



# **FILTECH**

February 14 – 16, 2023  
Cologne – Germany

The Filtration Event  
[www.Filtech.de](http://www.Filtech.de)

**Platform  
for your  
success**

**Conference Program  
Short Courses &  
Trade Show**

**Koelnmesse · Cologne · Germany**



# FILTECH

February 14 – 16, 2023  
Cologne – Germany

The Filtration Event  
[www.Filtech.de](http://www.Filtech.de)

**180+ Papers**  
**440+ Exhibitors**

**Join the largest  
Filtration Event  
worldwide**



# Benefit from top level knowledge and...

## ... know-how transfer

The Filtration industry provides innovative solutions for current and future challenges. This dynamic industry is of further growing importance and turning into a key industry worldwide. At the FILTECH 2023 Show the latest innovations will be on display and will provide visitors an exclusive overview and insights of the state-of-the-art science and technologies - no matter what sector they are in. The innovative power in the field of filtration and separation is strong. Particularly in air filtration, fine dust values and gases that affect the climate, germs that are harmful to health, and other impacts are leading to ever new developments. But also for solids separation and solid-liquid separation there are always new developments with the striving for maximum efficiency and higher qualities.

### More than 180 Technical Papers

The programme gives a representative cross-section of the different procedures and appliances of separation technology as well as across the industry about the applications, from the preparation of mineral raw materials, the chemistry, environmental technology and water purification down to the pharmacy and biotechnology. Solutions for ongoing problems are represented in the programme. For example the latest research and development of highly efficient respiratory masks, air cleaning and air monitoring technologies. Presentations also focus on the detection of micro pollutants, antibiotic-resistant bacteria/germs and micro plastics in water and removal technologies. Also presented are new developments in battery manufacturing and recycling. New approaches to face these and many other challenges are given at **FILTECH 2023** Conference.





# The International Exhibition...

## ...Platform for your success

**FILTECH** is the globally acknowledged platform and solution provider for all industries covering every market segment. This exhibition is a must for all those concerned with purchasing, selling, designing or researching filtration & separation equipment and services. FILTECH is the global platform to present and find solutions for all filtration tasks and to generate international business. At **FILTECH 2023** trade visitors will find targeted solutions for their Filtration & Separation tasks whatever market they are in.



# Exhibit at FILTECH 2023

New  
Halls

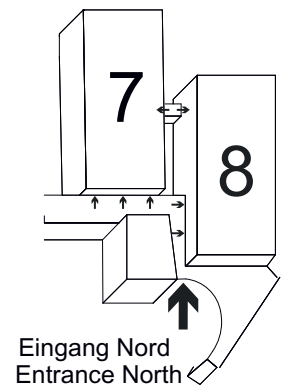
The FILTECH 2023 Show will offer Exhibitors a unique possibility to generate new business. The Show will feature 440+ Exhibitors and will again be the international platform and solution provider for all industries covering every market segment. To present future customers and prospects your state-of the art technologies you can **choose and reserve your space easily online** in a few steps. Visit [www.filtech.de](http://www.filtech.de)

Do you need any help with your space selection?

Please contact Mr. Jens Chittka at [jens@filtech.de](mailto:jens@filtech.de) or phone +49 (0)2132 935760.

## Your FILTECH 2023 participation includes:

- + **Free Print Communication Package**, incl. free entry in the exhibition catalogue incl. address, contact details, 4c company logo, company/ product description and 18 keywords in the product index listing.
- + **Free Online Communication Package**, incl. free entry at **FILTECH** website incl. company description (German & English), Company logo, pictures, 18 keywords in the multilingual product index and 10 keywords in the market index.
- + **Free publication** of Exhibitor news/press releases at the **FILTECH** website including pictures.
- + **Free Promotion Codes** to invite clients/potential customers
- + **Free Company branded Stickers**
- + **Free Company branded Exhibitor Badges**



## Register as a Trade Visitor

### Opening Hours Exhibition

**February 14–15, 2023**

9:00 am - 6:00 pm

**February 16, 2023**

9:00 am - 5:00 pm

### Venue: Koelnmesse

Halls 7 + 8, Entrance North

Messeplatz 1

50679 Cologne

Germany

Your **FILTECH 2023** Visitor Registration includes:

Free copy of the exhibition catalogue & hall plan as well as a free public transport ticket for visitors who pre-register by January 14, 2023.

### Registration Fees

### Pre-Registration until 14.01.2023

### Registration from 15.01.2023

1-Day Visitor Ticket

€ 20,-

€ 40,-

2-Day Visitor Ticket

€ 25,-

€ 45,-

3-Day Visitor Ticket

€ 30,-

€ 50,-

Fees already incl. German VAT

## Plan your visit

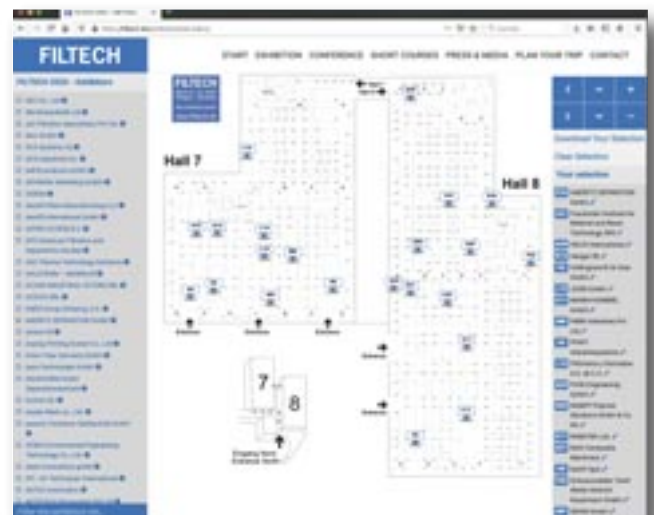
### The tool for Trade Visitors

Make your visit easy and effective by using your **FILTECH planning tool**.

You can also contact exhibitors of your interest prior to the Show via their company profiles at the FILTECH 2023 Website to arrange meetings at the show or ask for additional product information.

[www.Filtech.de](http://www.Filtech.de) → [exhibition/exhibitor-list/](http://www.Filtech.de/exhibition/exhibitor-list/)

[www.Filtech.de](http://www.Filtech.de) → [exhibition/hall-plans/](http://www.Filtech.de/exhibition/hall-plans/)



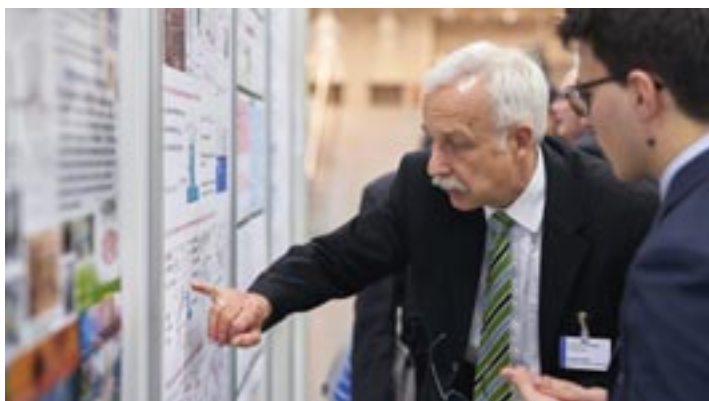
**+++ Ticket Sales will be handled exclusively online +++**



### Short Course I

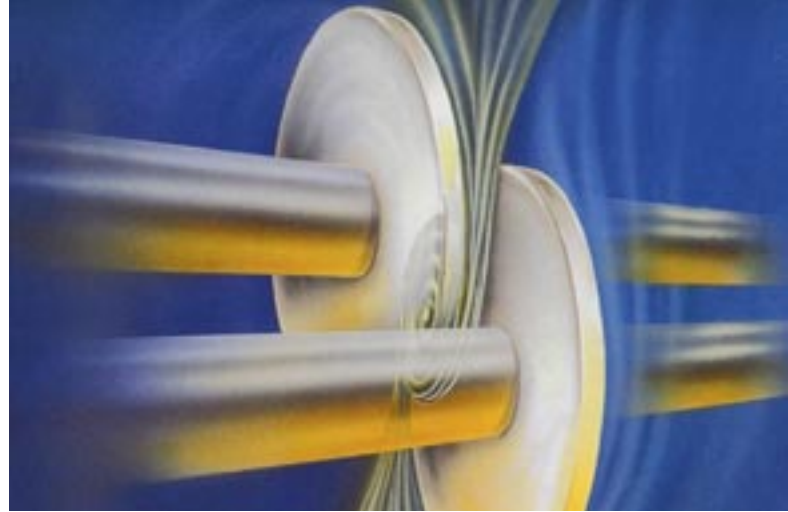
# Solid/Liquid Separation

This 1-day Course "Solid/Liquid Separation" is of interest to engineers, scientists, managers and other technical personnel involved in solid-liquid separation in the process and other industries. They will find the course informative, regardless of whether they design, purchase, research or use filtration and separation equipment. Plant engineers, technicians and operators should find the course materials directly applicable, and graduate research students will value the expert introduction to the technologies. It is a comprehensive review of the processes involved in the separation of solids from liquids, which will emphasise practical aspects and present appropriate theoretical information as necessary.



### Course Presenter

Dr.-Ing. Harald Anlauf was till March 2020 Academic Director at the Karlsruhe Institute of Technology (KIT), Institute of Mechanical Process Engineering and Mechanics and since more than 40 years active in the field of solid liquid separation technology. He earned his academic degrees as Chemical Engineer 1980 and 1985 at Karlsruhe University. 1999-2006 he was Chairman of the VDI-GVC working party „Mechanical Liquid Separation“, since 2000 Co-Chairman of the FILTECH Congress Scientific Committee. 2004-2008 he was Chairman of INDEFI and President of the 10th World Filtration Congress 2008 in Leipzig, Germany. He published more than 190 technical papers, books etc. and is internationally active in giving consultations and lectures.



