



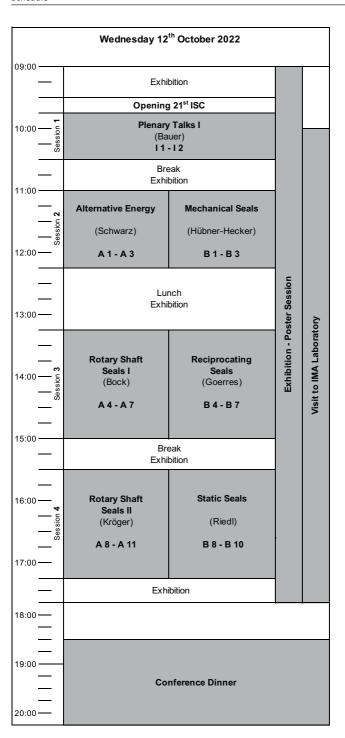
Invitation / Programme

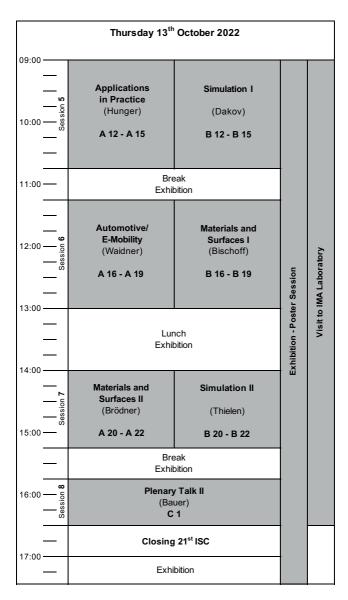
International Sealing Conference











The detailed programme can be downloaded from the ISC website or ordered at the contact adress.

International Sealing Conference

21st ISC

International Sealing Conference

Stuttgart, Germany October 12 – 13, 2022

Contact / Organisation

FVA GmbH 21st ISC Dr. Maximilian Hartmann Lyoner Str. 18 60528 Frankfurt am Main Germany

Institute of Machine Components (IMA) at the University of Stuttgart, Germany
Head of Sealing Technology / Frank Bauer

Dear Ladies and Gentlemen,

We would like to invite you to the **21st ISC on October 12 and 13, 2022** in Stuttgart. It is now the tenth time that the International Sealing Conference will take place at the University of Stuttgart, after it could not be held in 2020 due to the pandemic. This conference is again jointly organized by the VDMA and the Institute of Machine Components (IMA) at the University of Stuttgart.

Under the motto "Sealing Technology – Old School and Cutting Edge", lectures will be held that convey the latest findings from research and development, as well as practical experience.

The lectures will be held in English, only, with simultaneous translation into German provided.

We look forward to seeing you again in Stuttgart in the fall of 2022!

Ingrid Hunger

Chairwoman of the Fluid Power Sealing Group of VDMA Frank Bauer

Head of Sealing Technology, IMA, University of Stuttgart

21st ISC

International Sealing Conference

9:30 Welcoming Speech and Opening of the 21st ISC

Frank Bauer

Head of Sealing Technology of the Institute of Machine Components (IMA) at the University of Stuttgart

Ingrid Hunger

Chairwoman of the Fluid Power Sealing Group of VDMA, the German Engineering Federation

Session 1 I 09:45 – 10:30

Plenary Talks I

Lectures | 11-12

Lecture room V 47.02

Chairman Frank Bauer,

University of Stuttgart, Institute of Machine

Components (IMA)

