlight unit because adequate spare parts are not available. By using the introduced combination of Reverse Engineering and Rapid Manufacturing (see figure) a cost and resource efficient repair becomes possible.

1. The damaged part is digitized as a point cloud by the 3D-Scanner
2. A powerful software generates a highly accurate polygon mesh with accuracy values up to 0,02 mm
3. Using a Reverse Engineering Software the creation of a parametric surface model, e.g. a CAD model, becomes possible
4. The CAM model can subsequently be used for a direct manufacturing on a 3D-printer or a machine tool
5. With the new printed-out part the damaged part is replaced. Thereby the whole component achieves a well-functioning state again

For example the complex headlight spare part was digitized and manufactured in only

three hours. The experts from Bayreuth expect that in ten years at the latest 3D-Scanners and Rapid Manufacturing Systems will have become part of standard equipment in remanufacturing companies as well as in larger car repair shops. This assumption is based on outcomes of the actual research project "Kfz-Service-Engineering 2020" (Service engineering for motor vehicles 2020) and increasing requests from several remanufacturing companies.

Today for many applications the investment costs are often cheaper than expected. The Chair Manufacturing and Remanufacturing Technology thereby offers a professional support to choose the right hard- and software for every business. Companies thereby can benefit from the strong know-how of the experts from Bayreuth. Mr. Hans Westermann is looking forward to get in contact with interested companies to answer all questions regarding this innovative technology.

→ Hans Westermann

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Meet one of our Experts - Today: Dipl.-Ing. (FH) Sebastian Schoetz

Today we would like to introduce Sebastian Schoetz to you. He works at Prof. Steinhilper's chair since 2012 and is an expert in quality management and process optimization in the field of remanufacturing.

Sebastian Schoetz

Age: 27

Nationality: German



Career: 2003-2006 Industrial mechanic, 2011 degree in mechanical engineering, 2011-2012 production engineer, since 2012 research assistant at Prof. Steinhilper's Chair Manufacturing and Remanufacturing Technology

What are your activities in remanufacturing research?

My personal research interests are quality management, process optimization, and technology development in the field of remanufacturing.

How did you come to remanufacturing?

When I started working at the chair of Professor Steinhilper, I participated in a project for a Chinese remanufacturing company. My colleagues and I planned a factory for the remanufacturing of engines.

What do you do in your free time?

I enjoy travelling and mountaineering,

especially rock climbing.

What gives you pleasure?

Mastering new challenges and gathering experience – in business as well as in private life.

What are your wishes for the reman branch?

I hope that the reman branch keeps growing and helps to save resources as well as costs.

Imprint

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