### Topics:

#### Characterisation of Particles and Particle Separation

#### Density Separation - Static Thickeners and Solid Bowl Centrifuges

#### Depth, Cross Flow and Cake Filters

#### Filter Media

#### Suspension Pretreatment to Enhance Separation Properties

#### Alternative Separation Solutions & Apparatus Combinations

#### Selection Criteria for Separation Equipment

8.30 h Welcome Coffee

#### 9.00 h Introduction and Overview

Systematic survey of separation processes, apparatus examples and separation strategies

#### 10.00 h Particle Characterization

Characterization of single particles, particle collectives and particle separation.

10.45 h Coffee Break

#### 11.00 h Density Separation – Static Thickeners and Solid Bowl Centrifuges

Separation mechanisms, equipment, mode of operation, application.

#### 12.00 h Depth and Cross Flow Filtration

Separation mechanisms, equipment, mode of operation, application

12.45 h Lunch

#### 13.45 h Cake Filtration – Formation, Washing, Demounting

Separation mechanisms, consequences for practical use.

14.45 h Coffee Break

#### 15.00 h Cake Filters

Equipment, mode of operation, application

#### 16.00 h Filter Media

Overview and fields of application, influence of media properties on separation results.

#### 16.30 h Suspension Pretreatment to Enhance Separation Properties

Additional techniques for enhancing solid-liquid separation processes, physiochemical influences on slurry stability, flocculation

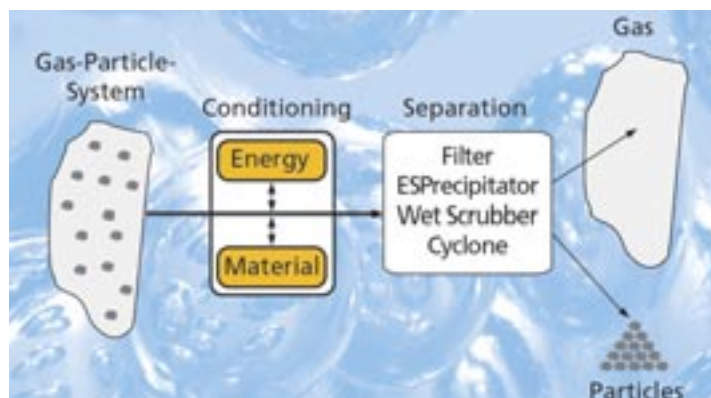
#### 17.00 h Apparatus Combinations, Alternative Solutions and Apparatus Selection Criteria

Strategies for process optimization & selection of suitable separation techniques.

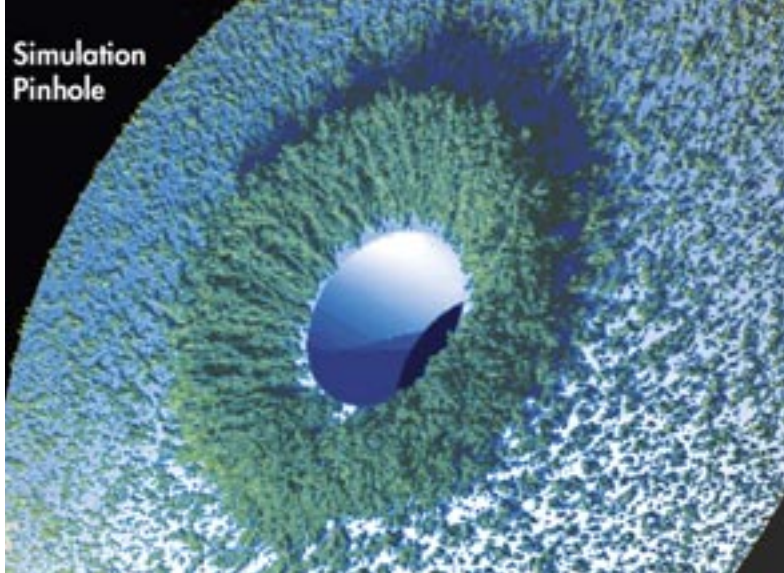
## Short Course II

# Fine Dust Separation

This 1-day "Fine Dust Separation" Short Course is of interest to engineers, technicians, scientists, managers, and other personnel involved in gas-solid separation in the process and other industries. They will find the course informative, regardless of whether they design, purchase, research, or use dust separation equipment for product recovery, emission control, air cleaning or process gas cleaning. It is a comprehensive review of the processes involved in the separation of solid or liquid particles from gases, which will emphasise practical aspects and present appropriate theoretical information as necessary.



Simulation  
Pinhole



## Topics:

**Evaluation & Selection of Dust Collection Equipment**

**Wet Scrubbers**

**Centrifugal Collectors / Cyclones**

**Electrical Precipitators**

**Fibrous Filters / Deep Bed Filters**

**Raw Gas Characterisation and Conditioning**

**Fabric Filters / Surface Filters**

8.30 h Welcome Coffee

### 9.00 h Introduction

Particulate Matter (PM<sub>x</sub>); Dust Separation; Air Cleaning; Overview of the course

### 9.15 h Evaluation of Dust Collection Equipment

Particle size characterisation, concentration measurement, overall and fractional collection efficiency

### 10.00 h Centrifugal Collectors (Cyclones)

Mode of operation, basic designs, application, collection efficiency, pressure drop

10.45 h Coffee Break

### 11.00 h Fibrous Filters (Deep-Bed Filters)

Mode of operation, basic designs, application, collection efficiency, pressure drop

### 11.45 h Fabric Filters (Surface Filters)

Mode of operation, basic designs, application, operating characteristics, design calculations

### 12.30 h Questions and answers

An open-floor question and answer session

13.00 h Lunch

### 14.00 h Wet Scrubbers

Mode of operation, basic designs, design calculations, application, droplet separation

### 14.45 h Electrical Precipitators

Mode of operation, basic designs, design calculations, application, operating characteristics

15.30 h Coffee Break

### 15.45 h Selection of Dust Collection Equipment

Comparison of the different techniques, strength and weaknesses, fields of application, selection procedure

### 16.30 h Raw Gas Conditioning

Additional techniques for enhancing dust separation equipment (Electrical and acoustic enhancement, additive dosing, precoating,...).

### 17.15 h Discussion

An open-floor question and answer session.

## Course Presenter

Prof. Dr.-Ing. habil. Eberhard Schmidt is Full Professor for Safety Engineering/Environmental Protection at Wuppertal University. His academic degrees he earned 1991 and 1998 at Karlsruhe University. From 1993 to 1994 he was affiliated with the Joint Research Centre in Ispra/Italy. In the years 1998 and 1999 he was with Degussa company in the department of process engineering / particle technology.

He is Co-Chairman of the FILTECH Conference and was Scientific Secretary of 10th World Filtration Congress. He has published more than 100 technical papers, books, patents, etc. and consulted and lectured throughout the world.





# Plenary and Keynote Lectures

## Scientific Committee

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**Dr. Matthias Waldenmaier** - Kaiserslautern - Germany

## Scientific Committee Chairmen

**Dr. Harald Anlauf** - Karlsruhe - Germany  
**Prof. Eberhard Schmidt** - Wuppertal - Germany



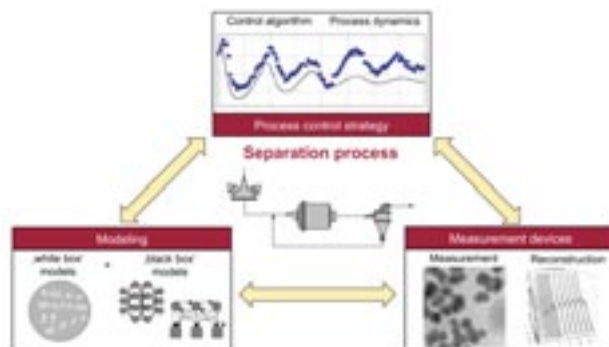
### Plenary Lecture From Digitalisation to Autonomous Processes

**Prof. Dr.-Ing. Hermann Nirschl**

Karlsruhe Institute of Technology (KIT) / Germany

In recent years, big efforts and investments have been made in the process industry to drive the digitalisation forward. This has led to extensive improvements in the design, the manufacturing and the operation of separation machines and systems. Huge progress has also been made in the field of simulation of the processes, so that now a prediction of the real performance in real time is possible. Therefore, it seems feasible in the near future to realize autonomous processes by means of a closed control loop, where the process models and the insitu measurement technology are coupled with a process control strategy. It is clear that just reduced order models, abstracted from complex simulations, are necessary to have a, faster as real time' performance which helps to predict the process in the future. Also insitu characterization devices will become more and more important for the realization of a 'model predictive control' strategy. This not only allows an automatic optimization of the target variables, but also helps to ensure a high resource efficiency according to raw materials and energy consumption. The presentation explains the basics of autonomous processes and their implementation in separation devices like centrifuges.

...learn more at **FILTECH 2023**





# presented by leading experts



## **The composite filter media for removal of high-concern contaminants from water**

Prof. Dr.-Ing. Andrzej Krasinski, Warsaw University of Technology, Poland

The presentation covers the enhancement of filtration performance by modification of porous media tailored for specific processes of water cleaning. The topic will include methods of filter structure modification by deposition or synthesis of particles on the fibers or granules to obtain a desired added functionality of filtration unit, including antibacterial, photocatalytic or/and adsorption capabilities. The presented applications refer to the cleaning of water from contaminants of recent concern, such as removal of heavy metals, pharmaceutical ingredients and prevention of microorganism colonization. This problem observed commonly in many applications can lead to a rapid clogging of the filter due to bacteria growth and reemission of these microorganisms due to their reentrainment from a biofilm to the outlet. Preventing the bacteria development can also be of a high importance in filters installed to eliminate microplastics, which are prone to bacteria deposition and the formation of biofilm.