I 1 Scaling of radial seals

Matthias Kröger,

Technische Universität Freiberg, Freiberg, Germany

I 2 Towards additively manufactured dynamic rod seals

Kathrin Ottink, Matthias Graf, Thomas Ebel,

Tobias Lankenau,

Hochschule Emden/Leer, Emden, Germany

Session 2 A 11:00 – 12:15

Alternative Energy

Lectures A 1 – A 3

Lecture room V 47.02

Chairman Thomas Schwarz,

SKF Sealing Solutions Austria GmbH

A 1 Sealing Solutions for Hydrogen Applications

Anna Berger, Anreas Mierzwa,

Frenzelit GmbH, Bad Berneck, Germany

A 2 Static seals for hydrogen at high pressure

Lucian Pasieka, Agim Gashi,

Eugen Seitz AG, Wetzikon, Switzerland

A 3 Tribological properties of PTFE sealing materials

with regard to bio-hybrid fuels

Marius Hofmeister, Matthias Grunewald,

Katharina Schmitz,

Institue for Fluid Power Drives and Systems, Aachen,

Germany

Session 2 B 11:00 – 12:15

Mechanical Seals

Lectures B1-B3

Lecture room V 47.03

Chairman Andreas Hübner-Hecker,

HECKER WERKE GmbH

- B 1
 Influence of the installation environment on the operating behavior of mechanical seals
 Peter Waidner,
 seal-ing the sealing doctor, Bamberg, Germany
- B 2

 A Numerical Investigation on the Effects of
 Operating Parameters on the Wear Behaviour
 of Metal Face Seals
 Dennis Keller, Georg Jacobs, Stephan Neumann,
 RWTH Aachen University, Aachen, Germany
- B 3

 Additive Manufacturing of Tungsten Carbide
 Surfaces with Extreme Wear Resistivity
 Florian Koehn, M. Sedlmajer, A. Guetlein, J. Albrecht,
 M. Merkel,
 Aalen University, Aalen, Germany

Lunch Exhibition

12:15 - 13:15

Session 3 A 13:15 – 15:00

Rotary Shaft Seals I

Lectures A 4 – A 7

Lecture room V 47.02

Chairman **Eberhard Bock**,

Freudenberg FST GmbH

A 4 On the prediction of the lubrication condition of grease sealing rotary shaft seals

Susanne Hahn, Simon Feldmeth, Frank Bauer, University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

A 5 Characterization of radial shaft seal performance in contaminated environments

Tim Schollmayer, Stefan Thielen, Bernd Sauer, Oliver Koch,

Technische Universität Kaiserslautern, Institute of Machine Elements, Gears, and Transmissions, Kaiserslautern, Germany

A 6
Influence of dynamic eccentricity on the pumping rate of rotary shaft seals at sub-zero temperatures
Sumbat Bekgulyan, Simon Feldmeth, Frank Bauer,
University of Stuttgart, Institute of Machine
Components (IMA), Stuttgart, Germany

A 7 Influence of Lubricants on the Thermal Behaviour of Rotary Shaft Seals

Simon Feldmeth, Christoph Olbrich, Frank Bauer, University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

Break Exhibition 15:00 - 15:30

Session 3 B

13:15 - 15:00

Reciprocating Seals

Lectures B 4 – B 7

Lecture room V 47.03

Chairman Martin Goerres,

Freudenberg FST GmbH

B 4 Condition monitoring of reciprocating seals

Boris Traber, Olaf Nahrwold,

Freudenberg Sealing Technologies, Weinheim,

Germany

B 5 Observations on Particle Wiping Behavior

of Hydraulic Wipers

Gonzalo A. Barillas, Andreas Gropp, Mert von Daven,

Freudenberg Sealing Technologies GmbH,

Schwalmstadt, Germany

B 6 DEVELOPMENT OF A NOVEL WIPER SEAL TEST RIG

AND VALIDATION OF WIPER SEAL PERFORMANCES

Seckin Semiz, **Cem Tanyeri**, Ozan Devlen, Kastas Sealing Technologies, Izmir, Turkey

An empirical study on the breakaway friction

and squeeze film effects of a polyurethane

U-cup rod seal

Oliver Feuchtmüller, Lothar Hörl, Frank Bauer, University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

Break Exhibition 15:00 - 15:30

Session 4 A 15:30 – 17:15

Rotary Shaft Seals II

Lectures **A 8 – A 11**

Lecture room V 47.02

Chairman Matthias Kröger,

TU Bergakademie Freiberg, Institute for Machine Elements, Engineering Design

and Manufacturing

A 8 Correlation between Wetting Properties and the Wear of Rotary Shaft Sealing Systems

Philipp Fricker, Matthias Baumann, Frank Bauer, University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

