WELCOME TO THE 14TH IFK!

We are excited to announce that the 14th International Fluid Power Conference (IFK) will be taking place in Dresden from March 19-21, 2024. IFK is a leading global scientific conference on fluid mechatronic systems and control technology. It provides a shared platform for manufacturers, users, and scientists to present and discuss trends and innovations. We are confident that this event will be a great opportunity for all attendees to learn and network.

The first day of the symposium will feature presentations focused on methodology and fundamental research. Over the next two days, the conference will offer a wide range of presentations focused on applications and technology, showcasing the latest advancements in fluid power. This combination makes the IFK an exceptional and exciting platform for exchanging academic research and industrial application experience. Moreover, the ongoing exhibition provides an opportunity to obtain product information and engage in one-on-one discussions with manufacturers.

At Fluid Power, we are committed to sustainable productivity. The 14th IFK showcases our ability to adapt to technological changes and overcome the challenges we face in the world. We are determined to meet the challenges of new system architectures and develop innovative solutions that will help us master the technical and social tasks of tomorrow. With increasing digitalization in all areas and the ever-growing demand for efficiency, fluid technology is presented with new opportunities and tasks, and we are confident in our ability to rise to the occasion. The exhibition also offers the opportunity to find out about products and talk to the manufactures.

The IFK is a congregation of worldwide fluid power specialists in Dresden, where they present, influence and discuss the future of fluid-mechatronic systems. Approximately 100 scientific and technical contributions from around the world provide an insight into current trends, innovative applications and research in the field of fluid power.

I warmly welcome you

Prof. Dr.-Ing. Jürgen Weber

CONTENT

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Fluid Power Associaton within VDMA, Frankfurt am Main

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Institute for Fluid Power Drives and Controls, RWTH Aachen University

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Dipl.-Ing. Simon Köhler
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Exhibition: Dipl.-Ing. Lukas Bachmann
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CONTACT DETAILS

Conference office

Hörsaalzentrum, TU Dresden
Bergstraße 64, 01069 Dresden
Tel.: + 49 (0) 351 463 33989

Opening hours:

Tuesday, March 19, 2024:	8 a.m. - 8 p.m.
Wednesday, March 20, 2024:	8 a.m. - 7 p.m.
Thursday, March 21, 2024:	8 a.m. - 5 p.m.

Technische Universität Dresden

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Emergency	112
Taxi	+49 (0) 351/211 211
Local public transport	www.dvb.de
Public transport	www.bahn.de

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Schmitz, K.	Prof. Dr.-Ing., RWTH Aachen
Schultz, A.	Dr.-Ing., Magnet-Schultz GmbH & Co. KG, Memmingen
Weber, J.	Prof. Dr.-Ing., TU Dresden

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Professor Andrea Vacca	Purdue University USA

GENERAL INFORMATION

Conference proceedings

For the 14th IFK each participant will receive an USB-Stick with a digital version of the conference proceedings. The proceedings will be available Open Access after the IFK.

Conference language

The official language of the conference is English.

Catering

Lunch and beverages will be provided on all three days of the conference. Costs are included in the attendance fee.

Conference venue

The conference will take place at the Hörsaalzentrum(HSZ) of TU Dresden, Bergstraße 64, 01069 Dresden. The map below shows the location of the HSZ and the Albertinum, where the conference banquet will take place on Wednesday evening. As organizers of the 14th IFK, we are committed to ensuring inclusiveness and full accessibility. All conference rooms in the HSZ have barrier-free access.

Map

REGISTRATION

We welcome you to register to the 14th IFK using the online provided forms at: **www.conftool.pro/ifk2024**.

Conference fees

	2 conference day (March 19 + 20 or March 20 + 21)	3 conference days (March 19 - 21)
regular attendee	750,- EUR*	980,- EUR*
presenting author / retiree	750,- EUR*	750,- EUR*

** All prices exclude the German applicable VAT.*

The conference registration features your admission to the Get-Together, the Conference Banquet and the Laboratory Party, and a digital version of the conference proceedings. Lunch and beverages will be provided on all three days of the conference. Presenting authors and retirees benefit from reduced conference fees.

Registrations are binding and you have to meet the included obligations. Cancellation fees are paid by the participant.

EVENING EVENTS

All conference participants are cordially invited to attend the following social events:

Tuesday, March 19, 2024, at 6 p.m.

Get-Together and opening of the exhibition

On Tuesday evening a casual Get-Together in the exhibition area of the Hörsaalzentrum of TU Dresden will take place. For those who have already visited the symposium during the first day, this is a nice opportunity to end the day with some good conversations at the booths. For those who will arrive on Tuesday evening, the exhibition opening offers an ideal possibility to arrive, check-in and get a first impression of the following days. Of course, it is also a perfect time for busy networking or enjoying time amongst peers!

Wednesday, March 20, 2024, at 7 p.m.

Conference banquet

The conference banquet will take place in the atrium of the Albertinum in Dresden. The Albertinum, a museum for art from Romanticism to the present, is located in the heart of Dresden near the Frauenkirche and the Brühl's Terrace. There, a diverse buffet along with an entertainment program awaits you in an elegant atmosphere. You may bring an additional guest if you would like someone to accompany you. Please register your accompanying person in advance.

Please use tram lines 3 from Münchner Platz or Nürnberger Platz and get off at Synagoge stop.