## **Electrostatically charged PVDF nanofiber filter for filtering submicron- and nano-aerosols**

Prof. Wallace WF Leung et. al., The Hong Kong Polytechnic University, Hong Kong SAR

Existing filter media are not very effective in capturing submicron aerosols ( $<1$  micron) and nanoaerosols ( $\leq 100$  nm). These aerosols can be pollutants in air or aerosols bearing deadly viruses, such as SARS-CoV-2 virus that triggers the worldwide pandemic since March 2020. Existing filter media with microfibers are poor in mechanical capture on these tiny aerosols. For charged microfiber filters, the filter efficiency has been improved, yet they suffer from skin effect for which a cake forms rapidly on the filter surface during aerosol loading for which most of the filter proper downstream is not being used. When the filter interior is equipped with disinfectant agents attached to the fibers, these become redundant as the incoming aerosols are deposited in the cake on the filter surface and not inside the filter. There is a need to prolong depth filtration for disinfection and to load the filter uniformly with aerosols.



## **Description of particle interactions in solid-fluid separation processes by CFD-DEM coupling method**

Prof. Dr.-Ing. Sergiy Antonyuk, Institute of Particle Process Engineering, Technical University of Kaiserslautern

The coupling of discrete element method (DEM) and computational fluid dynamics (CFD) is a very powerful tool for the numerical study of dynamical particle interactions and separation mechanisms in fluid. This contribution first gives a brief overview on the physical contact models which can be used in CFD-DEM. The established experimental methods for the parameter estimation and validation of models are discussed. The focus is particularly on the description of deformation mechanisms of particles in compressible filter cake. Plastic deformation of soft particles can lead to immense porosity changes of the filter cake, which leads to significantly higher pressure differences during filtration compared to stiff and elastic particle systems. However, only a few contact models for elastic-plastic particles and numerical considerations regarding compressibility can be found in current literature. Therefore, an elastic-plastic contact model was developed, experimentally validated and implemented in DEM.



## **Mineral tailings filtration: lessons learnt from wastewater sludge filtration**

Dr.-Ing. Anthony Stickland, The University of Melbourne / Australia

Mineral ore processing produces tailings at an enormous scale that is increasing with demand and decreasing ore grades. Decreasing ore grades also require additional grinding to liberate valuable minerals, resulting in more fine particles in the tailings. The minerals industry is shifting to dry stacking of tailings to reduce the environmental risk posed by tailings dams. For fine particle suspensions, dry stacking requires high pressure filtration to achieve stackable cake moisture contents, which has the added benefit recovering additional process water. The filter presses required to process tailings at the world's largest mines push the limits of plate size and minimal handling time to reduce capital and operating costs. However, these behemoths do not solve some of the underlying fundamental problems with filter presses such as batch processing, fixed cavity width, and the use of filter cloths. Cloths need to be regularly cleaned and replaced, becoming waste if they can't be repurposed or recycled.

# Session Overview

Monday 13.02.2023 09:00-18:00h

Short Course I · Solid/Liquid Separation

Short Course II · Fine Dust Separation

## Tuesday, 14.02.2023

08:30	Registration					
10:15	Opening Session -					
10:45 12:00	PL	Plenary Lecture – Prof. Dr.-Ing. Hermann Nirschl, Karlsruhe Institute of Technology (KIT), Germany From Digitalisation to Autonomous Processes				
Lunch 1st Floor						
	Room 1		Room 2		Room 3	
13:00 14:15	K1	Keynote Lecture I	L1	Depth Filtration and Adsorption I	G1 Measurement Techniques	
Coffee Break						
14:45 16:00	K2	Keynote Lecture II	L2	Depth Filtration and Adsorption II	G2 Filter Test Systems	
Coffee Break						
	Room 1		Room 2		Room 3	Room 4
16:45 18:00	L3	Advanced Pore Structure Analysis	L4	Particle Washing	G3 Air Filtration	G4 Particle-Collector-Interaction

## Wednesday, 15.02.2023

	Room 1		Room 2		Room 3	Room 4
09:00 10:15	<b>L5</b>	Microplastic Filtration and Filtration of highly Diluted Slurries	<b>L6</b>	Decanter Centrifuges	<b>G5</b> Industrial Air and Gas Cleaning	<b>G6</b> Adsorption
Coffee Break						
10:45 12:00	<b>K3</b>	Keynote Lecture III	<b>L7</b>	Filter Centrifuges and Hydrocyclons	<b>F1</b> Sustainable Filter Elements and Media	<b>M1</b> Water Treatment
Lunch 1st Floor						
13:00 14:15	<b>K4</b>	Keynote Lecture IV	<b>G7</b>	Vapor, Mist and Droplet Separation	<b>F2</b> Smart Filter Element Development and Production	<b>M2</b> Ultrafiltration
Coffee Break						
14:45 16:00	<b>L8</b>	Short Oral	<b>G8</b>	Short Oral	<b>G9</b> Short Oral	<b>F3/M3</b> Short Oral
16:00 16:45	All Poster Presentations in the Poster Section in Hall 8					
16:45 18:00	<b>L9</b>	Filter Presses and Press Filters I	<b>L10</b>	Advanced Filter Technology for Process Optimization	<b>G10</b> Pulse-Jet Cleaned Filters	<b>G11</b> Modelling and Simulation

## Thursday, 16.02.2023

	Room 1		Room 2		Room 3	Room 4
09:00 10:15	<b>L11</b>	Filter Presses and Press Filters I	<b>G12</b>	Indoor Air Cleaning	<b>F4</b> Innovative Media Development and Optimization	<b>M4</b> Transport Mechanisms
Coffee Break						
10:45 12:00	<b>L12</b>	Lab Scale Cake Filtration - Equipment and Fundamentals	<b>G13</b>	Indoor Air Quality	<b>F5</b> Media Deformation-Modelling and Simulation	<b>M5</b> Metal and Ceramic Membranes
Lunch 1st Floor						
13:00 14:15	<b>L13</b>	Digitalization of Separation Processes	<b>G14</b>	Automotive Applications I	<b>F6</b> Media Functionalization	<b>M6</b> Separation of Complex Systems
Coffee Break						
14:45 16:00	<b>L14</b>	Oil/Water- and Oil/Solid-Separation	<b>G15</b>	Automotive Applications II	<b>F7</b> Progress in Electrospinning	<b>M7</b> Membrane Fouling

Programme is subject to amendments. Up-to-date Programme is available at [www.Filtech.de](http://www.Filtech.de)



# FILTECH 2023 · Conference Programme

## Tuesday, February 14, 2023

O

Opening Session

10:15  
10:45

PL

Plenary Lecture

10:45  
12:00

**From Digitalisation to Autonomous Processes**, Prof. Dr.-Ing. Hermann Nirschl, Karlsruhe Institute of Technology (KIT), Germany

K1

Keynote Lecture 1

13:00  
14:15

room 1

**The composite filter media for removal of high-concern contaminants from water**, Prof. Dr.-Ing. Andrzej Krasinski, Warsaw University, Poland

L1

Depth Filtration and Adsorption I

13:00  
14:15

room 2

**Pre-Coat filter as advanced treatment step for further removal of dissolved and particulate emerging pollutants from municipal wastewater**, H. Geers\*, Hoffmann Maschinen- und Apparatebau GmbH; K. Bauerfeld, S. Karwat, Technical University Braunschweig, Germany

**Prevention of microbial contamination and biofouling in water filtration with agxx®**, M.-L. Harwardt\*, R. Ahlers, A.-L. Meza-Chincha, M. Danz, Heraeus Precious Metals - Antimicrobial Technologies; C. Meyer, Largentec GmbH, Germany

**The evolution of Disruptor® charged fiber technology**, E. Nelson\*, F. Cousart, D. Russell, Ahlstrom, USA; C. Läck, Ahlstrom, Sweden; J. Kaukopaasi, Ahlstrom, Finland; Christophe Theron, Ahlstrom, France

G1

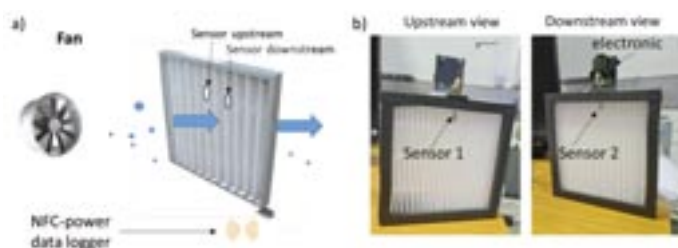
Measurement Techniques

13:00  
14:15

room 3

**Investigation of aging phenomena of low-cost pm sensors**, F. Reinke\*, J. Meyer, A. Dittler, Karlsruhe Institute of Technology (KIT), Germany

**Integration of pressure sensing system onto air filter**, A. Khaldi, A. Bouhangel\*, H. Wu, L. Dupont, E. Daniel, F. Seguin, F. Theron, A. Joubert, Y. Andrès, C. Lahuec, IMT Atlantique; M. Duclos, Groupe Titanair, France



**Preselection of fibres by igc techniques for applications in gas filtration**, R. Heidenreich\*, L. Kotte, D. Keßlau, Institute of Air Handling and Refrigeration (ILK), Germany

K2

Keynote Lecture 2

14:45  
16:00

room 1

**Electrostatically charged PVDF nanofiber filter for filtering submicron- and nano-aerosols**, Prof. Wallace WF Leung et. al., The Hong Kong Polytechnic University, Hong Kong SAR

L2

Depth Filtration and Adsorption II

14:45  
16:00

room 1

**Surface modification of polypropylene non-woven filter by O<sub>2</sub> plasma/acrylic acid enhancing Prussian blue immobilization for aqueous cesium adsorption**, N. Dehbashi Nia\*, S.-W. Lee, T.-H. Kim, Y. Hwang, Seoul National University of Science and Technology; S. Bae, Konkuk University, Republic of Korea

