



WFI 2021

Waterloo Filtration Institute

WFI 2021 ANNUAL VIRTUAL CONFERENCE

Post-Pandemic / Future Clean Air and Water Solutions

December 7-8, 2021

Meet leading experts online for emerging new opportunities, the latest updates, and trends of future clean air and water solutions



<https://www.wficonference.org/>





Welcome Message from WFI 2021 Chairs

On behalf of the WFI 2021 organizing committee, it is our pleasure to invite you to join the Waterloo Filtration Institute 2021 Annual Conference (WFI 2021). It will be held online, December 7-8, 2021, 8:00-12:00 am EST. The theme of this conference is "Post-Pandemic/Future Clean Air and Water Solutions." It will be an international conference to address the continuously critical roles of filtration and separation for public safety and health. The virtual conference will feature the following four sessions, and each session will have four speakers (20 min presentation plus 5 min Q&A for each speaker).

- Market Dynamics and Mega Trends after COVID-19
- Novel Clean Air Solutions for Public Health
- Emerging Technologies in Water Filtration
- New Techniques in Product Evaluation

We are excited to have 16 distinguished leading experts from academia and the industry to share their views of emerging new opportunities, new developments, the latest updates, and trends of future clean air/water solutions associated with the filtration and separation industry.

WFI is dedicated to supporting the growth of the global filtration industry and the advancement of filtration and separation processes for a clean, healthy, and sustainable world. We thank all the committee members, volunteers, and speakers for putting this fantastic program together to promote public health and clean environment via industrial innovations.

As the conference chairs, we would like to encourage you to join us at WFI 2021 to meet the experts and speakers online for an informative and interactive conference of the latest updated topics on Post-Pandemic/Future Clean Air and Water Solutions.

We look forward to seeing you at WFI 2021.

Sincerely,



Conference Chair

Dr. Christine Sun, President
WFI (Canada)



Conference Co-Chair

Mr. Jay Forcucci, Vice President
Cerex Advanced Fabrics (USA)



Conference Co-Chair

Mr. Richard Lydon, Professor
The Filtration Society (UK)



Program-at-a-Glance

Date/Time	Tuesday, December 7, 2021, 8:00 am – 12:00 pm, EST
8:00 - 8:10	Welcome and Introduction
8:10 - 9:50	Session I. Market Dynamics and Mega Trends after COVID-19 Session Chair: Mr. Bob Mcilvaine
9:50 - 10:00	Break
10:00 - 11:40	Session 2. Novel Clean Air Solutions for Public Health Session Chair: Dr. Thomas Caesar
11:40 - 12:00	2021 Product of Year Award Ceremony

Date/Time	Wednesday, December 8, 2021, 8:00 am – 12:00 pm, EST
8:00 - 8:10	Welcome and Introduction
8:10 - 9:50	Session 3. Emerging Technologies in Water Filtration Session Chair: Dr. Thomas Peters
9:50 - 10:00	Break
10:00 - 11:40	Session 4. New Techniques in Product Evaluation Session Chair: Dr. Paolo Tronville & Dr. Swarna Agarwal
11:40 - 12:00	CFSS 2021 Ceremony



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Waterloo Filtration Institute

Speakers



Mr. Sean O'Reilly
AAF Flanders,
USA



Dr. You-Zhi Tang
CleanTech Capital Inc,
Canada



Mr. Bob Mcilvaine
The Mcilvaine Company,
USA



Mr. Tyler Smith
Johnson Controls,
USA



Dr. Thomas Caesar
Freudenberg Filtration
Technologies, Germany



Dr. Christof Asbach
Inst. of Ene. and Env. Tech.,
Germany



Dr. Zhengwei Long
Tianjin University
China



Dr. Ellie Amirnasr
qlair
USA



Mr. Jochen Kallenberg
Dryden Aqua
Switzerland



Dr. Kuo-lun (Allan) Tung
National Taiwan Univ.
Taiwan



Dr. Peter Fiske
National Alliance for Water
Innovation (NAWI), USA



Dr. Anntti Häkkinen
LUT University
Finland



Ms. Sarah Smit
Nelson Laboratories, USA



Mr. Al Vatine
LMS Technologies, USA



Dr. Nicolas Petillon
IFTS, France



Dr. Miao Li
Cummins Filtration, USA



WFI 2021

Waterloo Filtration Institute

Organizing Committee



Conference Chair

Dr. Christine Sun
WFI (Canada)



