



Advanced international research in the field of cutting processes needs up-to-date machine tool technology as a prerequisite. The equipment provided by MTTRF plays not only a key role in our research work but also ensures that the principle of research-oriented teaching remain high-quality and sustainable at the TU Vienna.

RESEARCH

Precision machining of aluminum and wire arc sprayed material combination with internally cooled cutting tools

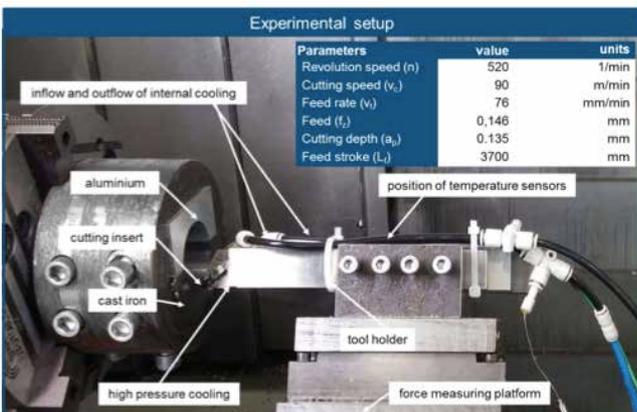
The major problem in machining of an aluminum and wire arc sprayed combination, beside the interrupted cut is the so called tribochemical reaction on the rake face, where a very stable built-up edge is growing steadily. Compared to homogeneous materials where this deposit will reset, the

built-up edge is very stable and is growing steadily, which results in a significant degradation in component geometry, surface quality and finally a highly reduced tool lifetime.

The subject of this project is the investigation of the precision machining of a cylinder core with an aluminum and arc wire sprayed material combination. The major goal is to reduce the tool wear, especially the tribochemical reactions and the notch wear on the cutting edge.

HaPTec: Further qualification of machine hammer peening technology for industrial use

The technology of machine hammer peening (MHP) represents a surface treatment with a far-reaching technological potential in terms of increasing the surface hardness, influencing the surface topography and generating near-surface compressive residual stresses. At the moment MHP is successfully used only in a few tool shops and for the post-processing of welding seams.



This project deals with the extension of existing limits towards a broader industrial application in machining on free form surfaces. The aim of the research work is to correlate technology parameters with the resulting surface quality.

Other research

-Dynamic behavior of indexable insert boring tools

-High performance machining of steel slabs

they manufacture all parts of the product according to the given materials dimensions and tolerances, conduct quality checks and assemble the product.

MTTRF equipment is used to show the differences to conventional machines regarding productivity and additional planning requirements.

Testing of Production Equipment (Graduate course)

In this course, students get acquainted with direct measurement methods of geometric error. Direct measurement methodologies are widely accepted by machine tool builders and the efficiency can be a critical issue for volumetric error compensation. For orthogonal three-axis machines, 3 linear displacement errors, 6 straightness errors, 6 angular errors and 3 orthogonality errors must be measured by different setups to construct the machine's kinematic model.

EDUCATION

Workshop on Production Technology (Undergraduate course)

Students manufacture a given product (such as a pneumatic motor) starting from part drawings and bill of materials, they plan the operation routing, choose appropriate machine tools, fixtures and tooling manufacture. Then



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MTTRF Awardee since 2014