**Removal of superfine adsorbents with 3d woven high performance OptiFiber pile cloth media**, T. Fundneider\*, R. Schäfer, U. Grabbe, Mecana Umwelttechnik GmbH; Switzerland; F. Kirchen, S. Lackner, Technical University Darmstadt, Germany

**Deep learning enhanced algorithm for in-line characterization of particle size and shape in depth filtration processes**, S. Daus\*, U.A. Peuker, Technical University Bergakademie Freiberg, Germany

G2

Filter Test Systems

14:45  
16:00

room 3

**Test of efficiency by particle size and total efficiency – influences of test parameters and measuring technology**, M. Schmidt\*, PALAS GmbH, Germany

**Investigation of viral aerosols on surfaces and in air for a better understanding of applying bacteriophages phi6 and MS2 as viral surrogates for air filter evaluation**, B. Führer\*, C. Hartl, A. Włodarczyk, J. Pokorny, V. Sharp, C. Kirchnawy, OFI Technology & Innovation Ltd, Austria

**Performance evaluation of engine air filter media coated with nylon nanofibers**, J. Johnson\*, M. Muzwar, R. Chetty, K. Arul Prakash, Indian Institute of Technology Madras, India

L3

Advanced Pore Structure Analysis

16:45  
18:00

room 1

**Description of depth filtration in filter aid structures through 3D microscopy**, T. Buchwald\*, J. Friebe, D. Neuber, U.A. Peuker, Technical University Bergakademie Freiberg, Germany

**Investigation of the influence of pore morphology on the deliquoring behavior of filter cakes using X-ray tomography**, E. Löwer\*, U.A. Peuker, Technical University Bergakademie Freiberg, Germany

**Characterisation of nonwoven materials with the POROLUXTM100**, M. Ängeslevä\*, D. Dutczak, E. Pattyn, K., I. Struzynska-Piron, D. Pattyn, Aptco Technologies, Belgium; Chojnacka-Górka, K. van der Kamp IB-FT GmbH, Germany.

L4

Particle Washing

16:45  
18:00

room 2

**Filtration and washing properties of black mass residues from battery recycling**, U.A. Peuker\*, T. Lyon, E. Löwer, Technical University Bergakademie Freiberg, Germany

**Wash liquid application: A blind spot of cake washing**, H. Henn\*, F. Sauer, B. Hoffner, Mannheim University of Applied Sciences, Germany

**Displacement washing of inhomogeneous filter cakes**, F. Sauer\*, H. Henn, B. Hoffner, Mannheim University of Applied Sciences, Germany

## G3

### Air Filtration

16:45 room  
18:00 3

**Influence of material compression on the mechanical and electrostatic capturing efficiency of filter media**, C. Mercier\*, R. Kirsch, S. Osterroth, S. Rief, Fraunhofer Institute for Industrial Mathematics (ITWM); S. Antonyuk, M. Kerner, University of Kaiserslautern-Landau, Germany

**How to quantify the influence of solid volume fraction heterogeneities on fibrous filter efficiency and permeability by computational simulations**, N. Bardin-Monnier\*, A.S. Rathore, A. Charvet, Lorraine University, France

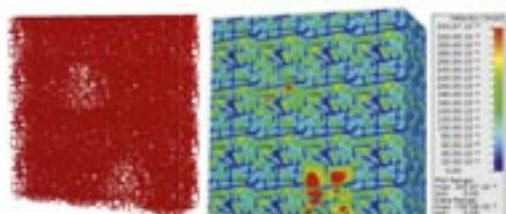


Figure 1: Fibrous structure and its flow visualization with two lower SVF heterogeneities within the depth of the fibrous filter

**How eurovent is improving ventilation and industry decision-making**, T. Stoffel\*, DELBAG GmbH, Germany

## G4

### Particle-Collector-Interaction

16:45 room  
18:00 4

**Concept of magnetic-induced gas cleaning filter regeneration – fundamental investigation of particle structure detachment from a magnetizable single fiber**, J Szabadi\*, J. Meyer, A. Dittler, Karlsruhe Institute of Technology (KIT), Germany

**Improved modeling of electrostatic charges in fibrous filter media**, L. Cheng\*, J. Becker, A. Wiegmann, Math2Market GmbH, Germany; K. Lee, FITI Testing & Research Institute; J. Kim, Seoul National University, South Korea

**Validation of the simulation of continuous aerosol deposition at various wire mesh types including non-trivial particle-particle and particle-wire adhesion forces by laboratory measurements**, K. Schmidt\*, S. Ripperger, IT for Engineering (it4e) GmbH; A. Mantler, F. Meyer, Haver & Boecker OHG, Germany

## Wednesday, February 15, 2023

## L5

### Microplastic Filtration and Filtration of highly Diluted Slurries

09:00 room  
10:15 1

**Microplastics from tire wear – Filtration in the field**, D. Herper\*, GKD - Gebr. Kufferath AG, Germany

**A novel precoat filtration method using fine bubbles**, M. Iwata\*, K. Yagishita, S. Oguri, T. Kitagawa, H. Yagishita, K. Yagishita, Sanshin Mfg. Co., Ltd., Japan

**Capacity of nonwoven filter layers for use in automatic filters**, T. Buchwald\*, U.A.Peuker, Technical University Bergakademie Freiberg, Germany

## L6

### Decanter Centrifuges

09:00 room  
10:15 2

**Parametric study of centrifugal dewatering of flocculated activated sludges with a lab screw decanter**, P. Ginisty\*, IFTS - Institute of Filtration & Techniques of Separation, France

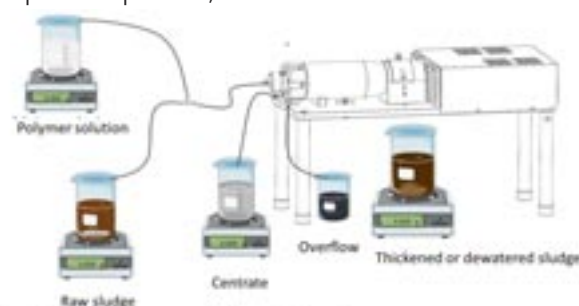


Fig. 1 - Lab screw centrifuge decanter

**Direct recycling of lithium-ion battery cathode materials from aqueous suspension by centrifugation**, T. Yildiz\*, M. Gleiß, H. Nirschl, Karlsruhe Institute of Technology (KIT), Germany

**Development of a dynamic grey box model for a digital twin of decanter centrifuges**, O. Zhai\*, M. Gleiß, H. Nirschl, Karlsruhe Institute of Technology (KIT), Germany

## G5

### Industrial Air and Gas Cleaning

09:00 room  
10:15 3

**Innovation meets filtration - Efficient filtration up to 160 °C**, K. Schmitt\*, Herding GmbH Filtertechnik, Germany

**SMF®- Industrial filtration processes with potential for CO<sub>2</sub> reduction**, S. Steigert, K. Schrewe\*, HJS Emission Technology GmbH & Co. KG, Germany

**Impact of conducting filter media on the performance of pulse-jet filtration assisted with pre-charger**, A. Mukhopadhyay\*, A.K. Choudhary, National Institute of Technology Jalandhar; S. Dutta, Bannari Amman Institute of Technology, C. C. Reddy, Indian Institute of Technology Ropar, India

## G6

### Adsorption

09:00 room  
10:15 4

**Improvement of mechanical properties maintaining adsorption capacity of permanganate-based media for the removal of indoor air pollutants**, I. Merino, S. Palekar\*, A. Doche, A. Puig, E. Sunye, Bioconservacion, S.A., Spain



**Multi-sorbent gas adsorption media for complex application demands for indoor air quality and electrical vehicle intake**, B. Shoar\*, ALKEGEN, USA

**Process air cleaning in the battery manufacturing**, S. Holfeld\*, R. Heidenreich, Institute of Air Handling and Refrigeration (ILK), Germany



# Solutions for current and future challenges

**K3**

**Keynote Lecture 3**

10:45 room  
12:00 **1**

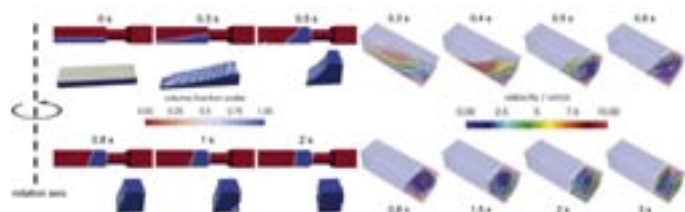
**Description of particle interactions in solid-fluid separation processes by CFD-DEM coupling method**, Prof. Dr.-Ing. Sergiy Antonyuk, University of Kaiserslautern-Landau, Germany

**L7**

**Filter Centrifuges and Hydrocyclons**

10:45 room  
12:00 **2**

**Numerical and experimental investigation of the particle segregation during centrifugal filtration**, F. Krull\*, P. Lösch, S. Antonyuk, University of Kaiserslautern-Landau; S. Boldt, D. Krause, D. Lerche, LUM GmbH, Germany



**Troubleshooting and optimization of industrial filter centrifuges with minimal experimental effort by using the CENTRISTAR software**, I. Nicolaou\*, NIKIFOS Ltd, Cyprus

**Design of hydrocyclones with minimal experimental effort by using the CYCLONPLUS Software**, I. Nicolaou\*, NIKIFOS Ltd, Cyprus

**F1**

**Sustainable Filter Elements and Media**

10:45 room  
12:00 **3**

**Reducing the carbon footprint of filter elements with design, process and material optimizations by means of life cycle assessments (LCA)**, L. Spelter\*, M. Hirt, C. Oprisch, T. Müller, MANN+HUMMEL GmbH, Germany; S. Arora, MANN+HUMMEL INC., USA; J. Zenner, MANN+HUMMEL S.A.S., France