Conference banquet at Albertinum

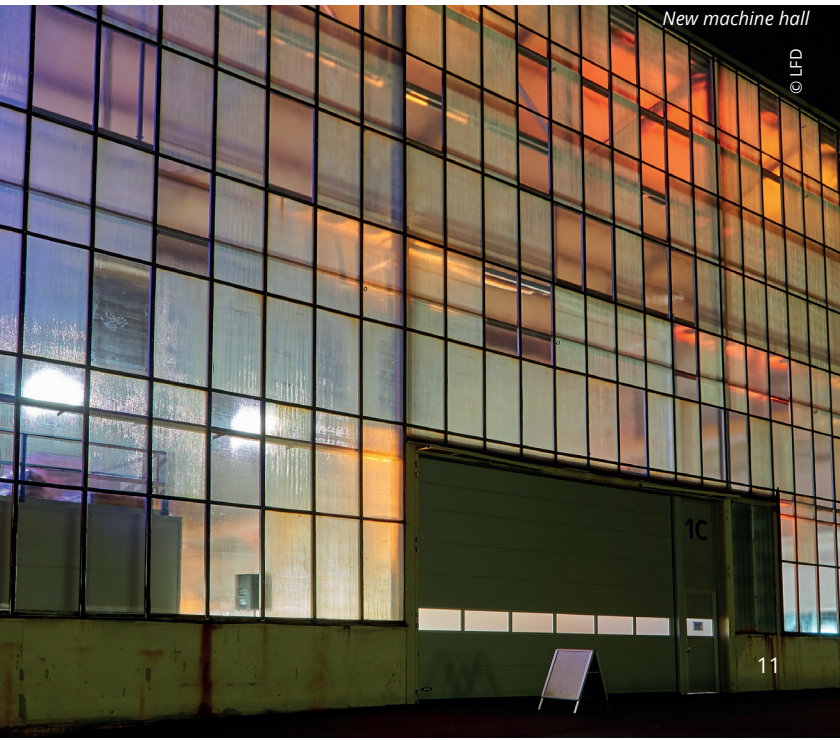
EVENING EVENTS

Thursday, March 21, 2024, at 6 p.m.

Laboratory Party in the test field of the hosting chair

Professor Weber and his team send all participants a warm invitation to the closing social event of the conference in the test field of the Chair of Fluid-Mechatronic Systems.

It is only a few minutes away from the Hörsaalzentrum, where you are served with a nice barbecue.



New machine hall

DRESDEN - THE FLORENCE OF THE ELBE

» Dresden – a wonderful city, full of art and history but still not a museum lived-in accidentally by Dresden's inhabitants. The past and the present live together in harmony. Or I should rather say polyphony. And together with its surroundings, with the Elbe, the bridges, the hilly slopes, the stretches of forests and mountains on the horizon, one could even speak of a whole symphony. History, art and nature waft over the city and the valley like a chord enchanted by its own harmony. «

ERICH KÄSTNER

author and poet, native of Dresden

Dresden is often nicknamed "Elbflorenz", denoting it as the german equivalent of the famous tuscan city. And that is for a reason! The IFK will be held at the Technische Universität Dresden south of the famous historical city center. The Hörsaalzenztum is designed to spread knowladge and encourage discussion. It has direct, barrier-free access for the visitors with special needs.

The local Elbe valley and its direct surroundings is a pathway of both cultural landscapes from the 18th- and 19th-century and of one of the most stunning geological landscapes in Germany. The palaces of Meißen, Pillnitz and Moritzburg, the porcelain manufactory in Meißen, and the fortifications at Königstein are all within reach by the city's public transportation. As a scenic highlight, Saxon Switzerland is perfectly located near Dresden for all nature and outdoor activities lovers. It is placed to the south-east of Dresden, not far from the city center and within comfortable reach of public transportation, offering endless possibilities for hiking and climbing.

So do not miss the chance to enjoy the flair of the saxon capital and combine your IFK-visit with a unique travel experience in Dresden.

VISIT THE LFD

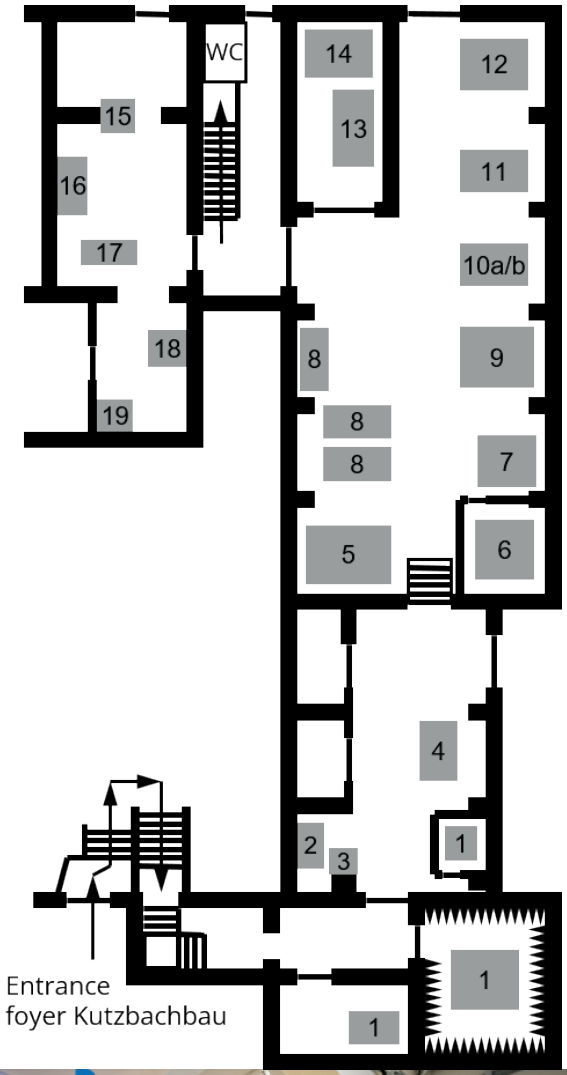
You are invited to visit the laboratory of the organizing Chair of Fluid-Mechatronic Systems at TU Dresden. Visitors can see various test rigs that help transfer theory to practice in action.