Conference Co-Chair

Mr. Jay Forcucci
Cerex Advanced Fabrics (USA)



Conference Chair

Mr. Richard Lydon
The Filtration Society (UK)



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Mr. Mitch McCreary
WFI (Canada)



Session Chair

Mr. Bob McIlvaine
McIlvaine Company (USA)



Session Chair

Dr. Thomas Caesar
Freudenberg Filtration Tech., (Germany)



Session Chair

Dr. Thomas Peter
Peters Consulting (Germany)



Session Chair

Dr. Swarna Agarwal
Parker Hannifin (USA)



Session Chair

Dr. Paolo Tronville
Politecnico di Torino (Italy)



Mr. Gongbi Yao
China Filtration &
Separation Society (China)



Dr. Vincent Hu
Taiwan Filtration &
Separation Society (Taiwan)



Mr. Vincent Edery
France Filtration & Separation
Society (France)

**WFI 2021**

Waterloo Filtration Institute

Post-Pandemic/Future Clean Air and Water Solutions

Conference Program

Tuesday, December 7, 2021, 8:00 am – 12:00 pm, EST

8:00-8:10 Welcome and Introduction

Session 1: Market Dynamics and Mega Trends after COVID-19

8:10-8:35 **Healthy Buildings are the Best Medicines for our Well Being**, Mr. Sean O'Reilly, AAF Flanders, USA
8:35-9:00 **Air Filtration - What Products the General Public, Building Managers and Government Officials May Look for During and Post Pandemic?**, Dr. You-Zhi Tang, Canada CleanTech Capital, Canada
9:00-9:25 **COVID as a Catalyst for Filtration Industry Changes**, Mr. Bob Mcilvaine, The Mcilvaine Company, USA
9:25-9:50 **The Future of Indoor Air Quality: Leveraging Outcomes to Sustain a Focus on IAQ post-COVID**, Mr. Tyler Smith, Johnson Controls, USA
9:50-10:00 Bio Break

Session 2: Novel Clean Air Solutions for Public Health

10:00-10:25 **High quality Air Filtration for improved Indoor Air Quality**, Dr. Thomas Caesar, Freudenberg Filtration Technologies, Germany
10:25-10:50 **Air Filtration Solutions to Minimize Infection Risks**, Dr. Christof Asbach, Institute of Energy and Environmental Technology, Germany
10:50-11:15 **What Does HVAC Need for the New COVID-19 Challenges?**, Dr. Zhengwei Long, HVAC Engineering, Tianjin University, China
11:15-11:40 Dr. Ellie Amirnasr, **Your Brain on Air Pollution**, qclair, USA
11:40-12:00 **2021 Product of the Year Award Ceremony**

Wednesday, December 8, 2021, 8:00 am – 12:00 pm, EST

8:00-8:10 Welcome and Introduction

Session 3: Emerging Technologies in Water Filtration

8:10-8:35 **Improving filtration Performance Using Activated Filter Media AFM**, Mr. Jochen Kallenberg, Dryden Aqua, Switzerland
8:35-9:00 **Ultrathin Silica Membranes with Straight-Through Channels for High-Performance Nanofiltrations**, Dr. Kuo-lun (Allan) Tung, National Taiwan University, Taiwan
9:00-9:25 **Distributed Water Treatment and Reuse: The NAWI Vision**, Dr. Peter Fiske, National Alliance for Water Innovation (NAWI), USA
9:25-9:50 **New Developments in Conservation and Reuse of Water in Industrial Processes**, Dr. Anntti Häkkinen, LUT University, Finland
9:50-10:00 Bio Break

