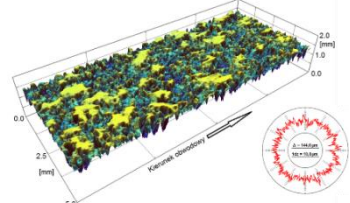
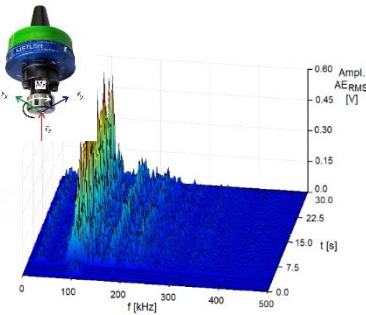
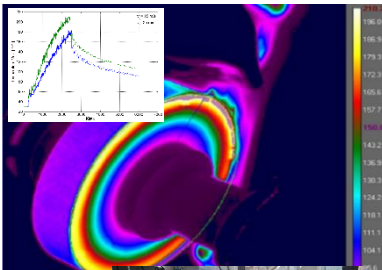





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<p>name of the unit:</p> <h2 style="text-align: center;">DIVISION OF MACHINING PROCESSES AND TOOLS</h2> <p style="text-align: center;">Institute of Machine Tools and Production Engineering, Lodz University of Technology</p>		<p>symbol:</p> <h1 style="text-align: center;">I-13</h1> <p style="text-align: center;">http://www.ioitbm.p.lodz.pl</p>
<p>head of the unit:</p> <p style="text-align: center;">Wojciech Stachurski, PhD, DSc, TUL Prof.</p>	<p>potential promoters:</p> <p style="text-align: center;">Wojciech Stachurski, PhD, DSc, TUL Prof.</p>	<p>contact person:</p> <p style="text-align: center;">Wojciech Stachurski, PhD, DSc, TUL Prof. phone: 48-42-631-24-13 wojciech.stachurski@p.lodz.pl</p>
<p>scope of activities:</p> <p>The main areas of interest and research directions are the following problems falling within the general concept of Mechanical Engineering:</p> <ul style="list-style-type: none"> research of material removal processes in the field of: <ul style="list-style-type: none"> analysis of cutting forces and temperatures, vibrations, acoustic emission, use of cooling and lubricating fluids, wear of cutting tools, modeling of machining processes. tests of technological surface layer (surface roughness, residual stress, microhardness), diagnostics of machining processes (signal processing), intelligent grinding system, design, machining and measurement of gears. 		 
<p>present activities:</p> <p>We conduct research work on improving the efficiency of supplying cooling and lubricating fluids into the grinding zone by modifying the shape of the grinding wheel active surface (GWAS). We develop technologies for shaping macrocontinuities on GWAS and determine the impact of the geometry of these macrocontinuities on the course and result parameters of the grinding process.</p> <p>We conduct research on the use of methods that minimize the amount of cooling and lubricating fluid supplied to the cutting zone, especially the MQL (<i>Minimum Quantity Lubrication</i>) method, in the material removal processes.</p> <p>We carry out research works in the field of measurement and analysis of temperatures in the cutting zone arising during the processing of difficult-to-cut materials. For this purpose, we use a laboratory IR camera.</p> <p>We conduct scientific research in the field of signal processing and modeling in order to determine the condition of the tool and identify undesirable states of the cutting process. We model machining processes in terms of the analysis of self-excited vibrations and the selection of the most important measurement variables.</p>		 
<p>future activities:</p> <p>Development of current research.</p>		



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[publications/patents, awards, projects:](#)

- Stachurski, W., Sawicki, J., Krupanek, K., Nadolny, K. (2020). Application of numerical simulation to determine ability of air used in MQL method to clean grinding wheel active surface during sharpening of hob cutters. *International Journal of Precision Engineering and Manufacturing – Green Technology*, <https://doi.org/10.1007/s40684-020-00239-x>.
- Rusinek, R., Lajmert, P. (2020). Chatter detection in milling of carbon fiber-reinforced composites by improved hilbert-huang transform and recurrence quantification analysis. *Materials*, 13(18), 4105.
- Kępczak, N., Zgórnjak, P., Lajmert, P., Rosik, R., Sikora, M. (2020). Influence of machining parameters on the polymer concrete milling process. *International Journal of Advanced Manufacturing Technology*, 106(7-8), 3017-3032.
- Stachurski, W., Sawicki, J., Wójcik, R., Nadolny, K. (2018). Influence of application of hybrid MQL-CCA method of applying coolant during hob cutter sharpening on cutting blade surface condition, *Journal of Cleaner Production*, 171, 892–910.
- Patent 237406: Method for supplying the cooling and lubricating agent into the toothed gears hobbing zone, Stachurski, W., Sawicki, J., Przybysz, M., Ostrowski, D., Krupanek, K. (2021).
- Patent 226148: System of supervision over the process of grinding on the centre-type cylindrical grinder, preferably

[keywords:](#)

material removal processes, coolants (cutting and grinding fluids), MQL method, technological surface layer, surface integrity in machining, cutting tools, monitoring of tools and machining processes condition

[list of internship proposal in this research team:](#)

- Stable machining conditions estimation and chatter vibrations detection during milling of hard to machine materials.