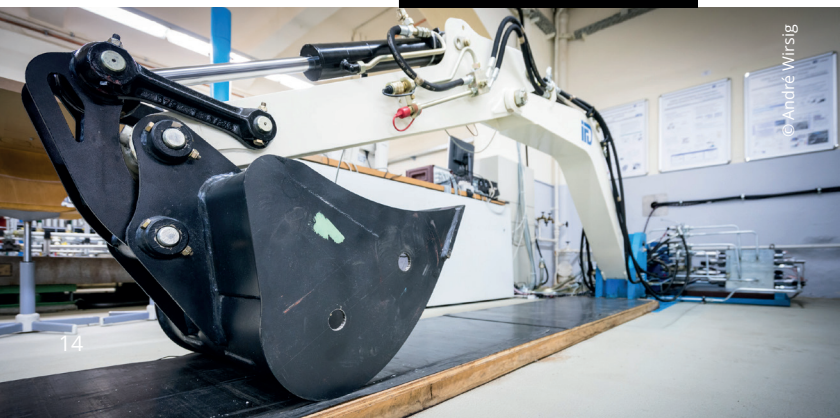
The laboratory is just a few steps away from the Hörsaalzentrum. On your way to the laboratory you can find our excavator with live demonstrations.

Tuesday		Wednesday		Thursday	
Lab-Tour	Excavator	Lab-Tour	Excavator	Lab-Tour	Excavator
9:00 a.m. - 6:00 p.m.	1:00 p.m. - 6:00 p.m.	9:00 a.m. - 6:00 p.m.	1:00 p.m. - 6:00 p.m.	9:00 a.m. - 1:00 p.m.	9:00 a.m. - 6:00 p.m.

How to get to the LFD

OVERVIEW OF THE LFD TEST FACILITIES





OVERVIEW OF THE LFD TEST FACILITIES

1	Anechoic test room according to ISO 3745
2	Cooling systems for stationary applications
3	Motor spindle cooling for stationary applications
4	Educational test rigs
5	Electro-hydrostatic compact drives
6	Reverberation test room according to ISO 3741
7	Cavitation and cavitation erosion test rigs
8	Independent metering systems for mobile applications
9	Energy harvesting
10a	3500 bar pressure viscometer
10b	Hydraulic accumulator test rig
11	Proportional pressure control valves
12	Educational test stand - hydraulic actuators
13	Hydraulic power unit
14	Central cooling unit
15	Test rig for investigating energy efficiency and fault detection methods
16	Visualization of compressible air flow
17	Multi-stable solenoids
18	Magnetic material measurements
19	3D-Profilometer

EXHIBITION

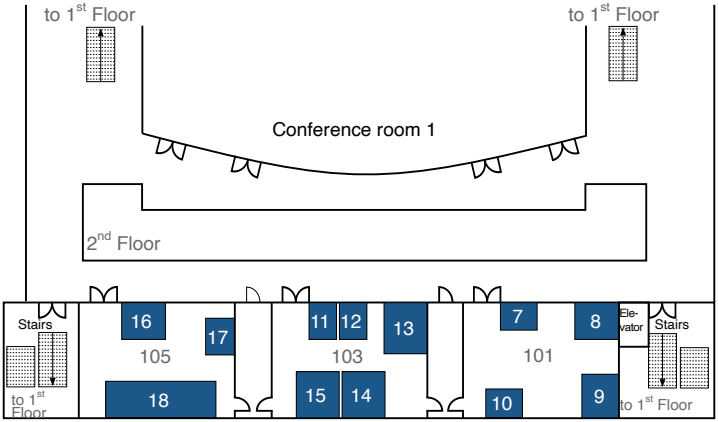
The conference will be accompanied by an exhibition. It provides the opportunity to gather information on innovative products and system solutions, but also offers an attractive platform for the presentation of new products and developments. Beyond this, you will have the chance to get in touch and converse with experts of the fluid power industry.

The IFK takes place at a new location and with it comes new opportunities and possibilities for the exebithon. The different booths are placed in the foyer arround the main conference room and in the second floor. Here rooms 101, 103 and 105 are dedicated for the exhibition.

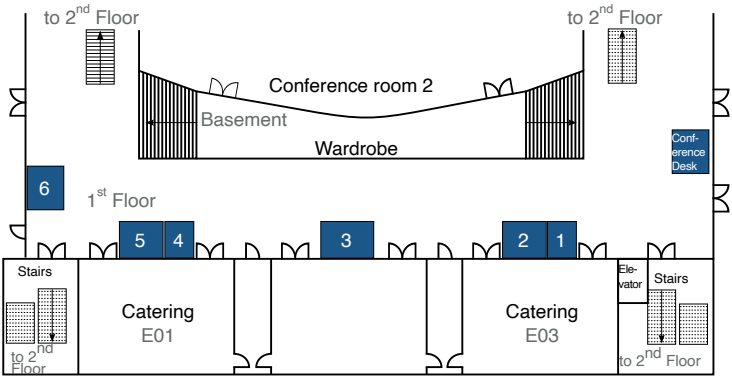
Exhibition area on IFK 2016

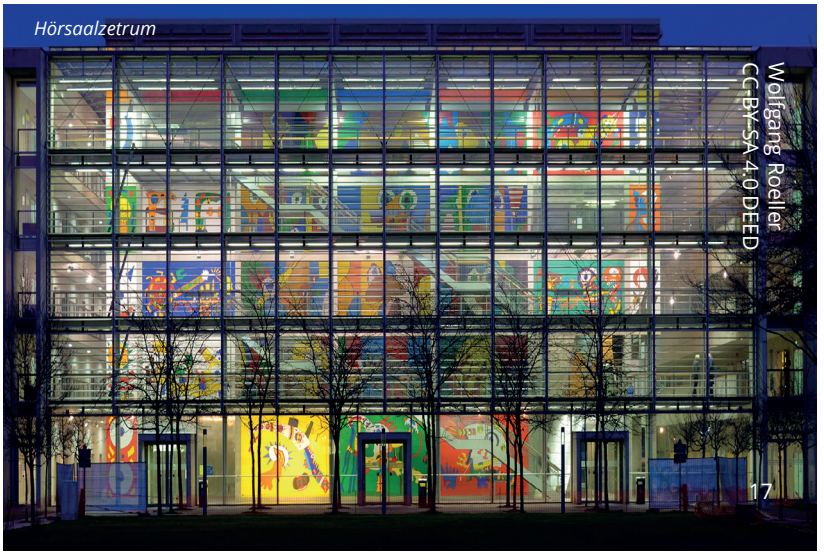
FLOOR PLAN

2nd floor



1st floor





EXHIBITORS INDEX

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www.balluff.com

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You can rely on us, our promises, our commitment and Balluff quality – all in the name of a mutually beneficial partnership.