Session 4: New Techniques in Product Evaluation

10:00-10:25 **Face Mask Performance Requirements and Testing Industry Trends Resulting from the Pandemic**, Ms. Sarah Smit, Nelson Laboratories, LLC, USA
10:25-10:50 **Facility and equipment to Study, by-products produced by air cleaners with technologies other than filtration**, Mr. Al Vatine, LMS Technologies, Inc., USA
10:50-11:15 **Upgrading of the existing standards to qualify nano and microfiltration water filter cartridges**, Dr. Nicolas Petillon, IFTS, France
11:15-11:40 **Adsorption Filtration of Harmful Chemicals for Clean Air and Water**, Dr. Miao Li, Cummins Filtration, USA
11:40-12:00 **CFSS 2021 Certification Ceremony**
12:00 **End**



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Tuesday, December 7, 2021, 8:00 am – 12:00 pm, EST

8:00-8:10 Welcome and Introduction

Session 1: Market Dynamics and Mega Trends after COVID-19

8:10-8:35 Healthy Buildings are the Best Medicines for our Well Being, Mr. Sean O'Reilly, AAF Flanders, USA



There has been so much written about IAQ/IEQ over the years, but particularly over the last 2 years, since Covid19. It is well documented that we spend, on average, 90% of our time indoors. Therefore, it is incumbent on the building owner/occupiers to make the buildings and homes we live and work in as safe as possible. Our bodies have an intimate relationship with both outdoor and more so, indoor air. A nasty cocktail of pollutants and contaminants can reach our brains, through our mouths, our eyes, and our bloodstream. Although there is so much information publicly available about the detrimental effects of IEQ on our health, the engineering, and standards/guidelines community have focused on designing buildings for comfort, energy efficiency and sustainability but almost nothing on human health. How we measure, monitor, and quite frankly monetize (for those of us in the industry) 'IEQ' beyond supplying a product to meet a given standard or meets a certain specification is not enough. This is our challenge, to make the invisible visible.

8:35-9:00 Air Filtration - What Products the General Public, Building Managers and Government Officials May Look for During and Post Pandemic?, Dr. You-Zhi Tang, Canada CleanTech Capital, Canada



During the Tokyo Olympics, the accordion-shaped face masks worn by American athletes attracted attention. This is, in fact, nothing new for air filtration professionals as pleated filters are widely used in the filtration industries. However, this does raise the question of what more the industry could do during and after the pandemic to satisfy the needs of our society, from personal protection to building air purification. While the filtration industry will continue to improve its existing products and develop new ones, it is worth looking into what is sought after from the consumers' point of view. For example, the Government of Canada's critical measures recommended in indoor environments during the pandemic are ventilation and filtration, in addition to physical distancing, wearing the face mask, and other hygiene practices. Stand-alone air cleaning devices are widely used indoors in some Asian countries, becoming more used for local IAQ improvement of concerned areas worldwide. Nevertheless, air cleaning systems with lower capital and operational cost (total ownership cost) and higher efficiency are highly in demand.

9:00-9:25 COVID as a Catalyst for Filtration Industry Changes, Mr. Bob Mcilvaine, The Mcilvaine Company, USA



What do face masks, gas turbines, vehicles, commercial HVAC, wildfire-prone areas, and pharmaceutical cleanrooms have in common? The answer is "air purity". COVID 19 has been a catalyst leading to filters which will better remove particles in the 0.3-micron range and smaller. Higher efficiency not only reduces disease transmission but lowers gas turbine maintenance and improves semiconductor yield. Advances in measurement allow you to measure viruses and even individual toxic metals in real time. Understanding of the one-stop flight phenomenon where a particle entrained in a droplet may only be temporarily captured due to evaporation is important. Advances in air flow include local air purifiers and better hooding designs. The concept of a very clean box within a clean box within a cleaner than ambient box is being applied in buildings and cleanrooms. It has even been expanded to an area concept with the placement of filter cubes at intersections. These advancements are occurring more rapidly due to the focus on COVID and a better understanding of the importance of better air purity. Water quality issues have also been an important subject. Virus measurement in wastewater has allowed early detection of virus outbreaks. A number of consulting firms are providing safety seals for buildings to include both air and water ratings.