A 9 Cost-efficient evaluation of elastomer-lubricant incompatibility under tribological loads equivalent to radial shaft seals

Laura Stubbe, Sarah Staub, Konrad Steiner, Stefan Thielen, Oliver Koch, Bernd Sauer, Technische Universität Kaiserslautern, Institute of Machine Elements, Gears, and Transmissions,

Kaiserslautern, Germany

A 10 Formation of Macro Lead using plunge grinding – a kinematic approach

Georg Haffner, Matthias Baumann, Frank Bauer, University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

A 11 Radial shaft seals failures investigation

Abdelhak Azzi, Samuel Maquinghen, Poclain Hydraulics, Verberie, France

Exhibition Conference Dinner

17:15 – 17:45 18:30 Session 4 B 15:30 - 16:50

Static Seals

B8 - B10Lectures

V 47.03 Lecture room

Chairman Alexander Riedl,

Fachhochschule Münster.

Fachbereich Physikalische Technik

B8 Evaluation of gasket performance at cryogenic

Temperature

Florian Werner, Oliver Zach,

Teadit International Produktions GmbH, Kirchbichl,

Austria

B9 Gasket sealability test results in accordance to new

test setup concerning Air Quality Control control act ("TA-Luft")

Ralf Kulessa.

Garlock GmbH, Neuss, Germany

B 10 The Smart Flange Joint - Bolt Force Measurement with Foil Sensors

Philipp Lambertz, Alexander Riedl,

FH Muenster – Center of Sealing Technologies,

Steinfurt, Germany

Session 5 A 09:00 – 10:45

Applications in Practice

Lectures **A 12 – A 15**

Lecture room V 47.02

Chairman Ingrid Hunger,

Hunger DFE GmbH

A 12 Digital twin for rubber seal manufacturing

Roy Ovink, Bas van der Vorst, Mickael Sansalone,

SKF B.V., Houten, Netherlands

A 13 Sealing solutions for industrial gear units

Franz Schmeink.

Flender GmbH, Voerde, Germany

A 14 Material comparison for high demands for the development of safety elements for Li-ion batteries

Volker Buchmann. André Konzelmann.

Konzelmann GmbH, Loechgau, Germany

A 15 Investigation of hydraulic fluid condition

on seal performance

Silvio Schreymayer, Thomas Schwarz, Michael Fasching, Michael Liebminger, Aldara Naveira Suarez, Tomas Östberg, Erik Råwall, SKF Sealing Solutions Austria GmbH, Judenburg,

Austria

Break Exhibition 10:45 - 11:15

Session 5 B 09:00 - 10:45

Simulation I

B 12 - B 15 Lectures

Lecture room V 47.03

Chairman Nino Dakov.

Trelleborg Sealing Solutions

B 12 Experimental determination and EHL simulation of transient friction of pneumatic seals in spool valves

> Niklas Bauer, Sumbat Bekgulyan, Simon Feldmeth, Frank Bauer, Katharina Schmitz, RWTH Aachen University, Aachen, Germany

B 13 Component-based modular system modeling of a spool valve

Dominik Lorenz, Lisa-Marie Schänzel,

Marc-Andre Hodapp,

Festo SE & Co. KG, Esslingen-Berkheim, Germany

B 14 Design for contact lubrication of large seals

Dirk Möhring, Tim Leichner, Frank Strübing,

Gonzalo Barillas,

Freudenberg Sealing Technologies GmbH & Co. KG,

Weinheim, Germany

B 15 **Modeling the Compression Set of Elastomers**

to Predict the Lifetime of Sealing Systems by Finite Element Analysis

Christoph Wehmann, Ambarish Kulkarni, Feyzan Durn,

Murat Gulcur.