Booth Nr. 17

Bosch Rexroth AG

Zum Eisengießer 1
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Germany

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www.boschrexroth.com

Bosch Rexroth sorgt als ein weltweit führender Anbieter von Antriebs- und Steuerungstechnologien für effiziente, leistungsstarke und sichere Bewegung in Maschinen und Anlagen jeder Art und Größenordnung. Das Unternehmen bündelt weltweite Anwendungserfahrungen in den Marktsegmenten Mobile und Industrie-Anwendungen sowie Fabrikautomation. Mit intelligenten Komponenten, maßgeschneiderten Systemlösungen, Engineering sowie Dienstleistungen schafft Bosch Rexroth die Voraussetzungen für vollständig vernetzbare Anwendungen. Bosch Rexroth bietet seinen Kunden Hydraulik, Elektrische Antriebs- und Steuerungstechnik, Getriebetechnik sowie Linear- und Montagetechnik einschließlich Software und Schnittstellen ins Internet der Dinge. Mit einer Präsenz in mehr als 80 Ländern erwirtschafteten über 32.000 Mitarbeitende 2022 einen Umsatz von rund 7,0 Milliarden Euro.

Booth Nr. 14

FLUID-MECHATRONIC SYSTEMS DRESDEN

Chair of Fluid-Mechatronic Systems

Technische Universität Dresden
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Germany

Tel.: +49 (0)351 463 33559

fluidtronik@mailbox.tu-dresden.de
www.tu-dresden.de/mw/fluidtronik

The Chair of Fluid-Mechatronic Systems does not only focus on the classical fluid power engineering fields, such as componentes, drives and controls in hydraulics and pneumatics. Rather, due to the ever-increasing integration with mechanical, electro- and information technical components, we have expanded the spectrum to open and to be a leader in the field of fluid-mechatronics.

Booth Nr. 16

HUNGER Hydraulik
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Walter Hunger GmbH & Co. KG Hydraulikzylinderwerk

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97816 Lohr am Main
Germany

Tel.: +49 (0)9352 501 0

kontakt@hunger-hydraulik.de
www.hunger-hydraulik.de

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The main focus of HUNGER business are problem solutions within the hydraulic field. Our business segment is divided up into cylinders, seals and power units, as well as commissioning and repair services. The company group operates internationally with its subsidiaries and a number of partner agencies worldwide.

Hydraulic components and systems produced by HUNGER are considered internationally to beleading brand names. Many years of experience together with state-of-the-art technologies are the basement for successful customer-specific problem solutions as well as for hydraulic components and systems at the highest quality level.

Products:

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- Surface coatings
- Seals and bearing elements
- Hydraulic power packs and controls
- Hydraulic components like rotary distributors, rotary actuators, special valves and spherical plain bearings

Booth Nr. 3

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www.hydac.com

Booth Nr. 4

Institute for Fluid Power Drives and Systems (ifas)

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www.ifas.rwth-aachen.de

The Institute for Fluid Power Drives and Systems (ifas) at RWTH Aachen University is one of the world's largest and best-known scientific institutions that deals with all aspects of fluid power. This includes hydraulic and pneumatic drives and systems as well as their areas of application. In addition to mechanical engineering, interdisciplinary research includes all related relevant areas, such as information technology, control engineering, electrical engineering, materials science, tribology and chemistry.

Increasing the economic and ecological sustainability of fluid power components and systems plays an essential role in research and development. The constantly growing environmental awareness and the consistent use of technological advances in related research fields, such as electrification, digitalization and additive manufacturing, open up new perspectives and result in innovative solutions for fluid power systems.

The highly motivated team of aspiring young scientists faces the challenges of this extensive and broad research area. Together with national and international partners in the fluid power industry, manufacturers, users and other research institutions, we make our contribution to future-oriented, digitalized and sustainable fluid power systems.

Booth Nr. 9

Kastas Sealing Technologies

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www.kastas.com

Kastas is one of the world's leading manufacturers offering high-performance products in fluid power industry and innovative sealing solutions via its global sales network.

With a corporate vision of ìbeing the first choice sealing technology partner of industries worldwideî and 40 yearsí experience in sealing, Kastas puts innovation and entrepreneurship at the center of its strategies and aims to produce high-quality, innovative and reliable sealing technologies with a focus on efficiency, continuous improvement and customer satisfaction in all business processes.

Booth Nr. 7

KTR Systems GmbH

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www.ktr.com

KTR Systems developed, produced and sells mechanical couplings, torque limiters, torque measuring shafts, brakes, cooler, and hydraulic components for machine and plant construction.

Product portfolio:

COUPLINGS
Shaft couplings and jaw couplings, pin & bush couplings, gear couplings, servo couplings, steel lamina couplings, flange couplings, magnetic couplings, fluid couplings

TORQUE LIMITERS
Torque limiters, overload systems

CLAMPING SETS and PRECISION LOINTS
External clamping sets, internal clamping sets, precision joints

BRAKE SYSTEMS
Hydraulic and electromechanical brakes, passive floating caliper brakes, active floating caliper brakes, active fixed caliper brakes, yaw brakes, thruster brakes, rotor lock

COOLING SYSTEMS
Oil/air cooler, oil/water cooler, combined cooler

HYDRAULIC COMPONENTS
Bellhousing, damping rings, damping rods, foot flanges, tanks, oil sumps, oil level indicators

Booth Nr. 8

THE LEE COMPANY

Lee Hydraulische Miniaturkomponenten GmbH

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info@lee.de
www.theleeco.com

For more than 70 years, „The Lee Company“ has been a leading supplier of high-precision, miniature hydraulic components

THE LEE COMPANY was founded by Leighton Lee II in 1948.
One of his many inventions was the LEEPLUG expansion plug. This innovation opened up new perspectives in the construction of manifolds for hydraulic systems in aircraft, engines and many other high-tech hydraulic systems.