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Session 1 Continued

9:25-9:50 The Future of Indoor Air Quality: Leveraging Outcomes to Sustain a Focus on IAQ post-COVID, Mr. Tyler Smith, Johnson Controls, USA



The airborne nature of COVID-19 is well-established. So are the infection risk mitigation strategies – including ventilation, air filtration, humidity control and disinfection – possible via HVAC and building management systems (BMS). However, the benefits of good indoor air quality (IAQ) extend well beyond infection risk mitigation. Those benefits include important health, wellness, and financial outcomes for building operators and their occupants, such as:

- Improved cognition and productivity
- Rental and lease premiums
- Higher average standardized test scores

Additionally, research into the linkage between good IAQ and health and wellness outcomes is accelerating in line with the general public's understanding of IAQ and its value. Mr. Smith will address the science behind good air filtration and IAQ, review potential health and wellness outcomes associated with good IAQ and propose strategies to ensure a sustained focus on IAQ post-COVID.

9:50-10:00 Bio Break

Session 2: Novel Clean Air Solutions for Public Health

10:00-10:25 High quality Air Filtration for improved Indoor Air Quality, Dr. Thomas Caesar, Freudenberg Filtration Technologies, Germany



The quality of the air we breathe has never been under such a high public focus as it is today during the Covid19 pandemic. But society needs to be aware that air may not only contain infectious virus but also can contain other harmful particles and gases like bacteria, allergens, toxic gases, VOCs or just small particles which can be harmful already just because of their small size. Air is the most important, but also most underestimated consumable. We take much care about the food we eat or the beverages we drink, but too little about the air we breathe. Humans can survive without food for a few weeks, without drinking for a few days, but without breathing, just a few minutes. Air handling units using high quality and efficient fine filters and by regarding specific advice given for the pandemic times do reduce the virus concentration in buildings. Together with other measures like keeping distance and wearing face masks, this can reduce the infection risk significantly. But even beyond the pandemic, all technologies are available to ensure healthy air in our homes and buildings. They “just” need to be designed, installed, operated, and maintained in a proper and efficient way to ensure the quality of the air we breathe. Thereby, a holistic approach is essential. None of the components of a building ventilation system on its own can ensure good air quality and minimum energy consumption at the same time. This can only be ensured if all components, the whole building, including its occupants, work smoothly together like a well-oiled machine.



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Session 2 Continued

10:25-10:50 Air Filtration Solutions to Minimize Infection Risks, Dr. Christof Asbach, Institute of Energy and Environmental Technology, Germany



Respiratory infections often occur through the inhalation of airborne pathogens like SARS-CoV-2. These viruses can become airborne with liquid aerosol particles exhaled during normal breathing, speaking, singing, coughing, or sneezing. Once airborne, these liquid particles undergo dynamic changes, i.e., they shrink due to evaporation of the liquid phase, while the residual particles are transported in the air due to e.g. inertia, sedimentation, advection and thermal buoyancy. Two different possible routes of infections need to be distinguished, direct and indirect infections. Whereas a direct infection means that the aerosol plume exhaled by an infectious person is directly inhaled by another person, indirect infections occur, when the exhaled viruses are not removed from the air space, therefore accumulate over time and an increasing virus concentration is inhaled by other persons in the same air space. Indirect infections are a substantial risk in closed indoor environments with no or poor air ventilation, whereas they are nearly impossible outdoors, where the exhaled breath is quickly dispersed and virus concentrations diluted due to ubiquitous natural air flows. Various air filtration solutions are readily available to minimize infection risks, of which face masks, air purifiers, and HVAC systems are the most prominent. Each of the solutions has their own advantages and disadvantages. The presentation will introduce the various filtration solutions and discuss their pros and cons. Experimental data on the efficacy of the different measures will be provided and conclusions drawn towards their effectiveness to lower infection risks.

