

Preface



CEO of the Cluster of Excellence "Integrative Production Technology for High-Wage Countries"

This book summarizes the recent findings in basic research fields of the Cluster of Excellence "Integrative Production Technology for High-Wage countries" that provide answers to the question how future production in high-wage countries can turn out to be both sustainable and successful. As part of a targeted production oriented research the challenging dimensions of a manufacturing company have to be examined in a holistic manner. In the framework of integrated production technology these cannot be examined separately but have to be considered comprehensively.

Even today, the research results show that the integrative approach and working method holds great potential for the future. The implementation of such a research approach is associated with an initial effort that pushes forward the crosslinking of different actors, allowing to identify synergies and fully exploit them. The coming years will therefore stand more than ever under the theme of strategic and structural alignment of material and production research in Aachen: The Excellence Initiative will set the course for a research program until 2017 that will greatly benefit from the initial efforts already taken. The research program defined in the running Cluster of Excellence with focus on individualization, virtualization, integrated technologies and self-optimization of production sets the framework for integrative research approaches to follow in the future.

The aim of this book is to present the Cluster of Excellence as a whole and emphasize the innovative character of the presented research whose detailed results are further described in renown technical publications. They clearly show that integrativity in production technology can only be realised with an integrative approach in research.

I want to thank all the scientists for their extraordinary results and the German Research Foundation (DFG) for the funding of the work described in the Cluster of Excellence "Integrative Production Technology for High-Wage Countries."

Aachen

Christian Brecher



Rector of RWTH Aachen University

Innovation—Production Engineering—Aachen: Since many decades, this triad represents the excellent research at RWTH Aachen University. Together with its production research institutes, RWTH Aachen University provides a sound basis for nationally and internationally acknowledged innovations, which have been transferred into industrial practice numerous times. Amongst others, its production research has significantly contributed to the fact that RWTH Aachen University today has the highest level of third-party funding in Germany (in terms of grantings) and came first in the Excellence Initiative of the German Research Foundation.

The success of RWTH Aachen University is also the success of its institutes and professors, which complement each other to an outstanding extent—especially in the field of production research. One of this strong network’s achievements is the Cluster of Excellence “Integrative Production Technology for High-Wage Countries”. Due to its structural aim, it has changed and will continue changing the participating institutes while continuously enhancing the collaboration among the involved production research institutes.

The Cluster of Excellence involves more than 20 professors of RWTH Aachen University from the fields of material science and production research as well as numerous affiliated institutes like for example of the Fraunhofer Gesellschaft. Together they contribute to securing employment-relevant industrial production in high-wage countries and thus eventually to securing Germany’s wealth as well. The research carried out in the Cluster of Excellence therefore focuses on economically relevant products, which are successfully being produced in Germany. The solution of the issues, which the cluster addresses in a fundamental manner, requires a novel understanding of product and production interrelations. Hence, the Cluster of Excellence aims for developing the fundamentals of a sustainable, production research-oriented strategy and theory as well as the required technologies.

I am happy that with this publication, the extraordinary results of the Cluster of Excellence are made accessible to a broad audience. I personally would like to thank all of the participants, who have contributed to the articles and to the realisation of this book with outstanding commitment. I wish the Cluster of Excellence “Integrative Production Technology for High-Wage Countries” all the best in the future.

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