Over the years, the patented expansion principle was also adopted in precision screens, check valves, pressure relief valves, shuttle valves and screens etc.
In 1974, the first LEE miniature solenoid valves were introduced to the market. Today, they continue to be used in many different kinds of fluidic systems in the areas of medicine, pharmaceuticals, chemicals and science. Further developments resulted in a new family of even smaller, fast-switching dispensing valves and peripheral components.

At the beginning of the 90s, the new product range „IMH“ was developed. These comprise check valves, precision restrictors, valve/restrictor combinations and screens for industrial use. Designed primarily for the automotive sector, the precision and quality of these products meant that they were soon also being used in medical technology as well as in machine engineering and tool construction and in general industrial applications.
Bellhousing, damping rings, damping rods, foot flanges, tanks, oil sumps, oil level indicators

Booth Nr. 13

MAPAL Fabrik für Präzisionswerkzeuge Dr. Kress KG

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www.mapal.com

Die MAPAL Präzisionswerkzeuge Dr. Kress KG gehört zu den international führenden Anbietern von Präzisionswerkzeugen für die Zerspanung nahezu aller Werkstoffe. Das 1950 gegründete Unternehmen beliefert namhafte Kunden vor allem aus der Automobil- und Luftfahrtindustrie und dem Maschinen- und Anlagenbau. Mit seinen Innovationen setzt das Familienunternehmen Trends und Standards in der Fertigungs- und Zerspanungstechnik. MAPAL versteht sich dabei als Technologiepartner, der seine Kunden bei der Entwicklung effizienter und ressourcenschonender Bearbeitungsprozesse mit individuellen Werkzeugkonzepten unterstützt. Das Unternehmen ist mit Produktions-, Vertriebsstandorten und Servicepartnern in 44 Ländern vertreten.

Booth Nr. 6

PIPE BENDING SYSTEMS GmbH & Co. KG

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57368 Lennestadt
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info@pipe-bending-systems.de
www.pipe-bending-systems.de

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Innovative Rohrbiegesysteme garantieren Prozesssicherheit

PIPE BENDING SYSTEMS besteht aus vier Komponenten, die das System im Zusammenspiel zuverlässig, genau, zukunftsweisend und zufriedenstellend machen:

- Innovative Rohrbiegemaschinen
- Hochpräzise Rohrmesstechnik
- Effiziente Softwarelösungen
- Exzellenter Service

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Booth Nr. 12

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Booth Nr. 2

Thomas Magnete GmbH

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Thomas ist ein führender Hersteller von elektromagnetischen Aktuatoren für Mobility- und Off-Highway-Lösungen.

Wir sind Entwicklungspartner und Systemlieferant für innovative, kundenspezifische elektrifizierte Aktuatorlösungen für fluidische und mechatronische Anwendungen.

Zu unseren Kunden zählen die Premiumhersteller der Automobilindustrie, führende internationale Hersteller von Fahrzeugen und mobilen Arbeitsmaschinen sowie Systemzulieferer. Seit Jahrzehnten profitieren sie vom Nutzen unserer innovativen Produkte und vertrauen auf deren Qualität und Leistungsfähigkeit.

Der wesentliche Schlüssel für unseren Erfolg sind rund 900 hoch qualifizierte und motivierte Mitarbeiterinnen und Mitarbeiter, denen Thomas mit Wertschätzung und Verantwortung begegnet.

Unsere Vision lautet: Fluid Control Solutions for a better Life: Healthy, safe and comfortable - wir wollen mit unseren Lösungen dazu beitragen, dass das Leben der Menschen gesünder, sicherer und komfortabler wird.

Booth Nr. 11

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Booth Nr. 5

SMART HYDRAULICS

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BOTT ist der Partner für die Entwicklung smarter Hydraulik-Lösungen – innovativ, einzigartig, kosteneffizient.

Renommierte Unternehmen schätzen uns als ideenreichen Entwicklungspartner in Sachen Hydraulik sowie als flexiblen und prozesssicheren Serienfertiger – vom Hydraulik-Ventil über Hydraulik-Steuerblöcke und Hydraulik-Zylinder bis zum Hydraulik-Aggregat.
Jede BOTT Lösung basiert auf einer kundenspezifischen Entwicklung und es sind innovative Details, die die Herzen der Hydraulik-Experten höherschlagen lassen. Hydraulik-Steuerblöcke, die ein Maximum an Funktionen auf einem Minimum an Bauraum vereinen. Hydraulik-Lösungen, die die Ölversorgung auch bei Stromausfall aufrechterhalten oder die sogar ganz ohne Stromzufuhr arbeiten. Hydraulik-Lösungen, die trotz geringsten Bauräumen enorme Kräfte entfalten, die einfach zu montieren, ausfallsicher und wartungsfreundlich sind.
Dass jedes einzelne BOTT Produkt strengsten Maßstäben entspricht, geben wir schriftlich: in Form eines Prüfprotokolls. Unser Qualitätsmanagement ist zudem nach DIN EN ISO 9001:2015 zertifiziert.

Peer-review procedure

Many public institutions that support research projects require regular publication of the results. To ensure that the results are of scientific value, peer review is often required. We would like to offer scientists the opportunity to have their work evaluated in order to be able to prove the scientific value. For evaluation relevant are criteria like novelty and scientific or industrial relevance of the topic, validation of the results, correct citation and comprehensive and logic conclusions.