10:50-11:15 What Does HVAC Need for the New COVID-19 Challenges?, Dr. Zhengwei Long, HVAC Engineering, Tianjin University, China



People usually spend 90% of their time in buildings. And air transmission is a typical way of transmission of the COVID-19 virus. Thus, people may be infected by the virus transmitted through the HVAC system of the buildings. There are many types of building HVAC systems. It is a big challenge to prevent the spread of the virus in the context of the pandemic. This report will analyze the possible virus transmission pathways in different building HVAC systems, as well as the removal ability of the existing air purification technologies. We will discuss the combination of HVAC systems and air purification technologies to prevent COVID-19 viruses from spreading in the building environment.

11:15-11:40 Your Brain on Air Pollution, Dr. Ellie, Amirnasr, qlair



Air pollution can have a temporary and permanent effect on cognitive functionality of people and cost the global economy nearly \$3 trillion. What can we do to create a healthy environment for ourselves and future generations? In 1906, thermostats were introduced as the first means for measuring indoor environmental conditions. Then emphasis on comfort sparked the beginning of commercial building automation controls in 1960 and today Building automation joins the cloud. There is no better time for data driven clean air management solutions as attention shifts to occupant health, asset optimization, and cost reduction. In this presentation you will find information about critical air quality parameters and their impact on our health, environment, and operational cost. In addition, we will present ways to improve and maintain healthy air both indoor and outdoor. We will also show how to reduce C-footprint of a building using air quality and ventilation information. In today's world there is no one solution for air quality improvement. We need an end-to-end solution for clean air management.

11:40-12:00

2021 Product of Year Award Ceremony



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Wednesday, December 16, 2020 , 8:00 am – 12:00 pm, EST

8:00-8:10

Welcome and Introduction

Session 3: Emerging Technologies in Water Filtration

8:10-8:35 Improving filtration performance using activated filter media AFM, Mr. Jochen Kallenberg, Dryden Aqua, Switzerland



Silica sand and other frequently used natural filter media such as garnet, zeolite and anthracite are good filtration media, but they are also a perfect home for growing bacteria on their surfaces and pore structures. Bacteria are required in biofilters and slow bed sand filters, but in rapid gravity or pressure filters, bacteria cause a biodynamic mechanical instability of performance. Bacteria stick themselves onto the surface of sand or other natural filter media by secreting an extracellular polymeric substance (EPS) and alginate jelly. EPS forms a biofilm that provides a home for bacteria and pathogens and even protects them from oxidation by disinfectants such as chlorine. Bacteria can double in biomass every 30 minutes and increase the differential pressure in media filtration, thereby half the length of the filtration run phase, promoting the development of wormhole channeling altogether leading to an insufficient filtration performance. Activated Filter Media - AFM® is based on green and brown up-cycled container glass, manufactured in state-of-the-art factories. AFM® contains metal oxide catalysts which generate free hydroxyl radicals leading to a high oxidation potential and thereby preventing bacteria growing on the surface of AFM®. During the 3-step chemical and heat activation (sol-gel) process the AFM® surface is highly increased by generating a mesoporous surface structure. In the activation process a negative surface charge (AFM®-s) or hydrophobic surface (AFM®-ng) is established providing for superior surface adsorption and filtration performance including excellent removal of heavy metals, sub-micron particles and organic molecules such as oil (hydrocarbons) and microplastics. AFM® reduces the biological risk from bacteria and parasites and is an effective barrier against Cryptosporidium and giardia.