Trelleborg Sealing Solutions Germany GmbH,

Stuttgart, Germany

Break **Exhibition** 10:45 - 11:15

Session 6 A 11:15 – 13:00

Automotive/E-Mobility

Lectures **A 16 – A 19**

Lecture room V 47.02

Chairman Peter Waidner,

seal-ing - der dichtungsdoktor -

the sealing doctor

A 16 Dynamic dirt deflectors for friction reduced shaft seals

Kenya Yoshioka, Tim Leichner, Max Freiberger, Freudenberg Sealing Technologies GmbH & Co. KG,

Weinheim, Germany

A 17 Axial seal for high-rpm application and poor lubrication

Christoph Schüle, Martin Franz, Christoph Wehmann,

Sergio Amorim,

Trelleborg Sealing Solutions Germany GmbH,

Stuttgart, Germany

A 18 Responding to sealing challenges in Electric Vehicles (EV)

Bas van der Vorst, Jeroen Lenten, Mickael Sansalone,

SKF, Houten, Netherlands

A 19 Validation cycles for electrical systems from a Seal's perspective – Discussion of LV124 compared to established seal test sequences

Jan Gölz,

Magna PT B.V. & Co. KG, Untergruppenbach, Germany

Lunch Exhibition 13:00 - 14:00

Session 6 B 11:15 – 13:00

Materials and Surfaces I

Lectures **B 16 – B 19**

Lecture room V 47.03

Chairman Andreas Bischoff,

ARLANXEO Deutschland GmbH

B 16 Regenerative Thermoplastic Polyurethane for Hydraulic Rod Seals – Material Development (Part 1) Joachim Möschel.

Fietz Automotive GmbH, Burscheid-Hilgen, Germany

B 17 Regenerative Thermoplastic Polyurethane for Hydraulic Rod Seals – Time-Accelerated Testing (Part 2) Sumbat Bekgulyan, Simon Feldmeth,

Oliver Feuchtmüller, Lothar Hörl, Frank Bauer, University of Stuttgart, University of Stuttgart, Institute of Machine Components (IMA),

Stuttgart, Germany

B 18 Interactions between elastomer fillers, strain, surface properties and friction

Fabian Kaiser, Theresa Miller, Matthias Adler, Freudenberg Technology Innovation SE & Co. KG,

Weinheim, Germany

B 19 Prediction of the functional limits of seals at low temperatures

Bernhard Richter,

O-Ring-Prüflabor Richter GmbH, Großbottwar,

Germany

Lunch Exhibition 13:00 - 14:00

Session 7 A 14:00 – 15:15

Materials and Surfaces II

Lectures **A 20 – A 22**

Lecture room V 47.02

Chairman Stefan Brödner,

Bosch Rexroth AG

A 20 Formation of Micro Lead in Cylindrical

Plunge Grinding

Matthias Baumann, Jannik Röttger, Frank Bauer,

Thomas Bergs,

University of Stuttgart, Institute of Machine Components (IMA), Stuttgart, Germany

A 21 3D Printing Flexible Materials: From Prototyping

to Industrial Manufacturing Barthel Engendahl, Cora Leibig,

Chromatic 3D Materials GmbH, Selfkant, Germany

A 22 Thermoset Shaft Seals – A new generation

of Radial Shaft Seals

Cornelius Fehrenbacher,

KACO GmbH + Co. KG, Kirchardt, Germany

Session 7 B

14:00 - 15:15

Simulation II

Lectures **B 20 – B 22**

Lecture room V 47.03

Chairman Stefan Thielen,

TU Kaiserslautern, Institute of Machine Elements, Gears, and Transmissions (MEGT)

B 20 SIMULATION OF COMPOSITE GUIDING ELEMENTS WITH ADVANCED ANALYSIS

Seckin Semiz, Cem Tanyeri, Yoncagul Celik Erez,

Ozan Devlen,

Kastas Sealing Technologies, Izmir, Turkey

B 21 Seal virtual optimization for enhanced sustainability

Sylvain Nadiama, Mickael Sansalone, SKF B.V., HOUTEN, Netherlands

B 22 Benefits and Applications of EHL Analysis in Sealing Technology

Nino Dakov.

Trelleborg Sealing Solutions Germany GmbH,

Stuttgart, Germany

Session 8 C 15:45 – 16:30

Plenary Talk II

Lectures C 1

Lecture room V 47.02

Chairman Frank Bauer,

University of Stuttgart, Institute of Machine

Components (IMA)

C 1 Tribology of dynamic seals on a nanoscale – where does this lead?