The IFK traditionally is a colloquium where both scientists and representatives of industry come together to exchange their knowledge and experience. Accordingly, a peer review is only meaningful for some of the speakers, with the associated additional effort for both sides. Therefore the peer review is not intended to classify the paper but rather to support the need for it.

GFPS best paper award

The GFPS best paper award is given to authors of papers recognized for outstanding work in fluid power, in both the manuscript preparation and the conference presentation. The conference organizers will select a number of papers candidate for the award from the results of the paper review process. Therefore only peer-reviewed contributions will be considered for the GFPS best paper award. A GFPS delegation will review the selected manuscripts and attend the presentation of each candidate paper. The best paper will be selected on the basis of originality, rigorousness, and technical contents of the manuscript and the quality of the presentation. The presenting author will receive a monetary prize and a certificate and will be honored in the course of the farewell at the end of the conference.

Speakers corner

After each session, the speakers are asked to gather at the bar table in the lecture room. There you can have a direct conversation with the speaker and discuss the things you have just heard in the session in depht.

KEYNOTES

Wednesday, March 20, 2024, at 9:15 a.m.

All Keynotes take place in the main conference room (Audimax)

Intelligent mobile machines contribute to productivity and sustainability of construction sites

Jürgen Weber, TU Dresden
Luisa Bindel, STRABAG AG

Wednesday, March 20, 2024, at 10:00 a.m.

Data management in fuid power technology

Steffen Haack, Bosch Rexroth AG
Ansgar Kriwet, Festo SE
Hartmut Rauen, VDMA

Wednesday, March 20, 2024, at 5:10 p.m.

KI

Boris Nikolai Konrad, Memory Expert

Thursday, March 21, 2024, at 10:00 a.m.

Decarbonization @Liebherr

Stefan Peters, Liebherr-EMtec GmbH

GENERAL LECTURES

Wednesday, March 20, 2024, in room 1 at 11:15 a.m.

Software-defined industrial hydraulics
Mark Krieg, Bosch Rexroth AG

Wednesday, March 20, 2024, in room 2 at 3:35 p.m.

Sustainable Fluid Power
Jeff Herrin, Danfoss Power Solutions

Thursday, March 21, 2024, in room 2 at 1:40 p.m.

Digital assisted collision avoidance for mobile machinery
Simon Köhler, TU Dresden
Manuel Boes, Liebherr Werk Bischofshofen GmbH

TUESDAY, MARCH 19, 2024

9:10 a.m.

Efficiency

Thermal analysis of the cylinder block of an axial piston pump – the key to monitoring efficiency
Roman Ivantysyn – TU Dresden, LFD, Germany

Comparison Study of Fully Individualized System Architectures for Electrified Mini-Excavators: Displacement Control (DC) vs Electro-Hydraulic Actuation (EHA)
Timir Patel – Purdue University, Maha Fluid Power Research Center, United States

Run-in behaviour and wear on hydraulic piston seals – evaluation of an endurance test for piston accumulators
Tobias Schulze – TU Dresden, LFD, Germany

Efficiency definitions of hydraulic transformers and first test results of the Floating Cup Transformer (FCT80)
Robin Mommers – INNAS BV, The Netherlands

Fundamentals

Remaining Useful Life Estimation for Rubber O-Ring under Storage Conditions Considering Dependent Performance Indicators
Chao Zhang – School of Automation Science and Electrical Engineering, Beihang University, China

Development of a Hydraulic Artificial Muscle with High Force Density
Mathias Niebergall - TH Ulm, Germany

Hydraulic pile hammer surrogate model based on physics-informed neural network
Yajun Liu – South China Universtiy, China

Computational Thermofluid analysis of a refrigeration CO_2 ejector
Roozbeh Mousavi – Hilite Germany GmbH, Germany

Water-Hydraulics

Holistic Efficiency Measurements of a Mobile Working Machine: Comparison of Conventional Mineral Oil and Sustainable Fluids
Sebastian Deuster – RWTH Aachen, ifas, Germany

Tribological properties of hydraulic cylinder piston sealings in water and oil hydraulics
Franc Majdič – University of Ljubljana, Slovenia

Numerical Model of Piston/Cylinder Interface with Consideration of Turbulence Effect for Water Hydraulics
Haotian Han - Purdue University, Maha Fluid Power Research Center, United States

Development of digital type tap-water drive flow control valve
Hiroki Atogami – Okayama University of Science, Japan

10:30 a.m. — COFFEE BREAK

10:55 a.m.

Valves

Characteristic and oscillation tendency study for different seat geometries of the pilot stage of a two-staged pressure control valve
Martin Gerhard Kloetzer – Rapa Rausch & Pausch, Germany

Dedicated design of the flow angle of free jets for rotary slide valves
Lennard Günther - TU Dresden, LFD, Germany

Simulation of Gas Leakage on Ball Seat Valves
Felix Fischer - RWTH Aachen, ifas, Germany

Development and Tests of a Hydraulic Swivel Drive with Hydrostatic Bearings
Lutz Müller – TU Dresden, LFD, Germany

Tribology

Tribological design by Molecular Dynamics simulation – The influence of polar additives on wall slip and bulk shear
Seyedmajid Mehrnia – TU Darmstadt, Institut für Fluidtechnik, Germany

Numerical Study on Abrasive Wear of Reciprocating Seals Under Mixed Lubrication Conditions
Jiehao Wang – Tongji University, China

Tribological Properties of Different Slipper Designs of an Axial Piston Pump
Svenja Horn – TU Dresden, LFD, Germany

Fast Computation of Lubricated Contacts: A Physics-Informed Deep Learning Approach
Faras Brumand-Poor – RWTH Aachen, ifas, Germany

Materials

Additive manufacturing of hydraulic components – pressure loss comparison of different selfsupporting channel geometries
Zita Kristin Tappeiner – RWTH Aachen, ifas, Germany

Bronze cladding on bimetal parts produced by laser deposition brazing
Hannes Freisse – Kugler Bimetal SA, Switzerland

On polyoxymethylene composite for sustainable hydraulic valves
Ana Trajkvoski – University of Ljubiljana, Slovenia

Sustainable productivity for machining key components in Fluid Power
Tobias Stolz – MAPAL Fabrik für Präzisionswerkzeuge Dr. Kress KG, Germany

12:15 p.m. **LUNCH**

1:05 p.m.