8:35-9:00 Ultrathin Silica Membranes with Straight-Through Channels for High-Performance Nanofiltrations, Dr. Kuo-lun (Allan) Tung, National Taiwan University, Taiwan



A nature-inspired mesoporous nanofiltration membrane with unprecedented permeability and high selectivity for selective protein and nanoparticle separations is reported herein. We describe a diatom-mimicking hierarchically porous membrane that consists of a single layer mesoporous silica thin film (MSTF) with perpendicular pores supported on top of a macroporous anodic aluminum oxide (AAO) membrane (MSTF-AAO) for nanofiltration. In the second part, a thin membrane with vertically aligned mesoporous silica nanochannels was modified with a long silane group molecule (E-MSTF-LTA) for organic solvent nanofiltration (OSN). The ultrathin thickness, low tortuosity, and ordered vertical channels of E-MSTF-LTA endowing it with an ultrahigh ethanol flux (110 LMH/bar) over the current state-of-the-art OSN membranes. Furthermore, a 99% rejection of Evans blue (EB) was demonstrated and a cut-off of approximately 660 Da was achieved. Besides, modified Hagen-Poiseuille (HP) equation was applied to evaluate the theoretical permeance which turns out very similar to the experimental results. Results show that viscosity is the critical factor in determining solvent permeation, while size exclusion effect dominates solutes rejection. These findings open up a way to design next-generation vertically aligned OSN membrane and shed light on OSN performance, both empirically and theoretically, under this system.



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Session 3 Continued

9:00-9:25 Distributed Water Treatment and Reuse: The NAWI Vision,

Dr. Peter Fiske, National Alliance for Water Innovation (NAWI), USA

The world is experiencing an inexorable shift to a hotter, dryer future. The water supply and distribution systems built in the 20th century and reliant largely on freshwater sources are not only unable to adapt to this change but are themselves reaching the end of their service life in many countries. The NAWI vision is to enable a much larger fraction of “non-traditional” water sources (wastewater, brackish and impaired groundwater, ocean water) to be treated, used and reused as a marginal water supply that augments our 20th century freshwater-based water supplies. Funded by the U.S. Dept. of Energy for 5 years, NAWI’s goal is to invest in early-stage applied research that lowers the cost of small-scale water treatment, desalination and reuse systems. I will highlight some of the key areas of research investment including modular, electrically-driven pretreatment systems that enable faster and more efficient suspended solids removal, as well as some of the emerging frontiers of research on brine waste management and valorization.



9:25-9:50 New Developments in Conservation and Reuse of Water in Industrial Processes,

Professor Anntti Häkkinen, LUT University, Finland

Transition towards more sustainable use of raw materials and resources in the society requires a radical shift from the typical linear take-make-consume-dispose model to the so-called circular economy. One part of this shift is that the resource efficiency of current industrial processes needs to be improved and more importantly, the utilization rate of current waste materials as secondary resources needs to be increased. Solid liquid separation is one of the most common chemical and industrial unit operations and it has a significant role when novel process solutions are being developed. Owing to rising energy prices, increasingly scarce water resources as well as decreasing quality of the primary raw materials, it is essential to strive for stronger energy and water saving solutions in separation processes. In addition, the quality requirements set for the final product of the separation processes are getting tougher at the same time when new innovations raise new performance challenges for separation technologies. Solid liquid separation plays a key role in solving cost efficiently some of these challenges. In this presentation, some developments of novel water treatment technologies in conservation and reuse of water for industrial processes will be presented.



9:50-10:00 Bio Break



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Session 4: New Techniques in Product Evaluation

10:00-10:25 Face Mask Performance Requirements and Testing Industry Trends Resulting from the Pandemic,
Ms. Sarah Smit, Nelson Laboratories, LLC, USA



The high demand for medical face masks, respirators, and general use masks created a wave of companies joining the industry as manufacturers, laboratories, consultants, and regulators. Navigating the required testing and regulatory requirements, especially as they are rapidly changing, has been difficult. Comparing results between product types when the required testing for breathability and filtration efficiency is not comparable causes a great deal of confusion and misconception of the products ability. The number of labs that now offer face mask testing has increased and the majority of them are new to this type of testing. With varying test results, how can manufacturers have confidence in the quality of the results? Additionally, how can end users be confident the mask they purchased does what it claims? The industry has come together to address these issues. Some meetings have resulted in successful ballots of new standards or added requirements to existing standards. Others have identified more work and research that needs to be done to determine how the standards can improve.