**On the road towards sustainable filtration - Aspects of automotive filter element recycling and disposal** Thilo Müller, T. Müller\*, L. Spelter, F. Keller, MANN+HUMMEL GmbH, Ludwigsburg, Germany

**A woven wire mesh for energy-efficient filtration processes**, M. Müller\*, Spörl KG, Germany

**M1**

**Water Treatment**

10:45 room  
12:00 **4**

**Challenges in introducing innovations in membrane technology-based applications with a focus on seawater desalination with reverse osmosis**, T. Peters\*, Membrane Consulting, Germany

**Dual freshwater and salts harvesting from brine via photothermal membrane**, H.M. Abdel-Ghafar\*, E.A. Abdel-Aal, M.T. Elbossy, Central Metallurgical Research and Development Institute (CMRDI), Egypt

**Activated carbon to improve the performance of membrane processes for the extraction and elimination of methylene blue pollutant**, S. Oukkass, R. Ouchn, I. Mechnou, I. El Yaakoubi, M. Hlaibi\*, University Hassan II, Morocco; L. Lebrun, University of Rouen, France

**K4**

**Keynote Lecture 4**

13:00 room  
14:15 **1**

**Mineral tailings filtration: lessons learnt from wastewater sludge filtration**, Dr.-Ing. Anthony Stickland, University of Melbourne, Australia

**G7**

**Vapor, Mist and Droplet Separation**

13:00 room  
14:15 **2**

**Separation of aerosols inducing localized condensation of vapors**, J. Vallejo, M. Dalmasso, M.J. Rubio, J. Marval, V. Gentile, P. Tronville\*, Politecnico di Torino, Italy

**Influence of filtration velocity on the local oil distribution of coalescence filter media**, C. Straube\*, J. Meyer, A. Dittler, Karlsruhe Institute of Technology (KIT), Germany

**Overcoming challenges when measuring particle size distributions in raw and clean gas of oil-injected screw compressors under realistic operating conditions**, J. C. Reinelt\*, C. Straube; J. Meyer; A. Dittler, Karlsruhe Institute of Technology (KIT); J. Eisengraber-Pabst; T. Grein, MANN+HUMMEL GmbH, Germany

**F2**

**Smart Filter Element Development and Production**

13:00 room  
14:15 **3**

**Smart filter element development – Applied machine learning for optimized element layouts**, T. Gose\*, C. Schulz, F. Keller, J. Ziegler, MANN+HUMMEL GmbH; C. Hitzke, S. Zöllner, MANN+HUMMEL Innenraumfilter GmbH & Co. KG, Germany

**From virtual production to real filter media samples**, F. J. Hahn\*, T. Gose, L. Spelter, K. Riedinger, F. Keller, MANN+HUMMEL GmbH; A. Schmeißer, W. Arne, R. Wegener, Fraunhofer Institute for Industrial Mathematics (ITWM), Germany

**Three dimensional AI-Segmentation of synthetic filter media**, P. Eichheimer, A. Grießer\*, Math2Market GmbH; K.M. Höss, F. Hahn, C. Schulz, MANN+HUMMEL GmbH, Germany; A. PS, MANN+HUMMEL, India



**M2**

**Ultrafiltration**

13:00 room  
14:15 **4**

**Ultrafiltration: The hydrophilicity advantage**, S. Dhole, S. Srivastava\*, Technorbital Advanced Materials Pvt Ltd, India

**Developing hydroxyapatite-based ultrafiltration membrane**, E.A. Abdel-Aal\*, H.M. Abdel-Ghafar, Central Metallurgical Research and Development Institute (CMRDI), Egypt

**Sustainable route in the preparation of flat-sheet and hollow fiber polymeric membranes**, A. Figoli\*, Institute on Membrane Technology, National Research Council of Italy (ITM-CNR), Italy

**L8**

**Short Oral + Poster Presentation**

14:45 room  
16:45 **1**

**Influence of gas injection on the particle separation behavior of a hydrocyclone**, T. Senfter\*, D. Hohenwarter, M. Dür, T. Kofler, C. Mayerl, M. Berger, M. Pillei, MCI - The Entrepreneurial School, Austria

**Simulation of the separation behavior in solid bowl centrifuges using material functions**, H. Baust\*, M. Gleiß\*, H. Nirschl\*, Karlsruhe Institute of Technology (KIT), Germany

**Experimental analysis of the vibration patterns of disk stack centrifuges for the determination of separation process parameters**, N. Janssen\*, F.K. Freese, U. Janoske, University of Wuppertal, Germany

**Experimental study of flocculation and flotation for the treatment of drilling wastewater**, X. Ma\*, J.-Y. Chen, H. Chi, Z. Zhang, Z. Zhang, China University of Petroleum, China

**Development of a modular process chain for the selective recovery of technology metals**, T. Dobler\*, M. Gleiß, H. Nirschl, Karlsruhe Institute of Technology (KIT), Germany

**Regenerative capability of membranes in case of fouling caused by microalgae**, V. Bächle\*, M. Gleiß, H. Nirschl, Karlsruhe Institute of Technology (KIT), Germany

**Optimal control of parallel pressure filtration systems**, H. Aalto\*, Take Control Oy, Finland

**Ore residue filtration: cake post-dewatering by pressurized air**, B. Fränkle\*, Nirschl, Karlsruhe Institute of Technology (KIT), Germany, J. Chaponnel, FLSmidth Salt Lake City Operations, USA

**Holistic approach of the filtration-drying process**, M. Rahmann\*, BHS-Sonthofen Process Technology GmbH & Co. KG, Germany

**G8**

Short Oral + Poster Presentation

14:45 room 2  
16:45

**Influence of pulse-jet pressure on the performance the cartridge type dust collector in clean-on-demand mode**, K. Fukui\*, K. Furumoto, Y. Muraoka, T. Fukasawa, T. Ishigami, Hiroshima University, Japan; Z. Yu, Northeastern University, China

**Moisture and thickness influence in precoating filtration**, B.K.S.A. Andrade, R. Sartim, M.L. Aguiar\*, Fed. University of São Carlos, Brazil

**Efficiency study and characterization of pan nanofibers incorporated with zno nanoparticles**, E.N. Silva, M.L. Aguiar\*, V.G.G. Bettega, Federal University of São Carlos, Brazil

**Generation of datasets using POD for an artificial intelligence to optimize an energy-efficient HVAC system**, L. Bittel\*, A. Baumann, L. Springsklee, S. Berger, J. Niessner, Heilbronn University of Applied Sciences, Germany



**Particulate matter efficiencies (ePMx) of air filters for general ventilation under real-life operation conditions**, M. Wist\*, M. Schroers, F. Schmidt, University Duisburg-Essen (UDE); T. Engelke, D. Kasper, E. Däuber, Institute of Energy and Environmental Technology e.V. (IUTA), Germany

**Development of long-term stable filters for air cleaners based on electrically conductive tufted structures**, S. Schumacher\*, B. Schunke, C. Asbach, Institute of Energy and Environmental Technology e.V. (IUTA); L. Zobel, D. Hanuschik, B. Aslan, RWTH Aachen University, Germany

**Insights into filtration performance of ISO 16890 and ISO 29463 air filter media using DEHS particles classified by aerodynamic diameter**, S. Payne, J. Symonds, Cambustion Ltd, UK

**Innovative solution for eliminating microbes from room air using roll to roll copper coating on non-wovens**, P. Goradia\*, Exposome Pvt Ltd., India

**Next-generation sequencing-based monitoring of biological pollutants concentration in university classroom equipped with hvac and air purifier crossfield technology – pilot study**, G. Porta, G. Micheloni, G. Montalbano, Insubria University; L. Nappa\*, V. Guttadauria, OVER, Italy

**Development of a practical laboratory testing procedure for mobile dust collection systems with cleanable filters**, M. Wist\*, F. Schmidt, University Duisburg-Essen (UDE); T. Engelke, Institute of Energy and Environmental Technology e.V. (IUTA), Germany

**Smartgreen – Accounting the ecosystem-performance of urban greenings**, M. Kaul\*, G. Reznik, E. Schmidt, University of Wuppertal, Germany

**On-line measurements of ultralow concentrated hydrocarbons in compressed air using a photoacoustic detector**, H. Bettermann\*, T. Dietzel, V. Chmiel, Heinrich-Heine-University Düsseldorf; M. Wittmar, Institute of Energy and Environmental Technology e.V. (IUTA), Germany

**G9**

Short Oral + Poster Presentation

14:45 room 3  
16:45

**Particle filtering face masks: Investigation of aerosol deposition under real-life wearing conditions**, D. Stoll\*, M. Kerner, S. Antonyuk, University of Kaiserslautern-Landau, Germany

**Application of a wool-based EcoStatic filter in a contingency breathing apparatus onboard the Orion spacecraft**, S. Tan\*, LANACO, New Zealand

**Studies on indoor air filtration supported by simulations**, T. Engelke\*, U. Sager, S. Haep, Institute of Energy and Environmental Technology e.V. (IUTA), Germany



**Electrospinning nanofiber for efficient cabin air filter applications**, F. Tezcan\*, V. Demirel, Hifyber - Acik Kart Bilgi Teknolojileri, Turkey

**Wet-laid nonwoven of activated carbon fiber for air filtration**, Y. Kim\*, G.D. Lee, S.J. Doh, J.N. Im, Korea Institute of Industrial Technology (KITECH), South Korea

**Removal of nanoparticles by electrostatic precipitation: evaluation of the collection efficiency behavior with the electric field and air velocity**, F. de Aquino Lima\*, G. B. Medeiros, M. L. Aguiar, V. G. Guerra, Federal University of São Carlos, Brazil

**Analysis of the dynamic characteristics of the vortex core in the cyclone separator**, K. Xie\*, J. Wang, J. Wang, G. Sun, China University of Petroleum, China