Mobile Applications

Methodology of System Parameter Optimization for Parallel Electric Hydraulic Hybrid Mobile Machine via Convex Programming
Zichang Lin – Zhejiang University, China

Control of rear-wheel steering for a four-wheel steered agricultural standard tractor
Ruben Hefele – TU München, Germany

Optimal Speed Trajectory of electric wheel loaders aiming at extending battery lifetime
Haoxiang Zhang – Zhejiang University, China

Automated System Synthesis for Electrified Mobile Machinery
Bernhard Sender – RWTH Aachen, ifas, Germany

Pumps

Predictive Maintenance for Axial Piston Pumps: A Novel Method for Real-Time Health Monitoring and Remaining Useful Life Estimation
Anik Kumar Samanta, Shrinivas Kulkarni – Danfoss, India

Practical review of reliability methods combined with virtual validation techniques to shift limits of todays hydrostats
Stefan Haug – Bosch Rexroth AG, Germany

A Study on the Effects of Body Deformation on the Performance of External Gear Machines
Ajinkya Pawar - Purdue University, Maha Fluid Power Research Center, United States

A novel pulsation compensator for displacement machines
Gudrun Mikota – Johannes Kepler University Linz, Austria

New and Special Applications

Development of reciprocating air expander for μ-CAES technology
Jan Markowski – AGH University of Science and Technology, Poland

Comparative Analysis of Performances of Non-metal Pressurized Reservoirs with Variable Volume
Dingyu Wang – Yanshan University, China

Ship ballasting process time calculation with use of submerged ballast pumps with hydraulic drive supplied from constant pressure hydraulic central loading system on modern product and chemical tankers
Andrzej Banaszek – West Pomeranian University of Technology Szczecin, Poland

Measuring cavitation erosion in hydraulics
Sven Osterland –T U Dresden, LFD, Germany

2:25 p.m. **COFFEE BREAK**

2:50 p.m.

Independent Metering in Mobile Applications

Compact Fluid Power Control Unit with Independent Metering
Mathias Niebergall – Technische Hochschule Ulm, Germany

Comparison of strategies for unnoticeable mode shifting for independent metering systems in mobile applications
Jan Lübbert – TU Dresden, LFD, Germany

Fault localization for independent metering systems by model-based fault detection
Eric Fischer – TU Dresden, LFD, Germany

Sustainable Pneumatics

Control of a pneumatic system for material strength testing
Zeljko Situm – University of Zagreb, Croatia

Product Carbon Footprint of Hydraulic and Pneumatic Components – Challenges in Accounting and Comparability
Johannes Sprink – RWTH Aachen, ifas, Germany

Exergy analysis for the intermittent air supply in pneumatic machines
Dominik Grybos – AGH University of Krakow, Poland

New and Special Applications

Digital redundance for compact subsea electro-hydrostatic actuators using sensor fusion
Joao Duarte da Silva – Bosch Rexroth AG, Germany

Development of a generic test rig for the determination of the influence of non-Newtonian fluid properties on the leakage characteristic of rotating displacement pumps
Pascal Moor – Technische Universität Darmstadt, Germany

Self-Sensing Micropump with Fas Bubble Detection for Improved Dosing Reliability
Kristjan Axelsson – Fraunhofer EMFT, Germany

4:00 p.m. — **EXHIBITION OPENING**

6:00 p.m. — **GET TOGETHER**

WEDNESDAY, MARCH 20, 2024

9:00 a.m. — **WELCOME AND KEYNOTES**

10:45 a.m. — **BREAK**

11:15 a.m.

Industrial Control Strategies

General Lecture: Software-defined industrial hydraulics
Mark Krieg – Bosch Rexroth AG, Germany

Seamless integration of device and field data into the system simulation of a hydraulic servo-press using AAS
Malte Becker- RWTH Aachen, ifas, Germany

Development of an open and modular Platform for Hydraulics to increase productivity and flexibility
Marco Genise - Bosch Rexroth AG, Germany

Physical implementation of a distributed, agent-based control for fluid systems using OPC-UA
Tobias Constantin Meck - TU Darmstadt, Germany

Pneumatics

Sizing of pneumatic drives under energy efficiency aspects
Matthias Doll – Festo SE & Co. KG, Germany

Feasibility Study and Experimental Validation of a Novel Combined Throttling Approach
Christian Reese - RWTH Aachen, ifas, Germany

Reinforcement Learning based PID Controller Design for Mass Flow
Moritz Allmendinger – Bürkert Fluid Control Systems, Germany

A Trajectory-Specific Approach for Calculating the Holding Force for Surface Grippers
Tobias Eberhardt – J. Schmalz GmbH, Germany

12:45 p.m. — **LUNCH**

1:45 p.m.