Peter Waidner,

 $seal\text{-}ing-der\ dichtungsdoktor-the\ sealing\ doctor,$

Bamberg, Germany

Closing 16:30 – 17:00

Frank Bauer,

Head of Sealing Technology of the Institute of Machine Components (IMA) at the University of Stuttgart

Closing End of Exhibition 16:30 - 17:00

Programme Commitee

Dr. Andreas Bischoff

Dr. Manfred Achenbach Ingenieur- und Sachverständigenbüro

Achenbach

PD Dr. Frank Bauer Universität Stuttgart, Institut für Maschinenelemente (IMA)

ARLANXEO Deutschland GmbH

Prof. Dr. Eberhard Bock Freudenberg FST GmbH

Stefan Brödner Bosch Rexroth AG Thomas Bürkle FESTO SE & Co. KG

Ozan Devlen Kastas Sealing Technologies

Martin Goerres Freudenberg FST GmbH

Rolf Hahn Sealing Technology Surveyor

and Consultant

Susanne Hahn Universität Stuttgart, Institut

für Maschinenelemente (IMA)

Dr. Maximilian Hartmann Fachverband Fluidtechnik

im VDMA e.V.

Andreas Hübner-Hecker HECKER WERKE GmbH Ingrid Hunger Hunger DFE GmbH

Holger Jordan Trelleborg Sealing Solutions Germany

GmbH

Prof. Dr. Alexander Riedl Fachhochschule Münster,

FB Physikalische Technik

Dr. Heinz Christian Rost Parker Hannifin GmbH,

Engineered Materials Group Europe

Prof. Dr. Katharina Schmitz RWTH Aachen, Institut

für fluidtechnische Antriebe

und Systeme (ifas)

Dr. Thomas Schwarz SKF Sealing Solutions Austria GmbH

Jun. Prof. Dr. Stefan Thielen Technische Universität Kaiserslautern, Lehrstuhl für Maschinenelemente

und Getriebetechnik (MEGT)

Klaus G. Wagner Herbert Hänchen GmbH & Co. KG

Prof. em. Dr. Peter Waidner seal-ing – der dichtungsdoktor –

the sealing doctor

Conference Venue

University of Stuttgart, Stuttgart-Vaihingen, ETI-Building Pfaffenwaldring 47 70569 Stuttgart Germany

Exhibition and Poster Session

There will be a commercial exhibition and poster session in the lobby of the Conference Centre throughout the conference. Information on the participation at the commercial exhibition and the registration form can be ordered at the contact address. This information is also available on the website as download under Exhibition. The target date for registration is July 15, 2022.

The list of 'Participants and Exhibitors' will be available at the conference.

Evening Event

A festive evening event will take place on October 12, 2022 in the Staatsgalerie Stuttgart. It will start with a reception in the foyer of the Neue Staatsgalerie. Afterwards, the paintings and sculptures of various epochs and schools from the 14th to the 21st century can be discovered. There will also be the opportunity to take part in guided tours. The tours and the museum visit will guide you to the premises of the Alte Staatsgalerie, where a festive dinner will be served in the Pillar and Apsidal Hall.

Main topics / Research projects of the IMA

Hydraulic Seals:

• Hydraulic rods for low friction and low leakage

Non-contact Seals:

- · Non-contact sealing of high speed shafts
- · Non-contact shaft sealing with grease packing

Shaft Seals:

- Influence of wetting by the lubricant on the function of dynamic seals
- Reliability of rotary shaft lip-type seals
- Direction of rotation independent PTFE-packings with spiral groove
- Analysis and modelling of wear on PTFE sealing elements
- Reliable sealing on innovative shaft materials and innovative shaft coatings
- Structural analysis of sealing counter-faces
- · 3D surface topography
- Reliable sealing of grease and liquid grease by means of rotary shaft seals

Static Seals:

- Limitation of use of modern liquid sealants at housing interfaces
- · Sealing of unequal housing interfaces

The following listed test benches and test facilities are available at the institute for investigations:

