

PRESS RELEASE

Aachen, September 19, 2019

Laboratory for Machine Tools and
Production Engineering (WZL) of
RWTH Aachen University

Stefanie Strigl
Head of Press and Public Relations

Award as "VDW Research Institute Project of the Year" for "BevelAngle"

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Julia Mazak receives award for her work at EMO Hannover

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The Scientific Advisory Board of the VDW Research Institute has decided to award the "VDW Research Institute Project of the Year" for the work of Julia Mazak from the Chair of Manufacturing Technology of the Laboratory for Machine Tools and Production Engineering (WZL) at RWTH Aachen University in the "BevelAngle" project. With this idealistic award, the VDW Research Institute honors the outstanding achievements of project workers. As part of EMO Hannover 2019, the VDW Research Institute honored Julia Mazak personally on September 17, 2019.

Project "BevelAngle"

The aim of the "BevelAngle" research project was to develop a guideline for the wear-optimized design of the technological angles of bevel gear milling tools for the industrially widespread "Face Milling" process. In particular, the focus was on a process robust definition of the tool geometry, which is why different angle combinations with several cutting parameters were investigated. The objective was the methodical investigation of the technological tool angles and feed strategies in bevel gear milling and their influence on tool wear. In particular, the observation and analysis of the interactions between the feed strategies and their technological tool angles provided an extension of the scientific basis for bevel gear milling.

The simulative process analysis was carried out with the aid of the manufacturing simulation for BEVEL-CUT bevel gear milling developed at WZL. This was extended by the calculation of the effective clearance and rake angles. Simulations with different constructive clearance and rake angles as well as with different constant feed levels showed that the feed has a small influence on the effective clearance and rake angles compared to the constructive tool angles. For manufacturing processes with a feed ramp, the course of the chip characteristics differed for each cut. To improve the comparability of characteristic values, a method was also developed for evaluating the values using density functions.

With feed ramps, the influence of the maximum feed and thus the maximum chip thickness is greater than the number of cuts a point experiences on the cutting edge. With regard to uniform abrasive tool wear and workpiece geometry development, progressive ramp shapes proved to be optimal. The variation of the constructive tool angles at a constant feed rate shows that higher clearance angles have a positive effect on the course of the wear curve as well as on the achievable tool life. However, wedge angles that were too large had a negative influence on the tool life.

Further information can be found on the [project website](#).

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Laboratory for Machine Tools and Production Engineering (WZL)

The Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University has stood worldwide for more than 100 years for future-oriented research and successful innovations in the field of production technology.

Under the leadership of four professors, Thomas Bergs, Christian Brecher, Robert Schmitt and Günther Schuh, the WZL is conducting research in six areas - production technology, machine tools, production systems, transmission technology, production metrology and quality management - on the future-oriented design of production in high-wage countries. Together with industry partners from various sectors, the WZL develops solutions for a wide variety of production scenarios in both publicly funded and bilateral projects. These activities are being consolidated on the RWTH Aachen Campus in the Cluster Production Engineering.

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Attachments:

Presentation of the "Project of the Year" award for "BevelAngle" (f.l.t.r.): Jürgen Kreschel, Gleason; Dr Stefan Brand, Member of the Executive Board of the VDW; Julia Mazak, WZL RWTH Aachen; Dr Alexander Broos, Head of Research and Technology VDW

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