

**CORNET Call for Proposals: International Collective Research**  
**--- Project idea ---**

<b>Subject:</b>	<b>Residual stress-adjusted drilling</b>
<b>Coordinator:</b>	Dresden University of Technology, Institute of Production Engineering, Chair of Forming Technology, Zeuner-Bau, 01062 Dresden, Germany
<b>Other applicant(s):</b>	Fraunhofer Institute for Ceramic Technologies and Systems, Dresden-Klotzsche (IKTS-MD), Maria-Reiche-Str. 2, 01109 Dresden, Germany
<b>Target group:</b>	The areas of application would range from general mechanical engineering, automotive and aircraft construction, engine construction to power plant and medical technology.
<b>Proposal summary:</b>	<p>Live detection of residual stress during machining and simulation-based adaptive control of the cutting parameters for targeted adjustment of residual stress states</p> <p>The ability to introduce residual stresses that increase edge zone strength during turning using existing technology significantly increases the range of applications. Longer component service life - especially for dynamically stressed components - can be achieved more cost-effectively.</p> <p>Relevant for: thin-walled components, components with unknown pre-treatment, components with unknown condition, high-precision parts, highly stressed parts (e.g., drive shaft), components that are difficult/expensive to replace (rotor shafts of wind turbines, ships, space).</p>
<b>Advantages for trade and industry:</b>	Increased strength without an extra process step (such as deep rolling) for almost all components, Elimination of a process step, hardening by turning. Increased service life for components with high pressure loads, reduction of failure rates for components with high pressure loads, elimination of hard turning, First-part-perfect, Process-reliable machining without knowledge of the component's previous life/condition like upcycling und repair of expensive parts
<b>Dissemination concepts:</b>	This process could be used whenever the operational strength of a metallic material in the form of a rotationally symmetrical body needs to be increased.
<b>Profile of additional partners:</b>	Machining by turning, expertise in turning tool
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