- 19 test benches for rotary shaft seals
- Test benches for hydraulic rod seals
- Test bench for scrapers / wipers
- Tribology test bench, ellipsometer
- Test benches for static flat seals
- Test bench for profile seals X-, R- and O-rings
- Tensile testing machine, Radial force measuring equipment
- · 3D-Coordinate measuring machine
- 3D-Measuring instruments for surface topography (contact and contactless, e.g. white light interferometer)
- Surface energy and contact angle measuring instrument
- Optical analysis of surfaces, 3D-Microscopic optics
- · FE-Working places
- · Scanning electron microscope

Registration

Each participant of the ISC needs to register and purchase a ticket. ISC-Tickets for one or more participants can be purchased on the website **www.sealing-conference.com**

Attendance Fees

The attendance fee includes conference literature with a USB stick, simultaneous translation of the lectures into German, admission to the exhibition and the IMA laboratory, the conference banquet, as well as the lunches and refreshments during the breaks.

The following fees will be charged:

Attendance fee: € 1090,00 + 19 % VAT
Attendance fee (VDMA member companies): € 890,00 + 19 % VAT
Speaker of the lectures and Chairpersons: € 290,00 + 19 % VAT
PhD-Students: € 290,00 + 19 % VAT
Additional Guests at the banquet: € 105,00 + 19 % VAT

For registration later than 9th September 2022 an extra charge of 10 % will be added.

The accounting is carried out by the FVA GmbH, a VDMA subsidiary company.

Cancellation

Cancellation must be made in writing. If a cancellation is received by 9th of September 2022 latest, 10 % of the attendance fee will be charged. For cancellations after the 9th of September 2022, 50 % of the attendance fee will be charged.

Conference Documentation

The admission tickets to the conference, the conference literature and the list of participants will be available at the conference office on **12th and 13th of October 2022**.

Translation

All lectures will be translated simultaneously into German. Headphones and wireless receivers are available from the conference office and have to be returned at the end of the conference.

Please note: Missing headphones have to be charged with 50.00 €, receivers with 210.00 € by the organizer.

Lunch

A snack will be provided at the conference centre at both days. The costs are included in the attendance fee.

Hotel Reservation

Please order your hotel as soon as possible because there are some international fairs and exhibitions in Stuttgart at the same time. It is recommended to make the reservation at the "Stuttgart-Marketing GmbH" as follows:

1. Online booking:

http://www.stuttgart-tourist.de/hotel-stuttgart

2. Reservation by fax or email:

Please send your address, the dates of your journey and the name of the hotel you want to book by fax to

+49 711 2228-214 or by email to hotels@stuttgart-tourist.de.

3. Reservation by phone:

You can book your hotel by phone at the "Stuttgart-Marketing GmbH" on Mon to Fri, 8:30 am to 6:00 pm at +49 711 2228-100.

Travel Information

... by car: On A8 or A81 to the intersection Stuttgart, follow the A831 in direction Stuttgart-Zentrum, after the "Johannesgraben" tunnel take the exit "Universität".

On-site parking will be signposted.

- ... by train: From Stuttgart Central Station by lines S1, S2 or S3 of the S-Bahn in direction Airport, Filderstadt, Herrenberg, Böblingen or Vaihingen. Getting out at the station "Universität".
- ... by plane: From the airport building by lines S2 or S3 of the S-Bahn in direction Schorndorf or Backnang. Getting out at the station "Universität"

Conference Organization

Susanne Hahn

Institute of Machine Components (IMA)

of the University of Stuttgart

Phone +49 711 685-66176

E-Mail susanne.hahn(at)ima.uni-stuttgart.de

Important Contact Information

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Internet www.ima.uni-stuttgart.de

Conference Office

(only on 12/13 October 2022)
Universität Stuttgart, Stuttgart-Vaihingen,

Pfaffenwaldring 47, Germany

Phone +49 711 685-66561

Opening hours:

8:00 a.m. to 6:00 p.m.

Stuttgart-Marketing GmbH Hotel Reservation

Rotebühlplatz 25, 70178 Stuttgart

Phone +49 711 2228-0

E-Mail hotels@stuttgart-tourist.de Internet www.stuttgart-tourist.de

VDMA

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