10:25-10:50 Facility and equipment to Study, by-products produced by air cleaners with technologies other than filtration,
Mr. Al Vatine, LMS Technologies, Inc., USA



Air cleaners that utilize different technologies to deactivate the micro-organism achieve this by producing other gases and products to affect the genetics or surface of the biologicals. There is a need to study these by-products and make sure that they are not harmful to humans. The manner this was achieved previously involved the absorption of volatiles and aldehydes into certain absorbent tubes. The tubes were then treated to release the by-product into GC mass and liquid chromatography systems to be analyzed. This method was not 100 percent reliable. There have been advances in the above-mentioned detection technologies, and the new GC Mass/PTR-TOF analyzers can do all these analyses in real-time and much more accurately. Also, these systems can separate solid particulate from gases and analyze these solid particles. The analysis of solid particles can be substantiated later by SEM/EDS for the type of compound in these particulates.



Post-Pandemic/Future Clean Air and Water Solutions Conference Program & Abstracts

Session 4 Continued

10:50-11:15 Upgrading of the existing standards to qualify nano and microfiltration water filter cartridges,

Dr. Nicolas Petillon, IFTS, France

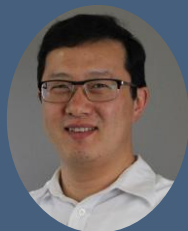
Unlike lubricating oil or fuel filtration fields, process fluid filtration is not broadly standardized in the world. Only French organizations such as AFNOR has developed in 2000's a full set of 11 NFX 45 300 standards to qualify and quantify the performances of liquid filters from 1 to 25 μm . These 11 standardized procedures had been written for the nuclear industry in the first time and then submitted in 2007 at the European level to the water conditioning equipment inside buildings (EN 13443 parts 1 and 2) from 1 to 150 μm . After 15 years, it appears that the nowadays procedures need to be upgraded and expanded to the nanofiltration field. A first step had been dealing with adjusting the particle size distribution of the well-known silica test dust to the expected filtration ratings in order to prevent from filter cake processing which misleads the exact characteristics of solid separation of the filter cartridge. A second step had been to expand the quantification procedure to nanofiltration cartridges (ratings varying from 0,1 to 1 μm) with monosized latex beads. The conference to be held will describe the test dust underuse, the adapted optics vs. the filtration ratings (light scattering technics vs. light extinctions sensors) and all the corresponding evolutions which lead to improvements in terms of better reliability in the results and reduction of the uncertainties when qualifying liquid filter cartridges.



11:15-11:40 Adsorption Filtration of Harmful Chemicals for Clean Air and Water,

Dr. Miao Li, Cummins Filtration, USA

Adsorption filtration has been widely used in many filtration industries. In short, it refers to the removal of harmful chemicals, either in states of gas or liquid solution, from fluid streams by means of adsorptive mechanisms. A common material used in adsorption filtration products is activated carbon (AC) flanked by fibrous media, where AC is primarily responsible for removing chemicals. Thus, it is critical that AC and the carbon-impregnated media are correctly evaluated. Such evaluations can be conducted not only by standard tests, but also at ones similar to environmental conditions. This presentation focuses on experimental methods practiced by Cummins Filtration to evaluate AC filtration solutions, as well as endeavors to investigate more sensible test methods and procedures than current ones.



11:40-12:00

CFSS 2020 Certification Ceremony

12:00

End



WFI 2021

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Upcoming Filtration Events

- ❑ **FILTECH 2022** | March 8-10, 2022 | Cologne, Germany
- ❑ **FiltXPO™** | March 29-31, 2022 | Miami Beach, FL USA
- ❑ **WFC 13** | October 5 - 9, 2022 | San Diego, CA, USA



info@wfinstitute.com, 1-866-546-0688
Suite 101, 150 Bridgeland Ave, Toronto, M6A 1Z5, Canada