**Structural optimization and performance research of new cyclone separator with high efficiency and low resistance**, H. Cui\*, J.-Y. Chen, L. Kong M. Cao, China University of Petroleum, China

**CFD study of the flow field in a stairmands reversed flow cyclone**, J. Oranje\*, John Crane Indufil, Netherlands



# Discover the Future of Filtration & Separation

**Design methodology of a pilot-scale scrubber implemented in a full-scale waste incineration plant for collection of nano and sub-micrometer sized particles in flue gas**, A. Hoyos\*, A. Joubert, A. Bouhanguel, L. Le Coq, IMT Atlantique; M. Henr, S. Durécu, Séché Environnement, France

**Simultaneous release and separation of dust by means of electrostatically assisted spray nozzle systems - experimental procedures**, M. Weidemann\*, E. Schmidt, University of Wuppertal, Germany

**Dust emission prediction – Announcing a reference material**, N. Woschny\*, E. Schmidt, University of Wuppertal, Germany

**Single bulk particle investigations for dust release simulations – Describing im-pact and fluid stressing**, N. Woschny\*, G. Reznik, M. Kaul, E. Schmidt, University of Wuppertal; D. Schulz, H. Kruggel-Emden, Technical University Berlin, Germany

**Investigations into a jet-based process of direct mixed aggregation in the gas phase for the formation of hetero-aggregates**, J. Witte\*, E. Schmidt, University of Wuppertal; V. Kolck, H. Kruggel-Emden, Technical University Berlin, Germany

## F3/M3 Short Oral + Poster Presentation 14:45 16:45 room 4

**Preparation and characterization of meta-aramid wet-laid nonwoven**, G.D. Lee\*, Y. Kim, J.N. Im, S.J. Doh, Korea Institute of Industrial Technology (KITECH), South Korea

**Contribution of sheath-core bicomponent based nonwovens to the design of synthetic composite filter media**, R. Winters\*, J. Westerdijk, M. Koerntjes, Freudenberg Performance Materials, Netherlands

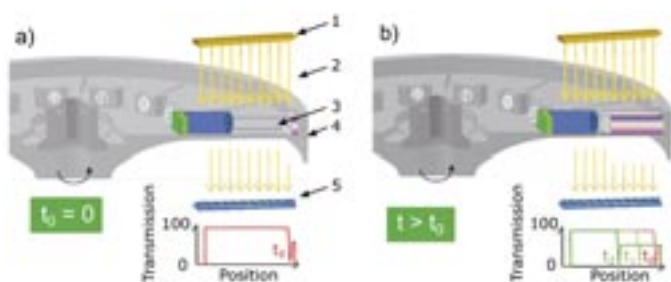
**On the impact of porous media inhomogeneity on pore scale on reactive flow**, O. Iliev, P. Toktaliev\*, Fraunhofer Institute for Industrial Mathematics ITWM, Germany

**AI-supported improvement of quality control and work quality in automotive filter production**, C. Boltersdorf\*, T. Gries, RWTH Aachen University; Dominik Herper, GKD - Gebr. Kufferath AG, Germany

**Fibre characterisation by dynamic image analysis**, J. Lunewski\*, E. Schmidt, University of Wuppertal, Germany

**Converting waste expanded polystyrene into filter media by electrospinning technique: Evaluation of air nanofiltration and permeability**, F. de Aquino Lima\*, G.B. Medeiros, M.L. Aguiar, V.G. Guerra, Federal University of São Carlos, Brazil

**Membrane characterization by analytical multisample photo-centrifugal filtration (ACF)**, P. Lösch, F. Krull\*, S. Antonyuk, University of Kaiserslautern-Landau; S. Boldt, D. Krause, D. Lerche, LUM GmbH, Germany



**Model of steady-state ultrafiltration of colloidal suspension with formation of non-newtonian concentration polarization layer and compressible deposit under laminar cross-flow**, M. Loginov\*, H. Gholamian, G. Gésan-Guizieu, INRAE - National Institute for Agriculture, Food and Environment, France

**Elaboration of a specific polymer inclusion membrane for the processes of total selective separation and recovery of methylene blue and direct red 80 dyes from contaminated aqueous solutions**, I. Mourtah, I. Mechnou, Y. Chaouqi, N. Sefiani, M. Hlaïbi\*, Morocco; L. Lebrun, University of Rouen, France

## L9 Filter Presses and Press Filters I 16:45 18:00 room 1

**Scale-up for optimized belt filter press operation**, G. Krammer\*, Graz University of Technology; R. Raberger, Andritz AG, Austria

**High pressure dewatering rolls Mk-II: A novel dewatering technology for mineral tailings**, S. Hassan\*, N.I. K. Ekanayake, P.J. Scales, Robin J. Batterham, A.D. Stickland, University of Melbourne, Australia

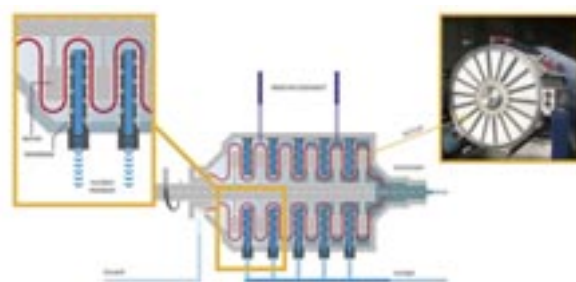
**Cake desaturation optimisation in filterpress process: an experimental approach**, F. Kaswalder\*, N.M. Finocchiaro, A. Grosso, Diemme Filtration Srl, Italy

## L10 Advanced Filter Technology for Process Optimization 16:45 18:00 room 2

**Saving energy in operating membrane filterpresses during optimizing the filtration process with JZ-Analysis-System**, J. Zeller\*, JZ Engineering GmbH, Germany

**Single-use multicycle filters for process intensification Single-Use-Technology by DrM, Dr. Müller AG**, P. Morsch\*, D. Stucchi, T. Bucher, DrM, Dr. Müller AG, Switzerland; C. Jerrold-Jones, DrM, USA

**Dynamic cross flow filtration with metallic filter media - Versatile, new process solutions: classification, clarification, concentration**, E. Ehrfeld\*, BOKELA GmbH, Germany



## G10 Pulse-Jet Cleaned Filters 16:45 18:00 room 3

**On the trade-off between energy efficiency and particle emissions for pulse-jet cleaned filters**, P. Bächler\*, J. Meyer, A. Dittler, Karlsruhe Institute of Technology (KIT), Germany

**Comparative analysis of filtration performance between flat based and industrial pilot pulse-jet test rigs using polyester filter materials**, A.K. Choudhary\*, National Institute of Technology Jalandhar; S. Dutta, Bannari Amman Institute of Technology, India

**The potential of Computational Fluid Dynamics (CFD) for efficient pulse-jet cleaning of fabric filters**, G.V. Messa\*, Politecnico di Milano; C. Maggi, L. Montanelli, CleanAir Europe S.r.l., Italy

## G11 Modelling and Simulation

16:45 room  
18:00 4

**CFD modelling tool for multiple filter systems on the macro level,** U. Heck\*, M. Becker, DHCAE Tools GmbH, Germany

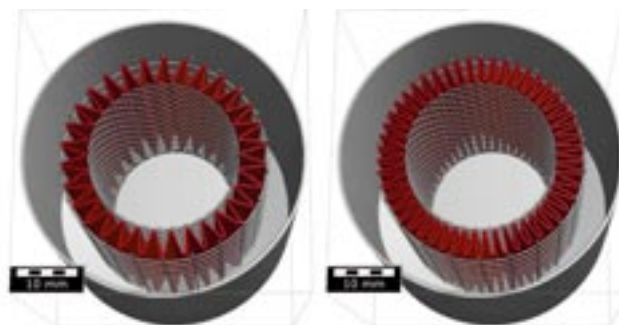
**Structural changes in the filtering layer during the dust separation with filtering separators — A holistic view of the filtration process,** Q. Zhang\*, University of Wuppertal, Germany

**Development of a cyclone sampler using CFD,** D. Misiulia\*, S. Antonyuk, University of Kaiserslautern-Landau, Germany; G. Lidén, Stockholm University, Sweden

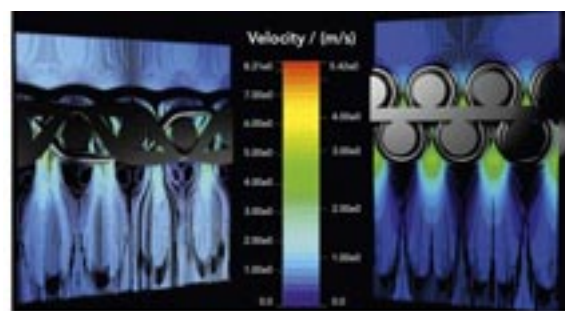
## F4 Innovative Media Development and Optimization

09:00 room  
10:15 3

**A digital framework for pleat optimization,** A. Wiegmann\*, L. Cheng, E. Glatt, D. Mosbach, S. Linden, P. Eichheimer, M. Azimian, Math2Market GmbH, Germany



**New developments in woven wire filtration media: 3D high performance filter cloth; woven wire mesh combinations in solid-liquid separation,** F. Edelmeier\*, F. Meyer, Haver & Boecker, Germany



**Conjugated microporous polymers from [3+2] and [4 + 2] cycloaddition reactions: prominent adsorbent materials of iodine and cationic dyes,** B. Alameddine\*, Gulf University for Science and Technology, Kuwait

## M4 Transport Mechanisms

09:00 room  
10:15 4

**Multidimensional particle fractionation using a crossflow and an electrical field,** S. Paas\*, P. Lösch, K. Nikolaus, S. Antonyuk, University of Kaiserslautern-Landau, Germany

