

PROGRAMME OF THE 2ND INTERNATIONAL CONFERENCE ON THERMAL ISSUES IN MACHINE TOOLS

Tuesday, April 20, 2021

MAIN STAGE			
9:00–9:25	Welcome and conference opening		Dr. Matěj Sulitka Prof. Steffen Ihlenfeldt Dr. Martin Mareš
9:25–9:55	Keynote speech: Thermo-energetic design of machine tools		Prof. Steffen Ihlenfeldt
9:55–10:25	Keynote speech: Hot topics in thermal compensation of machine tools		Prof. Konrad Wegener
10:25–10:55	Keynote speech: Design and evaluation challenges in solving spindle thermal issues		Prof. Atsushi Matsubara
10:55–11:10	Coffee break 1		
11:10–12:30	ROOM 1	ROOM 2	ROOM 3
	Improving thermal robustness of machine tools through design changes	Testing and simulation methods to identify thermal errors	Compensation and correction of thermal errors
042	Control approaches for tempering machine tool frames with multiple fluid channels and limited, jointly used actuating variable S. Mater, A. Hellmich, J. Popken, S. Ihlenfeldt	010 Part program dependent loss forecast for estimating the thermal impact on machine tools E. Wenkler, A. Hellmich, S. Schroeder, S. Ihlenfeldt	017 Examination of cooling systems in machine tools regarding system structure and control strategies C. Steiert, Ju. Weber, J. Weber
034	Thermal asymmetry analysis of motorized spindles L. Koch, N. Steinbock, G. Krüger	015 Thermal stiffness – a key accuracy indicator of the machine tools A. P. Kuznetsov, H. J. Koriath	020 Investigation on transient thermal discharge from machine tool to the ambient temperature K. Mori, M. Matsubara
035	Comparative analysis of fluid cooling systems in motorized spindles L. Koch, K. Gross, G. Krüger	023 Methodology for determining thermal errors in machine tools by thermo-elastic simulation in connection with thermal measurement in a climate chamber A. Geist, Ch. Naumann, J. Glänzel, M. Putz	022 Handling ambient temperature changes in correlative thermal error compensation Ch. Naumann, A. Geist, M. Putz
050	Characterization of heat conduction of eccentrically rotating heat pipes used for cooling motor spindles B. Denkena, B. Bergmann, K. Kono, R. Ishiguro, H. Klemme	027 A flexible and robust 3D coordinate measurement system based on white light interferometry for deviation measurement on swiss type turning machines H.-W. Lahmann, S. Schmalzried, G. Ketterer, D. Weber, F. Welzel, D. Jeyaraj	026 Investigation on thermal deformation in laser additive manufacturing Y. Kuroiwa, D. Kono, Y. Oda
12:30–13:30	Lunch		
13:30–14:50	ROOM 1	ROOM 2	ROOM 3
	Improving thermal robustness of machine tools through design changes	Testing and simulation methods to identify thermal errors	Compensation and correction of thermal errors
055	A novel design concept for a thermally stable linear scale using two different materials T. H. Lee, H. Gim, S. Oh, T. Gotthardt, A. Schmetz, D. Zontar, C. Brecher	032 Applying ISO 10791-6 kinematic tests to investigate the thermal stability of 5-axis machine tools G. Florussen, T. M. Spaan-Burke, H. Spaan	048 Prediction of thermal errors in machine tools through decoupled simulations using genetic algorithm and artificial neural networks T. Suresh Kumar, J. Glänzel, M. Bergmann, M. Putz
039	Efficient and robust creation of structural component models for thermo-elastic analysis of machine tools S. Schroeder, S. Ihlenfeldt, L. Penter	054 Examination of heat pipe based systems for energy-efficient reduction of thermally induced errors in machine tools I. Voigt, W.-G. Drossel	029 Comparison of methods for controlled thermal deformations in machine tools A. P. Kuznetsov, H. J. Koriath
053	Assisted, integrated workflow for parameter optimization of thermoelastic machine tool models M. Benesch	036 Optimal positioning methods of integral deformation sensors – expert knowledge versus mathematical optimisation Ch. Brecher, R. Herzog, A. Naumann, R. Spierling, F. Tzanetos	009 Enhancement of specialised vertical turning lathe accuracy through minimisation of thermal errors depending on turning and milling operations M. Mareš, O. Horejš
052	Precise machine tool column thermal deformation reduction applying fluid cooling Z. Winiarski, J. Jedrzejewski, H. Ha	030 Understanding temperature effects on friction at tool – CFRP workpiece interface using open-loop friction testing S. Ashworth, K. Kerrigan	044 Optimal temperature sensor placement for error compensation of distributed thermal effects N. Colinas-Armijo, B. Iñigo, L. N. López de Lacalle, G. Aguirre
14:50–15:05	Coffee break 2		
15:05–16:25	ROOM 1	ROOM 2	ROOM 3
	Modeling and simulation	Thermal interactions between workpiece, tool, machine	Reference workpieces and assessment
011	Prediction of thermal growth in a high-speed spindle by considering thermo-mechanical behavior E. Yuksel, E. Budak, E. Ozlu, A. Oral, F. Iğrek, F. Tosun	012 Unidirectional coupled finite element simulation of thermoelastic TCP-displacement through milling process caused heat load S. Brier, J. Regel, M. Putz, M. Dix	013 Solving transient inverse heat transfer problems in complex geometries using physics-guided neural networks (PGNN) D. Emonts, J. Yang, R. H. Schmitt
019	Modeling the cooling effect of the cutting fluid in machining using a coupled FE-CFD simulation H. Liu, T. Helmig, T. Augspurger, N. Nhat, R. Kneer, T. Bergs	016 In-process measurement and numerical determination of the temperature in the contact zone during single lip deep hole drilling R. Wegert, V. Guski, H.-C. Möhring, S. Schmauder	041 Highly responsive and accurate temperature measurements in orthogonal cutting through innovative single leg thermocouple I. Hamm, F. Rossi, G. Poulachon, B. Marcon, H. Birembaux, N. Maury, S. Valadon, F. Labarthe
018	Discontinuous drilling of Inconel 718 T. Wolf, I. Iovkov, D. Biermann	037 Thermal influence on the surface integrity during the single-lip deep hole drilling of steel components J. Nickel, N. Baak, P. Volke, F. Walther, D. Biermann	046 Effects of grinding wheel wear on the thermo-mechanical loads in the grinding process M. Bredthauer, T. Bergs, S. Barth, P. Mattfeld
040	Model order reduction methods for coupled machine tool models J. Vettermann, S. Sauerzapf, A. Naumann, M. Beitelschmidt, R. Herzog, P. Benner, J. Saak	049 A proposal for a systematization and taxonomy of methods to rectify thermally induced errors on existing machine tools C. Gißke, T. Albrecht, H. Wiemer, W. Esswein, S. Ihlenfeldt	051 Smart sensor for enhancement of a multi-spindle automatic lathe thermal error compensation model O. Horejš, M. Mareš, A. Mičoch
16:25–16:40	Coffee break 3		
MAIN STAGE			
16:40–17:00	Keynote speech: Active thermal error compensation in real industrial environment		Vojtěch Frkal
17:00–17:20	Keynote speech: Composite applications for thermal stable components		Dr. Ondřej Uher
17:20–17:30	Closing remarks		