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International Conference on SCREW MACHINES 2024

3-5 September DORTMUND, GERMANY

PROGRAMME

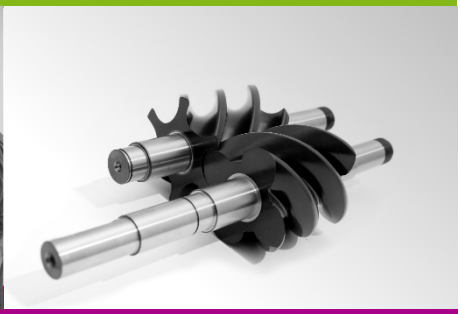
The International Conference on Screw Machines 2024 features presentations of research and technical papers on all kind of screw machines. This year's event will cover:

- » Design
- » Operation
- » Vacuum pumps
- » Contact & loss mechanisms
- » Heat pumps
- » Refrigerant oil mixtures
- » Simulation
- » Liquid injection

Learn about the latest developments and connect with scientists, manufacturers, service providers, and users from the screw machine community.

For registration, further information on the event, and past conference papers please visit:

WWW.ICSM.TU-DORTMUND.DE



CONFERENCE VENUE

TU Dortmund University
Seminar Building I
Friedrich-Wöhler-Weg 6
44227 Dortmund, Germany

GENERAL CHAIR

Andreas Brümmer
TU Dortmund University
Chair of Fluidics
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ICSM 2024

TUESDAY 3 September 2024

18:00	SOCIAL EVENT & LABORATORY TOURS Emil-Figge-Straße 71b, 44227 Dortmund

WEDNESDAY 4 September 2024

09:00	CONFERENCE REGISTRATION

WELCOME ADDRESS & PLENARY SESSION
Room H.001

10:00 **Welcome address**
S. Stumpf, managing director of the Department of Mechanical Engineering;
A. Brümmer, general chair & head of Chair of Fluidics

10:30 **Accurate Thermophysical Property Measurements of Refrigerants and their Mixtures with Oil – Is this Important for Practice?**
M. Richter, head of Chair of Applied Thermodynamics
Chemnitz University of Technology, DE

11:15 **High performance computing of screw machines - State of the art and future possibilities**
M. Möller, Associate Professor of Numerical Analysis
Delft University of Technology, NE

12:00 LUNCH BREAK

	ARCHIMEDES – FOR 5595 Room 1.001	DESIGN Room 2.008
13:30	**Influence of fluid properties and model parameters with regard to stratified gas-liquid gap flows** L. Burchardt[1] et al.[1,2,3] [1] TU Dortmund University, DE [2] RWTH Aachen University, DE [3] Ruhr University Bochum, DE	**On Rotor Profiling of Internally Geared Screw Machines** H. Lacevic et al. City, University of London, UK
13:55	**High-resolution simulations of gas-liquid Couette-type sealing gap flows** J. Vorspohl[1] et al.[1,2] [1] RWTH Aachen University, DE [2] TU Dortmund University, DE	**Designing novel rotor profiles of twin screw compressors using generative deep learning** R. Nakka, A. Kovacevic and S. A Ponnusami City, University of London, UK
14:20	**Astigmatism Quantification for Depth Localization of Bubbles and Tracers across Curved Surfaces** H. Lange[1] et al.[1,2] [1] Karlsruhe Institute of Technology (KIT), DE [2] TU Dortmund University, DE	**Design and Improvement of Curved Envelope Meshing Pair Profile of Single Screw Compressor** W. Lei et al. Xi'an Jiaotong University, CN

14:45 COFFEE BREAK

	SIMULATION Room 1.001	OPERATION Room 2.008
15:15	**Yet another structured mesh generator for screw machines simulations** Y. Ji and M. Möller Delft University of Technology, NE	**A Bayesian-inference approach to quantify degradation parameters in a water-cooled variable speed screw compressor chiller** A. J. Hoess et al. Purdue University, US
15:40	**Simulation analysis of the internal flow field in single screw compressor using local re-meshing method** W. Wu et al. Xi'an Jiaotong University, CN	**MoS_2 Coatings in unsynchronized, dry-running Screw Compressors: Experimental Insights on Operational Efficiency and Durability** M. Geissendorf et al. TU Dortmund University, DE
16:05	**CFD Analysis and Optimization of Oil Ports in Twin-Screw Compressors using Taguchi Method** A. Buyukbayraktar et al. Dalgakıran Compressor, TR	**Test rig setup for particle wear analysis in screw pumps** P. Moor, M. Kuhr and P. Pelz TU Darmstadt University, DE
16:20	**Stability and Convergence for Preconditioned Successive Over Relaxation and Incomplete LU Decomposition Iterative Linear Solvers used in an Oil-Injected Screw Compressor** D. Ziviani[1] et al.[1,2] [1] Purdue University, US [2] Hitachi Global Air Power (HGAP), US	**Economic Assessment of Multi-Stage Screw Compressors: A Comprehensive Lifecycle Cost Analysis** A. Kumar[1,2], A. Kovacevic[1] and N. Stosic[1] [1] City, University of London, UK [2] Kirloskar Pneumatic Company Limited, IN

