

REMANUFACTURING UPDATE

JUNE 2011

RESEARCH & DEVELOPMENT NEWS FROM BAYREUTH



Dear Readers,

Are you remanufacturing enthusiasts?

I am sure you are - because you can feel that you are in business at the right time in the history of this world to provide answers to many of our economic, environmental and customer satisfaction challenges today.

You do remanufacturing business - we do remanufacturing R&D for the industry - and we are remanufacturing enthusiasts, too!

So from now on, this our new quarterly newsletter offers you insights into our research and development work and results. You can also meet our people: learn about their current projects and expertise!

Enjoy reading - and e-mail me with any question or suggestion.

Rolf Steinhilper



→ **Rolf Steinhilper**
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and Team
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Chair Manufacturing And Remanufacturing Technology Exhibits At ReMaTec2011

Get ready for ReMaTec 2011: From 19th until 21st of June the leading remanufacturing trade fair opens its gates again at Amsterdam RAI Exhibition Center.

Dip into the world of remanufacturing and take this ideal opportunity to meet remanufacturers, suppliers, customers and scientists. Discover state-of-the-art technologies, make new contacts, discuss your ideas and exchange experiences!

We are going to be one of the 140 exhibitors. As Europe's leading research and technology centre for remanufacturing we help shape the latest global trends in remanufacturing. Many companies trust our competences for finding their future

cash cows and optimizing their reman processes with latest academic method skills.

Our current international research projects:

- CAN-Reman: Remanufacturing of CAN-controlled components
- CleanER: Improving cleaning processes in remanufacturing
- reCORE: Handling complexity in remanufacturing.

Curious to find out more? Why not get to know us in person? Come and visit us at our booth or join our experts' presentations during the APRA European Symposium on Monday, 20 June 2011 where we will e.g. present a unique low cost tool which supports you in testing and operating mechatronic units.

By tapping into our extensive experience, we can guide you through the entire innovation process for your remanufacturing operations.



Team of Chair Manufacturing and Remanufacturing Technology on ReMaTec2009

→ **Sandra Seifert**
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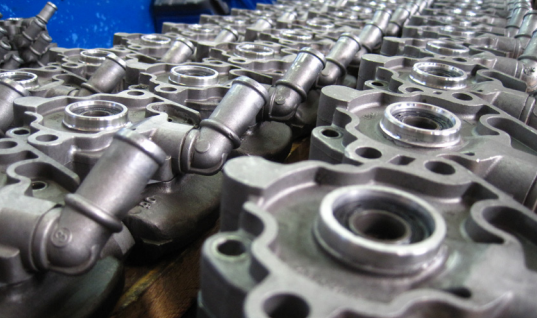
Visit Us At ReMaTec 2011 - We kindly invite you

Amsterdam RAI Convention Centre
Europaplein 8
1087 GZ Amsterdam
The Netherlands

Where you can find our booth:

Hall 11, Stand #11.222

If you need some tickets please contact Sandra Seifert (see e-mail address above)



Remanufacturing Is Not Melting The Icebergs – CO₂LCA Of Supply Chains

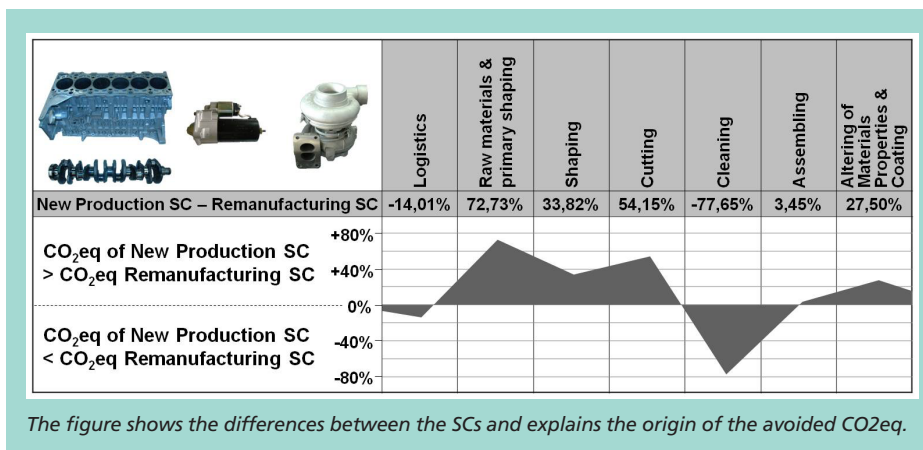
Highly detailed Life Cycle Assessments (LCAs) of Supply Chains (SCs) prove the contribution of remanufacturing to save our huge icebergs. For the LCA the processes of production and logistics of a new product and a remanufactured product SCs were modelled for three sample products: diesel engine, starter and exhaust turbocharger. Each SC was considered from the mining of resources to the finished product ready for dispatch. To avoid "green washed" results in this LCA a special scientific approach

similar to opportunity costs measured the environmental impact of the sourcing of a core. The more impressive are the results which demonstrate the enormous ecological benefit of a remanufactured product's SC: it saves up to 52,0% CO₂-equivalents (CO₂eq) compared to the SC of a new product. Thus the SC of a remanufactured product should be called "Regenerative SC" – it saves CO₂eq and regenerates parts as well as the value.

In the SC of a new product, the major

fractions of CO₂ are generated in the manufacturing processes of raw materials and their primary shaping (51,3%). Comparatively the transfer processes of logistics show only a surprising low fraction (9,0%) in contrast to the Regenerative SC where these processes own a higher percentage of 16,5% and therefore rank third. Second comes the cleaning processes with 23,9% and on the top – unexcelled – the processes of raw materials production and primary shaping which contribute 56,6% to the environmental impact of the Regenerative SC.

The customer should be provided with transparent information about the environmental impact he causes while making his decision on multiple buying choices. Thus, the market and the environmental awareness of the customers can fulfil their function of regulation. Subsequently the Regenerative SCs will march into the focus of the customer's requirements.



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Assemble-To-Order For Handling Variety In Remanufacturing

Thousands of different part numbers in remanufacturing companies raise the question how such variety can be managed without losing money for spending time on non-value adding activities.

Being a differentiator on the market, variety however is not only a burden but also a desired strategy of many remanufacturers. Generally, there are three options available for managing variety: avoid, reduce or handle. As remanufacturers have hardly any influence on the design of products, avoiding is not an option in this branch. The remaining "reduce" and "handle" offer a number of solutions for raising efficiency. Bayreuth researchers have these in focus and develop new practical approaches for the remanufacturing industry.

One solution for many remanufacturers is the assemble-to-order (ATO) concept. ATO splits up the process between remanufacturing and assembly by a stock of components. This allows for an easy-to-plan, well-predictable assembly which is separated from the highly fluctuating disassembly, cleaning and remanufacturing steps. Additionally, both areas can be optimized separately for different requirements. The customer-related area requires small order sizes while the non-customer-related area is more efficient with bigger order sizes because of lot purchasing as well as the batch-type cleaning process.

Analyses of the ATO concept both in OE-integrated and independent remanufacturing companies prove considerable gains in efficiency. Delivery times could be

reduced by up to 90% and total inventory by 60% while shortening transport routes by 20%.

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Imprint

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