Control

Online Learning of Cylinder Velocity Controllers for Excavator Assistance Functions using Local Model Networks
Benjamin Hartmann – Robert Bosch GmbH, Germany

Validation of a Hydraulic Pulse Contoller on an off-highway machine
Marvin Schell – Andreas Lupold Hydrotechnik GmbH, Germany

Model Predictive Control of Electro-Hydraulic Systems with multiple degrees of freedom
Thomas Sendelbach - Bosch Rexroth AG, Germany

Data-driven vibration control strategy for hypergravity centrifugal shaking table
Zhu Yang – Zhejiang University, China

System Design and Architecture

Efficient model-based Thermal Simulation method demonstrated on a 24-ton wheel loader
Eric Pohl – TU Dresden, LFD, Germany

A Hydro-Mechanical Vibration Absorber with Adjustable Operating Frequency
Helmut Kogler – Linz Center of Mechatronics GmbH, Austria

Energetic optimization of an existing clamping powerpack by system and control concept analysis and adaption of the hydraulic fluid viscosity
Johannes Gattinger – WEBER-HYDRAULIK GmbH, Germany

Use of Broadband Silencers in hydraulic circuits to reduce pulsations
Peter Kloft – HYDAC Technology GmbH, Germany

3:05 p.m. **COFFEE BREAK**

3:35 p.m. System Design and Architecture

General Lecture: Sustainable Fluid Power
Jeff Herrin – Danfoss Power Solutions, Danmark

Solutions for energy-efficient and easy implementable electrified variable-speed pump drives in mobile applications
Steffen Rose – Bosch Rexroth AG, Germany

Fundamentals of hydraulic transformers
Peter A.J. Achten – INNAS BV, The Netherlands

Dynamic valve plate design for an axial piston pump (servo-less pump)
Jaromir Tvaruzek – Danfoss Power Solutions, Germany

3:45 p.m. Simulation

An approach to the evaluation of the energy efficiency of machines based on digital twins and simulation methods
Rüdiger Kampfmann – Bosch Rexroth AG, Germany

A novel SaaS development platform for fluid power standard drives
Heiko Baum – FLUIDON GmbH, Germany

Credible simulation: Evaluating the credibility of simulation models and simulation model libraries
Simon Leutz – Bosch Rexroth AG, Germany

Hazard-free steer by wire in articulared heavy earth moving machinery using co-simulation model
Vinay Partap Singh – Tampere University, Finland

5:00 p.m. KEYNOTE

7:30 p.m. GALA DINNER

THURSDAY, MARCH 21, 2024

10:00 a.m. — **WELCOME AND KEYNOTE**

10:50 a.m. — **COFFEE BREAK**

11:20 a.m.

System Layouts in Mobile Machines

Electro-hydraulic damping strategies for hydro-pneumatic suspensions
Steffen Antoni – ARGO-HYTOS GmbH, Germany

Energy Efficient Excavator Functions based on Electro-hydraulic Variable-speed Drive Network
Lasse Schmidt – Aalborg University, Danmark

A comprehensive review of electronically controlled implement architectures for mobile machinery using secondary control
Edwin Heemskerk – Bosch Rexroth AG, Germany

Weight Saving Potentials of Pressure Increse in Cylinders of Mobile Machines Kinematics
Tobias Radermacher – TU Dresden, LFD, Germany

Digitalization

Precise hydrostatic Cylinder Drive with increased Pressure Level for industrial Applications
Ralf Bonefeld – Bosch Rexroth AG, Germany

Novel Engineering and Product Solutions towards Digitalization and Sustainability in Vacuum Handling Automation
Maik Fiedler – J. Schmalz GmbH, Germany

Hands-on Approach on developing a Deep Learning Algorithm for State Classification of a Hydraulic Accumulator
Oliver Mehl – HYDAC Technology GmbH, Germany

Acoustic optimization of a servo-hydraulic pump unit and AI evaluation of the subjective sound perception
Stefan-Georg Backhaus – Bosch Rexroth AG, Germany

12:40 p.m. — **LUNCH**

1:40 p.m.

Digital Construction

General Lecture: Digital assisted collision avoidance for mobile machinery
Simon Köhler – TU Dresden, LFD, Germany
Manuel Boes – Liebherr Werk Bischofshofen GmbH, Austria

Current challanges and possible solutions for the software and system development of mobile working machines
Sascha Grund – HYDAC Software GmbH, Germany

A Comparison of State-of-the-Art Network Architectures for Instance-Segmentation in Forest Environments
Lukas Michiels – Karlsruhe Institute of Technology, Germany

Assisted driving Midi-Excavator for augmented performances and improved safety
Andrea Cervi – Walvoil spa, Italy

1:50 p.m.

Actuators and Sensors

Research on fault diagnosis method of aviation digital hydraulic valve based on energy dissipation characterization
Jiesi Ren – Taiyuan University of Technology China

Experimental analysis of energy consumption of piezo actuators used in hydraulic switching valve
Marko Simic – University of Ljubljana, Slovenia

Energy harvesting from hydraulic pressure fluctuations using an oscillating piston
Hauke Lerche – TU Dresden, LFD, Germany

Load holding valves with integrated flow sensors
Bernd Zaehe – Sunhydraulics, Germany

3:10 p.m. — **COFFEE BREAK**

3:40 p.m.

Hydrogen

Hydrogen powered hydraulic Powerpack
Lukas Trommler – TU Dresden, Germany

High-Pressure Shut-Off Valve suitable for Hydrogen Applications
Peter Tappe – Magnet-Schultz GmbH & Co.KG, Germany

Holistic approach to electro-hydraulic drive solutions for hydrogen piston compressors
Nicolas Englert – Bosch Rexroth AG, Germany

Actuators and Sensors

Automation of pneumatic throttle check valves by using novel multi-stable solenoids
Thomas Kramer – TU Dresden, LFD, Germany

Low energy consumption high flow control system using spool-in-spool design of proportional valve
Jan Koudelka – Argo-Hytos s.r.o, Czech Republic

Real-Time Models of Valve Solenoids: An Evaluation of Measurement and Simulation-Based Parameter Identification
Simon Hucko – RWTH Aachen, ifas, Germany

4:50 p.m. — **FAREWELL AND AWARDS**

5:00 p.m. — **LABORATORY PARTY**

ROOM OVERVIEW

Basement

H02 Alfred-Post Hörsaal	Conference room 2

1st floor

Audimax	Conference room 1
E01	Catering
E05	Catering
Foyer	Exhibition

2nd floor

101	Exhibition
103	Exhibition
105	Exhibition

3rd floor

201	Lunch room
204	Lunch room

4th floor

301	Conference office Preparation room
304	Conference room 3 Meeting room