**Development of a simulation tool to accelerate the design of forward osmosis processes,** B. Greisner\*, D. Mauer, MionTec GmbH; F. Rögener, TH Köln; A. Lerch, Technical University Dresden, Germany

**Why surface charge is important for filters operated by size exclusion,** T. Luxbacher\*, Anton Paar GmbH, Graz, Austria

## L12 Lab Scale Cake Filtration - Equipment and Fundamentals

10:45 room  
12:00 1

**Influence of the measurement resolution on the filtration properties - A comparison of two test setups,** N. Benz\*, P. Lösch, S. Antonyuk, Technische Universität Kaiserslautern, Germany

**Modeling of nonideal cake filtration by regression of simulation results,** T. Buchwald\*, H.K. Gunda, U.A. Peuker, Technical University Bergakademie Freiberg, Germany

**Cooling of filter cakes by evaporation of water in vacuum dewatering,** T. Kinnarinen\*, A. Häkkinen, Lappeenranta-Lahti University of Technology LUT, Finland

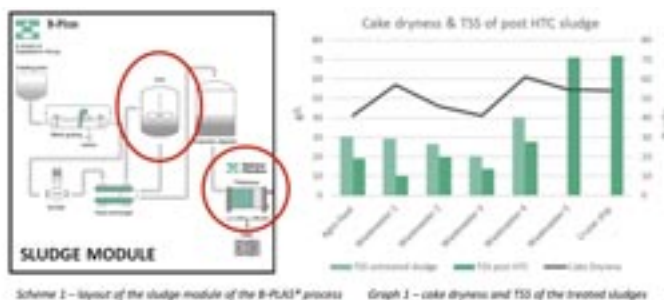
# Thursday, February 16, 2023

## L11 Filter Presses and Press Filters II

09:00 room  
10:15 1

**Quantifying the effects of clay on mineral tailings filtration,** Y. Luo\*, N.I.K. Ekanayake, S.P. Usher, K.P. Hapgood, P.J. Scales, A.D. Stickland, University of Melbourne; N. Amini, E. Moon, Deakin University, Australia

**Dehydration performance with filterpress of several hydrothermal treated waste sludges from different origins,** D. Pirini\*, D. Collini; B-PLAS s.r.l.; F. Kaswalder, N.M. Finocchiaro, Aqseptence Group s.r.l., Italy



**Reliable design and optimization of filter presses easy made by using the FILOS software,** I. Nicolaou\*, NIKIFOS Ltd, Cyprus

## G12 Indoor Air Cleaning

09:00 room  
10:15 2

**Investigation of indoor air cleaners in realistic scenarios by experiments and three-dimensional simulations,** S. Schumacher\*, K. Varzandeh, T. Hülser, C. Asbach, Institute of Energy and Environmental Technology e.V. (IUTA), C. Luzzato, J. Jilesen, Dassault Systemes Deutschland GmbH Germany

**Combining ionization and filter material for aerosol separation: Basic studies,** M. Lauer\*, R. Heidenreich, Institute of Air Handling and Refrigeration (ILK); C. Lerche, Ingenieurbüro Dr. Lerche GmbH; H. Siegmund, RL Raumlufttechnik und Raumluftqualität GmbH, Germany

**Inactivation of infectious bioaerosols by dielectric filter discharge,** S. Lee\*, K.-H. Baek, J.-Y. Park, S. Jung, E.-Y. Byeon, D.-G. Kim, Korea Institute of Materials Science (KIMS); S. Ryoo, Masan National Tuberculosis Hospital; S. Lee, Korea Conformity Laboratories, South Korea



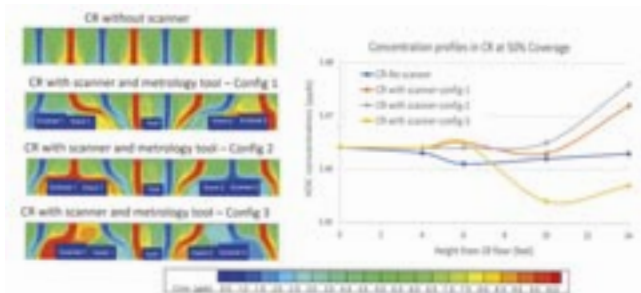
## G13 Indoor Air Quality

10:45 room 2  
12:00

**Energy-efficient operating concepts for air purification with cooperative ventilation systems based on simulations, sensor data and artificial intelligence**, L. Bittel, S. Berger, J. Niessner\*, L. Springsklee, Heilbronn University of Applied Sciences; Martin Lehmann, MANN+HUMMEL GmbH; F. Pagliarini, ebm-papst neo GmbH & Co. KG, Germany

**A comparative study on air filters to improve indoor air quality**, I.S. Akgün Güldür\*, A. Tüter, M.M. Ilgün, Arçelik A.S, R&D Center, Turkey

**Simulating contamination distribution in cleanroom environments**, A. Chakraborty \*, J.M. Lobert, Entegris, Inc., USA



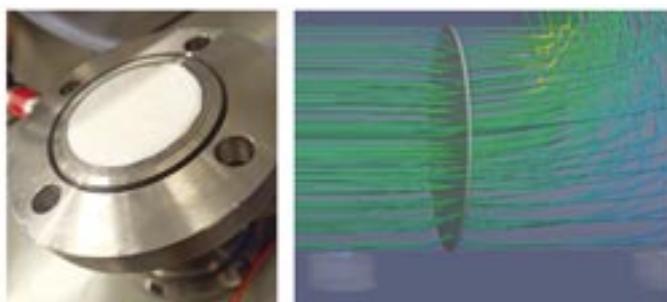
## F5 Media Deformation-Modelling and Simulation

10:45 room 3  
12:00

**Simulation and characterization of deformed filter media on the fiber level**, K.M. Höss\*, F. Keller, C. Schulz, MANN+HUMMEL GmbH; S. Schmauder, University of Stuttgart, Germany

**Efficient simulation of flow-induced deformation of woven filter media**, M. Krier\*, R. Kirsch, C. Mercier, J. Orlik, S. Rief, K. Steiner, Fraunhofer Institute for Industrial Mathematics (ITWM), Germany

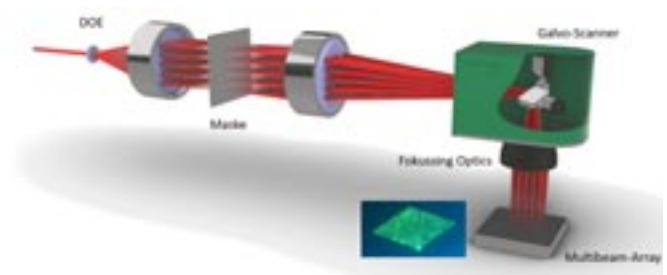
**Flow-induced deformation of nonwoven filter media: Experiments, modeling and simulation**, R. Kirsch, J. Köbler, N. Henkelmann, Fraunhofer Institute for Industrial Mathematics (ITWM); S. Antonyuk, V. Puderbach\*, M. Weirich, University of Kaiserslautern-Landau, Germany



## M5 Metal and Ceramic Membranes

10:45 room 4  
12:00

**Ultrafast laser precision drilling of metal and polymer membranes using multibeam scanner and UV-microscanner**, M. Osbild, P. Bremer\*, M. Reininghaus, Fraunhofer Institute for Laser Technology ILT, Germany



**Continuous cell cultivation with the perfusion crossflow fermenter (PCF)**, G. Grim\*, ANDRITZ Separation GmbH, Germany

**Slurry photocatalytic ceramic membrane reactor using Bi<sub>2</sub>O<sub>3</sub>/WO<sub>3</sub> composite for petrochemical industry wastewater treatment containing phenolic compound through visible-light-driven reactions**, Z. Sadeghian\*, Research Institute of Petroleum Industry (RIPI); M. R. Akrami, N. Ashrafzadeh, Iran University of Science and Technology (IUST), Iran; K. Sadeghian, University of Kaiserslautern-Landau, Germany

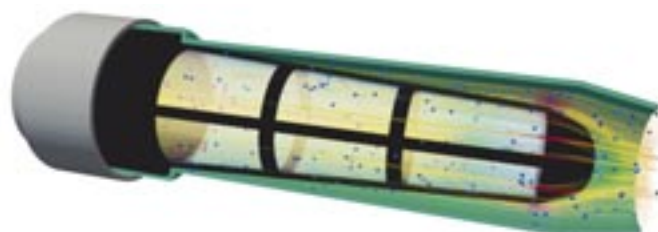
## L13 Digitalization of Separation Processes

13:00 room 1  
14:15

**Dewatering process: increasing productivity and embracing sustainability through digitalization**, J. Bruzzo\*, D. Otto, ROXIA Oy, Finland

**Potentials of digitalization in the direct recycling of Li-ion battery materials via centrifugation**, T. Sinn\*, M. Gleiß\*, H. Nirschl, Karlsruhe Institute of Technology (KIT), Germany

**Multiscale modelling and simulation of coolant particle filters and ion exchangers in electric mobility**, R. Kirsch, S. Osterroth\*, Fraunhofer Institute for Industrial Mathematics (ITWM), Germany



## G14 Automotive Applications I

13:00 room 2  
14:15

**AeroSolfd – Developing retrofit filtration devices for cleaner urban mobility: A project overview**, M.J. Lehmann\*, T. Warth, MANN+HUMMEL GmbH; J. Bilbao, Steinbeis Innovation gGmbH, M. Zessinger, Link Engineering Company; P. Henning, WABCO Radbremsen, Germany; T. Moreno, Agencia Estatal Consejo Superior de Investigaciones científicas, Spain; K.A. Jensen, National Research Centre for the Working Environment, Denmark, et al.