18:00 CONFERENCE DINNER – sponsored by Aerzener Maschinenfabrik GmbH
Storckshof, Ostenbergstr. 111, 44227 Dortmund

THURSDAY 5 September 2024

	LIQUID INJECTION I Room 1.001	ACOUSTICS Room 2.008
08:30	**Influence of Screw Parameters and Fluid Injection on the Performance of Screw Compressors** A. Kumar[1,2], A. Kovacevic[1] and N. Stosic[1] [1] City, University of London, UK [2] Kirloskar Pneumatic Company Limited, IN	**Experimental investigation and modelling of the noise and vibration in screw compressors** J. F. Willie and R. B. Ganatra Compressors and Vacuum Pumps Systems Engineering GmbH, DE
08:55	**Optimization of Specific Power Consumption in Single-Stage Oil-Injected Screw Air Compressors: Experimental and Computational Approaches** D. A Soylu et al. Dalgakıran Compressor, TR	**Investigation of Pulsation and Vibrations for an Internally Geared Screw Compressor** J. Zhu[1] et al.[1,2] [1] Carrier Global Corp, US [2] City, University of London, UK
09:20	**OilMixProp 1.0: Package for thermophysical properties of oils, common fluids, and their mixtures** X. Yang and M. Richter Chemnitz University of Technology, DE	**1D and Quasi-3D Simulation-Based Optimization of Discharge Noise Attenuation in Twin-Screw Machines Using GT-SUITE** M. Luzzi[1], N. Framke[1] and G. Ramchandran[2] [1] Gamma Technologies GmbH, DE [2] Gamma Technologies LCC, US

09:45 COFFEE BREAK

	STEAMSCREW Room 1.001	VACUUM TECHNOLOGY I Room 2.008
10:15	**Thermodynamic simulation of a water-injected twin-screw steam compressor** M. Grieb and A. Brümmer TU Dortmund University, DE	**CFD simulation of rotary positive displacement vacuum pumps: Possibilities and Challenges** J. Hesse and A. Spille CFX Berlin Software GmbH, DE
10:40	**Performance Analysis of a Water-Injected Twin-Screw Compressor in a High-Temperature R718 Heat Pump** S. Höckenkamp[1] et al.[1,2] [1] Fraunhofer IEG, DE [2] TU Dortmund University, DE	**Combined Rotor Rack Generation for Twin Screw Vacuum Pump Rotor Profile Design** Y. Lu and A. Kovacevic City, University of London, UK
11:05	**Experimental investigation of the operating behavior and efficiency of twin-screw compressors with water injection and complete evaporation** T. Kraschewski Aerzener Maschinenfabrik GmbH, DE	**Design of toothed belt driven screw vacuum pumps** R. Müller, A. Hellmig and T. Dreifert Leybold GmbH, DE

11:30 LUNCH BREAK

	LIQUID INJECTION II Room 1.001	VACUUM TECHNOLOGY II Room 2.008
13:00	**One-dimensional investigations of the periodic liquid-injection in twin-screw compressors** M. Heselmann, T. Monden and A. Brümmer TU Dortmund University, DE	**Investigations to reduce rarefied gap flows within positive displacement vacuum pumps by utilising surface structures** S. Brock et al. TU Dortmund University, DE
13:25	**Screw Compressors for High Temperature Heat Pump Duty** M. Sundström and Y. M. Muñoz-Muñoz Svenska Rotor Maskiner International AB, SE	**A Novel Approach for Measuring and Comparing Vacuum Pump Efficiency: Pumping Efficiency (PE)** K. Nadler, R. Müller and T. Dreifert Leybold GmbH, DE

14:00 SCIENCE UPDATE SESSION
(presentation only)
Room H.001

The ICSM science update session offers a platform for presenting innovative ideas, ongoing research, and developing student projects. Presenters will provide brief overviews of their work, focusing on novel concepts and preliminary results. The session encourages active dialogue, with ample time for questions and discussions, fostering deeper exploration and diverse insights.

CLOSING SESSION
Room H.001

16:00 **Closing remarks**
A. Brümmer, general chair & head of Chair of Fluidics
TU Dortmund University, DE

16:30 **End of conference**

PROGRAMME COMMITEE

Andreas Brümmer (general chair), TU Dortmund University, DE

Thomas Dreifert, Leybold GmbH, DE

Hans-Ulrich Fleige, Aerzener Maschinenfabrik GmbH, DE

Eckhard A. Groll, Purdue University, US

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Ahmed Kovacevic, City, University of London, UK

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Ronald Sachs (retired), Busch Produktions GmbH, DE

Jack Sauls (retired), Trane, US

REGISTRATION & FEES

Visit the conference web page **www.icsm.tu-dortmund.de** and register via **ConfTool** for the International Conference on Screw Machines 2024 in Dortmund. If you have any questions regarding the registration process, please do not hesitate to contact us.

The conference fee including all events is **675 €** (VAT not included, discounts available).

CONTACT

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