**Clean air in cars: a method to test air cleaning systems in cars under real-life conditions using bacteriophages as virus surrogate**, C. Hartl\*, B. Führer, V. Sharp, C. Kirchnawy, G. Ettenberger-Bornberg,, OFI Technology & Innovation Ltd, Austria; A. Löfvendahl, Volvo Car Corporation, Sweden

**It's a long way to clean air - If you wanna have zero emission cars**, S. Schütz\*, M. Schmidt, PALAS GmbH, Germany

## F6 Media Functionalization

13:00 room 3  
14:15

**Latest developments in plasma nanocoating technology to functionalize gas and liquid filter media**, F. Legein\*, Europlasma NV, Belgium

**Innovative bio-based filtration products made out of functionalised fibres**, I. Bernt\*, R. Schol, I. Kaczmarek, M. Crnoja-Cosic, Kelheim Fibres GmbH Germany

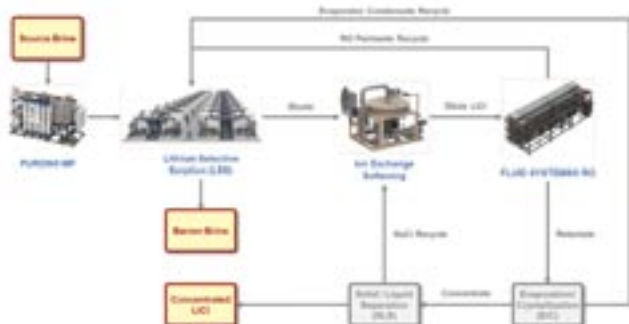
**Piezoelectric charge transfer phenomena**, K.-J. Choi\*, Clean & Science Co., Ltd, USA

## M6 Separation of Complex Systems

13:00 room 4  
14:15

**Enrichment of biofunctional proteins from acid whey by membrane filtration**, F. Ostertag\*, J. Hinrichs, University of Hohenheim, Germany

**The new Li-PRO™ process: a sustainable solution for lithium extraction**, J. André\*, Koch Separation Solutions, Germany

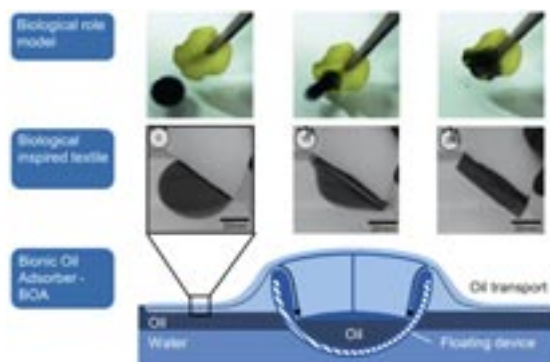


**Degradation and removal of polyester microplastics via  $\text{TiO}_2/\text{g-C}_3\text{N}_4$  photocatalytic membrane reactor**, M. Sharifi Teshnizi, S. Ayoubian Markazi, H. Khoramshahi, M. Karimi, Amirkabir University of Technology, Iran

## L14 Oil/Water- and Oil/Solid-Separation

14:45 room 1  
16:00

**Bioinspired oil/water separation with superhydrophobic textiles**, L. Beek\*, M. Akdere, T. Gries, RWTH Aachen University; P. Ditsche, M. Mail, W. Barthlott; University of Bonn; K. Klopp, Heimbach GmbH, Germany



**Enhancing filtration performances of wet-laid synthetic nonwovens thanks to improved structures and digital product development**, C. Prost, E. Ruiz\*, A. Corradi, O. Soikkeli, Ahlstrom-Munksjö, France/Italy/Finland; P. Eichheimer, M. Azimian, Math2Market GmbH, German

## G15 Automotive Applications II

14:45 room 2  
16:00

**Highly efficient nanofilter system for large scale petrol engine retrofit, core part of the EU Horizon Project AeroSolid**, A. Mayer\*, J. Czerwinski, T. Lutz, L. Rubino, L. Larsen, VERT Association, D. Engelmann, University of Applied Sciences Biel, Switzerland; V. Hensel, AURIGNA; M. Lehmann, Mann+Hummel GmbH; J. Dumno, CORNING GmbH, Germany

**Energy-efficient separation of nanoparticles through electrification of air filtration**, L. Petersen\*, A. Lawson, J. Niehoff, Hengst SE, Germany

**The Co-relation between actual vehicle performance and Laboratory test results of 3Wheeler air filter**, P.M. Gade, G.G. Garkhedkar\*, S.M. Chakote, R. More, Varroc Polymers Pvt Ltd, India; H. Sauter, Consultant, Germany

## F7 Progress in Electrospinning

14:45 room 3  
16:00

**Latest developments in plasma nanocoating technology to functionalize Defeating defects: new innovations in free-surface electrospinning**, J. Manasco\*, Elmarco, s.r.o., Czech Republic

**Electrospinning of polyurethane nanofibers with non-toxic solvents and production of hybrid filter media**, J. Liedtke\*, R. Weygandt, C. Mehning, University of Stuttgart, Germany

**Electrospun recycled poly(ethylene terephthalate) (PET) nanofiber for application in air filters**, G. Brunosi Medeiros\*, M.L. Aguiar, D. Sanches de Almeida, Federal University of São Carlos, Brazil

## M7 Membrane Fouling

14:45 room 4  
16:00

**Promoting fouling reversibility via introduction of sodium dodecyl sulfate prior to ultrafiltration of produced water in polishing step**, H. Idrees, I.M.A. ElSherbiny, S. Panglisch, University Duisburg-Essen (UDE), Germany

**Application of a hydrogen peroxide based cleaning strategy for ultrafiltration processes to protect the aquatic environment**, M. Werner\*, L. Matthies, MANN+HUMMEL Water and Fluid Solutions, A. Bauer, S. Krause, Darmstadt University of Applied Sciences, Germany



Figure 1: Lab scale (left), pilot plant (middle), full scale plant (right)

**New PAN-g-PEO ultrafiltration membrane: Filtration and anti-fouling performance with complex water composed of water/oil/particles**, E.H.I. Ndiaye\*, H. Nabet, J.-M. Pereuilh, S. Dehez, TotalEnergies; J.-M. Pandraud, Clean Membranes; J.M. Espenan, Polymem; N. Abidin, ABC Membranes, France





# Travel & Accommodation



**FILTECH 2023** will be held again at the venue Koelnmesse in Cologne. Due to Koelnmesse's central location, which is conveniently situated for all transport links, visitors can quickly reach the exhibition centre by car, train and plane.

## Train travel time from Airports to Cologne

From **Frankfurt Airport (FRA)**: —————> Approx. 50 min.  
From **Cologne-Bonn Airport (CGN)**: —————> Approx. 12 min.  
with train line S13 – Ticket Category 1B  
From **Düsseldorf Airport (DUS)**: —————> Approx. 45 min.

## koelnmesse Hotel Service

Find, compare, and book at your hotel with the online portal of the Koelnmesse Travel & Hotel Service. Make your online hotel accommodation reservation easily, securely and profit from favourable prices:

The Koelnmesse Travel & Hotel Service does everything to make your stay at **FILTECH 2023** as pleasant as possible. Use their experience and profit from particularly favourable prices.

For assistance please contact:

**Ms. Sara Langiu-Kollack**  
Koelnmesse Travel & Hotel Service  
Phone: +49 (0)221 8212087  
E-mail: s.langiu-kollack@koelnmesse.de

For online booking visit:  
[www.filtech.de](http://www.filtech.de) → plan your trip



Conference	Date	Early Bird until 01.12.2022	Normal Price from 01.12.2022
3-Day-Conference Ticket	14.-16.02.2023	€ 660,-	€ 850,-
1-Day-Conference Ticket	14.02.2023	€ 320,-	€ 410,-
1-Day-Conference Ticket	15.02.2023	€ 320,-	€ 410,-
1-Day-Conference Ticket	16.02.2023	€ 320,-	€ 410,-

## The Conference registration includes

- Proceedings featuring all papers in an abstract book & personalized download-link
- Cologne Public Transport Ticket (February 13 – 16, 2023)
- Lunch/es and Refreshments during breaks
- Entrance to the FILTECH 2023 Exhibition
- FILTECH 2023 Exhibition Catalogue
- Welcome Reception on February 14, 2023

Short Courses	13.02.2023	Early Bird until 01.12.2022	Normal Price from 01.12.2022
Short Course I – Solid/Liquid Separation		€ 490,-	€ 610,-
Short Course II – Fine Dust Separation		€ 490,-	€ 610,-

## The Short Course registration includes

- Extensive Short Course Notes
- Cologne Public Transport Ticket (February 13 – 16, 2023)
- Lunch and Refreshments during breaks
- Entrance to the FILTECH 2023 Exhibition
- FILTECH 2023 Exhibition Catalogue
- Welcome Reception on February 14, 2023

Trade Visitors	Early Bird until 14.01.2023	Normal Price from 15.01.2022
1-Day Visitor Ticket	€ 20,-	€ 40,-
2-Day Visitor Ticket	€ 25,-	€ 45,-
3-Day Visitor Ticket	€ 30,-	€ 50,-

## The Visitor registration includes

- Access to the Exhibition
- Free Copy of the Exhibition Catalogue & Hall Plans
- Free print-at-home Public Transport Ticket for Cologne

Fees already include 19% German VAT.

## Online Ticketing only

### Conference/Short Course Rules and Regulations

Substitutions may be made at any time. Please advise the organizer of a change of name. If you find it necessary to cancel the registration completely, please notify the organizer immediately. Provided written notice is received by January 01, 2023 a full refund will be given. Provided written notice is given by January 15, 2023 a 50% refund will be given. We have a 100% refund policy if conference attendees are unable to attend due to travel restrictions. If for any reasons the event will be cancelled the conference, short course and visitor registration fees will of course be fully refunded. The organizers responsibility is limited to the rules and regulations according to the legal regulations. Organizer: Filtech Exhibitions Germany · PO Box 12 25 · 40637 Meerbusch – Germany

